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PART I: INTRODUCTION

This document supports the Preliminary 2010 Effluent Guidelines Program Plan. It presents the methodology used to perform the annual reviews of industrial discharges required by the Clean Water Act and the results of the reviews.

1. BACKGROUND

This section explains how the Effluent Guidelines Program fits into EPA's National Water 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 guidelines 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 Clean Water Act (CWA), which enables EPA and the states 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 effluent limitations, or technology-based controls such as effluent guidelines and technology-based effluent limitations.

The CWA gives states the primary responsibility for establishing, reviewing, and revising water quality standards. These standards 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, based on current available technologies. These guidelines and standards are then incorporated into discharge permits as technology-based effluent limitations (U.S. EPA, 1996). While technology-based effluent limitations in discharge permits may be as stringent as or more stringent than water quality-based effluent limits, the effluent guidelines program is not specifically designed to ensure that the discharge from each facility meets the water quality standards of its receiving 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. These water-quality based limits may require industrial facilities to meet requirements that are more stringent than those in a national effluent guideline regulation. EPA notes that the various components of water quality-based permitting (water quality standards, water quality-based effluent limits, and total maximum daily loads) are in different stages of development nationally and by state, which may result in different levels of protection across states. Therefore, national categorical effluent limitations and standards remain a critical component of EPA's CWA Program. 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.

The 1972 CWA 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 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 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.

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.

The CWA directs EPA to promulgate effluent limitations guidelines and standards through six levels of control:

1. Best practicable control technology currently available (BPT);
2. Best available control technology economically achievable (BAT);
3. Best conventional control technology (BCT);
4. New source performance standards (NSPS);

5. Pretreatment standards for existing sources (PSES); and
6. Pretreatment standards for new sources (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.

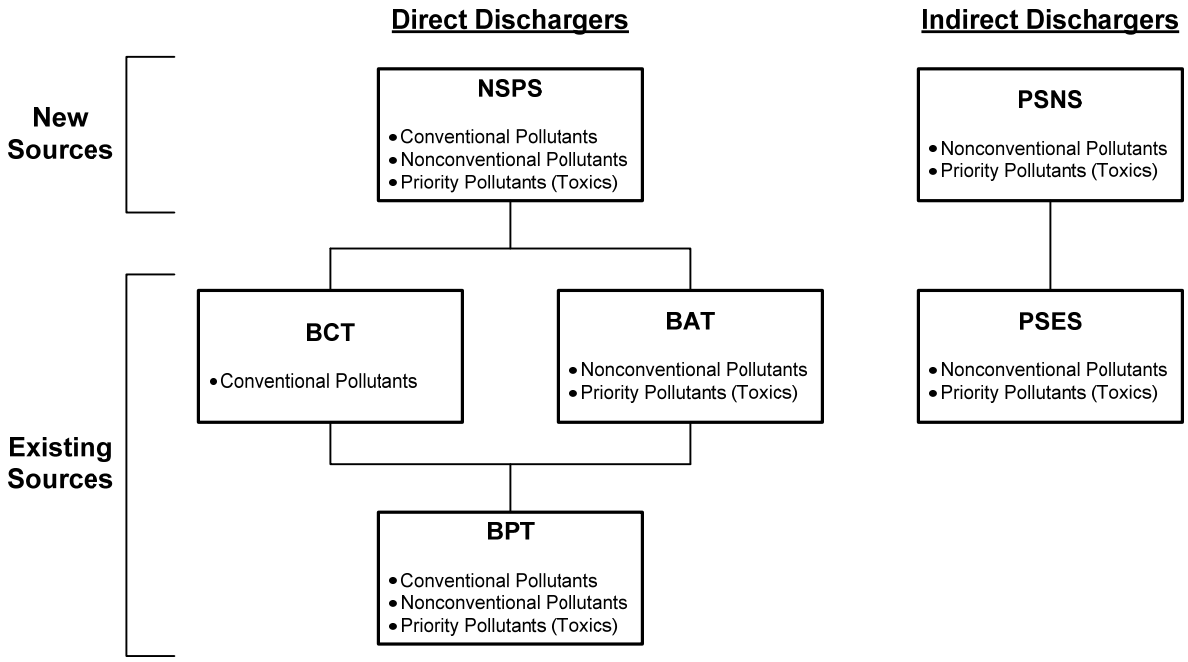


Figure 1-1. Regulations of Direct and Indirect Wastewater Discharges Under NPDES

1.3.1 Best Practicable Control Technology Currently Available (BPT) — CWA Sections 301(b)(1)(A) and 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) and 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) and 304(b)(2)

For toxic pollutants and nonconventional pollutants, EPA promulgates effluent guidelines based on BAT. See CWA sections 301(b)(2)(C), (D), and (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. In addition to end-of-pipe wastewater treatment, 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 wastewater conveyance and sludge disposal. 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 700 billion pounds of toxic pollutants each year.

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

In addition to establishing new regulations, the CWA also requires EPA to review existing effluent guidelines annually. 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). This document explains how EPA uses reported discharge data and other factors to conduct this review. 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)(1)(A) requires EPA to publish an Effluent Guidelines Program Plan every two years that establishes a schedule for the annual review and revision, in accordance with section 304(b), of the effluent guidelines that EPA has promulgated under that section. EPA's Preliminary 2010 Plan announces the schedule for the section 304(b) reviews. The schedule is as follows: EPA will coordinate its annual review of existing effluent guidelines under section 304(b) with its publication of the preliminary and final Plans under CWA section 304(m). In other words, in odd numbered years, EPA intends to complete its annual review upon publication of the preliminary Plan that EPA must publish for public review and comment under CWA section 304(m)(2). In even numbered years, EPA intends to complete its annual review upon the publication of the final Plan. EPA's 2009 annual review is the review cycle ending upon the publication of this Preliminary 2010 Plan.

EPA is coordinating its annual reviews under section 304(b) with publication of Plans under section 304(m) for several reasons. First, the annual review is inextricably linked to the planning effort, because the results of each annual review can inform the content of the preliminary and final Plans (e.g., by identifying candidates for ELG revision for which EPA can schedule rulemaking in the Plan, or by calling to EPA's attention point source categories for which EPA has not promulgated effluent guidelines). Second, even though not required to do so under either section 304(b) or section 304(m), EPA believes that the public interest is served by periodically presenting to the public a description of each annual review (including the review process employed) and the results of the review. Doing so at the same time EPA publishes preliminary and final Plans makes both processes more transparent. Third, by requiring EPA to review all existing effluent guidelines each year, Congress appears to have intended that each successive review would build upon the results of earlier reviews. Therefore, by describing the 2009 annual review along with the preliminary 2010 Plan, EPA hopes to gather and receive data and information that will inform its reviews for 2010 and the final 2010 Plan.

1.6 Background References

1. U.S. EPA. 1996. *U.S. EPA NPDES Permit Writers' Manual*. Washington, DC. (December). EPA-833-B-96-003. Available online at: http://cfpub.epa.gov/npdes/writermanual.cfm?program_id=45.

2. PUBLIC COMMENTS ON THE FINAL EFFLUENT GUIDELINES PROGRAM PLAN FOR 2008

EPA published its Final 2008 Effluent Guidelines Program Plan (2008 Final Plan) on September 15, 2008 (73 FRN 53218) and requested comments on various aspects of its analyses, data, and information to inform its 2009 annual review and detailed studies. The Agency received two comments on the 2008 Final Plan. Table 2-1 lists the commenters as well as a synopsis of the comments.

Table 2-1. Comments on the Final 2008 Effluent Guidelines Program Plans EPA Docket Number: EPA-HQ-OW-2008-0517

No.	Commenter Name	EPA Docket No.	Comment Summary
1	Deborah Goldberg (Earthjustice)	0045	General comments in favor of creating ELGs for wastewater from oil and gas drilling, hydraulic fracturing, and extraction for all oil and gas exploration, rather than focusing on coalbed methane extraction. Recommends zero discharge of all related wastewater.
2	Lisa Widawsky (Environmental Integrity Project)	0046	General comments in favor of creating ELGs for toxic metals from coal combustion wastes at steam electric power plants. Recommends zero discharge from scrubber and ash transport systems as BAT because it has been achieved by sources in the industry.
3	Nancy Stewart and Margie Parsley (League of Women Voters of Tennessee)	0047	General comments in favor of revising the Steam Electric Power Generating ELGs and containment guidelines for coal-ash impoundments. Recommends including inspection and monitoring for structural integrity, capping to prevent overflows, composite liners to prevent seepage, monitoring for heavy metals and other pollutants in nearby surface waters, and phase-out of wet ash storage systems.
4	Abigail Dillen (Earthjustice)	0048	General comments in favor of revising the Steam Electric Power Generating ELGs. Recommend eliminating all pollutant discharges from scrubber and ash handling systems and all discharge of leachate from land-based coal combustion waste disposal.

3. THE EFFLUENT GUIDELINES PLANNING PROCESS

This section provides a general overview of the process EPA used in 2009 to identify industrial categories for potential development of new or revised effluent limitations guidelines and pretreatment standards (ELGs). This process consisted 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 through Figure 3-3 and discussed below.

3.1 Goals of the ELG Planning Process

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

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

3.2 Annual Review of Existing Effluent Guidelines and Pretreatment Standards

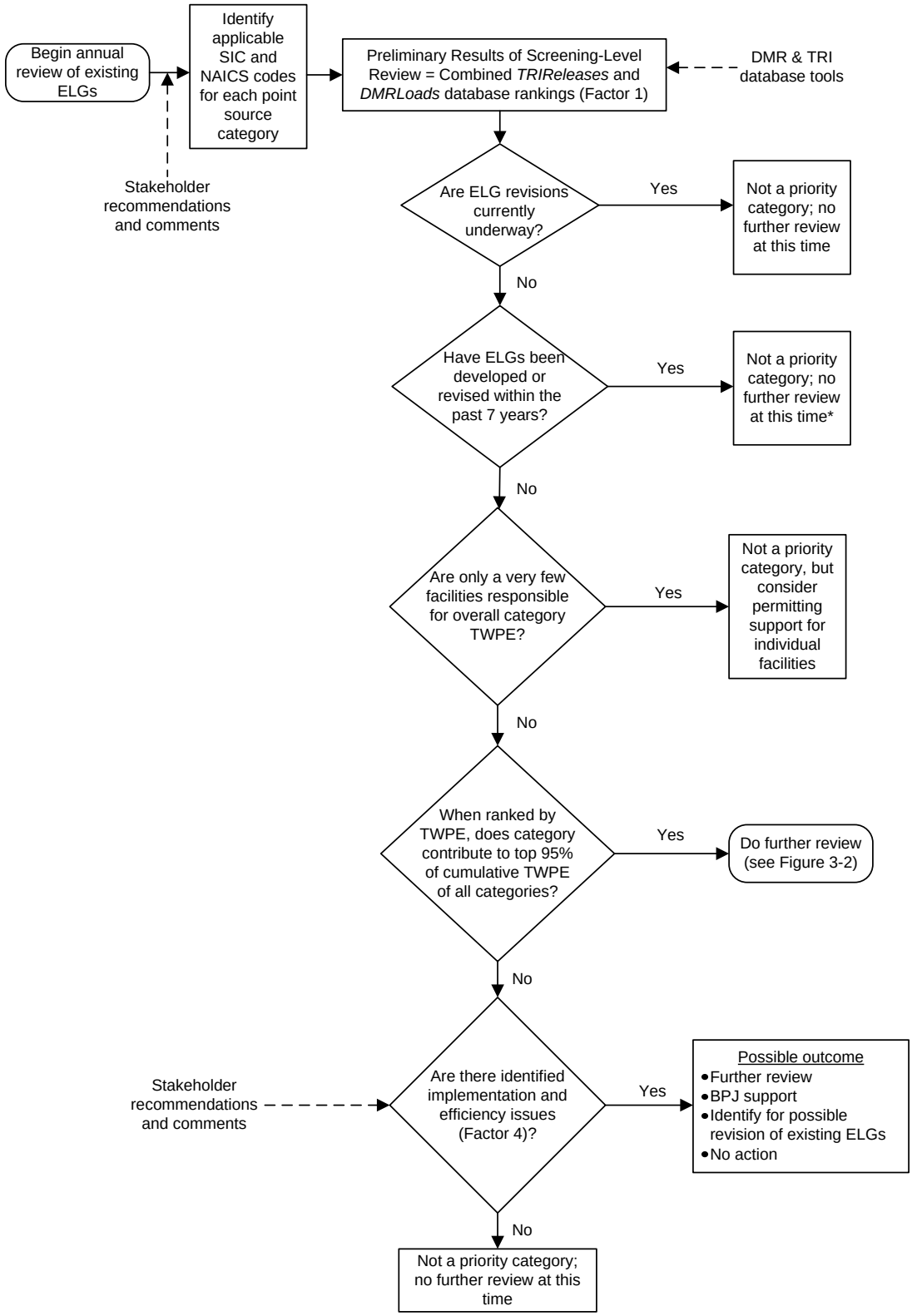
This section describes the four factors used (Section 3.2.1) and how they are used (Section 3.2.2) in the annual review of existing effluent guidelines and pretreatment standards.

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

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

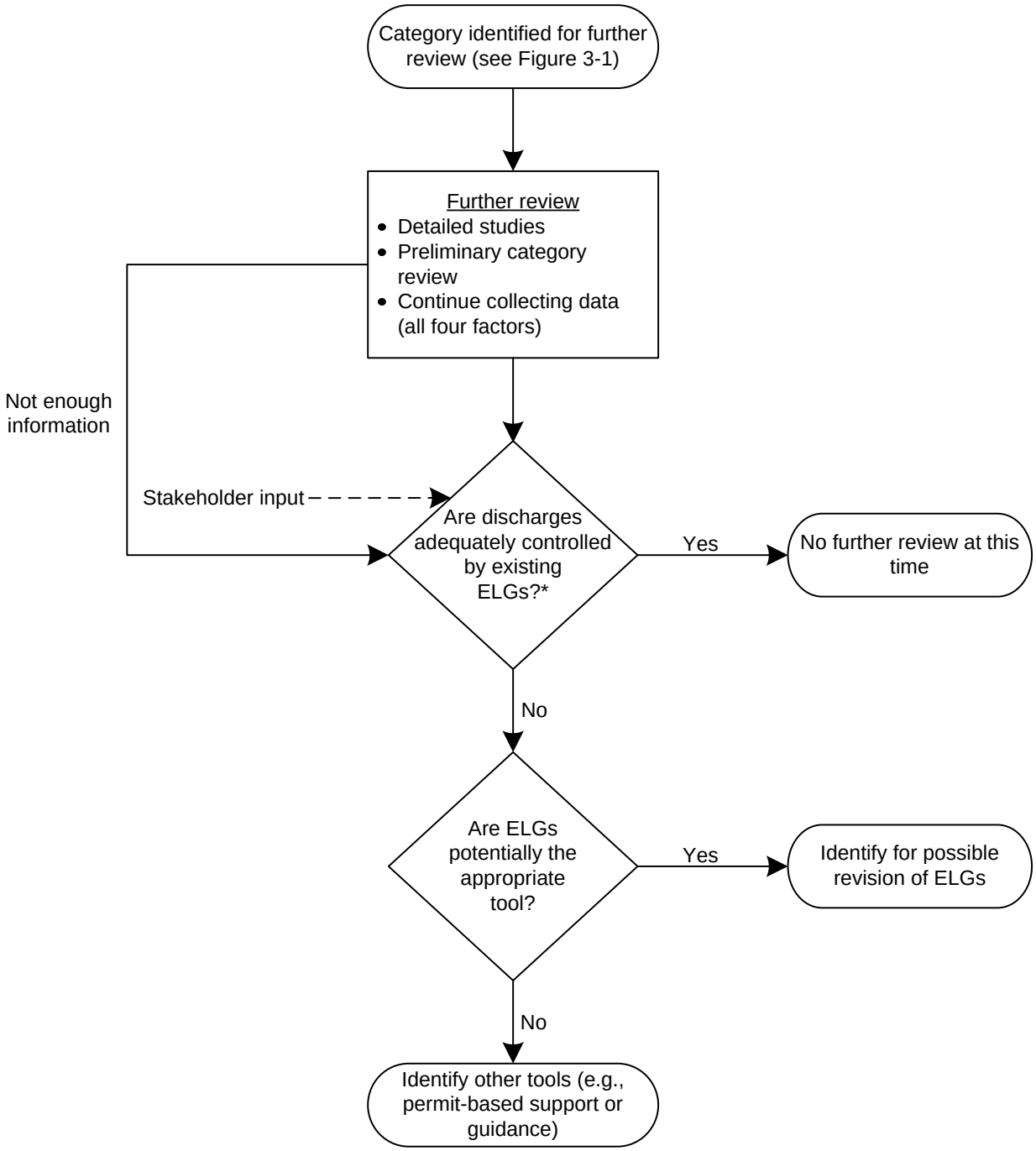
The first factor EPA considers is the amount and type of pollutants in an industrial category's discharge, and the relative hazard posed by that discharge. Use of this factor enables the Agency to set priorities for rulemaking to achieve the greatest environmental and health benefits. EPA estimates the potential hazard 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.



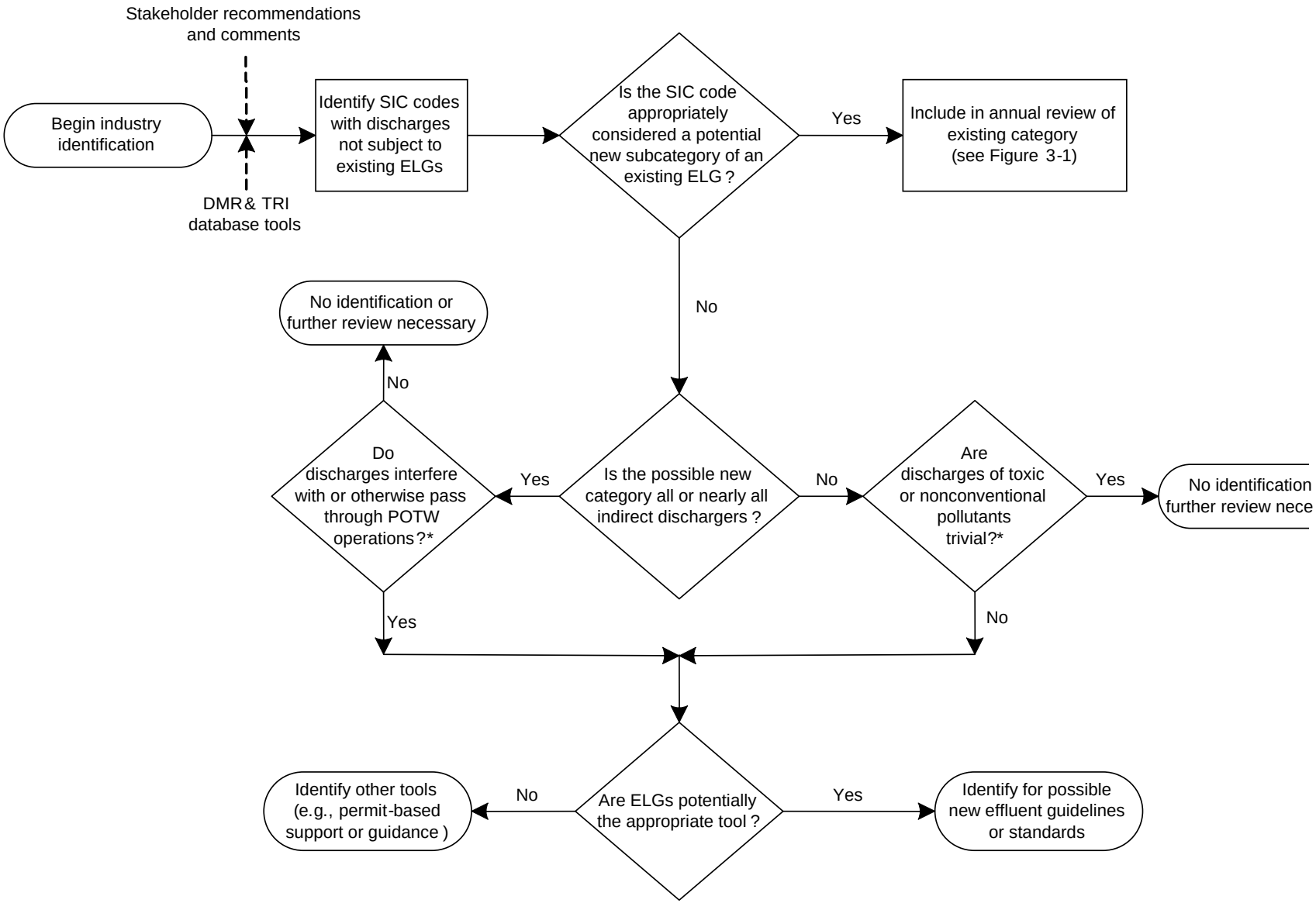
*If EPA is aware of new segment growth within such a category or new concerns are identified, EPA may do further review.

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



*Continue further review if not enough data

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



*Continue further review if not enough data.

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. EPA must annually review the ELGs for all of these categories. EPA first conducts 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 may pose a hazard to human health or the environment (Factor 1).

EPA conducts its screening-level review with data from the Toxics Release Inventory (TRI) and discharge monitoring reports (DMR) contained in the Permit Compliance System (PCS) and Integrated Compliance Information System - National Pollutant Discharge Elimination System (ICIS-NPDES). EPA combines the DMR data from PCS and ICIS-NPDES into *DMRLoads* database. The *Quality Assurance Project Plan for the 2009 Annual Screening-Level Analysis of TRI and PCS Industrial Category Discharge Data* describes in detail the quality criteria EPA used to evaluate the TRI and DMR data (ERG, 2009). TRI and DMR data do not identify the effluent guideline(s) applicable to a particular facility. However, TRI includes information on a facility's North American Industry Classification System (NAICS) code, while DMR data includes information on a facility's Standard Industrial Classification (SIC) code. Therefore, the first step in EPA's screening-level review is to relate each SIC and NAICS code to an industrial category.[1] The second step is to use the information reported in TRI and DMR, for a specified year, to calculate the annual pollutant discharges in pounds, including toxic,

[1] For more information on how EPA related each SIC and NAICS code to an industrial category, see Section 5.0 of the *2009 Technical Support Document for the Annual Review of Existing Effluent Guidelines and Identification of Potential New Point Source Categories* (U.S. EPA, 2009).

nonconventional, and conventional pollutants. For indirect dischargers, EPA adjusts the facility discharges to account for removals at the POTW. The third step is to apply toxic weighting factors (TWFs)[2] to the annual pollutant discharges to calculate the total discharge of toxic and nonconventional pollutants (reported in units of toxic-weighted pound equivalent or TWPE). 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 DMR data. EPA combined the estimated discharges of toxic and nonconventional pollutants calculated from TRI and DMR data to estimate a single TWPE value for each industrial category. EPA took this approach because it found that combining the TWPE estimates from TRI and DMR data 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). Illustrated in Figure 3-1, EPA also excludes from further review categories for which an effluent guidelines rulemaking is currently underway or for which effluent guidelines have been recently promulgated or revised (within the past seven years). 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 typically 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

[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).

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

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). Last, EPA considers the affordability or economic achievability of the technology, process change, or pollution prevention measures identified using the second factor (Factor 3).

Types of data sources that EPA may consult in conducting its detailed studies include, but are not limited to: (1) U.S. Economic Census; (2) TRI and DMR 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 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 DMR and TRI. Facilities with data in DMR and TRI are identified by a four-digit SIC code or six-digit NAICS code (Section 4.1.1 and 4.1.2 provide more details on SIC and NAICS codes, respectively). EPA links each four-digit SIC code and six-digit NAICS code to an appropriate industrial category (i.e., "the crosswalk").[4] This crosswalk identifies SIC codes and NAICS codes that EPA associated with industries subject to an existing guideline. The crosswalk also identifies SIC and NAICS codes not associated with an existing guideline. In addition to the crosswalk analysis, EPA relies on stakeholder comments to identify potential new point sources categories. Section 4.1.5 and 4.1.6 discuss the utility and limitations of TRI and DMR, respectively, 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

[4] For additional information on "the crosswalk," see Section 4 of the *2009 Technical Support Document for the Annual Review of Existing Effluent Guidelines and Identification of Potential New Point Source Categories* (U.S. EPA, 2009).

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.

3.3.1 Direct Discharges

Because the CWA has different requirements for potential new categories of direct and indirect dischargers, EPA examines potential new categories to determine if the category comprises mostly indirect dischargers or if it comprises both direct and indirect dischargers. If a category consists largely of indirect dischargers, EPA evaluates the pass-through and interference potential of the category discharges. If a category consists largely of direct dischargers, EPA evaluates the type of pollutants discharged by facilities in the category.

3.3.2 Indirect Discharges

For potential new categories with primarily indirect dischargers, EPA evaluates the potential for the wastewater discharges 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.

3.4 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 contemporaneous reviews will provide meaningful insight into EPA's effluent guidelines and pretreatment standards program decision-making. Additionally, by providing a single notice for these and future reviews, EPA hopes to provide a consolidated source of information for the Agency's current and future effluent guidelines and pretreatment standards program reviews.

3.5 The Effluent Guidelines Planning Process References

1. ERG. 2009. *Quality Assurance Project Plan for 2009 Annual Screening-Level Analysis of TRI and PCS Industrial Category Discharge Data.* (TBD). EPA-HQ-OW-2008-0517. DCN 06558.

2. U.S. EPA. 2006. *Toxic Weighting Factor Development in Support of CWA 304(m) Planning Process*. Washington, DC. (June). EPA-HQ-OW-2004-0032-1634.

3. U.S. EPA. 2009. *Technical Support Document for the Annual Review of Existing Effluent Guidelines and Identification of Potential New Point Source Categories*. EPA-821-R-09-007. Washington, DC. (October). EPA-HQ-OW-2008-0517 DCN 06557.

4. 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 industrial categories without applicable ELGs. EPA's methodology for this annual review and new point source category identification involves several components, as discussed in Section 3.0.

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). Part II of this report (Sections 5.0 to 12.0) discusses the findings of EPA's 2009 annual review. 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). 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. EPA did not identify for rulemaking any indirect or direct discharging industries not currently subject to pretreatment standards or ELGs in the 2009 annual review.

In performing the screening-level reviews of existing ELGs and identifying industrial categories without ELGs, EPA relies on DMR data and the Toxics Release Inventory (TRI). This section discusses these databases, related data sources, and their limitations. DMR data is contained in EPA's Permit Compliance System (PCS) and the Integrated Compliance Information System for the NPDES (ICIS-NPDES).

EPA has developed two screening-level tools, the *TRIReleases* and *DMRLoads* databases, to facilitate analysis of TRI and PCS/ICIS-NPDES data. EPA has explained the creation of these screening-level analysis tools in the *Technical Support Document for the Annual Review of Existing Effluent Guidelines and Identification of Potential New Point Source Categories* (2009 Screening-Level Analysis (SLA) Report) (U.S. EPA, 2009). The 2009 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 presents the preliminary category rankings from the *TRIReleases2007_v2* and *DMRLoads2007_v3*.

4.1 Data Sources and Limitations

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

- *Technical Support Document for the Annual Review of Existing Effluent Guidelines and Identification of Potential New Point Source Categories*, (U.S. EPA, 2009). Documents the methodology and development of the *DMRLoads2007* and *TRIReleases2007* databases, including (but not limited to)

matching NAICS and SIC codes to point source categories and using TWFs to estimate toxic-weighted pound equivalents (TWPE).

- *Draft Toxic Weighting Factor Development in Support of the CWA 304(m) Planning Process* (Draft TWF Development Document), dated July 2005 (U.S. EPA, 2005). Explains how EPA developed the December 2004 TWFs.

- *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 code system was developed to help with the collection, aggregation, presentation, and analysis of data from the U.S. economy (OMB, 1987). The different parts of the SIC code signify the following:

- 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 26: Paper and Allied Products, includes all pulp, paper, and paperboard manufacturing operations. Within SIC code 26, the three-digit SIC codes are used to distinguish the type of facility: 263 for paperboard mills, 265 for paperboard containers and boxes, etc. Within SIC code 265, the four-digit SIC codes are used to separate facilities by product type: 2652 for setup paperboard boxes, 2653 for corrugated and solid fiber boxes, 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 track only the primary SIC code for each establishment. PCS and ICIS-NPDES include one four-digit SIC code, reflecting the principal activity causing the discharge at each facility.

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 four-digit SIC code to an appropriate point source category, as summarized in the "SIC/Point Source Category Crosswalk" table (Table A-1 in Appendix A).

There are some SIC codes for which EPA has not established national ELGs. Table A-2 in Appendix A lists the SIC codes for which facility discharge data are available in PCS and ICIS-NPDES, but for which EPA could not identify an applicable point source category. For a more detailed discussion, see Section 6 of the 2009 SLA Report (U.S. EPA, 2009).

4.1.2 NAICS Codes

In 1997, the U.S. Census Bureau introduced the NAICS code system, to better represent the economic structure of countries participating in the North American Free Trade Agreement and to respond to criticism about the SIC code system. Table 4-1 explains the nomenclature and format of NAICS and SIC codes.

Table 4-1. Nomenclature and Format of NAICS and SIC Codes

NAICS		SIC	
2-digit	Sector	Division	Letter
3-digit	Subsector	Major Group	2-digit
4-digit	Industry Group	Industry Group	3-digit
5-digit	NAICS Industry	Industry	4-digit
6-digit	National	N/A	N/A

For example, major SIC code 26: Paper and Allied Paper Products, includes all pulp, paper, and paperboard manufacturing operations. Within SIC code 26, the three-digit SIC codes are used to distinguish the type of facility: 263 for paperboard mills, 265 for paperboard containers and boxes, etc. Within SIC code 265, the four-digit SIC codes are used to separate facilities by product type: 2652 for setup paperboard boxes, 2653 for corrugated and solid fiber boxes, etc.

In the NAICS code system the classification is more stratified:

- 32: Manufacturing;
  - 322: Paper Manufacturing;
    - 3222: Converted Paper Product Manufacturing;
      - 322212: Folding Paperboard Box Manufacturing.

The NAICS system is the new system for industrial classification purposes at many government agencies, including EPA. As 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 NAICS code.

Regulations for an individual point source category may apply to one NAICS code, multiple NAICS codes, or a portion of the facilities in an NAICS code. Therefore, to use databases that identify facilities by NAICS code (e.g., TRI), EPA linked each six-digit NAICS code to an appropriate point source category, as summarized in the "NAICS/Point Source Category Crosswalk" table (Table A-3 in Appendix A). This table was based on the SIC/Point Source Category Crosswalk table (Table A-1 in Appendix A) and the NAICS/SIC Code Crosswalk that EPA developed for past comparisons.

There are some NAICS codes for which EPA has not established national ELGs. Table A-4 in Appendix A lists the NAICS codes for which facility discharge data are available in TRI, but for which EPA could not identify an applicable point source category. For a more detailed discussion, see Section 6 of the 2009 SLA Report (U.S. EPA, 2009).

4.1.3 Toxic Weighting Factors

In developing ELGs, EPA developed a wide variety of tools and methodologies to evaluate effluent discharges. Within EPA's Office of Water, Engineering and Analysis Division (EAD) maintains a Toxics Database compiled from over 100 references for more than 1,900 pollutants. The Toxics Database includes aquatic life and human health toxicity data, as well as physical and chemical property data. A unique Chemical Abstract Service (CAS) number identifies the pollutants in this database. 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. 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). Throughout this document, the toxic-equivalent is also referred to as toxic-weighted pound equivalents, or TWPE. The Draft and Final TWF Development Documents discuss the use and development of TWFs in detail (U.S. EPA, 2005; 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. In the TWF method for assessing water-based effects, these aquatic life and human health toxicity levels are compared to a benchmark value that represents the toxicity level of a specified pollutant. EPA selected copper, a metal commonly detected and removed from industrial effluent, as the benchmark pollutant. The Final TWF Development Document contains details on how EPA developed its TWFs (U.S. EPA, 2006a). Table A-5 in Appendix A lists the TWFs for those chemicals in the *DMRLoads2007* and *TRIReleases2007* databases for which EPA has developed TWFs.

4.1.3.1 New Toxic Weighting Factors Developed During the 2009 Annual Review

During the 2009 annual review, EPA revised the TWF for boron to reflect updated information. EPA did not revise any other TWFs or develop TWFs for any chemicals that had not previously had TWFs as part of the 2009 annual review (Abt, 2008). Table 4-2 lists the revised boron TWF. Boron is reported in both *DMRLoads2007* and *TRIReleases2007*.

Table 4-2. Revised Boron TWF

Pollutant	CAS Number	Old TWF	New TWF
Boron	7440428	0.177	0.0083

Source: Memorandum to Josh Hall, U.S. EPA from Meghan Lynch, Sue Greco, and Emily Simmons, Abt Associates Inc. Subject: Revised Draft – Updating the Boron TWF (Abt, 2008).

4.1.3.2 Calculation of TWPE

EPA weighted the annual pollutant discharges calculated from the *TRIReleases* (see Section 4.1.5) and *DMRLoads* (see Sections 4.1.6) 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. 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. A separate report must be filed for each chemical that exceeds the reporting threshold. The TRI list of chemicals for reporting year 2007 includes more than 600 chemicals and chemical categories. For the 2009 screening-level review, EPA used data for reporting years 2007, 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. *NAICS Code Determination*. The primary NAICS code determines if TRI reporting is required. The primary NAICS code is associated with the facility's revenues, and may not relate to their pollutant discharges (73 FR 324666). Most facilities in NAICS codes 11, 21, 22, 31 through 33, 42, 48 through 49, 51, 54, 56 and 81, and federal facilities are potentially subject to TRI reporting. EPA generally relies on facility claims regarding the NAICS code identification.

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 NAICS 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 other 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 onsite releases or disposal to air, receiving streams, land, underground wells, and several other categories. They must also report the amount of toxic chemicals in wastes transferred to offsite locations, (e.g., POTWs, commercial waste disposal facilities).

For its screening-level reviews, EPA focused on the amount of chemicals facilities reported either discharging directly to a receiving stream or transferring to a POTW. For facilities discharging directly to a stream, EPA took the annual loads directly from the reported TRI data for calendar year 2007. For facilities transferring to POTWs, EPA first adjusted the TRI pollutant loads reported to be transferred to POTWs to account for pollutant removal that occurs at the POTWs prior to discharge to the receiving stream. Table A-6 in Appendix A lists the POTW removals used for all TRI chemicals reported as transferred to POTWs.

Facilities reporting to TRI are not required to sample and analyze waste streams to determine the quantities of toxic chemicals released. They may estimate releases based on mass balance calculations, published emission factors, site-specific emission factors, or other approaches. Facilities are required to indicate, by a reporting code, the basis of their release estimate. TRI's reporting guidance is that, for most chemicals reasonably expected to be present but measured below the detection limit, facilities should use half the detection limit to estimate the mass released. However, for dioxins and dioxin-like compounds, non-detects 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 midpoint 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 NAICS 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 do not 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 (polycyclic aromatic compounds (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 NAICS code, not point source category. For some NAICS 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 *TRIReleases2007* were usable for the 2009 screening-level review and prioritization of the toxic-weighted pollutant loadings discharged by industrial categories.

4.1.5 Data from PCS and ICIS-NPDES

EPA has used data reported to PCS as a part of its screening level review of existing effluent guidelines since the 2003 annual review (68 FRN 75515). Since 2002, EPA has been working to modernize PCS by creating a new data system called the Integrated Compliance Information System – National Pollutant Discharge Elimination System (ICIS-NPDES). In 2006, some states began transitioning their DMR reporting from PCS to ICIS-NPDES. Currently 45 of the 71 states and territories have migrated to ICIS-NPDES. Therefore, for the 2009 annual review, EPA's view of nationwide discharges was split between two sets of data. EPA created the database *DMRLoads2007* to combine the two systems (PCS and ICIS-NPDES) and generate industrial category rankings for all U.S. states and territories. Both PCS and ICIS-NPDES automate entering, updating, and retrieving NPDES data and track permit issuance, permit limits and monitoring data, and other data pertaining to facilities regulated by the NPDES program under the CWA.

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 usually have the capability to impact receiving waters if not controlled and, therefore, have received more regulatory attention than minor discharges. There are approximately 7,000 facilities (including sewerage systems) with major discharges for which PCS and ICIS-NPDES have 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 DMRs submitted to the permitting authority. The permitting authority enters the

reported DMR data into PCS or ICIS-NPDES, 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 and ICIS-NPDES databases includes data only for a limited set of minor dischargers if the states choose to include these data.

Parameters in PCS and ICIS-NPDES 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 and ICIS-NPDES contain 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 2009 annual review, EPA used data for reporting year 2007, to correspond to the data obtained from TRI. For the 2009 annual review, EPA corrected certain aspects of the 2007 data (see Section 4.5). EPA calculated annual loads for the PCS and ICIS-NPDES data using the *PCSLoadCalculator* and the ICIS-NPDES Pollutant Loading Tool, respectively. EPA combined the annual loads from PCS and ICIS-NPDES into the *DMRLoads2007* database. Section 2 of the 2009 SLA Report provides details on the methodology and development of *DMRLoads2007* (U.S. EPA, 2009).

4.1.5.1 Utility of PCS and ICIS-NPDES

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

- PCS and ICIS-NPDES combined are national in scope, including data from all 50 states and 19 U.S. territories/tribes.
- Discharge reports included in PCS and ICIS-NPDES are based on effluent chemical analysis and metered flows.
- PCS and ICIS-NPDES include facilities in all SIC codes.
- PCS and ICIS-NPDES include 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 and ICIS-NPDES

Limitations of the data collected from PCS and ICIS-NPDES databases include the following:

- The databases contain 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.

- The databases include very limited discharge monitoring data from minor dischargers.

- The databases do not include data characterizing indirect discharges from industrial facilities to POTWs.

- Many of the pollutant parameters included in the databases 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 databases identify 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 and ICIS-NPDES 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 and ICIS-NPDES may double-count a facility's discharge. In other cases, an outfall may be labeled as an internal monitoring point, and PCS and ICIS-NPDES may not account for all of a facility's discharge.

- 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 discharges5.

- PCS and ICIS-NPDES were designed as a permit compliance tracking system and do not contain production information.

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

- In PCS and ICIS-NPDES, data may be reported as an average quantity, maximum quantity, average concentration, maximum concentration, and/or 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 *DMRLoads2007* were usable for the 2009 screening-level reviews and prioritizations of the toxic-weighted pollutant loadings discharged by industrial facilities. The combined PCS and ICIS-NPDES databases remain the only data source quantifying the pounds of regulated pollutants discharged directly to surface waters of the United States.

[5] ICIS-NPDES includes a data field for applicable ELGs; however, it is not required and typically not populated.

4.2 Methodology Corrections Affecting Both Screening-Level Review Databases

EPA did not make any methodological changes to the screening-level review databases, *TRIReleases2007* and *DMRLoads2007* as part of the 2009 annual review.

4.3 Corrections to the DMRLoads2007 Database

EPA developed the *DMRLoads2007* database as part of the 2009 annual review using the methodology explained in the 2009 SLA Report (U.S. EPA, 2009).

During previous screening-level analyses, EPA identified numerous facility-specific corrections for PCS data reported for calendar years 2000, 2002, and 2004. Several of these corrections similarly apply to the 2007 DMR data. In addition, EPA reviewed the quality of the 2007 DMR data and discharges from facilities with discharges that have the greatest impact on total category loads and category rankings. Table B-2 in Appendix B of this report lists all corrections made to the 2007 DMR data in *PCSLoadCalculator2007* and in *DMRLoads2007*.

4.3.1 DMRLoads2007: Categorization of Discharges

This section describes database corrections to categorization of facilities and pollutant discharges in *DMRLoads2007*. Section 4 of the 2009 SLA Report describes the development of the SIC/Point Source Category Crosswalk, which EPA uses to link between facility SIC codes and categories with existing ELGs (U.S. EPA, 2009). Because most point source categories are not defined by SIC code, the relationship between SIC code and point source category is not a one-to-one correlation. A single SIC code may include facilities in more than one point source category, and associating an SIC code with only one category may be an over simplification. Also, many facilities have operations subject to more than one point source category. Further, facilities in some categories cannot be identified by SIC code (e.g., Centralized Waste Treatment facilities). Section 4 of the 2009 SLA Report describes the database changes, summarized below (U.S. EPA, 2009):

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

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

— MP&M/Metal Finishing. EPA used the methodologies described in Section 4 of the 2009 SLA Report to apportion pollutant loads between the MP&M and Metal Finishing Point Source Categories.

4.3.2 DMRLoads2007: Internal Monitoring

This section describes database corrections to identify internal monitoring points in *DMRLoads2007*. As discussed in Sections 3.2.1.3 and 3.2.3.2 of the 2009 SLA Report (U.S. EPA, 2009), *PCSLoadCalculator2007* and the ICIS-NPDES Load Calculator calculated loads only for monitoring locations that are labeled as effluent (MLOC 1 or 2 in PCS and MLOC 1, 2, A, B, or SC in ICIS-NPDES). As a result, the Load Calculators exclude discharges for internal monitoring locations such as intake water, influent to treatment, and intermediate points in the wastewater treatment system. However, during previous category reviews and detailed studies, EPA identified instances of double counting that resulted from including certain internal monitoring points in the loads database. For example, a facility monitors for Pollutant A at the effluent from its wastewater treatment system (Internal Outfall 101). Outfall 101 wastewater is later combined with other plant discharges at final Outfall 001 and is discharged to a receiving stream. The facility also monitors for Pollutant A at Final Outfall 001. Both outfalls are effluent monitoring points identified as MLOC 1 or MLOC 2; however, Outfall 101 is upstream of the final outfall. Calculating loads for Pollutant A at both the internal and final outfalls results in double counting Pollutant A discharges. EPA identified instances where pollutant discharges are reported for multiple monitoring locations along the same discharge line, and eliminated the discharges for the upstream monitoring locations. EPA made these corrections in *PCSLoadCalculator2007* for the PCS data and in *DMRLoadsAnalysis2007* for the ICIS-NPDES data.

4.3.3 DMRLoads2007: Intermittent Discharges

This section describes database corrections made for intermittent discharges in *DMRLoads2007*. As described in Sections 3.2.1.3 and 3.2.3.2 of the 2009 SLA Report (U.S. EPA, 2009), in *PCSLoadCalculator2007* and the ICIS-NPDES Load Calculator EPA assumes that all discharges in PCS and ICIS-NPDES are continuous. During previous annual reviews, EPA identified facility discharges that are intermittent and therefore overestimated by the Load Calculator. EPA calculated annual loads for these discharges based on information obtained from the facility on the frequency and duration of wastewater discharges. EPA made these corrections in *PCSLoadCalculator2007* for the PCS data and in *DMRLoadsAnalysis2007* for the ICIS-NPDES data.

4.3.4 DMRLoads2007: Excluded Pollutant Parameters

This section describes database corrections made to exclude water quality parameters (e.g., dissolved oxygen and temperature), specific chemicals (e.g., phenol), bulk parameters (e.g., biochemical oxygen demand), and flow from the annual load calculation in *DMRLoads20007*. As described in Sections 3.2.1.3 and 3.2.3.2 of the 2009 SLA Report (U.S. EPA, 2009), facilities report pollutant mass quantities, pollutant concentrations, and wastewater flow rates to PCS and ICIS-NPDES using a variety of units. EPA's PCS CNVRT program and the ICIS-NPDES Convert Module convert the discharges into standard units of kilograms per day (kg/day) for mass quantities, milligrams per liter (mg/L) for concentrations, and millions of gallons per day

(MGD) for flow rates. However, some parameters are reported in units that cannot be converted into kg/day or mg/L (e.g. temperature and pH). EPA excluded these parameters from the screening-level analysis. Table B-3 of Appendix B lists the excluded parameters.

4.3.5 DMRLoads2007: Flow Corrections

This section describes database changes made to flows in the *PCSLoadCalculator2007* databases that impacted EPA's 2009 screening-level review of the *DMRLoads2007* database. *PCSLoadCalculator2007* assumes that any flow rate reported over 5,000 MGD is actually gallons per day (GPD), and divides the reported flow by one million. For flows ranging from 1,300 to 5,000 MGD, EPA compared units for flow permit limits to verify the units reported in PCS and made corrections on a case-by-case basis. EPA determined that all flows between 1,300 and 5,000 MGD reported by all facilities except facilities reporting SIC code 4911, Electrical Services, in Ohio were actually in GPD. EPA corrected 1,015 flows between 1,300 and 5,000 MGD.

4.3.6 DMRLoads2007: Pollutant Corrections

This section describes database changes made to discharges of specific pollutants reported to the DMR for EPA's 2009 screening-level review in the *DMRLoads2007* database.

During the reasonableness checks of the PCS CNVRT output, EPA identified unusually high mercury concentrations reported to PCS by facilities located in Ohio in the PCS CNVT output. These facilities reported mercury discharges using PRAM 50092 (Mercury Total Low Level). The PRAM 50092 concentrations in the 2004 CNVRT output ranged from 0.2 to 673 mg/L. EPA contacted the Ohio Environmental Protection Agency (Ohio EPA) to determine the correct reporting units for PRAM 50092 (Finseth, 2007). An Ohio EPA representative explained that Ohio EPA started requiring low level mercury analyses in 2002. At that time, some facilities had limits in micrograms per liter (µg/L). Currently, all of the limits are in nanograms per liter (ng/L).

As a result of this contact, EPA concluded that the units for the PRAM 50092 concentrations for the 2004 PCS data should be ng/L, not mg/L. The PRAM 50092 concentrations in the 2007 CNVRT output ranged from 0.0035 to 260,000 mg/L with greater than 99 percent of these concentrations between 0.5 and 800 mg/L. Based on this distribution, EPA concluded that the error for the 2004 data persisted in 2007. Therefore, EPA corrected the concentrations by dividing all concentrations for PRAM 50092 in *PCSLoadCalculator2007* by one million. EPA did not make any corrections to the ICIS-NPDES Pollutant Loading Tool because Ohio 2007 DMR data are only in PCS.

4.3.7 DMRLoads2007: Data Quality Review

EPA evaluated the quality of the PCS and ICIS-NPDES DMR data for use in *DMRLoads2007* as part of the 2009 screening-level review. This evaluation considered data completeness, accuracy, reasonableness, and comparability. The *Quality Assurance Project Plan for the 2009 Annual Screening-Level Analysis of TRI and PCS Industrial Category Discharge Data* describe the quality objectives in more detail (ERG, 2009). EPA conducted quality reviews for four stages of the development of *DMRLoads2007*: PCS CNVRT program output; ICIS-

NPDES Convert Module output; *PCSLoadCalculator2007* and the ICIS-NPDES Pollutant Loading Tool output; and *DMRLoads2007* results. The following discussion provides an overview of the quality review steps for each stage:

- **ICIS-NPDES Convert Module output**. EPA conducted an initial quality review of the extracted ICIS-NPDES DMR data to evaluate its completeness, reasonableness, and comparability. For completeness, EPA compared the number of major facilities and the universe of SIC codes in the 2007 ICIS-NPDES DMR data to the PCS DMR data in 2004, the last complete DMR data set for ICIS-NPDES states. The 2007 ICIS-NPDES data had at least as many majors and SIC codes as PCS in 2004. Additionally, EPA verified that, while PCS 2004 had more parameter codes than ICIS-NPDES in 2007, all commonly reported parameters are present in the 2007 ICIS-NPDES DMR data.

  EPA reviewed the DMR data for reasonableness to identify any data quality issues, such as misreported units that the ICIS-NPDES Convert Module did not correct. EPA identified several wastewater flows that exceeded the reasonable range. EPA reviewed these flows and developed the flow correction function for the ICIS-NPDES Convert Module (described in Section 3.2.3 of the 2009 SLA Report (U.S. EPA, 2009)). This function is designed to identify data entry errors for flows greater than 1,000 MGD. The ICIS-NPDES Convert Module corrects all flows exceeding 5,000 MGD, and applies more conservative criteria to correct flows from 1,000 to 5,000 MGD. The ICIS-NPDES Convert Module made the following corrections to ICIS-NPDES wastewater flows:
  - 1,113 corrections based on month-to-month variations;
  - 1,605 corrections based on comparing flows to design flows; and
  - 142 corrections based on assuming that flows exceeding 5,000 MGD are reported in units of GPD.

  EPA also evaluated the comparability of the extracted 2007 ICIS-NPDES DMR data to the 2004 PCS data. EPA determined that most of the average loads and concentrations in ICIS-NPDES are within one order of magnitude of the 2004 PCS data. However, the maximum loads and concentrations indicate that there may be some unreasonable values in the 2007 ICIS-NPDES DMR data. EPA verified the unit conversions used in the ICIS-NPDES Convert Module and for this reason concluded that the unreasonable flows and pollutant measurements are likely the result of data entry errors and are not the result of any errors in the ICIS-NPDES Convert Module functions.

- **Load Calculator routines.** EPA's quality review for the Load Calculator routines included accuracy checks for database queries on *PCSLoadCalculator2007*. EPA reviewed the programming code used to develop each query to verify the logic and verified that the number of records in the output table equaled the number of records in intermediate queries to ensure that no data were missing and that there were no duplicate data. EPA also verified the Load Calculator routine in the ICIS-NPDES Pollutant Loading Tool. EPA created a query-based system and compared the annual loads calculated by the queries to those calculated by the ICIS-NPDES Pollutant Loading Tool. The output from the queries was identical

to that of the ICIS-NPDES Pollutant Loading Tool. In addition, EPA performed hand calculations to verify the accuracy of the *PCSLoadCalculator2007* and ICIS-NPDES Load Calculator Module outputs during reviews of facility discharges for *DMRLoads2007* results.

- ***DMRLoads2007* results.** EPA's quality review of the *DMRLoads2007* results included the following:
  - *Completeness checks*. EPA compared counts of dischargers in *DMRLoads2007* to *PCSLoads2004* to describe the completeness of the database. There were 2,027 facilities that reported a load to *PCSLoads2004* and 2,018 facilities that reported a load to *DMRLoads2007*. Therefore, EPA determined *DMRLoads2007* was complete.

  - *Accuracy of facility discharges*. EPA reviewed the accuracy of facilities' discharges that had the greatest impact on total category loads and category rankings to identify possible calculation errors. EPA reviewed monthly information in PCS and ICIS-NPDES, measurement data available on EPA's Envirofacts web page, and information from the facility's NPDES permit. In some cases, EPA contacted facilities to verify the monthly measurements in their DMR. Section 4.3.8 describes EPA's review of facility discharges in more detail.

  - *Accuracy of category discharges*. EPA reviewed the accuracy of category discharges by verifying that pollutant discharges in PCS and ICIS-NPDES were assigned to the appropriate point source category. EPA used engineering judgment to determine if the pollutant discharge was reasonably associated with the point source category. Section 4.3.1 discusses facility-level and pollutant-level category assignments.

  - *Accuracy of database queries*. EPA's quality review for the development of *DMRLoads2007* included accuracy checks for database queries in *DMRLoadsAnalysis2007* and *DMRLoads2007*. Documentation of accuracy checks is provided in a QC table in each Microsoft Access™ database.

  - *Reasonableness of pollutant loads*. EPA reviewed the Load Calculator output (i.e., the calculated kg/year for each pollutant at each discharge pipe and monitoring location) for those pollutant discharges with the highest toxic-weighted loads (e.g., dioxins, PCBs, and mercury). To identify possible errors in recording units of measure, EPA identified calculated discharges that were orders of magnitude higher than previous years' discharges or other facilities within the same category. EPA reviewed quantities or concentrations and flows that the *PCSLoadCalculator2007* and ICIS-NPDES Pollutant Loading Tool databases used to calculate the annual discharge. EPA compared these measurements with measurements available on EPA's Envirofacts web page. If the measurements were similar then EPA concluded that the

output was acceptable. If the data did not match between the databases and Envirofacts, EPA corrected the data to match Envirofacts. When EPA was unsure what the correct data were, EPA contacted the facility for more information (see Section 4.3.8).

— *Reasonableness of facility loads*. EPA identified facility discharges with the highest TWPE. EPA identified facilities for review whose pollutant discharges accounted for more than 95 percent of the TWPE for its point source category. EPA compared 2007 PCS and ICIS-NPDES data to other available information, such as information from EPA's Envirofacts web page, the facility's NPDES permit, and discussion with the facility contact.

— *Comparability*. EPA compared *DMRLoads2007* to *PCSLoads2004* and *PCSLoads2002* to identify pollutant discharges or wastewater flows that differ more than the year-to-year variation of other chemicals and facilities. EPA used this comparison to determine if quantity, concentration, or flow corrections were needed for facility discharges with the highest TWPE. If the comparison was unavailable (e.g., the pollutant was not previously reported) EPA contacted the facility.

4.3.8 DMRLoads2007: Facility Reviews

EPA reviewed the accuracy of facility discharges that had the greatest impact on total category loads and category rankings in *DMRLoads2007*. EPA reviewed facilities with the highest toxic-weighted discharges of individual pollutant parameters. For the identified facilities, EPA used the following steps to review the accuracy of the loads calculated from PCS and ICIS-NPDES data:

1. Reviewed database corrections for *PCSLoads2004*, *PCSLoads2002,* and *PCSLoads2000* to determine whether corrections were made during previous reviews and evaluated whether EPA should apply these corrections to the 2007 DMR discharges.

2. Reviewed 2007 DMR data, hand calculated annual pollutant loads, and compared results to loads calculated by *PCSLoadCalculator2007*and the ICIS-NPDES Pollutant Loading tool, and stored in *DMRLoads2007*.

3. Reviewed PCS and ICIS-NPDES pipe description information available in PCS, EPA's on-line Envirofacts data system, ICIS-NPDES supporting tables, or from the facility's NPDES permit to identify monitored pollutant discharges that are:
   — Intermittent (e.g., tidal, seasonal, or occur after a storm event);
   — Internal monitoring locations from which wastewater is combined with other waste streams and monitored again, resulting in double counting loads; and
   — Not representative of category discharges (e.g., storm water runoff from non-process areas, non-contact cooling water, or wastewater related to operations in another point source category).

Table 4-3 presents EPA's facility review and corrections made to the *DMRLoads2007* database.

4.4 Corrections to the TRIReleases2007 Database

EPA developed the *TRIReleases2007* database as part of the 2009 annual review using the methodology explained in the 2009 SLA Report (U.S. EPA, 2009).

During previous screening-level analyses, EPA identified numerous facility-specific corrections for TRI data reported for calendar years 2002 through 2005. Several of these corrections similarly apply to the 2007 TRI data. In addition, EPA reviewed the quality of the 2007 TRI data and discharges from facilities with discharges that have the greatest impact on total category loads and category rankings. Table B-1 in Appendix B of this report lists all corrections made to the 2007 TRI data.

4.4.1 TRIReleases2007: Categorization of Discharges

This section describes database corrections to categorization of facilities and pollutant discharges in *TRIReleases2007*. Section 4 of the 2009 SLA Report describes the development of the NAICS/Point Source Category Crosswalk, which EPA uses to link between facility NAICS codes and categories with existing ELGs (U.S. EPA, 2009). Because most point source categories are not defined by NAICS code, the relationship between NAICS code and point source category is not a one-to-one correlation. A single NAICS code may include facilities in more than one point source category, and associating an NAICS code with only one category may be an over simplification. Also, many facilities have operations subject to more than one point source category. Further, facilities in some categories report a variety of NAICS codes that do not correlate directly to a point source category, precluding identification by NAICS code (e.g., Centralized Waste Treatment facilities). Section 5 of the 2009 SLA Report describes the database changes, summarized below (U.S. EPA, 2009):

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

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

  - MP&M/Metal Finishing. EPA used the methodologies described in Section 4 of the 2009 SLA Report to apportion pollutant loads between the MP&M and Metal Finishing Point Source Categories.

Table 4-3. Summary of *DMRLoads2007* Facility Review

Facility	Location	Point Source Category	Pollutant(s) in Question	Review Findings	Action Taken/ Database Correction
Blue Heron Paper Company	Oregon City, OR	Pulp and Paperboard	Methylmercury	Methylmercury concentrations in *PCSLoadCalculator2007* are 1,000 times higher than the concentrations in Envirofacts. Envirofacts methylmercury concentrations are in ng/L but were entered into *PCSLoadCalculator2007* as µg/L. Facility contact verified units should be ng/L.	Database Change: Correct methylmercury concentrations
Cargill Fertilizer, Inc. – Riv	Hillsborough County, FL	Phosphate Manufacturing	Phosphorous	Facility reports DRID 1 (monthly conc.) and A (annual quan.) with annual loads that do not equal. DMR is counting both DRIDs instead of just one also. Unable to determine the correct DRID to use based on Envirofacts.	None
CF Industries – Donaldsonville	Donaldsonville, LA	Fertilizer Manufacturing	Nitrogen, Ammonia	Maximum quantities are less than average quantities. Suspect that some average quantities should be divided by 10. Envirofacts has the same quantities.	None.
Clean Harbors White Castle LLC	Iberville Parish, LA	CWT	Benzidine	The permitted benzidine limit is three orders of magnitude lower than the concentrations in *PCSLoadCalculator2007*. Facility contact said that benzidine was ND (Ourso, 2009).	Database Change: Revise benzidine concentrations to zero
Climax Mine	Summit County, CO	Ore Mining and Dressing	Molybdenum	This is a molybdenum mine. Units are consistent with Envirofacts and permit reporting limits. Permit/fact sheet contains self-monitoring data that agrees with the values reported to PCS (CO DPS, 2004; Climax Molybdenum Company, 2002).	None

Table 4-3. Summary of *DMRLoads2007* Facility Review

Facility	Location	Point Source Category	Pollutant(s) in Question	Review Findings	Action Taken/ Database Correction
Doe Run Resources Co	Viburnum, MO	Ore Mining and Dressing	Lead	This is a lead or zinc mine based on SIC code. Units are consistent with Envirofacts and permit reporting limits (0.005 mg/L to 0.8 mg/L).	None
Dyno Nobel, Inc.	Carthage, MO	Explosives Manufacturing	Nitrogen, Ammonia	For pram 00610, each outfall reports 6 months under DRID B and 6 months under DRID C. Flows for some months are 1,000 times greater than other months.	Database Change: Change DRID B and D to C for PRAM 00610 and divide affected flows by 1,000.
Envirosystems Incorporated	Hampton, NH	Independent And Stand Alone Labs	Cadmium	Review of fact sheet shows that facility incorrectly reported flows in GPD instead of MGD for certain months (U.S. EPA Region 1, 2006).	Database Change: Correct flows for the affected monitoring periods
Front St. Remedial Action	Kansas City, MO	Waste Combustors	Dioxin	Facility is a superfund site, and operated in the past as both a waste combustor and CWT. Currently treating groundwater contaminated by organics and inorganics. Three of four dioxin concentrations in 2007 were above the detection limit and the MDL. Concentrations were provided by permitting authority. Detected dioxin in Q2 2007 and Q3 and Q4 were ND. Lab did not analyze wastewater for dioxin for Q1 (Auchterlonie, 2009).	Database Change: Revise SIC code to link to superfund category

Table 4-3. Summary of *DMRLoads2007* Facility Review

Facility	Location	Point Source Category	Pollutant(s) in Question	Review Findings	Action Taken/ Database Correction
GE Silicones, LLC	Friendly, WV	OCPSF	Copper	Suspected copper concentrations units error because the permit reporting requirements are in µg/L instead of mg/L. Facility confirmed the units error and provided correct concentrations for 2 quarters. Data was reported as µg/L not mg/L (Martin, Jason, 2009).	Future Database Change: Revise copper concentrations
General Electric – Erie	Erie, PA	Metal Finishing	Mercury	Facility reported 3.3 mg/L in December 2007, reported annually. Verified units in OTIS. Facility said mercury should be ng/L instead of mg/L (Verderese, 2009).	Future Database Change: Revise mercury concentration
Golden Eagle Refinery	Martinez, CA	Petroleum Refining	TCDD Equivalents	TCDD Equivalents measurements in database are 1,000 times larger than the concentrations in Envirofacts. The units for concentrations in Envirofacts are in pg/L.	Database Change: Correct TCDD Equivalents measurements
IMC – Phosphates Company	Donaldsonville, LA	Fertilizer Manufacturing	Phosphorous	Highest phosphorous loads are from outfall 002. Loads are approximately the same using the quantity and the concentration calculations. Loads also are comparable to *PCSLoads2004*.	None
Innovia Films	Tecumseh, KS	Plastics Molding and Forming	Carbon Disulfide	One monthly concentration appears to be 100 times higher than the other months in 2007 and 2004. Facility contact provided corrected concentrations for April and May that were units errors (Martin, Tony, 2009).	Database Change: Correct carbon disulfide concentrations

Table 4-3. Summary of *DMRLoads2007* Facility Review

Facility	Location	Point Source Category	Pollutant(s) in Question	Review Findings	Action Taken/ Database Correction
Jackson County	Pascagoula, MS	Fertilizer Manufacturing	Phosphorous	Concentrations in Envirofacts match concentrations in *PCSLoadCalculator2007*.	None
LAC Minerals	Central City, SD	Ore Mining	Cyanide	A review of the permit and fact sheet indicated that the outfall STR is an in-stream monitoring location and therefore should be excluded from the facility's loads (LAC Minerals, 2005).	Database Change: Change MLOC to Z (excluded from database) outfall STR
Morgan's Point Plant	Morgan's Point, TX	OCPSF	Chlorine	The monthly average flow for March 2007 was 10,000 times higher than the monthly maximum flow for that month and the flows for the rest of the year.	Database Change: Correct March 2007 flow
Northshore Mining/Silver Bay P	Silver Bay, MN	Ore Mining and Dressing	Copper	This is a taconite mine. Units are consistent with Envirofacts and permit reporting limits. The calculation relies on only one reported measurement when the permit shows facility must monitor monthly.	None
PEPCO-Benning	Washington, DC	Steam Electric Power Generation	Arochlor 1260	A review of OTIS data shows that all PCBs were reported as BDL with "<" and a concentration. The data in ICIS-NPDES did not include the less than signs. Because all monthly values are BDL, using the hybrid method all PCB loads should be zero.	Database Change: Zero all PCB (PRAM codes 39508, 39504, and 39496) loads

Table 4-3. Summary of *DMRLoads2007* Facility Review

Facility	Location	Point Source Category	Pollutant(s) in Question	Review Findings	Action Taken/ Database Correction
Prasa El Yunque Filtration Plant	Rio Grande, PR	Drinking Water Treatment	Copper	Review of the 2007 concentration data in OTIS indicated that February through August, November, and December copper concentrations were reported in µg/L but were in the ICIS-NPDES database as mg/L.	Database Change: Revise affected copper concentrations by 1,000
Rhone-Poulenc Basic Chemicals	Baton Rouge, LA	Inorganic Chemicals Manufacturing	Phosphorus, Total (as P)	A review of the facility's discharges and Envirofacts data shows the phosphorous concentrations should be in pg/L rather than µg/L.	Database Change: Revise Phosphorus, Total (As P) concentrations
Sabic Innovate Plastics	Ottawa, IL	OCPSF	Hexachlorobenzene	Review of concentration data for OTIS showed that the data were missing '<' signs for every month reported for all parameters except for copper.	Database Change: Zero all loads except for copper
SIGECO FB Cully Station	Newburgh, IN	Steam Electric Power Generation	Aluminum	For aluminum, the concentration for 10 months is 1,000 times higher than the Form 2C data (2006) and 2006/2008 data in OTIS. Silver, arsenic, and cadmium concentrations are suspected units error based on the Form 2C data. Corrected concentrations to correspond to Form 2C data (SIGECO, 1994).	Database Change: Revise metal concentrations
Tampa Bay Desal	Tampa Bay, FL	Drinking Water Treatment	Chloride	Previous review identified a mismatch between flows and concentrations. NPDES permit fact sheet indicated the flow is diluted by 70 percent from the plant outfall to the final outfall (FL DEP, 2001).	Database Change: Divide monthly flows by 70

Table 4-3. Summary of *DMRLoads2007* Facility Review

Facility	Location	Point Source Category	Pollutant(s) in Question	Review Findings	Action Taken/ Database Correction
Tosco Refinery (Rodeo)	Rodeo, CA	Petroleum Refining	TCDD Equivalents	TCDD equivalents measurements in database are 1,000 times larger than the concentrations in Envirofacts. The units for concentrations in Envirofacts are in pg/L.	Database Change: Revise TCDD equivalents concentrations
USA Holston Army Ammo Plant Area	Kingsport, TN	Explosives Manufacturing	RDX, Total	Facility contact said the December 2007 value was RDX, Total production instead of effluent concentration. Contact provided correct concentration (House, 2009).	Database Change: Revise RDX, Total December 2007 concentration
Westvaco Texas, L.P.	Evadale, TX	Pulp, Paper And Paperboard	TCDD Equivalents	Concentrations in *PCSLoadCalculator2007* are 1,000 times larger than the concentrations in Envirofacts. The units for concentrations in Envirofacts are in pg/L. Facility contact also said all quarters were ND, even though the fourth quarter did not have a '<' indicator (Davis, 2009).	Database Change: Revise TCDD equivalents concentrations Future Database Change: Add < indicator to fourth quarter 2007 TCDD equivalents concentration
Wise Alloys LLC	Muscle Shoals, AL	Aluminum Forming	Nitrogen, Nitrate Total (as N)	The facility reported two DRIDs: 1 (monthly concs.) and Q (quarterly quan.). Unable to determine the difference between DRIDs. Envirofacts does not have the permit/fact sheet.	None

BDL – Below detection limit.
CWT – Centralized waste treaters.
MDL – Minimum detection limit.
ND – Non-detect.
OCPSF – Organic chemicals, plastics, and synthetic fibers.
PCB – Polychlorinated biphenyl.

- *Categories Not Identified by NAICS Code (e.g., Centralized Waste Treatment, Waste Combustor, and Landfills).* The NAICS/Point Source Category Crosswalk does not assign any NAICS codes to the Centralized Waste Treatment (CWT) Point Source Category (40 CFR Part 437), Waste Combustor Point Source Category (30 CFR Part 444), or Landfills Category (40 CFR Part 445). Furthermore, the applicability of these three regulations are not defined by NAICS codes and no NAICS code properly describes the CWT, waste combustor, or landfill services. EPA identified specific facilities as CWTs during previous category reviews and assigned these CWT facilities a placeholder NAICS code of "CWT," putting them in the CWT Point Source Category. EPA also identified specific facilities as waste combustors during previous category reviews and assigned these waste combustor facilities a placeholder NAICS code of "WC," putting them in the Waste Combustor Point Source Category. The remaining facilities were categories as the Landfills Point Source Category. In addition, for the TRIReleases2007 database, EPA categorized the facilities reporting the following six NAICS codes into the CWT, Landfills, or Waste Combustors Point Source Categories based on the specific operations at the facility:
  - 562112: Hazardous Waste Collection;
  - 562211: Hazardous Waste Treatment and Disposal;
  - 562213: Solid Waste Combustors and Incinerators;
  - 562219: Other Nonhazardous Waste Treatment and Disposal; and
  - 562920: Materials Recovery Facilities.

4.4.2 TRIReleases2007: Pollutant Corrections

This section describes database corrections made to discharges of specific pollutants reported to the TRI for EPA's 2009 screening-level review in the *TRIReleases2007* database.

- *Metal Compounds.* For TRI reporting, facilities may be required to report discharges of a metal (e.g., zinc) and its compounds (e.g., zinc compounds) on a single reporting form. Because the release quantity for the metal compound reporting is based on the mass of the parent metal, EPA uses the parent metal TWF to calculate TWPE for the metal and metal compound discharges. For ranking purposes, EPA combined the TWPEs for the metal and metal compounds (i.e., TWPE reported for "zinc and zinc compounds"). For more details on this correction, see Section 3.4.4 of the 2009 SLA Report (U.S. EPA, 2009).

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

- *Phosphorus (Yellow or White).* Yellow and white phosphorus, both allotropes of elemental phosphorus, are hazardous chemicals that spontaneously ignite in air. During the 2006 screening-level review, EPA determined that facilities were incorrectly reporting discharges of total phosphorus (i.e., the phosphorus portion of phosphorus-containing compounds) as phosphorus (yellow or white) (U.S. EPA, 2006b). Therefore, EPA deleted all phosphorus (yellow or white) discharges reported to TRI for the 2009 screening-level review.

4.4.3 TRIReleases2007: Data Quality Review

EPA evaluated the quality of TRI data for use in the 2009 screening-level review and prioritization of loadings of toxic and non-conventional pollutants discharged by industrial categories based on completeness, accuracy, reasonableness, and comparability. The *Quality Assurance Project Plan for the 2009 Annual Screening-Level Analysis of TRI, ICIS-NPDES, and PCS Industrial Category Discharge Data* describes the quality objectives in more detail (ERG, 2009). The following discussion provides an overview of the quality review steps:

- *Completeness Checks.* EPA compared counts of facilities in *TRIReleases2007* to *TRIReleases2005*, *TRIReleases2004*, *TRIReleases2003*, and *TRIReleases2002* to describe the completeness of the database. The comparison showed that for 72 percent of the point source categories or SIC code groupings, the number of facilities reporting wastewater discharges changed by less than 25 percent from 2005 to 2007. EPA also determined that most NAICS codes exhibiting a large percentage change did so because only a few facilities in these NAIC codes reported discharges (e.g., a change from one facility to three facilities is equivalent to a 200 percent increase).

- *Accuracy of Facility Discharges.* EPA identified facilities with the highest TWPE loadings. EPA identified facilities for review whose pollutant discharges accounted for more than 95 percent of the TWPE for their point source category. EPA compared 2007 TRI data to other available information, such as PCS and ICIS-NPDES, information from EPA's Envirofacts web page, the facilities' NPDES permits, and discussion with facility contacts.

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

- *Accuracy of Database Queries.* EPA's quality review for the development of *TRIReleases2007* included accuracy checks for database queries in *TRICalculations2007* and *TRIReleases2007*. Documentation of accuracy checks is provided in a QC table in each Microsoft Access™ database.

- *Comparability.* EPA compared *TRIReleases2007* to *TRIReleases2005*, *TRIReleases2004*, *TRIReleases2003* and *TRIReleases2002* to identify pollutant discharges that differ more than the year-to-year variation of other chemicals and facilities. From the comparison, EPA determined that 42 percent of the pollutants

discharged in both 2007 and 2005 had a change of less than 50 percent in the quantity discharged. EPA also determined that most of the pollutants with a large percentage change reflected initial discharges of small quantities. In addition, most of these pollutant discharges resulted in small TWPEs.

4.4.4 TRIReleases2007: Facility Reviews

Table 4-4 presents EPA's TRI facility review and corrections made to the *TRIReleases2007* database. EPA reviewed the accuracy of calculated discharges from facilities with discharges that have the greatest impact on total category loads and category rankings. EPA used the following criteria to select facilities for review:

- Facilities with the highest toxic-weighted discharges of all facilities reporting to TRI for reporting year 2007;
- Facilities with the highest toxic-weighted discharges of individual chemicals that contribute the majority of the toxic-weighted discharges for all categories; and
- Facilities with the highest toxic-weighted discharges from categories that contribute the majority of the toxic-weighted discharges for all categories.

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

1. Review database corrections for *TRIReleases2005*, *TRIReleases2004*, *TRIReleases2003*, *TRIReleases2002*, and *TRIReleases2000* to determine whether corrections were made during previous reviews and evaluate whether these corrections should be applied to *TRIReleases2007*.

2. Review discharges reported to TRI for other reporting years (i.e., 2000, 2002, 2003, 2004 and 2005) and compare to discharges reported to TRI for reporting year 2007.

3. Review 2007 discharge monitoring report data in PCS and ICIS-NPDES, if available, to hand-calculate annual pollutant loads and compare to discharges reported to TRI for reporting year 2007.

4. Contact the facility to verify whether the pollutant discharges are reported correctly.

4.4.5 Trends in TRI Data

EPA has identified a consistent decrease every year since 2002 in the total number of facilities reporting to TRI and the number of facilities reporting discharges to TRI. Table 4-5 illustrates the decrease for each year since 2002.

Table 4-4. Summary of *TRIReleases2007* Facility Review

Facility Name	Facility Location	Point Source Category	Chemical(s) in Question	Review Findings	Actions Taken/Database Correction
Dow Chemical Co	Midland, MI	OCPSF	Dioxin Compounds	Facility is continuing to review dioxin discharges.	No change - on hold pending facility response.
Eastman Kodak Co Kodak Park	Rochester, NY	Metal Finishing	Dioxin Compounds	Detected two dioxin congeners in 2007. Facility provided water congener distribution and concentrations (Smith, 2009).	Database Change: Revise dioxin load and distribution
LNVA - North Regional Treatment Plant	Beaumont, TX	CWT	PACs	All PAC measurements were ND (Eastep, 2009).	Database Change: Zero PACs load
Chevron Products Co. Div Of Chevron USA Inc.	El Segundo, CA	Petroleum	Dioxin Compounds	Facility said all congeners were ND (Tea, 2009).	Database Change: Zero dioxin load
Viskase Corp	Loudon, TN	Plastics	Carbon Disulfide	POTW receiving wastewater provided monitoring data (Birkholz, 2009). Facility estimates are extremely conservative (Glarrow, 2009).	Database Change: Revise carbon disulfide load
BP Products North America Inc Toledo Refinery	Oregon, OH	Petroleum	Dioxin Compounds	Facility verified dioxin load and distribution based on historical measured data (Ellet and Thurber, 2009).	None
Chevron Products Co. Richmond Refinery	Richmond, CA	Petroleum	Dioxin Compounds	Facility verified dioxin load and distribution based on measured concentrations (O'Hare and Howell, 2009b).	None
Dupont Chambers Works	Deepwater, NJ	Inorganic	PACs	All PAC measurements were ND in New Jersey DMR database (Krejci, 2009).	Database Change: Zero PACs load
AK Steel Corp. (Rockport Works)	Rockport, IN	Iron & Steel	Nitrate Compounds	Facility provided revised load. Facility previously calculated load assuming it was a leap year (McCoy, 2009).	Database Change: Revise nitrate compounds load
Tronox LLC	Hamilton, MS	Inorganic	Manganese Compounds	Facility provided monitoring data that verified load (Dickerson, 2009).	None
Louisiana Pigment Co LP	Westlake, LA	Inorganic	Dioxin Compounds	Facility provided water congener distribution (Kashyap, 2009).	Database Change: Revise dioxin distribution

CWT – Centralized waste treaters.
OCPSF – Organic chemicals, plastics, and synthetic fibers.
PACs – Polycyclic aromatic compounds.
ND – Non-detect.

Table 4-5. Number of Facilities with Data in TRI for Reporting Years 2002 Through 2007

Reporting Year	Number of Facilities Reporting to TRI	Number of Facilities Reporting Discharges to TRI
2002	24,379	8,291
2003	23,811	8,051
2004	23,675	7,930
2005	23,461	7,837
2006	22,880	7,506
2007	21,965	6,572

Source: *TRIReleases2002_v4*; *TRIReleases2003_v2*; *TRIReleases2004_v3*; *TRIReleases2005_v2*; *TRIReleases2006_v1*; and *TRIReleases2007_v2*.

EPA does not have sufficient information to determine the cause of the decrease in the number of facilities reporting to TRI over the past six years. The aggregate number of establishments[6] reported to the US Economic Census increased from 2002 to 2007. No changes in reporting requirements occurred which can be attributed to the decrease. EPA will continue to monitor this change in the future.

4.5 *TRIReleases2007* Rankings and *DMRLoads2007* Rankings

After incorporating the changes discussed in Sections 4.3 and 4.4, EPA generated the final versions of the *TRIReleases* and *DMRLoads* databases used for the 2009 screening-level review: *TRIReleases2007_v2 and DMRLoads2007_v3*. Tables C-1 and C-2 in Appendix C present the category rankings by TWPE from the *TRIReleases2007_v2* and *DMRLoads2007_v3* databases, respectively. The category rankings presented in these tables reflect all the corrections made during the 2009 screening-level reviews. Tables C-3 and C-4 in Appendix C present the six-digit NAICS code rankings by TWPE from *TRIReleases2007_v2* and the four-digit SIC code rankings by TWPE from *DMRLoads2007_v3*, respectively. Tables C-5 and C-6 in Appendix C present the chemical rankings by TWPE from *TRIReleases2007_v2* and *DMRLoads2007_v3*, respectively.

4.6 Methodology, Data Sources, and Limitations References

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PART II: RESULTS OF THE 2009 ANNUAL REVIEW OF INDUSTRIAL CATEGORIES WITH EXISTING ELGS

5. 2009 ANNUAL REVIEW OF EXISTING EFFLUENT LIMITATIONS GUIDELINES AND STANDARDS AND RANKING OF POINT SOURCE CATEGORIES

For the 2009 annual review, EPA conducted the following activities:

- Updated the reviews from previous years (i.e., revised the 2008 annual review results with new or corrected data);
- Performed new research (i.e., contacted industry to verify discharges, conducted literature searches, and collected additional data); and
- Solicited information from stakeholders through comment response and other stakeholder outreach (e.g., meetings with industry trade groups).

This section presents the results of the 2009 screening-level review (Section 5.1), and presents the prioritization of categories for the 2009 annual review (Section 5.2).

5.1 Results of the 2009 Screening-Level Review

For the 2009 screening-level review, EPA combined the results of the *TRIReleases2007_v2* and the *DMRLoads2007_v3* databases, which are described in the *Technical Support Document for the Annual Review of Existing Effluent Guidelines and Identification of Potential New Point Source Categories* (U.S. EPA, 2009). When combining the results of these databases, EPA made eliminated from further consideration the results for the following:

- Discharges from industrial categories for which EPA is currently developing or revising ELGs;
- Discharges from point source categories for which EPA has recently promulgated or revised ELGs; and
- Discharges from facilities determined not to be representative of their category.

Sections 5.2.1 through 5.2.3 discuss the rationale for these decisions. The final combined database rankings represent the results of the 2009 screening-level review and are presented in Section 5.2.4.

5.1.1 Categories for Which EPA is Currently Developing or Revising ELGs

EPA is currently considering revisions to ELGs for Organic Chemicals, Pesticides, and Synthetic Fibers (OCPSF) (40 CFR 414) and the Inorganic Chemicals Manufacturing (40 CFR 415) Point Source Categories for facilities that produce Chlorine and Chlorinated Hydrocarbons (CCH). Because the CCH rulemaking is underway, EPA excluded discharges from these facilities from further consideration under the current planning cycle. EPA subtracted the Toxic Weight Pollutant Equivalent (TWPE) loads from facilities that produce chlorine or chlorinated hydrocarbons from the OCPSF and Inorganic Chemicals Manufacturing Point Source Category loads. Because facilities that produce chlorine and chlorinated hydrocarbons are only a subset of

the OCPSF and Inorganic Chemicals Manufacturing Categories, EPA included loads for all other facilities in these two categories in the prioritization of categories for further review[7].

5.1.2 Categories for Which EPA Recently Promulgated or Revised ELGs

For the 2009 annual review and development of category rankings, EPA excluded point source categories for which ELGs were recently established or revised but not yet fully implemented, or were recently reviewed in a rulemaking context where EPA decided to withdraw the proposal and select the "no action" option. In general, EPA removes a category from further consideration during a review cycle if EPA established, revised, or reviewed the category's ELGs within seven years prior to the annual review. This seven-year period allows time for the ELGs to be incorporated into NPDES permits. For the 2009 annual review EPA excluded from the development of category rankings any categories with ELGs established, revised, or recently reviewed after August 2002. Table 5-1 lists these categories.

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

Table 5-1. Point Source Categories That Have Undergone a Recent Rulemaking or Review

40 CFR Part	Point Source Category	Date of Rulemaking
122 and 412	Concentrated Animal Feeding Operations (CAFOs)	November 20, 2008
451	Concentrated Aquatic Animal Production (or Aquaculture)	August 23, 2004
432	Meat and Poultry Products	September 8, 2004
413, 433, and 438	Metal Products and Machinery (including Metal Finishing and Electroplating)	May 13, 2003
420	Iron and Steel Manufacturing	October 17, 2002

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

5.1.3 Discharges Not Categorizable

EPA identified discharges that are not categorizable into new point source categories or subcategories. In particular, due to the high TWPE discharges EPA reviewed reported discharges from a Superfund site (Auchterlonie, 2009).[8] Direct discharges from Superfund sites, whether made onsite or offsite, are subject to NPDES permitting requirements (U.S. EPA, 1988a; U.S. EPA, 1988b). For the reasons discussed below EPA determined that these discharges do not

[7] EPA is also currently revising the concentrated animal feeding operations (CAFOs) ELG (Part 412); however, the TWPE associated with this category is low and does not affect the prioritization of categories based on TWPE. For more information on industries currently undergoing rulemakings, see http://www.epa.gov/guide/industry.html.
[8] The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as Superfund, was enacted by Congress on December 11, 1980.

represent a point source category and excluded these TWPE from the point source category rankings.

EPA identified that discharges from Superfund sites are too varied to be categorized into a point source category. In particular, these discharges vary by:

- Contaminants (e.g., metals, pesticides, dioxin);
- Treatment technologies (e.g., air stripping, granular activated carbon, chemical/ultra-violet oxidation, aerobic biological reactors, chemical precipitation); and
- Types of facilities causing groundwater contamination (e.g., wood treatment facilities, metal finishing and electroplating facilities, drum recycling facilities, mine sites, mineral processing facilities, radium processing facilities).

Moreover, the duration and volume of these direct discharges vary significantly due to differences in aquifer characteristics and the magnitude, fate, and transport of contaminants in aquifers and vadose zones. Currently at Superfund sites, permit writers determine technology-based effluent limits using their best professional judgment (BPJ). EPA selects the remedial technology and derives numerical effluent discharge limits. The permit must also contain more stringent effluent limitations when required to comply with state water quality standards. EPA finds that the current site-specific BPJ approach is workable and flexible within the context of a Superfund cleanup.

5.1.4 Categories with One Facility Dominating the TWPE

EPA identified point source categories with significant TWPE where only one facility was responsible for most of the TWPE reported to be discharged (i.e., where one facility's TWPE accounted for more than 95 percent of the category TWPE, but was not the only facility reporting discharges for the category). Table 5-2 lists these categories. EPA identified 10 facilities that dominated the TWPE in the category to which they belonged. EPA investigated these facilities to determine if their discharges were representative of the category. If they were not, EPA subtracted the facility's TWPE from the total category TWPE and recalculated the category's ranking. EPA performed this analysis separately for both of the databases. Based on EPA's knowledge of these industries and the review of the pollutant discharges for these facilities, EPA determined that all of the pollutant discharges are representative of the industry and therefore, EPA did not remove the discharges from the category.

5.1.5 Results of the 2009 Screening-Level Review

After adjusting the category TWPE totals and rankings as described in Sections 5.2.1 through 5.2.3, EPA consolidated the *DMRLoads2007* and *TRIReleases2007* rankings into one list using the following steps:

Table 5-2. Point Source Categories with One Facility Dominating the TWPE Discharges

Point Source Category	Facility with Over 95% of Category TWPE	Facility Location	Data Source	Pollutant Driving TWPE	Facility TWPE	Percent of Total Category TWPE	Action
Textile Mills (Part 410)	Deroyal Textiles	Camden, SC	DMR 2007	Aldrin	76,469	95.6%	Did not remove load from category TWPE
Independent and Stand Alone Labs (Potential New Category)	Brookhaven National Laboratory	Upton, NY	DMR 2007	PCBs	5,166	96.5%	Did not remove load from category TWPE
Canned and Preserved Seafood Processing (Part 408)	Campbell Soup Company	Napoleon, OH	DMR 2007	Hexavalent Chromium	3,123	96.6%	Did not remove load from category TWPE
Plastics Molding and Forming (Part 463)	Innovia Films, Inc	Topeka, KS	DMR 2007	Carbon Disulfide	24,219	98.3%	Did not remove load from category TWPE
Timber Products Processing (Part 429)	Stimson Lumber Co Bonner Mill	Bonner, MT	DMR 2007	Chlorine	51,374	99.7%	Did not remove load from category TWPE
Soap and Detergent Manufacturing (Part 417)	Stepan Company-Elwood	Elwood, IL	DMR 2007	Hexachlorobenzene	47,795	99.96%	Did not remove load from category TWPE
Ferroalloy Manufacturing (Part 424)	Eramet Marietta Inc	Marietta, OH	DMR 2007	Cadmium	4,349	99.99%	Did not remove load from category TWPE
Construction and Development (Potential New Category)	Aeroquip - Vickers	Joplin, MO	DMR 2007	Cadmium	324	99.99%	Did not remove load from category TWPE
Soap and Detergent Manufacturing (Part 417)	Crodia Inc	New Castle, DE	TRI 2007	Bis(2-chloroethyl) Ether	14,453	99.1%	Did not remove load from category TWPE
Tobacco Products (Potential New Category)	Philip Morris Park 500 Site	Chester, VA	TRI 2007	Chlorine	4,730	99.4%	Did not remove load from category TWPE

Source: *TRIReleases2007_v2*; and *DMRLoads2007_v3*.

- EPA combined the two lists of point source categories by adding each category's *DMRLoads2007* TWPE and *TRIReleases2007* TWPE[9].
- EPA then ranked the point source categories based on total *DMRLoads2007* and *TRIReleases2007* TWPE.

Table 5-3 presents the combined *DMRLoads2007* and *TRIReleases2007* rankings. These are the final category rankings accounting for all corrections made to the databases during the 2009 screening-level review and removal of any categories and discharges as discussed in Sections 5.2.1 through 5.2.3.

5.2 Prioritization of Categories for the 2009 Annual Review

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

Table 5-4 lists the point source categories with existing ELGs, the level of review EPA performed as part of the 2009 annual review, and how the category was identified for further review, if applicable.

5.2.1 Detailed Study of Existing ELGs

EPA performed detailed studies on three point source categories as part of its 2009 annual review based on the results of its 2007 and 2008 annual reviews, as shown in Table 5-4. Because EPA data collection was not finished in 2008, EPA continued detailed studies of the Steam Electric Generating Category (Part 423), Oil and Gas Extraction (Part 435) (to assess whether to revise the limits to include coalbed methane extraction as a new subcategory), and the Health Care Industry (includes Hospitals (Part 460)). EPA did not identify additional categories for detailed study as part of the 2009 annual review.

[9] EPA notes that this may result in "double-counting" of chemical discharges a facility reported to both PCS/ICIS-NPDES and TRI, and "single-counting" of chemicals reported in only one of the databases. Further, the combined databases do not count chemicals that may be discharged but are not reported to PCS/ICIS-NPDES or TRI.

Table 5-3. Final *DMRLoads2007* and *TRIReleases2007* Combined Point Source Category Rankings

40 CFR Part	Point Source Category	*DMRLoads2007* TWPE	*TRIReleases2007* TWPE	Total TWPE	Cumulative Percent of Total TWPE	Rank
423	Steam Electric Power Generating	20,374,829 [a]	541,508	20,916,337	72.64	1
430	Pulp, Paper And Paperboard	2,726,865 [b]	459,959	3,186,823	83.71	2
418	Fertilizer Manufacturing	1,095,046	4,462	1,099,509	87.53	3
414	Organic Chemicals, Plastics And Synthetic Fibers	413,226 [c]	574,742	987,968	90.96	4
419	Petroleum Refining	402,506	171,756	574,262	92.96	5
415	Inorganic Chemicals Manufacturing	393,523	54,657	448,181	94.51	6
421	Nonferrous Metals Manufacturing	342,747	38,885	381,632	95.84	7
440	Ore Mining And Dressing	184,455	44,437	228,892	96.63	8
455	Pesticide Chemicals	180,117	24,693	204,810	97.35	9
471	Nonferrous Metals Forming And Metal Powders	119,244	8,834	128,077	97.79	10
410	Textile Mills	79,934	2,389	82,323	98.08	11
429	Timber Products Processing	51,552	16,301	67,852	98.31	12
417	Soap And Detergent Manufacturing	47,815	14,585	62,401	98.53	13
444	Waste Combustors	38,412 [d]	40	38,451	98.66	14
445	Landfills	35,804 [d]	83	35,887	98.79	15
463	Plastics Molding And Forming	24,626	8,781	33,407	98.90	16
439	Pharmaceutical Manufacturing	24,937	7,996	32,934	99.02	17
409	Sugar Processing	32,520	26	32,545	99.13	18
458	Carbon Black Manufacturing		32,375	32,375	99.24	19
436	Mineral Mining And Processing	26,719	2,416	29,135	99.34	20
428	Rubber Manufacturing	11,195	7,864	19,059	99.41	21
422	Phosphate Manufacturing	18,459	250	18,709	99.47	22
464	Metal Molding And Casting (Foundries)	11,271	6,115	17,386	99.54	23
469	Electrical And Electronic Components	9,350	7,551	16,902	99.59	24
467	Aluminum forming	12,182	2,707	14,889	99.65	25
437	Centralized Waste Treatment	10,403 [d]	3,785	14,189	99.69	26

Table 5-3. Final *DMRLoads2007* and *TRIReleases2007* Combined Point Source Category Rankings

40 CFR Part	Point Source Category	*DMRLoads2007* TWPE	*TRIReleases2007* TWPE	Total TWPE	Cumulative Percent of Total TWPE	Rank
NA	Miscellaneous Foods And Beverages	5,842	6,576	12,418	99.74	27
454	Gum And Wood Chemicals Manufacturing	10,478	55	10,532	99.77	28
411	Cement Manufacturing	8,960	452	9,412	99.81	29
425	Leather Tanning And Finishing	8	7,802	7,809	99.83	30
468	Copper forming	2,310	4,951	7,261	99.86	31
NA	Independent And Stand Alone Labs	5,355	30	5,385	99.88	32
NA	Tobacco Products	3	4,756	4,759	99.89	33
407	Canned And Preserved Fruits And Vegetables Processing	1,757	2,960	4,717	99.91	34
424	Ferroalloy Manufacturing	4,349	340	4,689	99.93	35
406	Grain mills	1,984	2,084	4,068	99.94	36
408	Canned And Preserved Seafood Processing	3,232	234	3,467	99.95	37
434	Coal Mining	2,294	493	2,787	99.96	38
461	Battery Manufacturing	1,096	1,642	2,738	99.97	39
405	Dairy products processing	76	2,402	2,479	99.98	40
443	Paving And Roofing Materials (Tars And Asphalt)	1,280	249	1,529	99.99	41
NA	Printing & Publishing	999	110	1,109	99.99	42
426	Glass Manufacturing	353	546	899	99.99	43
457	Explosives Manufacturing	785	14	798	100.00	44
465	Coil Coating	166	241	407	100.00	45
435	Oil & Gas Extraction	256		256	100.00	46
466	Porcelain Enameling	11	164	175	100.00	47
446	Paint Formulating		140	140	100.00	48
447	Ink Formulating		20	20	100.00	49
460	Hospital	15		15	100.00	50
NA	Photo Processing	1		1	100.00	51

Table 5-3. Final *DMRLoads2007* and *TRIReleases2007* Combined Point Source Category Rankings

40 CFR Part	Point Source Category	*DMRLoads2007* TWPE	*TRIReleases2007* TWPE	Total TWPE	Cumulative Percent of Total TWPE	Rank
459	Photographic	1		1	100.00	52
442	Transportation Equipment Cleaning	0		0	100.00	53
	Total	**26,719,348**	**2,073,457**	**28,792,806**		

Source: *TRIReleases2007_v2*; *DMRLoads2007_v3*.
NA – Not applicable; no existing ELGs apply to discharges.
a – EPA corrected a suspected units error in *DMRLoads2007_v3* for FB Culley Station in Newburgh, IN (IN0002259) in the Steam Electric Power Generating Category. EPA attempted to contact the facility but the facility never returned calls. Therefore, EPA was unable to verify the correction.
b – For the Pulp, Paper, and Paperboard Category, EPA contacted facilities to verify the concentrations of dioxin and dioxin-like compounds in PCS and ICIS-NPDES. EPA found that, for all facilities contacted, there were either units errors (e.g., reported as ng/L but in the database as mg/L) or missing non-detect indicators. The new Pulp, Paper, and Paperboard Category total TWPE is 252,163. See Section 12.2.2.1 for additional details on the facilities-specific corrections.
c – EPA contacted GE Silicones in Friendly, WV (WV0000094), in the OCPSF Category and identified a units error in *DMRLoads2007_v3* (Martin, 2009). The new LBY and TWPE reported for this facility were recalculated and are now 158 and 100.3, respectively. The new OCPSF Category total TWPE is 308,946.
d – EPA also reviewed the operations of facilities reporting SIC code 4953 (Refuse Systems) and classified them into the Centralized Waste Treaters (CWT) Category (40 CFR Part 437), Landfills Category (40 CFR Part 445), and Waste Combustors Category (40 CFR Part 444). The new TWPE for the CWT, Landfills, and Waste Combustors Categories are 30,904; 15,303; and 3,221, respectively.

Table 5-4. 2009 Annual Review of Categories with Existing ELGs: Level of Review

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

Table 5-4. 2009 Annual Review of Categories with Existing ELGs: Level of Review

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

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

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 fill in data gaps. Next, EPA considers costs and performance of applicable and demonstrated control technology, process change, or pollution prevention alternatives that can effectively reduce the pollutants remaining in the industrial category's wastewater. Last, EPA considers the affordability or economic achievability of the technology, process change, or pollution prevention measures identified above.

Types of data sources that EPA may consult in conducting its detailed studies include, but are not limited to: (1) the U.S. Economic Census; (2) TRI, PCS, and ICIS-NDPES 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.

For more information about the Oil and Gas Extraction Detailed Study (Coalbed Methane Industry), the Health Care Industry Detailed Study, and the Steam Electric Generating Detailed Study, see Sections 13, 14, and 15 of this report, respectively.

5.2.2 Preliminary Category Reviews

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

As shown in Table 5-4, EPA identified for preliminary review those industrial categories currently regulated by existing effluent guidelines that cumulatively compose more than 95 percent of the combined *DMRLoads2007* and *TRIReleases2007* total TWPE. EPA also reviewed the Ore Mining and Dressing Category (40 CFR Part 440) because during previous annual reviews, EPA has concluded that there are not sufficient data available to determine whether wastewater discharges from the Ore Mining and Dressing Category warrant a detailed study. In addition to the Steam Electric Power Generating Category this list includes the following point source categories, along with a reference to where they are discussed in this report:

- Fertilizer Manufacturing (Section 6.0);
- Inorganic Chemicals Manufacturing (Section 7.0);
- Nonferrous Metals Manufacturing (Section 8.0);
- Ore Mining and Dressing (Section 9.0);
- Organic Chemicals, Plastics, and Synthetic Fibers (Section 10.0);
- Petroleum Refining (Section 11.0); and
- Pulp, Paper and Paperboard (Section 12.0).

EPA recently conducted detailed studies or preliminary reviews of many of the categories listed above. Table 5-5 lists these categories and the level of review performed for its 2005 through 2008 annual reviews. For each of these categories, because EPA's annual review builds on previous reviews, EPA primarily looked at the pollutants reported in 2007 and their contribution to their category's TWPE.

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

40 CFR Part	Point Source Category	Level of Review for 2005/2006	Level of Review for 2007/2008
414	Organic Chemicals, Plastics, and Synthetic Fibers	Preliminary Category Review	Preliminary Category Review
415	Inorganic Chemicals Manufacturing	Preliminary Category Review	Screening-Level Review [a]

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

40 CFR Part	Point Source Category	Level of Review for 2005/2006	Level of Review for 2007/2008
418	Fertilizer Manufacturing	Preliminary Category Review	Screening-Level Review [a]
419	Petroleum Refining	Preliminary Category Review	Preliminary Category Review
420	Pulp, Paper, and Paperboard	Detailed Study	Preliminary Category Review
421	Nonferrous Metals Manufacturing	Preliminary Category Review	Screening-Level Review [a]
423	Steam Electric	Detailed Study	Detailed Study
435	Oil and Gas Extraction	NA	Detailed Study
440	Ore Mining and Dressing	Preliminary Category Review	Preliminary Category Review
460	Hospitals (Health Services)	NA	Detailed Study

a – EPA conducted a preliminary category review as part of the 2007 annual review, but not as part of the 2008 annual review.

5.3 2009 Annual Review References

1. Auchterlonie, Steve. 2009. Notes from Telephone Conversation between Chris Krejci, ERG and Steve Auchterlonie, Front St. Remedial Action. RE: Verification of magnitude and basis of estimate for dioxin and dioxin-like compounds discharges in PCS. (March 13). EPA-HQ-OW-2008-0517 DCN 06636.

2. Davis, Katherine. 2009. Notes from Telephone Conversation between Elizabeth Sabol, Eastern Research Group, Inc. and Katherine Davis, Westvaco Texas, L.P. RE: Basis of TCDD Equivalent Concentrations Reported in 2007. (July 7). EPA-HQ-OW-2008-0517 DCN 06547.

3. Martin, Jason. 2009. Notes from Telephone Conversation between Elizabeth Sabol, Eastern Research Group, Inc. and Jason Martin, MPM Silicones LLC. RE: Basis of Copper (Total Recoverable) Concentrations Reported in 2007. (July 1). EPA-HQ-OW-2008-0517 DCN 06549.

4. McCuutchen, Kate. 2009. Notes from Telephone Conversation between Elizabeth Sabol, Eastern Research Group, Inc. and Kate McCuutchen, Blue Heron Paper Co. RE: Basis of Methylmercury Concentration Reported in 2007 in DMR. (July). EPA-HQ-OW-2008-0517 DCN 06546.

5. Schwartz, Jerry. 2009. Notes from email conversation between Carey Johnston, EPA and Jerry Schwartz, EPA. RE: Information in Response to EPA Questions on Data. EPA-HQ-OW-2008-0517 DCN 06700-06700A2.

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8. U.S. EPA. 2008. *Coal Mining Detailed Study.* EPA-821-R-08-012. Washington, DC. (August). EPA-HQ-OW-2006-0771-1695.

9. U.S. EPA. 2009. *Technical Support Document for the Annual Review of Existing Effluent Guidelines and Identification of Potential New Point Source Categories.* EPA-821-R-09-007. Washington, DC. (October). EPA-HQ-OW-2008-0517 DCN 06557.

6. FERTILIZER MANUFACTURING (40 CFR PART 418)

EPA identified the Fertilizer Manufacturing Category (40 CFR Part 418) for preliminary category review as part of the Preliminary 2010 Effluent Guidelines Program Plan. EPA previously reviewed discharges from fertilizer manufacturing facilities as part of each of EPA's Preliminary and Final Effluent Guidelines Program Plans from 2004 to 2007 (U.S. EPA, 2004; U.S. EPA, 2005; U.S. EPA, 2006; U.S. EPA, 2007). This section summarizes the 2009 annual review of the Fertilizer Manufacturing Category.

6.1 Fertilizer Manufacturing Category Background

This subsection provides background on the Fertilizer Manufacturing Category including a brief profile of the fertilizer manufacturing industry and background on 40 CFR Part 418.

6.1.1 Fertilizer Manufacturing Industry Profile

The fertilizer manufacturing industry includes facilities that produce phosphorus- and nitrogen-based fertilizers (U.S. EPA, 2006). EPA considered the following four NAICS codes as part of the Fertilizer Manufacturing Category:

- 311225FER: Fats and Oils Refining and Blending;
- 325312: Phosphatic Fertilizer Manufacturing[10];
- 325311: Nitrogenous Fertilizer Manufacturing; and
- 325314: Fertilizer (Mixing Only) Manufacturing.

Wastewater generated by facilities in NAICS code 311225 can be regulated under multiple categories. EPA reviewed available information about pollutant loads and manufacturing operations for facilities reporting this NAICS code. EPA assigned the extension "FER" to the end of the NAICS codes of facilities that likely primarily generate wastewater regulated by the Fertilizer Manufacturing ELGs. Most facilities in NAICS 311225 are grouped under the Miscellaneous Foods and Beverages Potential New Point Source Category.

Table 6-1 lists the four NAICS codes with operations in the Fertilizer Manufacturing Category. Because facilities report SIC codes in *DMRLoads2007*, and the U.S. Economic Census and TRI report data by NAICS code, EPA reclassified the 2007 DMR by the equivalent NAICS code.

[10] EPA identified an error in the *TRIReleases2007_v02* database, and pollutant loads associated with NAICS code 325312 are currently associated with the Phosphate Manufacturing Point Source Category. EPA is choosing to correct the error in future versions of the database, because the TWPE associated with NAICS code is negligible (total of 242 TWPE/yr).

Table 6-1. Number of Fertilizer Manufacturing Facilities

NAICS Code	Number of Facilities		
	2002 U.S. Economic Census	2007 DMR [a]	2007 TRI [b]
325311 Nitrogenous Fertilizer Manufacturing	144	58 [c]	40
311225FER Fats and Oils Refining and Blending	NA		1
325312 Phosphatic Fertilizer Manufacturing [d]	45	0	17
325314 Fertilizer (Mixing Only) Manufacturing	534	27	52
Total	**>723**	**85**	**110**

Source: U.S. Economic Census, 2002 (U.S. Census, 2002) *TRIReleases2007_v2*; *DMRLoads20007_v3*.
a – Major and minor dischargers. Also, DMR data is reported by SIC code; therefore EPA used an NAICS to SIC crosswalk for comparison purposes.
b – Releases to any media.
c – Includes facilities that EPA determined were subject to the Fertilizer Manufacturing ELGs as part of the 2006 annual review reporting SIC code 2874: Phosphatic Fertilizers (U.S. EPA, 2006).
d – EPA identified an error in the *TRIReleases2007_v2* database, and pollutant loads associated with NAICS code 325312 are currently associated with the Phosphate Manufacturing Point Source Category. EPA is choosing to correct the error in future versions of the database, because the TWPE associated with NAICS code is negligible (total of 240 TWPE/yr).
NA – Not applicable. This facility-specific NAICS code that EPA assigned does not correspond to NAICS code in the 2002 U.S. Economic Census.

6.1.2 40 CFR Part 418

EPA first promulgated ELGs for the Fertilizer Manufacturing Category (40 CFR Part 418) on April 8, 1974 (39 FR 12836) for the Basic Fertilizer Chemicals Segment and on January 14, 1975 (40 FR 2652) for the Formulated Fertilizer Chemicals Segment. The Fertilizer Manufacturing ELGs are applicable to process wastewater and contaminated nonprocess wastewater discharged from the specific subcategories listed in Table 6-2. The seven subcategories are based on the type of fertilizer produced (U.S. EPA, 2006). Discussion of the pollutants regulated for each subcategory can be found in Table 5-25 of the 2004 TSD (U.S. EPA, 2004).

Table 6-2. Subcategories in the Fertilizer Manufacturing Category

Subpart	Title	Related SIC Code(s)	Related NAICS Code(s)	Description
A	Phosphate Subcategory	2874: Phosphatic Fertilizers	325312: Phosphatic Fertilizer Manufacturing [a]	Manufacture of sulfuric acid by sulfur burning, wet-process phosphoric acid, normal superphosphate, triple superphosphate, and ammonium phosphate.
B	Ammonia Subcategory	2873: Nitrogenous Fertilizers	325311 Nitrogenous Fertilizer Manufacturing	Manufacture of ammonia.
C	Urea Subcategory	2873: Nitrogenous Fertilizers	325311 Nitrogenous Fertilizer Manufacturing	Manufacture of urea.

Table 6-2. Subcategories in the Fertilizer Manufacturing Category

Subpart	Title	Related SIC Code(s)	Related NAICS Code(s)	Description
D	Ammonium Nitrate Subcategory	2873: Nitrogenous Fertilizers	325311 Nitrogenous Fertilizer Manufacturing	Manufacture of ammonium nitrate.
E	Nitric Acid Subcategory	2873: Nitrogenous Fertilizers	325311 Nitrogenous Fertilizer Manufacturing	Production of nitric acid in concentrations up to 68 percent.
F	Ammonium Sulfate Production Subcategory	2873: Nitrogenous Fertilizers	325311 Nitrogenous Fertilizer Manufacturing	Production of ammonium sulfate by the synthetic process and by coke oven by-product recovery.
G	Mixed Blend Fertilizer Production Subcategory	2875: Fertilizers, Mixing Only	325314 Fertilizer (Mixing Only) Manufacturing	Production of mixed [b] and blend [c] fertilizer.

Source: *Fertilizer Manufacturing Point Source Category - 40 CFR Part 418*; *Preliminary Review of Prioritized Categories of Industrial Dischargers* (U.S. EPA, 2005).
a – EPA identified an error in the *TRIReleases2007_v2* database, and pollutant loads associated with NAICS code 325312 are currently associated with the Phosphate Manufacturing Category (40 CFR Part 422). EPA is choosing to correct the error in future years of the TRI database, because the TWPE associated with NAICS code is negligible (total of 242 TWPE).
b – Mixed fertilizer means "a mixture of wet and/or dry straight fertilizer material, mixed fertilizer materials, fillers and additives prepared through chemical reaction to a given formulation."
c – Blend fertilizer means "a mixture of dry, straight and mixed fertilizer materials."

6.2 Fertilizer Manufacturing Category 2009 Annual Review

This subsection discusses EPA's 2009 annual review of the Fertilizer Manufacturing Category including the screening-level review and category-specific review.

6.2.1 Fertilizer Manufacturing 2009 Screening-Level Review

Table 6-3 compares the screening-level results for the Fertilizer Manufacturing Category from the 2004 and 2007 TRI and DMR databases. The combined DMR and TRI TWPE decreased from 2004 to 2007. However, the 2007 DMR TWPE accounts for approximately 99 percent of the combined 2007 TWPE.

Table 6-3. Fertilizer Manufacturing Category TRI and DMR Discharges for 2004 and 2007

Year of Discharge	Year of Review	Fertilizer Manufacturing Category	
		TRI TWPE [a]	DMR TWPE [b]
2004	2007	10,843 [c]	1,168,160
2007	2009	4,462	1,095,046

Source: *PCSLoads2004_v4*; *TRIReleases2004_v3*; *TRIReleases2007_v2*; and *DMRLoads2007_v3*.
a – Discharges include transfers to POTWs and account for POTW removals.
b – Discharges include only major dischargers.
c – EPA identified an error in the *TRIReleases2007_v2* database, and pollutant loads associated with NAICS code 325312 are currently associated with the Phosphate Manufacturing Category (40 CFR Part 422). EPA is choosing to correct the error in future years of the TRI database, because the TWPE associated with NAICS code is negligible (total of 242 TWPE).

6.2.2 Fertilizer Manufacturing Category 2009 Pollutants of Concern

Table 6-4 compares the five chemicals with the highest TWPE in *TRIReleases2007_v2* and *TRIReleases2004_ v3*, while Table 6-5 lists the five pollutants with the highest TWPE in *DMRLoads2007_v3* and *PCSLoads2004_v4*.

Table 6-4. 2009 Review: Fertilizer Manufacturing Category Top TRI Pollutants

Pollutant	2004 [a]			2007 [a]		
	Rank	Number of Facilities Reporting Pollutant	TWPE	Rank	Number of Facilities Reporting Pollutant	TWPE
Nitrate Compounds	1	31	3,557	1	19	2,254
Chlorine	5	8	1,211	2	5	653
Mercury and Mercury Compounds	8	3	140	3	2	648
Zinc and Zinc Compounds	7	11	158	4	5	240
Copper and Copper Compounds	4	13	1,241	5	4	228
Dioxin and Dioxin-Like Compounds	2	1	1,961	NR	NR	NR
Polycyclic Aromatic Compounds	3	1	1,570	NR	NR	NR
Fertilizer Manufacturing Category Total	**NA**	**47 [b]**	**10,843**	**NA**	**29 [b]**	**4,462 [c]**

Source: *TRIReleases2004_v3*; and *TRIReleases2007_v2*.
a – Discharges include transfers to POTWs and account for POTW removals.
b – Number of facilities reporting TWPE greater than zero.
c – EPA identified an error in the *TRIReleases2007_v2* database, and pollutant loads associated with NAICS code 325312 are currently associated with the Phosphate Manufacturing Category (40 CFR Part 422). EPA is choosing to correct the error in future years of the TRI database, because the TWPE associated with NAICS code is negligible (total of 242 TWPE).
NA – Not applicable.
NR – Not reported.

Table 6-5. 2009 Review: Fertilizer Manufacturing Category Top DMR Pollutants

Pollutant	2004		2007	
	Number of Facilities Reporting Pollutant	TWPE	Number of Facilities Reporting Pollutant	TWPE
Fluoride	4	1,124,712	3	1,055,300
Cadmium	2	16,576	2	25,387
Aluminum	1	16,747	1	10,579
Ammonia as N	19	4,521	16	2,402
Nitrogen, nitrate total (as N)	12	4,084	11	782
Fertilizer Manufacturing Category Total	**22 [a]**	**1,168,160**	**19 [a]**	**1,095,046**

Source: *PCSLoads2004_v4*; and *DMRLoads2007_v3*.
a – Number of facilities reporting TWPE greater than zero.

EPA identified the Fertilizer Manufacturing Category pollutants of concern based on relative TWPE. EPA focused the 2009 annual review on discharges of fluoride from 2007 DMR because fluoride discharges account for over 96 percent of the combined 2007 DMR and TRI TWPE. Fluoride discharges decreased by approximately 69,000 TWPE between 2004 and 2007 in DMR. EPA did not investigate the other top pollutants as part of the 2009 annual review because the remaining TRI and DMR TWPE is such a small percentage (4 percent) of the combined Fertilizer Manufacturing Category 2007 TWPE.

6.2.2.1 Fertilizer Manufacturing Category Fluoride Discharges in DMR

According to the 2006 Effluent Guidelines Program Plan, fluoride discharges result from phosphorous-based fertilizer manufacturing (U.S. EPA, 2006). The phosphate rock is not a pure compound, but a fluorapitite mineral containing impurities of fluoride, iron, aluminum, silica, and uranium. The fluoride impurities evolve into gaseous silicon tetrafluoride (SiF_4) or gaseous hydrofluoric acid (HF) throughout the manufacture of phosphoric acid and the processing of phosphoric acid into triple superphosphates. The gaseous fluoride compounds are collected in a wet scrubber unit, generating fluoride-contaminated wastewater. Additional fluoride remains in the gypsum by-product as a variety of various fluoride compounds. The gypsum is combined with contaminated wastewater and pumped to a storage and disposal area. Wastewater is also generated from the storage and disposal area (U.S. EPA, 1974). For additional information about phosphate-based fertilizer manufacturing, see Sections 8.5.1 through 8.5.3 in the 2006 Effluent Guidelines Program Plan (U.S. EPA, 2006).

The majority (90 percent) of the fluoride discharges were from Mosaic Fertilizer, LLC in Uncle Sam, Louisiana. Mosaic Fertilizers' Uncle Sam facility manufactures phosphate fertilizer and would be subject to 40 CFR Part 418 Subpart A (Phosphate Subcategory). However, the applicability of Subpart A excludes certain wet-process phosphoric acid processes from BPT, BAT, and BCT limitations that were under construction either on or before April 8, 1974, at plants located in the state of Louisiana. As a result, Mosaic Fertilizers' Uncle Sam facility is excluded from Subpart A. Permit writers limit discharges from these facilities using best professional judgment (BPJ) (see 52 FR 28428, July 29, 1987). For a portion of the discharges from Mosaic Fertilizers' Uncle Sam facility, BPJ permits incorporate Subpart A requirements (LDEQ, 2003). For additional information on Mosaic Fertilizers' Uncle Sam facility (previously

owned by IMC Phosphates), see Section 8.5.4 in the 2006 Effluent Guidelines Program Plan (U.S. EPA, 2006). EPA concludes that these large discharges of fluoride are restricted to a single plant whose permit basis differs from limits set for the Fertilizer Category, and do not reflect the industry as a whole.

6.3 Fertilizer Manufacturing Category Potential New Subcategories

During the 2009 review, EPA did not identify any additional potential new subcategories for the Fertilizer Manufacturing Category.

6.4 Fertilizer Manufacturing Category Issues Identified and Additional Review

EPA's estimate of the toxicity of Fertilizer Manufacturing Point Source Category discharges is largely due to the DMR-reported discharges of fluoride. As shown in Table 6-5, the DMR discharge of fluoride accounted for 96 percent of the 2007 TWPE. During the 2009 annual review, EPA did not obtain any information to change its conclusions that have previously been made regarding the wastewater discharges from the fertilizer manufacturing facilities. Therefore, the conclusions of the Fertilizer Manufacturing Category review are as follows:

- EPA verified the fluoride discharges in DMR 2007 for Mosaic Fertilizers' Uncle Sam facility, a phosphate fertilizer manufacturer in Uncle Sam, LA. This facility is exempt from 40 CFR Part 418, Subpart A, the permit is based on BPJ, and the permit includes fluoride limits. EPA concludes that this facility does not represent the category as a whole, because it is exempt from Part 418 (see 52 FR 28428, July 29, 1987).

- The total 2007 TWPE excluding Mosaic Fertilizers' Uncle Sam facility's 2007 TRI and DMR discharges is 221,768 TWPE.

EPA prioritizes point source categories with existing regulations for potential revision based on the greatest estimated toxicity to human health and the environment, measured as TWPE. Based on the above conclusions, EPA is assigning this category with a lower priority for revision (i.e., this category is marked with "(3)" in the "Findings" column in Table V-1 in the Federal Register notice that presents the 2009 annual review of existing effluent guidelines and pretreatment standards).

6.5 Fertilizer Manufacturing Category References

1. LDEQ. 2003. Louisiana Department of Environmental Quality. Office of Environmental Services Water Discharge Permit and Fact Sheet NPDES LA0004847 – IMC Phosphates Company Uncle Sam Plant, Uncle Sam, LA. Baton Rouge, LA. (June 16). EPA-HQ-OW-2004-0032-1773.

2. U.S. Economic Census. 2002. Available online at: http://www.census.gov/econ/census02.

3. U.S. EPA. 1974. *Development Document for Effluent Limitations Guidelines and New Source Performance Standards for the Basic Fertilizer Chemicals Segment of the Fertilizer Manufacturing Point Source Category*. EPA-440/1-75/042-a. Washington, DC. (March).

4. U.S. EPA. 2004. *Technical Support Document for the 2004 Effluent Guidelines Program Plan*. EPA 821-R-04-014. Washington, DC. (August). EPA-HQ-OW-2003-0074-1346 through 1352.

5. U.S. EPA. 2005. *Preliminary 2005 Review of Prioritized Categories of Industrial Dischargers*. EPA-821-B-05-004. Washington, DC. (August). EPA-HQ-OW-2004-0032-0053.

6. U.S. EPA. 2006. *Technical Support Document for the 2006 Effluent Guidelines Program Plan.* EPA-821-R-06-018. Washington, DC. (December). Docket OW-2004-0032-2782.

7. U.S. EPA. 2007. *Technical Support Document for the Preliminary 2008 Effluent Guidelines Program Plan*. EPA-821-R-07-007. Washington, DC. (October). EPA-HQ-OW-2006-0771-0819.

7. INORGANIC CHEMICALS MANUFACTURING (40 CFR PART 415)

EPA identified the Inorganic Chemicals Manufacturing (Inorganic Chemicals) Point Source Category (40 CFR Part 415) for preliminary category review as part of the Preliminary 2010 Effluent Guidelines Program Plan. This industry was reviewed previously in each of EPA's Preliminary and Final Effluent Guidelines Program Plans from 2004 to 2007, except 2005 (U.S. EPA, 2004; U.S. EPA, 2006; U.S. EPA, 2007).

This section describes the results of EPA's 2009 preliminary category review of the Inorganic Chemicals Category. EPA is currently reviewing discharges from the Chlor-Alkali Subcategory as part of the Chlorine and Chlorinated Hydrocarbons (CCH) ELGs rulemaking. Because a rulemaking for this segment of the Inorganic Chemicals Category is underway, EPA excluded discharges from these facilities from further consideration in this review (see Table V-1, 73 FR 53218, September 15, 2008).

7.1 Inorganic Chemicals Category Background

This section provides background on the Inorganic Chemicals Category including a brief profile of the inorganic chemicals manufacturing industry and background on 40 CFR Part 415.

7.1.1 Inorganic Chemicals Industry Profile

The inorganic chemicals manufacturing industry includes facilities that manufacture a broad class of substances encompassing those substances that do not include carbon and its derivatives as their principal elements. EPA considered the following seven NAICS codes as part of the Inorganic Chemicals Category:

- 325120: Industrial Gases;
- 325131: Inorganic Pigments;
- 325181: Alkalies and Chlorine;
- 325188: All Other Basic Inorganic Chemical Manufacturing;
- 325998INORG: All Other Miscellaneous Chemical Product and Preparation;
- 331311: Alumina Refining; and
- 325510INORG: Paint and Coating Manufacturing.

Wastewater generated by facilities in NAICS codes 325998 and 325510 can be regulated under multiple categories. EPA reviewed available information about pollutant loads and manufacturing operations for facilities reporting these NAICS codes. EPA assigned the extension "INORG" to the end of the NAICS codes of facilities that likely primarily generate wastewater regulated by the Inorganic Chemicals ELGs. For example, most facilities in NAICS 325510 are grouped under the Organic Chemicals, Plastics, and Synthetic Fibers Point Source Category.

This list of NAICS codes includes facilities that EPA determined are potential new subcategories to the Inorganic Chemicals Category. As part of the 2004 annual review, EPA reviewed industries with SIC codes not clearly subject to existing ELGs. EPA concluded that the

processes, operations, wastewaters, and pollutants of facilities in the following SIC codes are similar to those of the Inorganic Chemicals Category (U.S. EPA, 2004):[11]

- 2812: Alkalies and Chlorine;
- 2813: Industrial Gases;
- 2816: Inorganic Pigments; and
- 2819: Industrial Inorganic Chemicals.

As part of the 2009 annual review, EPA reclassified these SIC codes as equivalent NAICS codes for use with the U.S. Economic Census and 2007 TRI data that are reported by NAICS code. However, there is not a direct relationship between one SIC and one NAICS codes. As a result, EPA included the following NAICS codes in the 2009 annual review of the Inorganic Chemicals Category because they contain facilities with operations that are similar to the SIC codes above:

- 325120: Industrial Gases;
- 325131: Inorganic Pigments;
- 325181: Alkalies and Chlorine;
- 325188: All Other Basic Inorganic Chemical Manufacturing;
- 331311: Alumina Refining; and
- 325510INORG: Paint and Coating Manufacturing.

Table 7-1 lists the seven NAICS codes with operations in the Inorganic Chemicals Category. Because facilities report SIC codes in *DMRLoads2007*, and the U.S. Economic Census and TRI report data by NAICS code, EPA reclassified the 2007 DMR by the equivalent NAICS code.

Table 7-1. Number of Inorganic Chemical Manufacturing Facilities

NAICS Code	Number of Facilities		
	2002 U.S. Economic Census	2007 DMR [a]	2007 TRI [b]
325120 Industrial Gases	572	384	82
325131 Inorganic Pigments	81		41
325188 All Other Basic Inorganic Chemical Manufacturing	631		263
325510INORG Paint and Coating Manufacturing	NA		2
325998INORG All Other Miscellaneous Chemical Product and Preparation	NA		12
331311 Alumina Refining	10		6

[11] The tables in this section include discharge information from facilities reporting these SIC codes and the corresponding NAICS codes; however, these facilities contribute negligible amounts of TWPE. Consistent with the conclusions drawn during the 2004 detailed study (U.S. EPA, 2004) and 2006 review (U.S. EPA, 2006), EPA found that large numbers of these facilities discharge no wastewater and only a small number of facilities discharge TWPE greater than zero.

Table 7-1. Number of Inorganic Chemical Manufacturing Facilities

NAICS Code	Number of Facilities		
	2002 U.S. Economic Census	2007 DMR [a]	2007 TRI [b]
325181 Alkalies and Chlorine	41	10	8
Total	**1,335**	**394**	**414**

Source: U.S. Economic Census, 2002 (U.S. Census, 2002); *TRIReleases2007_v2*; *DMRLoads20007_v3*.
a – Major and minor dischargers. Also, DMR data are reported by SIC code; therefore, EPA used an NAICS to SIC crosswalk for comparison purposes.
b – Releases to any media.
NA – Not applicable. These facility-specific NAICS codes do not correspond to NAICS codes in the 2002 U.S. Economic Census.

7.1.2 40 CFR Part 415

Wastewater discharges for the inorganic chemicals manufacturing industry are regulated under 40 CFR Part 415: Inorganic Chemicals Manufacturing Point Source Category. This category consists of 67 subcategories defined by the type of inorganic chemical product manufactured. In addition to BPT, BAT, BCT, and NSPS, the category includes PSES and PSNS limitations for at least one subcategory. Table 5-6 in the 2004 Effluent Guidelines Program Plan contains details on the pollutants regulated by subpart (U.S. EPA, 2004). The effluent guidelines for the Inorganic Chemicals Category were first promulgated in 1974 and revised in 1975, 1976, 1982, and 1986.

7.2 Inorganic Chemicals Category 2009 Annual Review

This section discusses EPA's 2009 annual review of the Inorganic Chemicals Category including the screening-level review and category-specific review.

7.2.1 Inorganic Chemicals 2009 Screening-Level Review

Table 7-2 compares the Inorganic Chemicals Category TWPE for 2004 and 2007, calculated using *TRIReleases2004_v3*, *PCSLoads2004_v4*, *TRIReleases2007_v2*, and *DMRLoads2007_v3*. The table excludes the amount of TWPE contributed by the Chlor-Alkali Subcategory. EPA is currently considering revisions to ELGs for discharges from facilities that produce chlorine by the chlor-alkali process. Because a rulemaking for the chlor-alkali sector of the Inorganic Chemicals Category is underway, discharges from these facilities were excluded from further consideration for the Inorganic Chemicals Category review under the current planning cycle.

The combined DMR and TRI TWPE decreased from 2004 to 2007. However, the 2007 DMR TWPE is higher than the 2004 DMR TWPE. The 2007 DMR TWPE accounts for approximately 88 percent of the combined 2007 TWPE.

Table 7-2. Inorganic Chemicals Manufacturing Category TRI and DMR Discharges for 2004 and 2007

Year of Discharge	Year of Review	Inorganic Chemicals Manufacturing Category [a]	
		TRI TWPE [b]	DMR TWPE [c]
2004	2007	122,514	315,780
2007	2009	54,657	393,523

Source: *PCSLoads2004_v4; TRIReleases2004_v3*; *TRIReleases2007_v2; DMRLoads2007_v3*.
a – Excludes the Chlor-Alkali Subcategory of the Inorganic Chemicals Category.
b – Discharges include transfers to POTWs and account for POTW removals.
c – Discharges include only major dischargers.

7.2.2 Inorganic Chemicals Category 2009 Pollutants of Concern

Table 7-3 lists the five chemicals with the highest TWPE in *TRIReleases2007_v2* and *TRIReleases2004_v3*, while Table 7-4 lists the five chemicals with the highest TWPE in *DMRLoads2007_v3* and *PCSLoads2004_v4*.

Table 7-3. 2009 Review: Inorganic Chemicals Category Top TRI Pollutants

Pollutant	2004 [a]			2007 [a]		
	Rank	Number of Facilities Reporting Pollutant	TWPE	Rank	Number of Facilities Reporting Pollutant	TWPE
Manganese and Manganese Compounds	1	29	67,379	1	22	14,627
Dioxin and Dioxin Like Compounds	2	5	24,966	2	5	11,568
Mercury and Mercury Compounds	3	13	4,386	3	12	6,505
Arsenic and Arsenic Compounds	8	4	2,120	4	3	5,481
Nitrate Compounds	4	48	3,966	5	41	3,574
Hexachlorobenzene	5	4	3,603	8	2	1,558
Inorganic Chemicals Category Total	**NA**	**191 [b]**	**122,514**	**NA**	**141 [b]**	**54,657**

Source: *TRIReleases2004_v3*; *TRIReleases2007_v2*.
a – Discharges include transfers to POTWs and account for POTW removals.
b – Number of facilities reporting TWPE greater than zero.
NA – Not applicable.

Table 7-4. 2009 Review: Inorganic Chemicals Category Top DMR Pollutants

Pollutant	2004			2007		
	Rank	Number of Facilities Reporting Pollutant	TWPE	Rank	Number of Facilities Reporting Pollutant	TWPE
Polychlorinated biphenyls (PCBs)	6	1	16,173	1	1	363,489
Chlorine	3	10	40,467	2	13	10,483
Fluoride	9	9	7,444	3	8	4,586

Table 7-4. 2009 Review: Inorganic Chemicals Category Top DMR Pollutants

Pollutant	2004			2007		
	Rank	Number of Facilities Reporting Pollutant	TWPE	Rank	Number of Facilities Reporting Pollutant	TWPE
Heptachlor	NR	NR	NR	4	1	2,136
Copper	5	27	29,821	5	24	2,050
Iron	4	8	29,871	8	8	766
Sulfide	1	2	87,918	NR	NR	NR
Lead	2	14	52,423	21	9	236
Inorganic Chemical Category Total	**NA**	**58 [a]**	**315,780**	**NA**	**51 [a]**	**393,523**

Source: *PCSLoads2004_v4*; and *DMRLoads2007_v3*.
a – Number of facilities reporting TWPE greater than zero.
NA – Not applicable.
NR – Not reported.

EPA identified the Inorganic Chemicals Category pollutant of concern based on relative TWPE. EPA focused the 2009 annual review on discharges of manganese and manganese compounds from 2007 TRI and polychlorinated biphenyls (PCBs) from 2007 DMR. Discharges of manganese and manganese compounds decreased by approximately 53,000 TWPE from TRI 2004 to TRI 2007, while PCBs account for approximately 92 percent of the 2007 DMR TWPE. EPA did not investigate the other top pollutants as part of the 2009 annual review because the remaining TRI and DMR TWPE is such a small percentage (16) of the combined Inorganic Chemicals Category TWPE.

7.2.2.1 Inorganic Chemicals Category Manganese and Manganese Compound Discharges in TRI

Discharges of manganese and manganese compounds decreased by approximately 53,000 TWPE from TRI 2004 to TRI 2007. Manganese and manganese compounds contributed 35 percent of the category TRI TWPE for 2007. The majority (55 percent) of the manganese and manganese compound discharges were from Tronox, LLC in Hamilton, MS.

EPA contacted Tronox, LLC as part of the 2009 annual review and verified the manganese and manganese compound discharges (Dickerson, 2009). Tronox, LLC identified the chloride titanium dioxide manufacturing process as the source of their manganese discharges.[12] As a next step, EPA examined the manganese and manganese compound discharges from the other U.S. titanium dioxide manufacturing facilities, as reported to the 2007 TRI. Table 7-5 lists these discharges. Although seven of the nine U.S. titanium dioxide manufacturing facilities reported manganese discharges, none were of the order of magnitude of the 115,150 lbs/yr from the Tronox facility in Hamilton, MS. EPA concludes that these large discharges of manganese are restricted to a single plant, and do not reflect the industry as a whole.

[12] See Section 9.6.3 of the 2006 Effluent Guidelines Program Plan (U.S. EPA, 2006) for additional information on the chloride method of manufacturing titanium dioxide.

Table 7-5. Manganese Discharges Reported by U.S. Titanium Manufacturing Facilities in TRI 2007

TRI ID	Facility Name	Pounds Released	TWPE
39746KRRMCUSHWY	Tronox (Hamilton, MS)	115,150	8,110
44004SCMCH2426M	Millennium Inorganic Chemicals (Ashtabula, OH)	36,000	2,536
70669KRNSL3300B	Louisiana Pigment Company (Westlake, LA)	23,309	1,642
44004SCMCH2900M	Millennium Inorganic Chemicals (Ashtabula, OH)	12,000	845
19809DPNTD104HA	Du Pont Edge Moor (Edgemoor, DE)	10,304	726
39571DPNTD7685K	Du Pont Delisle Plant (Pass Christian, MS)	762	54
37134DPNTJ1DUPO	Du Pont Johnsonville Plant (New Johnsonville, TN)	111	7.8

Source: *TRIReleases2007_v2*.

7.2.2.2 Inorganic Chemicals Category Polychlorinated Biphenyl Discharges in DMR

PCBs accounted for 95 percent of the 2007 DMR TWPE. PCBs were reported from only one facility, Department Of Energy's Paducah Gaseous Diffusion Plant, in McCracken County, KY. The Paducah Gaseous Diffusion Plant is one of two plants in the United States that commercially enrich uranium for use in nuclear reactors. Kentucky Natural Resources and Environmental Protection Cabinet (KY NREPC) determined that the PCBs from the Paducah Gaseous Diffusion Plant were from historical industrial and waste management practices associated with capacitors or transformers. These practices resulted in PCB contamination at the facility, drainage ditches, and streams. KY NREPC developed a total maximum daily load (TMDL) for PCBs for Little Bayou Creek, the discharge location for Paducah Gaseous Diffusion Plant, in 2001. The TMDL identified controls for limiting the addition of new PCB discharges to the stream along with activities to remediate historical PCB discharges (U.S. EPA, 2001). EPA concludes that the PCB discharges are specific to the Paducah facility, and do not reflect the industry as a whole.

7.3 Inorganic Chemicals Category Potential New Subcategories

During the 2009 review, EPA did not identify any additional potential new subcategories for the Inorganic Chemicals Manufacturing Point Source Category.

7.4 Inorganic Chemicals Category Issues Identified and Additional Review

The estimated toxicity of Inorganic Chemicals Category discharges is largely due to the TRI-reported discharges of manganese and manganese compounds and dioxin and dioxin-like compounds and DMR-reported discharges of PCBs. During the 2009 annual review, EPA did not obtain any information to change its conclusions that have previously been made regarding the wastewater discharges from the inorganic chemicals manufacturing facilities. Therefore, the conclusions of the Inorganic Chemicals Category are as follows:

- EPA verified the manganese discharges reported to the 2007 TRI by Tronox, LLC, a titanium dioxide manufacturing facility in Hamilton, MS. This facility's discharges are large compared to other titanium dioxide manufacturers, and EPA concludes that this facility does not represent the category as a whole.

Further review of this category may focus on the following issues:

- In future years, EPA may analyze the DMR-reported PCB discharges, including the methods used to estimate reported discharge, process sources, and concentrations discharged.

EPA prioritizes point source categories with existing regulations for potential revision based on the greatest estimated toxicity to human health and the environment, measured as TWPE. Based on the above conclusions, EPA is assigning this category with a lower priority for revision (i.e., this category is marked with "(3)" in the "Findings" column in Table V-1 in the Federal Register notice that presents the 2009 annual review of existing effluent guidelines and pretreatment standards).

7.5 Inorganic Chemicals Category References

1. Dickerson, Leonard. 2009. Notes from Telephone Conversation between Chris Krejci, ERG and Leonard Dickerson, Tronox LLC. RE: Verification of magnitude and basis of estimate for manganese discharges reported to TRI. (March 12). EPA-HQ-OW-2008-0517 DCN 06405.

2. U.S. Economic Census. 2002. Available online at: http://www.census.gov/econ/census02.

3. U.S. EPA. 2001. Kentucky Division of Water. Total Maximum Daily Loads Development Polychlorinated biphenyls for Little Bayou Creek. McCracken, KY. (November). EPA-HQ-OW-2008-0517 DCN 06550.

4. U.S. EPA. 2004. *Technical Support Document for the 2004 Effluent Guidelines Program Plan*. EPA 821-R-04-014. Washington, DC. (August). EPA-HQ-OW-2003-0074-1346 through 1352.

5. U.S. EPA. 2006. *Technical Support Document for the 2006 Effluent Guidelines Program Plan*. EPA-821-R-06-018. Washington, DC. (December). EPA-HQ-OW-2004-0032-2782.

6. U.S. EPA. 2007. *Technical Support Document for the Preliminary 2008 Effluent Guidelines Program Plan*. EPA-821-R-07-007. Washington, DC. (October). EPA-HQ-OW-2006-0771-0819.

8. NONFERROUS METALS MANUFACTURING (40 CFR PART 421)

EPA identified the Nonferrous Metals Manufacturing (NFMM) Point Source Category (40 CFR Part 421) for preliminary category review as part of the Preliminary 2010 Effluent Guidelines Program Plan. This industry was reviewed previously in each of EPA's Preliminary and Final Effluent Guidelines Program Plans from 2004 to 2007, except 2005 (U.S. EPA, 2004; U.S. EPA, 2006; U.S. EPA, 2007). This section describes the results of EPA's 2009 preliminary category review of the NFMM Category.

8.1 Nonferrous Metals Manufacturing Category Background

This section provides background on the NFMM Category including a brief profile of the nonferrous metals manufacturing industry and background on 40 CFR Part 421.

8.1.1 Nonferrous Metals Manufacturing Industry Profile

The nonferrous metals manufacturing industry includes facilities that smelt and refine metals other than steel, such as aluminum, copper, and nickel (U.S. EPA, 2006). EPA considered the following eight NAICS codes as part of the NFMM Category:

- 325188NMM: All Other Basic Inorganic Chemical Manufacturing;
- 331312: Primary Aluminum Production;
- 331314: Secondary Smelting and Alloying of Aluminum;
- 331411: Primary Smelting and Refining of Copper;
- 331419: Primary Smelting and Refining of Nonferrous Metal (except Copper and Aluminum);
- 331423: Secondary Smelting, Refining, and Alloying of Copper;
- 331492: Secondary Smelting, Refining, and Alloying of Nonferrous Metal (except Copper and Aluminum); and
- 331521: Aluminum Die-Casting Foundries.

Wastewater generated by facilities in NAICS code 325188 can be regulated under multiple categories. EPA reviewed available information about pollutant loads and manufacturing operations for facilities reporting this NAICS code. EPA assigned the extension "NMM" to the end of the NAICS codes of facilities that likely primarily generate wastewater regulated by the NFMM ELGs. Most facilities in NAICS 325188 are grouped under the Inorganic Chemicals Point Source Category.

Table 8-1 lists the eight NAICS codes with operations in the NFMM Category. Because facilities report SIC codes in *DMRLoads2007*, and the U.S. Economic Census and TRI report data by NAICS code, EPA reclassified the 2007 DMR by the equivalent NAICS code.

Table 8-1. Number of Nonferrous Metals Manufacturing Facilities

NAICS Code	Number of Facilities		
	2002 U.S. Economic Census	2007 DMR [a]	2007 TRI [b]
325188NMM All other Basic Inorganic Chemical Manufacturing	NA [c]	2	1
331312 Primary Aluminum Production	40	82	19
331314 Secondary Smelting and Alloying of Aluminum	148		86
331423 Secondary Smelting, Refining, and Alloying of Copper	31		18
331492 Secondary Smelting, Refining, and Alloying of Nonferrous Metal (except Copper and Aluminum)	235		74
331411 Primary Smelting and Refining of Copper	15	4	5
331419 Primary Smelting and Refining of Nonferrous Metal (except Copper and Aluminum)	172	26	33
331521 Aluminum Die-Casting Foundries	296	NA [d]	102
Total	**937**	**114**	**338**

Source: U.S. Economic Census, 2002 (U.S. Census, 2002); *TRIReleases2007_v2*; and *DMRLoads2007_v3*.
a – Major and minor dischargers. Also, DMR data are reported by SIC code; therefore, EPA used an NAICS to SIC code crosswalk for comparison purposes.
b – Releases to any media.
c – These facility-specific NAICS codes do not correspond to NAICS codes in the 2002 U.S. Economic Census.
d – The corresponding SIC code is 3363: Aluminum Die-Castings and links to the Aluminum Forming Category (40 CFR Part 467) and the Nonferrous Metals Forming and Metal Powders Category (40 CFR Part 471).
NA – Not applicable.

8.1.2 40 CFR Part 421

EPA first promulgated ELGs for the NFMM Category (40 CFR Part 421) on March 8, 1984 (49 FR 8790). All 31 subcategories have NSPS and PSNS standards. Fourteen subcategories do not have PSES standards; the Bauxite Refining and Primary Copper Smelting Subcategories are limited to zero discharge of process wastewater under BPT, BAT, and NSPS; and EPA reserved BPT and BAT limitations for four subcategories (Secondary Indium, Secondary Mercury, Secondary Nickel, and Primary Rare Earth Metals). Most NFMM subcategories include limitations guidelines for lead, chromium, copper, arsenic, and zinc. Section 5.3.2 of the *Technical Support Document for the 2004 Effluent Guidelines Program Plan* lists the regulated priority and nonconventional pollutants in the NFMM Category (U.S. EPA, 2004).

8.2 Nonferrous Metals Manufacturing Category 2009 Annual Review

This section discusses EPA's 2009 annual review of the NFMM Category including the screening-level review and category-specific review.

8.2.1 Nonferrous Metals Manufacturing 2009 Screening-Level Review

Table 8-2 compares the NFMM Category TWPE for 2004 and 2007, calculated using *TRIReleases2004_v3*, *PCSLoads2004_v4*, *TRIReleases2007_v2*, and *DMRLoads2007_v3*. The combined DMR and TRI TWPE increased by approximately 10,000 TWPE from 2004 to 2007. The 2007 DMR TWPE accounts for approximately 90 percent of the combined 2007 TWPE.

Table 8-2. Nonferrous Metals Manufacturing Point Source Category TRI and DMR Discharges for 2004 and 2007

Year of Discharge	Year of Review	Nonferrous Metals Manufacturing Category	
		TRI TWPE [a]	DMR TWPE [b]
2004	2007	52,599	321,299
2007	2009	38,885	342,764

Source: *PCSLoads2004_v4*; *TRIReleases2004_v3*; *TRIReleases2007_v2*; and *DMRLoads2007_v3*.
a – Discharges include transfers to POTWs and account for POTW removals.
b – Discharges include only major dischargers.

8.2.2 Nonferrous Metals Manufacturing Category 2009 Pollutants of Concern

Table 8-3 compares the five chemicals with the highest TWPE in *TRIReleases2007_v2* and *TRIReleases2004_v3*, while Table 8-4 lists the five pollutants with the highest TWPE in *DMRLoads2007_v3* and *PCSLoads2004_v4*.

Table 8-3. 2009 Review: Nonferrous Metals Manufacturing Category Top TRI Pollutants

Pollutant	2004 [a]			2007 [a]		
	Rank	Number of Facilities Reporting Pollutant	TWPE	Rank	Number of Facilities Reporting Pollutant	TWPE
Cadmium and Cadmium Compounds	1	9	19,752	1	7	28,699
Lead and Lead Compounds	3	79	6,070	2	101	3,245
Copper and Copper Compounds	6	67	3,062	3	82	2,225
Nitrate Compounds	7	18	2,710	4	16	1,863
Arsenic and Arsenic Compounds	9	13	1,161	5	9	632
Manganese and Manganese Compounds	2	20	6,299	8	15	346
Polycyclic Aromatic Compounds	4	4	5,244	7	3	533
Vanadium and Vanadium Compounds	5	2	4,267	16	1	15
Nonferrous Metals Manufacturing Category Total	**NA**	**110 [b]**	**52,599**	**NA**	**106 [b]**	**38,885**

Source: *TRIReleases2004_v3*; and *TRIReleases2007_v2*.
a – Discharges include transfers to POTWs and account for POTW removals.
b – Number of facilities reporting TWPE greater than zero.
NA – Not applicable.

Table 8-4. 2009 Review: Nonferrous Metals Manufacturing Category Top DMR Pollutants

Pollutant	2004			2007		
	Rank	Number of Facilities Reporting Pollutant	TWPE	Rank	Number of Facilities Reporting Pollutant	TWPE
Cadmium	3	11	44,768	1	11	165,155
Arochlor 1260	NR	NR	NR	2	1	28,352
Fluoride	5	18	31,484	3	19	28,086
Chlorine	7	9	15,475	4	12	24,181
Silver	6	3	21,006	5	8	21,742
Polychlorinate Biphenyls (PCB)	1	1	69,768	11	2	3,881
Arsenic	2	10	49,305	13	7	2,910
Molybdenum	4	6	34,924	15	5	2,519
Nonferrous Metals Manufacturing Category Total	**NA**	**36 [a]**	**321,299**	**NA**	**59 [a]**	**342,764**

Source: *PCSLoads2004_v4*; and *DMRLoads2007_v3*.
a – Number of facilities reporting TWPE greater than zero.
NA – Not applicable.
NR – Not reported.

EPA identified the NFMM Category pollutants of concern based on relative TWPE. EPA focused the 2009 annual review on discharges of cadmium from 2007 TRI and DMR because the combined cadmium TWPE accounts for over 50 percent of the combined 2007 DMR and TRI TWPE. Cadmium discharges increased from 2004 to 2007 in both TRI and DMR. EPA did not investigate the other top pollutants as part of the 2009 annual review because the majority of the NFMM Category TWPE is due to cadmium. Additionally, the TWPE of other top pollutants from the NFMM Category are consistent with findings in past years of review of this category, including similar facilities and pollutants. As a result, EPA does not plan to review these pollutants in detail.

Discharges of cadmium and cadmium compounds increased by approximately 9,000 TWPE from TRI 2004 to TRI 2007. In addition, cadmium and cadmium compounds contributed 78 percent of the TRI TWPE for 2007.

Discharges of cadmium increased by approximately 120,000 TWPE from DMR 2004 to DMR 2007, contributing 48 percent of the DMR TWPE for 2007. The majority (94 percent) of the cadmium discharges were from Zinifex Clarksville, Inc. in Clarksville, Tennessee. Zinifex Clarksville, Inc. primarily produces zinc along with cadmium and sulfuric acid as by-products. The majority of Zinifex Clarksville, Inc.'s cadmium discharges were from stormwater outfalls with monitoring only permit requirements. The facility's cadmium discharges did not exceed the permit limits for the outfall with cadmium limits (TDEC, Unknown).

8.3 Nonferrous Metals Manufacturing Category Potential New Subcategories

During the 2009 review, EPA did not identify any additional potential new subcategories for the NMM Category.

8.4 Nonferrous Metals Manufacturing Category Issues Identified and Additional Review

The estimated toxicity of the NMM Category discharges are largely due to the TRI-reported and DMR-reported discharges of cadmium and cadmium compounds. Further review of this category may focus on the following issues:

- In future years, EPA may analyze the TRI-reported and DMR-reported cadmium and cadmium compound discharges, including facilities dominating the TWPE, the methods used to estimate reported discharge, process sources, and concentrations discharged.

EPA prioritizes point source categories with existing regulations for potential revision based on the greatest estimated toxicity to human health and the environment, measured as TWPE. Based on the above conclusions, EPA is assigning this category with a lower priority for revision (i.e., this category is marked with "(3)" in the "Findings" column in Table V-1 in the Federal Register notice that presents the 2009 annual review of existing effluent guidelines and pretreatment standards).

8.5 Nonferrous Metals Manufacturing Category References

1. TDEC. Unknown. Tennessee Department of Environment and Conservation Division of Water Pollutant Control. Authorization to Discharge under the National Pollutant Discharge Elimination System Permit TN0029157- Zinifex Clarksville, Inc., Clarksville, TN. EPA-HQ-OW-2004-0032-1176.

2. U.S. Economic Census. 2002. Available online at: http://www.census.gov/econ/census02.

3. U.S. EPA. 2004. *Technical Support Document for the 2004 Effluent Guidelines Program Plan.* EPA 821-R-04-014. Washington, DC. (August). EPA-HQ-OW-2003-0074-1346 through 1352.

4. U.S. EPA. 2006. *Technical Support Document for the 2006 Effluent Guidelines Program Plan.* EPA-821-R-06-018. Washington, DC. (December). EPA-HQ-OW-2004-0032-2782.

5. U.S. EPA. 2007. *Technical Support Document for the Preliminary 2008 Effluent Guidelines Program Plan.* EPA-821-R-07-007. Washington, DC. (October). EPA-HQ-OW-2006-0771-0819.

9. ORE MINING AND DRESSING (40 CFR PART 440)

EPA selected the Ore Mining and Dressing (Ore Mining) Category (40 CFR Part 440) for additional data collection and analysis because of the high TWPE identified in several years of screening-level review (see Table V-1, 70 FR 51050, August 29, 2005). This industry was reviewed previously in each of EPA's Preliminary and Final Effluent Guidelines Program Plans from 2004 to 2008 (U.S. EPA, 2004, U.S. EPA, 2005, U.S. EPA, 2006, U.S. EPA, 2007, U.S. EPA, 2008a). Each year, EPA has concluded that there are not sufficient data available to determine whether wastewater discharges from the Ore Mining Category warrant a detailed study. The 2008 Effluent Guidelines Program Plan summarized the results of EPA's previous reviews of this industry (U.S. EPA, 2008a).

This section describes the status and preliminary results of the 2009 annual review of the discharges associated with the Ore Mining Category. EPA's 2009 annual review builds on the 2008 annual review. The 2009 preliminary category review of the Ore Mining Category differs from those of the other categories in this year's TSD because EPA focused on collecting discharge data as well as examining which wastewaters are regulated by 40 CFR Part 440 versus general stormwater permits.

9.1 Ore Mining Category Background

This subsection provides background on the Ore Mining Category including a brief profile of the ore mining industry and background on 40 CFR Part 440.

9.1.1 Ore Mining Industry Profile

The ore mining and dressing industry includes facilities that mine, mill, or prepare 23 separate metal ores (U.S. EPA, 2005). EPA considered the following eight NAICS codes as part of the Ore Mining Category:

- 212210: Iron ore mining;
- 212234: Copper ore and nickel ore mining;
- 212231: Lead ore and zinc ore mining;
- 212221: Gold ore mining;
- 212222: Silver ore mining;
- 212291: Uranium-radium-vanadium ore mining;
- 212299: All other metal ore mining; and
- 213114: Support activities for metal mining.

Table 9-1 lists the eight NAICS codes with operations in the Ore Mining Category. Because facilities report SIC codes in *DMRLoads2007*, and the U.S. Economic Census and TRI report data by NAICS code, EPA reclassified the 2007 DMR data by the equivalent NAICS code.

Of the 510 ore mines in the 2002 U.S. Economic Census, only 76 (15 percent) reported to TRI in 2007. The low number of facilities reporting to TRI is likely a result of the following:

- Facilities in NAICS codes 212210 (Iron Ores)[13], 212291 (Uranium-Radium-Vanadium Ores)[14], and 213114 (Metal Mining Services)[15] are not required to report discharges to TRI;
- Activities do not occur at some facilities in excess of reporting thresholds (25,000 lbs for processing and manufacturing and 10,000 lbs for otherwise use of most TRI chemicals); and
- Facilities do not meet employee threshold reporting requirements – many facilities may operate with limited staff during inactive periods.

As part of the 2008 annual review, EPA compared the discharges in the DMR databases to the threshold reporting values for TRI. From this analysis, it appears that some ore mines that may be meeting threshold reporting requirements are not reporting to TRI (Krejci, 2008a).

Of the ore mines that have historically reported wastewater discharges to TRI, most facilities are direct dischargers. Table 9-2 presents the types of discharges reported by facilities in *TRIReleases2007*.

Table 9-1. Number of Ore Mining Facilities

NAICS Code	2002 U.S. Economic Census	2007 DMR [a]	2007 TRI [b]
212210: Iron ore mining	24	4	NR [c]
212234: Copper ore and nickel ore mining	33	5	20 [d]
212231: Lead ore and zinc ore mining	22	22	14
212221: Gold ore mining	180	10	24
212222: Silver ore mining	11	1	4
212291: Uranium-radium-vanadium ore mining	17	4	NR [c]
212299: All other metal ore mining	39	8	19
213114: Support activities for metal mining	184	3	NR [c]
Total	**510**	**57**	**76**

Source: U.S. Economic Census, 2002 (U.S. Census, 2002); *TRIReleases2007_v2*; *DMRLoads2007_v3*.
a – Major and minor dischargers.
b – Releases to any media.
c – Facilities in this NAICS code are not required to report to TRI.
d – Copper and nickel ores share the same NAICS code.
NR – Not reported.

[13] The Minnesota Emergency Response Commission specifically found that toxic chemical releases and transfers from NAICS code 212210 facilities in Minnesota were not of sufficient quantities to warrant reporting. Based on this information, EPA determined that NAICS code 212210 facilities should not be required to report to TRI. EPA may reconsider the addition of this industry segment at a future date in light of additional information (62 FR 23859).
[14] EPA has deferred final action on TRI reporting for NAICS code 212291 until a later date. EPA received comments related to NAICS code 212291 and TRI reporting that raised difficult technical and policy issues which will require additional time to address (62 FR 23838).
[15] EPA determined that requiring NAICS code 213114 to report to TRI was not appropriate because operations in this category are not generally associated with threshold activities (62 FR 23838).

Table 9-2. Ore Mining Category Facilities by Type of Discharge Reported in TRI 2007

NAICS Code	Reported Only Direct Discharges	Reported Only Indirect Discharges	Reported Both Direct and Indirect Discharges	Reported No Water Discharges
212221: Gold Ores	4	1	1	18
212222: Silver Ores	3	NR	NR	1
212231: Lead and Zinc Ores	8	NR	NR	6
212234: Copper and Nickel Ores	5	NR	1	14
212299: All Other Metal Ore Mining	5	NR	NR	9

Source: *TRIReleases2007_v2.*
NR – Not reported.

9.1.2 40 CFR Part 440

EPA first promulgated ELGs for the Ore Mining Category (40 CFR Part 440) on December 3, 1982 (47 FR 54609). This category consists of 12 subcategories, as shown in Table 9-3 with the related SIC and NAICS codes and descriptions of the subcategories' applicability (U.S. EPA, 1982; U.S. EPA, 1988). BAT limitations are set equal to BPT levels for priority pollutants for this category. The priority pollutants arsenic, cadmium, copper, lead, mercury, nickel, and zinc are regulated in at least one subcategory (U.S. EPA, 2005). None of the subcategories include PSES or PSNS limitations.

Table 9-3. Ore Mining Category Subcategory Applicability

Sub-part	Subcategory Title	Related SIC Code(s)	Related NAICS Code(s)	Subcategory Applicability
A	Iron Ore	1011: Iron Ores	212210: Iron Ores	Iron Ore Mines and Mills using Physical or Chemical Separation or Magnetic & Physical Separation in the Mesabi Range
B	Aluminum Ore	1099: Miscellaneous Metal Ores, NEC	212299: All Other Metal Ores	Bauxite Mines Producing Aluminum Ore
C	Uranium, Radium, & Vanadium Ores	1094: Uranium-Radium-Vanadium Ores	212291: Uranium-Radium-Vanadium Ores	Open-Pit or Underground Mines and Mills using Acid Leach, Alkaline Leach, or Combined Acid & Alkaline Leach to Produce Uranium, Radium, & By-product Vanadium
D	Mercury Ore	1099: Miscellaneous Metal Ores, NEC	212299: All Other Metal Ores	Open-Pit or Underground Mercury Ore Mines and Mills using Gravity Separation or Froth-Flotation
E	Titanium Ores	1099: Miscellaneous Metal Ores, NEC	212299: All Other Metal Ores	Titanium Ore Mines from Lode Deposits and Mills using Electrostatic, Magnetic & Physical Separation, or Flotation; Dredge Mines and Mills for Placer Deposits of Rutile, Ilmenite, Leucoxene, Monazite, Zircon, and Other Heavy Metals
F	Tungsten Ore	1061: Ferroalloy Ores, Except Vanadium	212234: Copper and Nickel Ores	Tungsten Mines and Mills using Gravity Separation or Froth-Flotation

Table 9-3. Ore Mining Category Subcategory Applicability

Sub-part	Subcategory Title	Related SIC Code(s)	Related NAICS Code(s)	Subcategory Applicability
G	Nickel Ore	1061: Ferroalloy Ores, Except Vanadium	212234: Copper and Nickel Ores	Nickel Ore Mines and Mills
H	Vanadium Ore (Mined Alone, not as By-product)	1094: Uranium-Radium-Vanadium Ores	212291: Uranium-Radium-Vanadium Ores	Vanadium Ore Mines and Mills
I	Antimony Ore	1099: Miscellaneous Metal Ores, NEC	212299: All Other Metal Ore Mining	Antimony Ore Mines and Mills
J	Copper, Lead, Zinc, Gold, Silver, & Molybdenum Ores	1021: Copper Ores 1031: Lead and Zinc Ores 1041: Gold Ores 1044: Silver Ores 1061: Ferroalloy Ores, Except Vanadium	212234: Copper and Nickel Ores 212231: Lead and Zinc Ores 212221: Gold Ores 212222: Silver Ores 212299: All Other Metal Ores	Copper, Lead, Zinc, Gold, Silver, & Molybdenum Ore Open-Pit or Underground Mines, except for Placer Deposits, and Mills using Froth-Flotation and/or Other Separation Techniques; Mines and Mills using Dump, Heap, In-Situ Leach, or Vat-Leach to Extract Copper from Ores or Ore Waste Materials; Gold or Silver Mills using Cyanidation; Except for Mines and Mills from the Quartz Hill Molybdenum Project in the Tongass National Forest, Alaska
K	Platinum Ore	1099: Miscellaneous Metal Ores, NEC	212299: All Other Metal Ores	Platinum Ore Mines and Mills
M	Gold Placer Mine	1041: Gold Ores	212221: Gold Ores	Placer Deposit Gold Ore Mines, Dredges, & Mills using Gravity Separation

Source: *Development Document for Effluent Limitations Guidelines and Standards for the Ore Mining and Dressing Point Source Category* (U.S. EPA, 1982); *Development Document for Effluent Limitations Guidelines and Standards for the Ore Mining and Dressing Point Source Category Gold Placer Mine Subcategory* (U.S. EPA, 1988); *Technical Support Document for the Annual Review of Existing Effluent Guidelines and Identification of Potential New Point Source Categories* (U.S. EPA, 2009).

Runoff from waste rock, tailings, and overburden piles is not subject to effluent guidelines unless it naturally drains (or is intentionally diverted) to a point source and combines with "mine drainage" that is otherwise subject to the effluent guidelines (65 FR 64774, October 30, 2000). These discharges are controlled by the Federal Stormwater Multi-Sector General Permit (MSGP) or state general stormwater permits.[16] (See 65 FR 64746, Oct. 30, 2000, and 70 FR 72116, December 1, 2005.) The federal MSGP pertains to four authorized states, federal facilities, and Indian Country in Region 10; stormwater from all other facilities is regulated by state general stormwater permits.

9.2 Ore Mining Category 2009 Annual Review

This subsection discusses EPA's 2009 annual review of the Ore Mining Category including the screening-level review and category-specific review.

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

9.2.1 Ore Mining Category 2009 Screening-Level Review

Although EPA recognizes that the screening-level databases do not contain data for many ore mines, EPA used the data available to characterize ore mining wastewater. Table 9-4 shows the screening-level results for the Ore Mining Category from the 2004 and 2007 TRI and DMR databases. Based on the data that EPA has available, toxic weighted discharges from ore mining facilities decreased from 2004 to 2007 by approximately 445,000 TWPE. The majority of the decrease in TWPE is due to North Shore Mining in Silver Bay, MN no longer reporting mercury discharges in DMR.

Table 9-4. Ore Mining Category TRI and DMR Discharges for 2004 and 2007

Year of Discharge	Year of Review	Ore Mining Category	
		TRI TWPE [a]	DMR TWPE [b]
2004	2007	88,001	580,831
2007	2009	39,354	184,455

Source: *PCSLoads2002_v4*; *TRIReleases2002_v4*; *TRIReleases2003_v2; PCSLoads2004_v4; TRIReleases2004_v3*; *TRIReleases2005_v2; TRIReleases2007_v2; DMRLoads2007_v3*.
a – Discharges include transfers to POTWs and account for POTW removals.
b – Discharges include major and minor dischargers.

9.2.2 Ore Mining Category 2009 Pollutants of Concern

Table 9-5 compares the five chemicals with the highest TWPE in TRI from 2002 through 2007, while Table 9-6 lists the five pollutants with the highest TWPE in DMR from 2002 through 2007.

All of the pollutants of concern that EPA has identified for the Ore Mining Category are metals. EPA identified the following three metals for further review, because they have been in the top five list of pollutants in both TRI and DMR during each year of EPA's review:

- Arsenic;
- Cadmium; and
- Lead.

EPA focused the 2009 annual review on discharges of the above pollutants from DMR. In addition to these three metals, EPA also identified mercury discharges from Northshore Mining Company for further review, based on the high TWPE reported for 2004 DMR (greater than 99 percent of the Ore Mining Category mercury DMR 2004 TWPE). The following sections discuss the discharges of these pollutants from ore mining facilities.

Table 9-5. 2009 Review: Ore Mining Category Top TRI Pollutants

Pollutant [a]	2002 [a]		2003 [a]		2004 [a]		2005 [a]		2007 [a]		Average Annual TWPE
	Number of Facilities Reporting Pollutant	TWPE	Number of Facilities Reporting Pollutant	TWPE	Number of Facilities Reporting Pollutant	TWPE	Number of Facilities Reporting Pollutant	TWPE	Number of Facilities Reporting Pollutant	TWPE	
Arsenic	9	13,383	8	23,770	5	30,439	6	26,600	4	427	18,924
Lead	25	12,378	23	11,542	21	20,930	21	16,291	23	20,452	16,318
Cadmium	10	19,603	9	14,848	6	11,840	6	11,905	4	1,422	11,924
Silver	2	8,235	2	8,235	2	8,235	2	8,235	2	8,245	8,237
Vanadium	3	5,156	3	8,407	3	7,193	3	3,868	2	5,688	6,062

Source: *TRIReleases2002_v4*; *TRIReleases2003_v3; TRIReleases2004_v3; TRIReleases2005_v2*; *TRIReleases2007_v2.*
a – Discharges include transfers to POTWs and account for POTW removals.
b – All listed are pollutant compound groups – they are referred to as parent metals (e.g., arsenic/arsenic compounds).

Table 9-6. 2009 Review: Ore Mining Category Top DMR Pollutants

Pollutant	2002			2004			2007			Average Annual TWPE
	Rank	Number of Facilities Reporting Pollutant	TWPE	Rank	Number of Facilities Reporting Pollutant	TWPE	Rank	Number of Facilities Reporting Pollutant	TWPE	
Lead	4	30	23,309	4	40	19,091	1	37	42,419	28,273
Copper	9	62	4,874	8	35	8,690	2	41	40,950	18,171
Molybdenum	1	4	155,174	5	4	18,757	3	7	27,763	67,231
Arsenic	5	11	12,701	2	10	30,921	4	15	21,955	21,859
Cadmium	3	26	54,556	3	38	21,052	5	38	17,172	30,927
Mercury	12	52	1,971	1	28	441,338 [a]	10	22	2,023	148,444
Cyanide	2	7	109,018	16	4	616	13	9	284	36,639

Source: *PCLoads2002_v4*; *PCSLoads2004_v4;* and *DMRLoads2007_v3.*
a – Total TWPE after correction for Northshore Mining Company is 245 (See Section 9.2.2.4).

9.2.2.1 Ore Mining Category Arsenic Discharges in TRI and DMR

The arsenic TWPE for the Ore Mining Category has remained relatively high (greater than 10,000) over the years of EPA's review in both DMR and TRI, although the TRI TWPE decreased by 98 percent from 2005 to 2007 to a total of 427 TWPE. Prior to 2007, two facilities dominated the Ore Mining Category arsenic TWPE in TRI: Newmont Lone Tree in Valmy, Nevada, and the Kennecott Smelter in Salt Lake City, Utah. These facilities had high arsenic discharges in past years (both around 10,000 TWPE), but did not report to TRI in 2007.

Table 9-7 shows arsenic discharges by facility in *DMRLoads2007_v3, PCSLoads2004_v4* and *PCSLoads2002_v4*. In *DMRLoads2007_v3*, arsenic discharges from the Ore Mining Category are dominated by Teck-Pogo, Inc. in Delta Junction, AK that accounts for 80 percent of Ore Mining Category arsenic DMR 2007 TWPE. In 2002 and 2004, arsenic discharges from the Ore Mining Category were dominated by two other facilities: Kennecott Utah Copper Mine in Salt Lake City, UT, and Lac Minerals (USA) Gold Mine in Lead, SD. In 2002 and 2004, Tech-Pogo, Inc. did not report arsenic discharges.

9.2.2.2 Ore Mining Category Cadmium Discharges in TRI and DMR

The cadmium TWPE for the Ore Mining Category has decreased over the years of EPA's review; however, it has remained above 10,000 in both DMR and TRI during every year except 2007. The number of ore mining facilities reporting cadmium discharges has remained relatively constant over this period (Tables 9-5 and 9-6). Prior to 2007, two facilities dominated the Ore Mining Category cadmium TWPE in TRI: Kennecott Mine and Power Plant in Salt Lake City, Utah, and the Kennecott Smelter in Salt Lake City, Utah. These facilities had high cadmium discharges in past years (both around 5,000 TWPE); however, in 2007 Kennecott Smelter did not report to TRI and the cadmium discharges reported by the Kennecott Mine and Power Plant facility decreased by an order of magnitude (from 5,000 to 500 TWPE).

Table 9-8 shows cadmium discharges by facility in *DMRLoads2007_v3, PCSLoads2004_v4* and *PCSLoads2002_v4*. The largest number of ore mining facilities discharging cadmium are lead/zinc facilities (18 of 37 as determined by SIC code). A large number of facilities contribute to the total cadmium TWPE from the Ore Mining Category. No individual facilities dominate the cadmium TWPE from the Ore Mining Category.

9.2.2.3 Ore Mining Category Lead Discharges in TRI and DMR

The lead TWPE for the Ore Mining Category has remained above 10,000 in DMR and TRI during every year of EPA's review. The number of ore mining facilities reporting lead discharges has remained relatively constant over this period.

Table 9-9 shows lead discharges by facility in *DMRLoads2007_v3, PCSLoads2004_v4* and *PCSLoads2002_v4*. The largest number of ore mining facilities discharging lead are lead/zinc facilities (20 of 38 facilities as determined by SIC code). A large number of facilities contribute to the total lead TWPE from the Ore Mining Category. In 2007, the lead TWPE was dominated by two facilities in particular: Doe Run Resources in Viburnum, MO, and Northshore Mining/Silver Bay Mining Co. in Silver Bay, MN, which account for 65 percent of the total TWPE.

Table 9-7. Arsenic Discharges Reported by Ore Mining Facilities in DMR for 2002, 2004 and 2007 [a]

Type of Mine	Facility Name	Location	2002		2004		2007	
			Total Pounds Released	TWPE	Total Pounds Released	TWPE	Total Pounds Released	TWPE
Gold	Teck-Pogo Inc.	Delta Junction, AK	NR	NR	NR	NR	4,363	17,634
Copper	Kennecott Copper Co	Salt Lake City, UT	2,660	10,750	5,051	20,414	785	3,172
Gold	Lac Minerals (USA) Inc	Lead, SD	7	27	2,512	10,153	29	117
Gold	Wharf Resources (USA), Inc.	Lead, SD	113	455	41	166	230	930
Gold	Golden Reward Mining Co	Lead, SD	30	121	27	108	18	71
Copper	BHP Pinto Valley Operations	Miami, AZ	NR	NR	NR	NR	5	20
Silver	Platoro Mining Co & Union Gold	Conejos County, CO	1	4	3	10	3	10
Gold	Homestake Mining Co-Gold Div	Lead, SD	212	856	17	70	NR	NR
Gold	Zortman Mining Inc.	Zortman, MT	76	307	NR	NR	NR	NR
Gold	Zortman Mining Inc.	Zortman, MT	34	138	NR	NR	NR	NR
Gold	Hecla Mining Co	Stanley, ID	9	36	NR	NR	NR	NR
Copper	Phelps Dodge Corp	Cottonwood, AZ	2	7	NR	NR	NR	NR
Total			**3,144**	**12,701**	**7,651**	**30,921**	**5,432**	**21,954**

Source: *DMRLoads2007*_v3, *PCSLoads2004_v4; PCSLoads2002_v4.*
a – Includes only discharges greater than one TWPE.
NR — Not reported.

Table 9-8. Cadmium Discharges Reported by Ore Mining Facilities in DMR for 2002, 2004, and 2007 [a]

Type of Mine	Facility Name	Location	2007		2004		2002	
			Total Pounds Released	TWPE	Total Pounds Released	TWPE	Total Pounds Released	TWPE
Lead/Zinc	Doe Run Resources Co	Viburnum, MO	161	3,720	220	5,080	135	3,130
Copper	East Tn Zinc Co., LLC	Jefferson City, TN	113	2,610	3.29	76.1	2.2	50.8
Lead/Zinc	U.S. Silver Corporation	Osburn, ID	101	2,330	NR	NR	1.24	28.7
Ferroalloy (except Alum.)	Climax Mine	Summit County, CO	88.8	2,050	43.2	1,000	NR	NR
Lead/Zinc	Doe Run Resources Co	Viburnum, MO	76.5	1,770	140	3,230	167	3,850
Lead/Zinc	Doe Run Company	Viburnum, MO	64.2	1,480	43.1	997	180	4,160
Lead/Zinc	Doe Run Resources Corp	Viburnum, MO	57.1	1,320	29.6	685	29.1	674
Copper	Mammoth, Sutro, Keystone Et Al	Redding, CA	21.6	499	10.8	250	16	371
Lead/Zinc	Doe Run Company	Bunker, MO	21.3	492	84.2	1,950	1,480	34,200
Gold	Lac Minerals	Lead, SD	14.6	338	0.179	4.13	NR	NR
Gold	Wharf Resources (USA)	Lead, SD	4.5	104	NR	NR	NR	NR
Lead/Zinc	East Tennessee Zinc Co. LLC	Jefferson City, TN	3.82	88.4	11.6	267	6.41	148
Ferroalloy (except Alum.)	Henderson Mine, Urad Minesite	Clear Creek County, CO	3.52	81.5	6.77	156	4.41	102
Lead/Zinc	Cominco American Inc	Bixby, MO	2.29	52.9	1.24	28.6	8.15	188
Gold	Carlton Tunnel Portal Site	Victor, CO	1.97	45.6	NR	NR	NR	NR
Gold	London Water Tunnel	Park County, CO	1.44	33.3	3.25	75.2	1.09	25.1
Lead/Zinc	Kennecott Greens Creek Mining C	Juneau, AK	1.36	31.4	3.02	69.9	1.73	40.1
Gold	Golden Reward Mining Co.	Lead, SD	1.1	25.4	NR	NR	NR	NR
Lead/Zinc	East Tennessee Zinc Co., LLC	Mascot, TN	0.876	20.2	5.95	138	2.35	54.4
Lead/Zinc	Mossy Creek Mining, LLC	Thorn Hill, TN	0.752	17.4	0.659	15.2	4.59	106
Lead/Zinc	Mt. Emmons/Keystone Mine	Gunnison County, CO	0.725	16.8	1.46	33.7	NR	NR
Copper	Bhp Pinto Valley Operations	Miami, AZ	0.536	12.4	NR	NR	NR	NR
Gold	Teck-Pogo Inc	Delta Junction, AK	0.505	11.7	NR	NR	NR	NR
Ferroalloy (except Alum.)	Thompson Creek Mining Company	Clayton, ID	0.376	8.69	0.144	3.33	NR	NR
Lead/Zinc	East Tennessee Zinc Co., LLC	Strawberry Plains, TN	0.235	5.44	NR	NR	2.78	64.2

Table 9-8. Cadmium Discharges Reported by Ore Mining Facilities in DMR for 2002, 2004, and 2007 [a]

Type of Mine	Facility Name	Location	2007		2004		2002	
			Total Pounds Released	TWPE	Total Pounds Released	TWPE	Total Pounds Released	TWPE
Lead/Zinc	East Tennessee Zinc Co., LLC	Jefferson County, TN	0.191	4.41	6.93	160	2.65	61.2
Lead/Zinc	Teck Cominco Alaska Inc	Kotzebue, AK	0.094	2.17	NR	NR	NR	NR
Copper	Kennecott Copper Co	Salt Lake City, UT	NR	NR	292	6,750	278	6,430
Lead/Zinc	Upland Wings	Sullivan, MO	NR	NR	2.85	66	NR	NR
Lead/Zinc	Mossy Creek Mining, LLC	Gordonsville, TN	NR	NR	0.248	5.74	NR	NR
Gold	Gold King Mines Corporation	San Juan County, CO	NR	NR	0.192	4.44	10.9	252
Gold	Coeur Alaska Inc	Juneau, AK	NR	NR	0.163	3.77	NR	NR
Copper	Phelps Dodge	Christmas, AZ	NR	NR	0.0487	1.13	NR	NR
Gold	Zortman Mining Inc.	Zortman, MT	NR	NR	NR	NR	26.2	605
Ferroalloy (except Alum.)	Hecla Mining Co	Mullan, ID	NR	NR	NR	NR	10.2	236
Gold	Zortman Mining Inc.	Zortman, MT	NR	NR	NR	NR	3.05	70.5
Lead/Zinc	Mossy Creek Mining, LLC	New Market, TN	NR	NR	NR	NR	1.53	35.4
Total			**743**	**17,171**	**911**	**21,050**	**2,375**	**54,882**

Source: *DMRLoads2007_v3*, *PCSLoads2004_v4; PCSLoads2002_v4.*
a – Includes only discharges greater than one TWPE.
NR – Not reported.

Table 9-9. Lead Discharges Reported by Ore Mining Facilities in DMR for 2002, 2004, and 2007 [a]

Type of Mine	Facility Name	Location	2007		2004		2002	
			Total Pounds Released	TWPE	Total Pounds Released	TWPE	Total Pounds Released	TWPE
Lead/Zinc	Doe Run Resources Co	Viburnum, MO	6,510	14,600	3,860	8,640	1,340	3,010
Iron	Northshore Mining/Silver Bay P	Silver Bay, MN	5,840	13,100	NR	NR	NR	NR
Lead/Zinc	Doe Run Company	Viburnum, MO	2,070	4,640	1,080	2,420	3,820	8,560
Lead/Zinc	U.S. Silver Corporation	Osburn, ID	1,870	4,180	14	31.3	27.2	60.8
Lead/Zinc	Doe Run Resources Co	Viburnum, MO	1,400	3,140	765	1,710	1,340	3,000
Lead/Zinc	Doe Run Resources Corp	Viburnum, MO	690	1,540	702	1,570	1,070	2,400
Copper	Kennecott Copper Co	Salt Lake City, UT	149	335	31.7	70.9	NR	NR
Lead/Zinc	Doe Run Company	Bunker, MO	143	320	434	972	2,220	4,980
Lead/Zinc	Kennecott Greens Creek Mining C	Juneau, AK	126	282	136	305	85	190
Gold	LAC Minerals	Lead, SD	34.4	77	1,250	2,810	NR	NR
Lead/Zinc	East Tennessee Zinc Co. LLC	Jefferson City, TN	29	64.9	10.9	24.5	29.4	65.8
Ferroalloy (except Alum.)	Climax Mine	Summit County, CO	20.2	45.3	0.609	1.36	NR	NR
Lead/Zinc	Jordanelle Ssd	Wasatch County, UT	18.4	41.2	NR	NR	NR	NR
Lead/Zinc	East Tn Zinc Co., LLC	Jefferson City, TN	9.8	22	3.58	8.02	10.5	23.6
Gold	Wharf Resources (USA)	Lead, SD	5.48	12.3	NR	NR	NR	NR
Lead/Zinc	Cominco American Inc	Bixby, MO	5.24	11.7	2.3	5.15	8.15	18.3
Gold	Carlton Tunnel Portal Site	Teller County, CO	3.21	7.2	8.68	19.4	3.84	8.61
Lead/Zinc	East Tennessee Zinc Co., LLC	Strawberry Plains, TN	2.16	4.85	7.15	16	15.3	34.2
Gold	Teck-Pogo Inc	Delta Junction, AK	1.13	2.53	NR	NR	NR	NR
Ferroalloy (except Alum.)	Henderson Mine, Urad Minesite	Clear Creek County, CO	1.11	2.49	4.24	9.49	1.69	3.79
Gold	Golden Reward Mining Co.	Lead, SD	1.11	2.48	NR	NR	NR	NR
Ferroalloy (except Alum.)	Thompson Creek Mining Company	Clayton, ID	1.05	2.34	0.619	1.39	1.01	2.26
Lead/Zinc	Mt. Emmons/Keystone Mine	Gunnison County, CO	0.434	0.972	NR	NR	NR	NR
Gold	Balmat Mines & Mill	Balmat, SD	NR	NR	140	313	28.1	62.9
Iron	Upland Wings	Sullivan,	NR	NR	21.4	48	NR	NR
Lead/Zinc	Mossy Creek Mining, LLC	Thorn Hill, TN	NR	NR	20.4	45.8	21.4	48
Lead/Zinc	Mossy Creek Mining, LLC	Elmwood, TN	NR	NR	12.8	28.7	279	624
Lead/Zinc	Asarco, Inc., Tn Mines Div.	Mascot, TN	NR	NR	5.95	13.3	9.12	20.4

Table 9-9. Lead Discharges Reported by Ore Mining Facilities in DMR for 2002, 2004, and 2007 [a]

Type of Mine	Facility Name	Location	2007		2004		2002	
			Total Pounds Released	TWPE	Total Pounds Released	TWPE	Total Pounds Released	TWPE
Lead/Zinc	Mossy Creek Mining, LLC	Gordonsville, TN	NR	NR	3.56	7.97	NR	NR
Gold	London Mine LLC	Park County, CO	NR	NR	2.86	6.4	3.71	8.3
Gold	Gold King Mines Corporation	San Juan County, CO	NR	NR	0.866	1.94	17.8	39.9
Lead/Zinc	Leadville Corporation	Leadville, CO	NR	NR	NR	NR	154	345
Ferroalloy (except Alum.)	Hecla Mining Co	Mullan, ID	NR	NR	NR	NR	48.7	109
Gold	Zortman Mining Inc.	Zortman, SD	NR	NR	NR	NR	26.5	59.3
Gold	Zortman Mining Inc.	Zortman, SD	NR	NR	NR	NR	19.5	43.7
Lead/Zinc	Asarco, Inc., Tn Mines Div.	New Market, TN	NR	NR	NR	NR	9.65	21.6
Lead/Zinc	Mossy Creek Mining, LLC	New Market, TN	NR	NR	NR	NR	8.81	19.7
Gold	Calais Resources Colorado, Inc	Caribou, CO	NR	NR	NR	NR	1.42	3.18
Total			**18,931**	**42,434**	**8,519**	**19,080**	**10,600**	**23,762**

Source: *DMRLoads2007*_v3, *PCSLoads2004_v4: PCSLoads2002_v4.*
a – Includes only discharges greater than one TWPE.
NR — Not reported.

9.2.2.4 Ore Mining Category Mercury Discharges from Northshore Mining Company in DMR

From *PCSLoads2004_v04*, EPA had identified large discharges of mercury from the Northshore Mining Company taconite mine in Silver Bay, MN (U.S. EPA, 2008a). EPA contacted the Minnesota Pollution Control Agency (MPCA) in 2009 to obtain additional information about the mercury discharges. The MPCA identified a data entry error: the facility reports mercury concentrations in ng/L, but the data in PCS were entered in mg/L without any conversion. The correction resulted in a reduced estimate of mercury discharges from 3,765 lbs/yr (prior to correction) to less than one lb/yr. This correction reduced the mercury TWPE from Northshore Mining Company from 441,093 to 0.12. Based on EPA's discharge estimates using the corrected DMR data provided by MPCA, mercury discharges from Northshore Mining Company are not a priority hazard for the 2009 review (Thomas, 2009).

9.2.3 Ore Mining Category Data Obtained from Permits, Permit Fact Sheets, and Permit Applications

As part of the 2008 annual review, EPA collected readily available ore mining facility permits, permit fact sheets, and permit applications. These data were useful for wastewater characterization and determining current permitting practices. EPA made the following findings (U.S. EPA, 2008a):

- EPA analyzed discharges reported to *PCSLoads2004_v4* to determine if loads were resulting from noncompliance. EPA reviewed all discharges greater than 4,000 TWPE, and determined that mines appear to be in compliance with permit limits. The permits often only required monitoring of pollutants, without setting limits.

- EPA reviewed permit fact sheets to determine the basis for permit limits. When individual permits are in place (as opposed to general stormwater permits), the permitting authority usually used a combination of technology- and water quality-based limits. EPA found that water quality-based limits are typically set for the following parameters:
  - Total mercury;
  - Total recoverable lead;
  - Total recoverable copper;
  - Total recoverable cadmium; and
  - Total recoverable zinc.

- EPA analyzed permit monitoring data from fact sheets for five gold mining facilities. The following metals were measured at concentrations above the method detection limit, illustrating that these pollutants are likely present in wastewaters from gold mining operations:
  - Arsenic (80 percent of mines);
  - Cadmium (80 percent of mines);

— Molybdenum (100 percent of mines with data[17]); and
— Lead (100 percent of mines) (U.S. EPA, 2008a).

9.3 Ore Mining Category 2009 Preliminary Category Review Summary of Findings

EPA collected additional data as part of the 2009 preliminary category review of the Ore Mining and Dressing Category. This subsection summarizes EPA's findings from the following data searches:

- Review of ore mining discharges that are exempt from Part 440 because they are regulated by stormwater general permits;
- Review of *Waters*[18] database to search for documented surface water impacts resulting from wastewater from ore mines; and
- Ongoing data collection.

9.3.1 Discharges Exempt from Part 440 and Covered by General Permits

As part of the 2009 preliminary category review, EPA is evaluating the impact of discharges from waste rock, tailings, and overburden piles, which are not currently covered by effluent guidelines. The purpose of this evaluation is to determine whether these discharges are adequately controlled by state and federal multi-sector general permits (MSGPs) (See 65 FR 64746, Oct. 30, 2000; 70 FR 72116, December 1, 2005).

9.3.1.1 The Federal MSGP

The Federal MSGP establishes general benchmark values for sampling and general requirements to develop a stormwater pollution prevention plan, but does not establish numeric limits or stormwater containment/treatment requirements. The MSGP establishes benchmark monitoring for pollutants including TSS, pH, hardness, arsenic, beryllium, cadmium, copper, iron, lead, manganese, mercury, nickel, selenium, silver, zinc, and uranium.[19]

In 2008, EPA published a new MSGP, which requires more frequent monitoring requirements, more frequent site inspections, and more stringent benchmark concentrations for arsenic, mercury, and selenium. Active facilities covered by the MSGP must monitor discharges from waste rock, tailings, and overburden piles for the parameters in Table 9-10 and Table 9-11, as well as the ore-specific parameters in Table 9-12. The parameters in Table 9-10 and Table 9-11 are compared to the listed benchmark concentration to determine whether corrective actions (i.e., additional control measures) are needed.

[17] Only two of the five facilities reviewed monitor for molybdenum.
[18] Available online at http://www.epa.gov/waters/geoservices/index.html (Date accessed: July 7, 2009). The *Waters* database provides information on waters that are listed as "impaired" according to Section 303d of the CWA.
[19] Table G-4 of the MSGP lists the types of mining wastewater covered by Part 440 and the types covered by the industrial MSGP. In response to litigation from the National Mining Association, EPA revised its interpretation of applicability for wastewaters from hard rock mining operations. Under the revised interpretation, runoff from waste rock, tailings, and overburden piles is not subject to effluent guidelines unless it naturally drains (or is intentionally diverted) to a point source and combines with "mine drainage" that is otherwise subject to the effluent guidelines (65 FR 64774).

Table 9-10. Parameters with Benchmarks Not Dependant on Hardness

Parameter	Benchmark Monitoring Cutoff Concentration
Total Suspended Solids (TSS)	100 mg/L
Turbidity	50 NTU
pH	6.0 – 9.0 Standard Units
Hardness	No Benchmark
Total Antimony	0.64 mg/L
Total Arsenic	0.15 mg/ L
Total Beryllium	0.13 mg/L
Total Iron	1.0 mg/L
Total Mercury	0.0014 mg/L
Total Selenium	0.005 mg/L

Table 9-11. Parameters with Benchmarks Based on Water Hardness

Parameter	Water Hardness Range (mg/L)										
	<25	25-50	50-75	75-100	100-125	125-150	150-175	175-200	200-225	225-250	250+
Cadmium (mg./L)	0.0005	0.0008	0.0013	0.0018	0.0023	0.0029	0.0034	0.0039	0.0045	0.005	0.0053
Copper (mg./L)	0.0038	0.0056	0.009	0.0123	0.0156	0.0189	0.0221	0.0253	0.0285	0.0316	0.0332
Lead (mg./L)	0.014	0.023	0.045	0.069	0.095	0.122	0.151	0.182	0.213	0.246	0.262
Nickel (mg./L)	0.15	0.2	0.32	0.42	0.52	0.61	0.71	0.8	0.89	0.98	1.02
Silver (mg./L)	0.0007	0.0007	0.0017	0.003	0.0046	0.0065	0.0087	0.0112	0.0138	0.0168	0.0183
Zinc (mg./L)	0.04	0.05	0.08	0.11	0.13	0.16	0.18	0.2	0.23	0.25	0.26

Table 9-12. Parameters Specific to the Type of Ore Being Mined

Type of Ore Mined	TSS	pH	Arsenic	Cadmium (H)	COD	Copper (H)	Iron	Lead (H)	Mercury	Nickel (H)	Radium [a]	Uranium	Zinc (H)
Tungsten	X	X	X	X		X		X					X
Nickel	X	X	X	X		X		X					X
Aluminum	X	X					X						
Mercury	X	X								X			
Iron	X	X					*						
Platinum				X		X		X					X
Titanium	X	X					X			X			X
Vanadium	X	X	X	X		X		X					X
Molybdenum	X	X	X	X		X		X	X				X

Table 9-12. Parameters Specific to the Type of Ore Being Mined

Type of Ore Mined	TSS	pH	Arsenic	Cadmium (H)	COD	Copper (H)	Iron	Lead (H)	Mercury	Nickel (H)	Radium [a]	Uranium	Zinc (H)
Uranium, Radium, and Vanadium	X	X	X		X						X	X	X
Copper	X				X								

All metals are total metals unless otherwise specified.
a – Total and dissolved radium.
(H) – Permittee is required to measure hardness along with the metal of concern.
* - Dissolved iron.

Benchmark monitoring is required in the first year of activity under the MSGP. If the average of the first four quarterly monitoring results is below the specified benchmark for all parameters, the permittee is no longer required to monitor for the term of the permit. If any of the benchmark values are exceeded, the permittee must either modify the best management practices (BMPs) employed at the site or show just cause for an exception. Exceptions are granted in the following two cases:

- The permittee shows that further pollutant reduction is not economically feasible considering best industry practices; or
- Pollutant levels contributing to exceedances of specified benchmark values are attributable to background levels.

In either case, the permittee must provide documentation to EPA that must also be included in the site-specific Stormwater Pollution Prevention Plan (SWPPP).

9.3.1.2 State MSGPs

EPA identified nine western[20] states (listed in Table 9-13) with NPDES primacy and active ore mining that have established state general permits instead of the federal MSGP. EPA reviewed these state general permits to understand the level of control that state permits exhibit on stormwater discharges from mines in NPDES-delegated states. Table 9-13 compares stormwater monitoring requirements between state and federal MSGPs.

[20] EPA focused on western states because the majority of ore hard rock mining operations occur in the western U.S.

Table 9-13. Comparison of Monitoring Requirements for Western States and Federal General Stormwater Permits

Permit [a]	Monitoring Requirements	Analytes to be Monitored								
		TSS	TDS	Turbidity	pH	Hardness	Metals	Sulfates	COD	Nitrogen (NO_3+NO_2)
Washington (WA DE, 2008)	Permittee must monitor discharges four times per year until concentrations below benchmarks are measured for eight quarters.			X	X	X	X			
2008 Federal MSGP (covers Idaho and New Mexico [b]) (U.S. EPA, 2008b)	Permittee must monitor discharges four times per year in the first year of permit coverage. If pollutant concentrations exceed benchmark values, then the permittee must implement additional BMPs to remedy the situation and continue to monitor four times per year until measured concentrations are below benchmark values.	X		X	X	X	X			
California (CA WRCB, 2004)	Permittee must monitor discharges three times per year.	X			X					
Montana (MO DEQ, 2007)	Permittee must monitor discharges at least twice per year until all concentrations are below benchmarks for three consecutive sampling events.	X			X		X		X	X
Arizona [c]	Permittee must monitor at least once during the first year of coverage. If pollutant concentrations exceed benchmark values, then permittee must implement additional BMPs to remedy the situation and must continue to monitor twice per year until measured concentrations are below benchmark values.	X		X	X	X	X			
Utah (UT DEQ, 2006)	Copper mining and dressing facilities must monitor their discharges four times per year for COD, TSS, and nitrate plus nitrite nitrogen during years 2 and 4 of permit coverage. No specifications for other types of mines.	X							X	X
Nevada (NV DCNR, 2008)	Permittee must monitor discharges once per year; alternatively, the permittee may submit a statement that these discharges will not cause exceedances of applicable WQS.	X	X		X	X	X	X		
Wyoming (WY DEQ, 2007)	Permittee must monitor discharges once per year.	X							X	X
South Dakota (SD DENR, 2003)	Except for coal pile runoff, monitoring is not required on a routine basis. [d]									
Colorado (CO DPHE, 2006)	Monitoring is not required on a routine basis. [d]									

a – Ranked by likely availability of monitoring data.
b – Facilities in Alaska are covered by the 2008 Federal MSGP until its state general permit is published.
c – Arizona continued the 2000 Federal MSGP until the state general permit is published. Requirements from this permit continue regardless of the revised federal MSGP.
d – State may require sampling if noncompliance with Stormwater Pollution Prevention Plan is suspected or to measure the effectiveness of BMPs.

During the review of state general permits, EPA identified the following issues:

- One state, Washington, required more stringent stormwater monitoring than the Federal MSGP;
- Four states did not require that metals be analyzed;
- Eight states required less frequent sampling than what is specified in the Federal MSGP; and
- Two states require no routine sampling at all.

EPA found that state stormwater permits are generally less restrictive than the federal MSGP.

9.3.2 Surface Water Impacts from Ore Mines

To research surface water impacts from ore mines, EPA conducted a search of Total Maximum Daily Load (TMDL) documents. To identify TMDL studies for this analysis, EPA used search tools available from the *Waters*[21] Web site. While these tools allowed EPA to focus the search on ore mine-related TMDLs, they represent an incomplete collection of TMDL documents. At the time of this search, the *Waters* tool contained 7,670 TMDL documents; however, EPA has anticipated that more than 36,000 TMDLs will be completed for water bodies that were identified as impaired as of 2001 (U.S. EPA, 2001). Because some TMDL documents are not available through EPA's database, it was not feasible to do a comprehensive review of every TMDL document for this analysis.

9.3.2.1 Extraction and Review of TMDL Documents Database

EPA used the *Waters* TMDL Document Search tool[22], which performs text searches of all TMDL documents in EPA's database. EPA searched for all documents containing the terms "mine" or "mining."

Some of the TMDL documents in EPA's database that contain the search terms "mine" or "mining" are irrelevant to the Ore Mining ELGs. For example, a TMDL document may discuss watershed impacts from coal or gravel mining. To screen out these and other types of irrelevant documents, EPA developed the system for identifying TMDL documents relevant to the Ore Mining ELGs discussed in the remainder of this subsection.

The search for documents containing the terms "mine" or "mining" narrowed the 7,760 TMDL documents available to 1,668. EPA then identified documents that contained information relevant to the Ore Mining ELGs. This analysis consisted of the following steps:

1. EPA removed TMDL documents for all states expect the following states with major ore mining activities:

[21] Available online at http://iaspub.epa.gov/waters10/text_search.tmdl_search_form. Accessed on January 22nd, 2009.
[22] Ibid.

— Alaska
— Arizona;
— California;
— Colorado;
— Montana;
— New Mexico;
— Nevada;
— South Dakota;
— Utah; and
— Washington.

Removing TMDL documents for all states other than those listed above reduced the number of documents for further review from 1,668 to 158.

2. EPA performed a text search using the terms "mine" and "mining" and determined if mining operations discussed in the document were ore mining operations. EPA removed documents that lacked detail on the type of mining present in the watershed from the tracking spreadsheet. Removing documents that did not specifically describe ore mining operations reduced the number of documents for further review from 158 to 42.

3. EPA reviewed the sections containing the search terms "mine" and "mining" to determine whether the document identified abandoned or closed mines. EPA noted this information but did not remove any documents from further analysis.

4. EPA reviewed the sections containing the search terms "mine" and "mining" to determine whether the document identified large-scale (non-recreational), active mines. Removing documents that did not specifically describe large-scale, active mines reduced the number of documents for further review from 42 to 9.

5. EPA performed a text search using the terms "waste rock" and "tailing" to identify documents that discuss water quality impacts from waste rock and tailings piles. EPA identified 23 documents that discuss impacts from waste rock and tailings piles.

6. EPA verified that TMDLs listed mining activities as a source of impairment. In cases where it was not clear that mining was a source of impairment, EPA removed these from further analysis. Removing documents that described ore mining activities but did not list them as a source of impairment reduced the number of documents for further review from nine to seven.

9.3.2.2 TMDL Studies Identifying Active Ore Mining Sources

EPA identified seven TMDL studies that described impacts from mining operations that were active/recently active[23] at the time the studies were written. EPA reviewed in detail the relevant information in these studies as part of the TMDL analysis. Table 9-14 summarizes information from these seven TMDL studies (Krejci, 2009).

[23] Ore mining operations commonly close and re-open periodically according to the fluctuating prices of the metals they produce. Few mines are continually operational over spans of time long enough to identify them as sources of impairment while they are still active. In light of these observations, ERG selected TMDL studies that included discussion of recently closed mines.

Table 9-14. TMDL Studies with Information on Active and Recently Closed Ore Mines [a]

TMDL Study	Pollutants of Concern	Active and Recently Closed Mines [b]	Summary of Data Available	Additional Comments
Pinto Creek	Copper	• Gibson Mine (closed); • BHP Pinto Creek Mine (active); and • Carlota Copper Project (active).	Appendix A (data and figures) not included; some data is provided in the text of the report.	None.
French Gulch	Cadmium, Copper, Zinc	Zonia Mine (closed)	Document includes extensive in-stream monitoring data for metals and load estimates for all stream segments.	None.
Pena Blanca	Mercury	St. Patrick Mine (closed)	Study provides concentration data from sediment and fish tissue samples and some concentration data from water column samples	The TMDL study identified other past mining projects and current exploratory projects, but it does not provide information on their relative potential mercury loads.
Red River (Rio Grande to Headwaters)	Aluminum, Turbidity, and Sediment	Molycorp Questa Mine (active)	Document includes in-stream monitoring data for aluminum, benthic macroinvertebrates, stream flow, turbidity, and TSS; it does not provide data for any mine sites.	None.
Bryant Creek	Arsenic, Copper, Iron, Nickel, Temperature, Turbidity, TSS	Leviathan Mine (closed)	Document includes statistical summary of stream flow, arsenic, iron, turbidity, and TSS measurements in creek. No data are provided for mine sites.	Although mining impacts are referenced throughout the TMDL document, the study describes only the Leviathan Mine.
Lower Similkameen River	Arsenic	• Similco Mine (active); • Dankoe Mine (active); • Corona Nickel Plate Mine (active); and • Cadorado Mine (active). • (All in Canada)	Document includes in-stream monitoring data for arsenic. No data are provided for mine sites.	The TMDL study acknowledges that active mining occurs in the U.S. portion of the Similkameen watershed, but it does not specifically mention any mine sites in the U.S.
Trinity River	Sediment	• Deiner Mine (closed) • La Grange (closed)	Study estimates sediment loads from major sources.	None.

a – Listed in order of probable relevance to the Ore Mining and Dressing ELGs.
b – Mine status in parenthesis. "Closed" means both inactive and permanently closed.
TSS – Total Suspended Solids.

Although many TMDL documents discuss water quality impacts due to historic mining, EPA found only a limited number of documents discussing impacts due to current mining operations. Based on this information, EPA concluded that discharges from active mines have not been a significant reason for the development of TMDLs.

9.3.3 Compliance Analysis of the Ore Mining Category

At this time (at this report's publication), EPA continues a compliance review for facilities in the Ore Mining Category with data available through Enforcement and Compliance History Online (ECHO). ECHO is a data system administered by EPA's Office of Enforcement and Compliance Assurance (OECA) and is available online at http://www.epa-echo.gov/echo/. EPA plans to use ECHO data as an indicator of general compliance status for the ore mining category. Conclusions about compliance status will be limited due to the incomplete information for NPDES minors in ECHO. This data will also assist EPA in determining which - if any - of the pollutants controlled by the Ore Mining ELGs are commonly associated with effluent limits violations.

EPA also anticipates using information available through ECHO, PCS, and ICIS-NPDES to identify facilities in the Ore Mining Category classified as NPDES minors. For some states, ECHO includes information on NPDES minor facilities, including facilities that are permitted through general stormwater permits. Where possible, EPA will evaluate the completeness of databases used for EPA's annual review (e.g., TRI, PCS, ICIS-NPDES) for those states that voluntarily submit data on NPDES minors to the ECHO database. EPA is specifically using ECHO to identify NPDES minors because the annual review databases have less information on NPDES minors.

9.3.4 Ongoing Activities

As part of the Ore Mining Category review, EPA continues to collect monitoring data from EPA's regional offices to assess the potential hazard of stormwater discharges from ore mining operations. EPA will analyze available pollutant concentration data for stormwater to determine if discharges from the Ore Mining Category warrant further review. Based on the information provided by the review of state general stormwater permits, only limited stormwater monitoring data will be available for some states.

9.4 Ore Mining Category Issues Identified and Additional Review

The conclusions of the Ore Mining Category review are as follows:

- The Ore Mining Category discharges continue to rank high according to EPA's screening-level databases;
- Discharges from active mines are not a significant reason for the development of TMDLs; and
- There are incomplete data available (e.g., stormwater discharge data, discharge data for PCS/ICIS-NPDES minors) for a full analysis of the Ore Mining Category.

EPA prioritizes point source categories with existing regulations for potential revision based on the greatest estimated toxicity to human health and the environment, measured as TWPE. Based on the above conclusions, EPA is assigning this category with a lower priority for revision (i.e., this category is marked with "(5)" in the "Findings" column in Table V-1 in the Federal Register notice that presents the 2009 annual review of existing effluent guidelines and pretreatment standards).

9.5 Ore Mining Category References

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10. ORGANIC CHEMICALS, PLASTICS, AND SYNTHETIC FIBERS (40 CFR PART 414)

EPA identified the Organic Chemicals, Plastics, and Synthetic Fibers (OCPSF) Point Source Category (40 CFR Part 414) for preliminary category review as part of the Preliminary 2010 Effluent Guidelines Program Plan. This industry was reviewed previously in each of EPA's Preliminary and Final Effluent Guidelines Program Plans from 2004 to 2007 (U.S. EPA, 2004; U.S. EPA, 2005; U.S. EPA, 2006; U.S. EPA, 2007; U.S. EPA, 2008).

This section describes the results of EPA's 2009 preliminary category review of the OCPSF Category. EPA is currently reviewing discharges from the Chlorinated Hydrocarbon Manufacturing Segment of the OCPSF Category as part of the Chlorine and Chlorinated Hydrocarbons (CCH) effluent guidelines rulemaking. Because a rulemaking for this segment of the OCPSF Category is underway, EPA excluded discharges from these facilities from further consideration in this review (see Table V-1, 73 FR 53218, September 15, 2008).

10.1 OCPSF Category Background

This subsection provides background on the OCPSF Category including a brief profile of the OCPSF industry and background on 40 CFR Part 414.

10.1.1 OCPSF Industry Profile

The OCPSF industry includes many chemical industries producing a wide variety of end products, such as polypropylene, vinyl chloride and polyvinyl chloride (PVC), chlorinated solvents, rubber precursors, Styrofoam additives, and polyester. Some OCPSF facilities are extremely complex and produce hundreds of chemicals, while others are simpler, producing one or two end products. EPA considered the following 22 NAICS codes as part of the OCPSF Category:

- 311999OCPSF: All Other Miscellaneous Food Manufacturing;
- 324199OCPSF: All Other Petroleum and Coal Products Manufacturing;
- 325110: Petrochemical Manufacturing;
- 325120OCPSF: Industrial Gas Manufacturing;
- 325132: Synthetic Organic Dye and Pigment Manufacturing;
- 325188OCPSF: All Other Basic Inorganic Chemical Manufacturing;
- 325192: Cyclic Crude and Intermediate Manufacturing;
- 325193: Ethyl Alcohol Manufacturing;
- 325199: All Other Basic Organic Chemical Manufacturing;
- 325211: Plastics Material and Resin Manufacturing;
- 325221: Cellulosic Organic Fiber Manufacturing;
- 325222: Noncellulosic Organic Fiber Manufacturing;
- 325510OCPSF: Paint and Coating Manufacturing;
- 325520: Adhesive Manufacturing;
- 325611OCPSF: Soap and Other Detergent Manufacturing;
- 325612: Polish and Other Sanitation Good Manufacturing;
- 325620: Toilet Preparation Manufacturing;
- 325998: All Other Miscellaneous Chemical Product and Preparation Manufacturing;

- 326199OCPSF: All Other Plastics Product Manufacturing;
- 339999OCPSF: All Other Miscellaneous Manufacturing;
- 424690: Other Chemical and Allied Products Merchant Wholesalers; and
- 562920: Materials Recovery Facilities.

Wastewater generated by facilities in NAICS codes 311999, 324199, 325120, 325188, 325510, 325611, 326199, 339999 can be regulated under multiple categories. EPA reviewed available information about pollutant loads and manufacturing operations for facilities reporting these NAICS codes. EPA assigned the extension "OCPSF" to the end of the NAICS codes of facilities that likely primarily generate wastewater regulated by the OCPSF ELGs. For example, most facilities in NAICS code 324199 are grouped under the Petroleum Refining ELGs.

This list of NAICS codes includes facilities that EPA determined are potential new subcategories to the OCPSF Category. As part of the 2004 annual review, EPA reviewed industries with SIC codes not clearly subject to existing ELGs. EPA concluded that the processes, operations, wastewaters, and pollutants of facilities in the following SIC codes are similar to those of the OCPSF Category (U.S. EPA, 2004):[24]

- 2821: Plastics Materials, Synthetic and Resins, and Nonvulcanizable Elastomers;
- 2824: Manmade Organic Fibers, Except Cellulosic;
- 2842: Specialty Cleaning, Polishing, and Sanitation Preparations;
- 2844: Perfumes, Cosmetics, and Other Toilet Preparations (except toothpaste, gel, and dentifrice powders);
- 2869: Industrial Organic Chemicals, NEC (cyclopropane, diethylcyclohexane, naphthalene sulfonic acid);
- 2891: Adhesives and Sealants;
- 2899: Chemicals and Chemical Preparations, NEC (table salt); and
- 5169: Chemicals and Allied Products, NEC (merchant wholesalers).

As part of the 2009 annual review, EPA reclassified these SIC codes as equivalent NAICS codes for use with the U.S. Economic Census and 2007 TRI data that are reported by NAICS code. However, there is not a direct relationship between one SIC and one NAICS code. As a result, EPA included the following NAICS codes in the 2009 annual review of the OCPSF Category because they contain facilities with operations that are similar to the SIC codes above:

- 311999OCPSF: All Other Miscellaneous Food Manufacturing;
- 325188OCPSF: All Other Basic Inorganic Chemical Manufacturing;
- 325199: All Other Basic Organic Chemical Manufacturing;
- 325222: Noncellulosic Organic Fiber Manufacturing;
- 325510OCPSF: Paint and Coating Manufacturing;
- 325520: Adhesive Manufacturing;
- 325611OCPSF: Soap and Other Detergent Manufacturing;
- 325620: Toilet Preparation Manufacturing;

[24] The tables in this section include discharge information from facilities reporting these SIC codes and the corresponding NAICS codes; however, these facilities contribute negligible amounts of TWPE. Consistent with the conclusions drawn during the 2004 detailed study (U.S. EPA, 2004) and 2006 review (U.S. EPA, 2006), EPA found that large numbers of these facilities discharge no wastewater and only a small number of facilities discharge TWPE greater than zero.

- 325998: All Other Miscellaneous Chemical Product and Preparation Manufacturing;
- 326199OCPSF: All Other Plastics Product Manufacturing;
- 339999OCPSF: All Other Miscellaneous Manufacturing; and
- 424690: Other Chemical and Allied Products Merchant Wholesalers.

Table 10-1 lists the number of facilities for the 22 NAICS codes with operations in the OCPSF Category. Because facilities report SIC codes in *DMRLoads2007*, and the U.S. Economic Census and TRI report data by NAICS code, EPA reclassified the 2007 DMR by the equivalent NAICS code.

Table 10-1. Number of OCPSF Facilities

NAICS Code	Number of Facilities		
	2002 U.S. Economic Census	2007 DMR [a]	2007 TRI [b]
311999OCPSF All Other Miscellaneous Food Manufacturing	NA	817	2
324199OCPSF All Other Petroleum and Coal Products Manufacturing	NA		1
325110 Petrochemical Manufacturing	56		66
325120OCPSF Industrial Gas Manufacturing	NA		2
325132 Synthetic Organic Dye and Pigment Manufacturing	123		37
325188OCPSF All Other Basic Inorganic Chemical Manufacturing	NA		1
325192 Cyclic Crude and Intermediate Manufacturing	37		19
325193 Ethyl Alcohol Manufacturing	72		110
325199 All Other Basic Organic Chemical Manufacturing	685		373
325211 Plastics Material and Resin Manufacturing	690		354
325222 Noncellulosic Organic Fiber Manufacturing	95		28
325510OCPSF Paint and Coating Manufacturing	NA		9
325520 Adhesive Manufacturing	595		150
325611OCPSF Soap and Other Detergent Manufacturing	NA		13
325612 Polish and Other Sanitation Good Manufacturing	604		87
325620 Toilet Preparation Manufacturing	867		28
325998 All Other Miscellaneous Chemical Product and Preparation Manufacturing	1,188		305
326199OCPSF All Other Plastics Product Manufacturing	NA		3
339999OCPSF All Other Miscellaneous Manufacturing	NA		2
562920 Materials Recovery Facilities	947		5

Table 10-1. Number of OCPSF Facilities

NAICS Code	Number of Facilities		
	2002 U.S. Economic Census	2007 DMR [a]	2007 TRI [b]
424690 Other Chemical and Allied Products Merchant Wholesalers	11,158	83	433
325221 Cellulosic Organic Fiber Manufacturing	8	3	4
Total	**> 17,125**	**903**	**2,032**

Source: U.S. Economic Census, 2002 (U.S. Census, 2002); *TRIReleases2007_v2*; *DMRLoads2007_v2*.
a – Major and minor dischargers. Also, DMR data are reported by SIC code; therefore, EPA used an NAICS to SIC crosswalk for comparison purposes.
b – Releases to any media.
NA – Not applicable. These facility-specific NAICS codes do not correspond to NAICS codes in the 2002 U.S. Economic Census.

10.1.2 40 CFR Part 414

EPA first promulgated ELGs for the OCPSF Category (40 CFR Part 414) on November 5, 1987 (52 FR 42568). This category consists of seven subcategories that apply to the manufacture of products and product groups, as shown in Table 10-2 with corresponding NAICS codes and applicability. Subparts B through H have limitations for BOD_5, TSS, and pH. The regulation also includes limitations and/or pretreatment standards for certain toxic pollutants in three additional subparts:

- Subpart I — Direct Discharge Point Sources That Use End-of-Pipe Biological Treatment;
- Subpart J — Direct Discharge Point Sources That Do Not Use End-of-Pipe Biological Treatment; and
- Subpart K — Indirect Discharge Point Sources.

Table 10-2. Applicability of Subcategories in the OCPSF Category

Subpart	Subcategory Title	Related SIC Code(s) [a]	Subcategory Applicability
B	Rayon Fibers	2823: Cellulosic Manmade Fibers	Cellulosic manmade fiber (Rayon) manufactured by the Viscose process.
C	Other Fibers	2824: Synthetic Organic Fibers, Except Cellulosic	All other synthetic fibers (except Rayon) including, but not limited to, products listed in Section 414.30.
D	Thermoplastic Resins	28213: Thermoplastic Resins	Any plastic product classified as a thermoplastic resin including, but not limited to, products listed in Section 414.40.
E	Thermosetting Resins	28214: Thermosetting Resins	Any plastic product classified as a thermosetting resin including, but not limited to, products listed in Section 414.50.

Table 10-2. Applicability of Subcategories in the OCPSF Category

Subpart	Subcategory Title	Related SIC Code(s) [a]	Subcategory Applicability
F	Commodity Organic Chemicals	2865: Cyclic Crudes and Intermediates, Dyes and Organic Pigments 2869: Industrial Organic Chemicals, NEC	Commodity organic chemicals and commodity organic chemical groups including, but not limited to, products listed in Section 414.60.
G	Bulk Organic Chemicals	2865: Cyclic Crudes and Intermediates, Dyes and Organic Pigments 2869: Industrial Organic Chemicals, NEC	Bulk organic chemicals and bulk organic chemical groups including, but not limited to, products listed in Section 414.70.
H	Specialty Organic Chemicals	2865: Cyclic Crudes and Intermediates, Dyes and Organic Pigments 2869: Industrial Organic Chemicals, NEC	All other organic chemicals and organic chemical groups including, but not limited to, products listed in the OCPSF Development Document (Vol. II, Appendix II-A, Table VII).

Source: *Product and Product Group Discharges Subject to Effluent Limitations and Standards for the Organic Chemicals, Plastics, and Synthetic Fibers Point Source Category — 40 CFR 414*, Table 2-2 (U.S. EPA, 2005b).
a – During the 2009 annual review EPA developed a crosswalk between SIC codes and NAICS codes. Because there is not a direct match EPA did not report NAICS codes.

10.2 OCPSF Category 2009 Annual Review

This subsection discusses EPA's 2009 annual review of the OCPSF Category including the screening-level review and category-specific review.

10.2.1 OCPSF 2009 Screening-Level Review

Table 10-3 compares the OCPSF Category TWPE for 2004 and 2007, calculated using *TRIReleases2004_v3*, *PCSLoads2004_v4*, *TRIReleases2007_v2*, and *DMRLoads2007_v3*. The table excludes the amount of TWPE contributed by the Chlorinated Hydrocarbon Manufacturing Segment. EPA is currently considering revisions to ELGs for discharges from facilities that produce chlorinated hydrocarbons. Because a rulemaking for the CCH sector of the OCPSF is underway, discharges from these facilities were excluded from further consideration for the OCPSF Category review under the current planning cycle.

The combined DMR and TRI TWPE decreased from 2004 to 2007. The 2007 TRI TWPE accounts for approximately 58 percent of the combined 2007 TWPE.

Table 10-3. OCPSF Point Source Category TRI and DMR Discharges for 2004 and 2007

Year of Discharge	Year of Review	OCPSF Category [a]	
		TRI TWPE [b]	DMR TWPE [c]
2004	2007	957,134	608,394
2007	2009	574,741	413,226

Source: *PCSLoads2004_v4; TRIReleases2004_v3*; *TRIReleases2007_v2; DMRLoads2007_v3*.
a – Excludes the chlorinated hydrocarbon manufacturing facilities in the OCPSF Category.
b – Discharges include transfers to POTWs and account for POTW removals.
c – Discharges include only major dischargers.

10.2.2 OCPSF Category 2009 Pollutants of Concern

Table 10-4 lists the five chemicals with the highest TWPE in *TRIReleases2007_v2* and *TRIReleases2004_v3*, while Table 10-5 lists the five chemicals with the highest TWPE in *DMRLoads2007_v3* and *PCSLoads2004_v4*.

Table 10-4. 2009 Review: OCPSF Category Top TRI Pollutants

Pollutant	2004 [a]			2007 [a]		
	Rank	Number of Facilities Reporting Pollutant	TWPE	Rank	Number of Facilities Reporting Pollutant	TWPE
Dioxin and Dioxin Like Compounds	1	8	693,358	1	4	397,949
Chlorine	3	15	22,921	2	13	27,542
Hydroquinone	4	6	17,051	3	4	18,469
Polycyclic Aromatic Compounds	8	8	11,027	4	7	18,157
Lead and Lead Compounds	20	63	2,468	5	55	16,517
Hexachlorobenzene	2	4	84,480	26	2	627
Nitrate Compounds	5	130	16,217	7	91	9,133
OCPSF Category Total	**NA**	**745 [b]**	**957,134**	**NA**	**586 [b]**	**574,742**

Source: *TRIReleases2004_v3*; *TRIReleases2007_v2*.
a – Discharges include transfers to POTWs and account for POTW removals.
b – Number of facilities reporting TWPE greater than zero.
NA – Not applicable.

Table 10-5. 2009 Review: OCPSF Category Top DMR Pollutants

Pollutant	2004			2007		
	Rank	Number of Facilities Reporting Pollutant	TWPE	Rank	Number of Facilities Reporting Pollutant	TWPE
Copper	7	92	17,062	1	88	119,475
Hexachlorobenzene	2	13	122,529	2	13	62,671
Chlorine	4	46	38,162	3	46	45,596
Fluoride	5	12	28,238	4	13	35,481
Nickel	20	54	3,477	5	58	23,008

Table 10-5. 2009 Review: OCPSF Category Top DMR Pollutants

Pollutant	2004			2007		
	Rank	Number of Facilities Reporting Pollutant	TWPE	Rank	Number of Facilities Reporting Pollutant	TWPE
Aluminum	1	20	209,183	12	18	6,380
Benzidine	3	1	63,844	NR	NR	NR
OCPSF Category Total	**NA**	**202 [a]**	**608,394**	**NA**	**195 [a]**	**413,226**

Source: *PCSLoads2004_v4*; and *DMRLoads2007_v3*.
a – Number of facilities reporting TWPE greater than zero.
NA – Not applicable.
NR – Not reported.

EPA identified the OCPSF Category pollutants of concern based on relative TWPE. EPA focused its 2009 annual review on discharges of dioxin and dioxin-like compounds from 2007 TRI and discharges of copper from 2007 DMR. EPA did not investigate the other top pollutants as part of the 2009 annual review because they are consistent with findings in past years of review of this category, including similar facilities and pollutants. As a result, EPA does not plan to review the other top pollutants in detail.

10.2.2.1 OCPSF Category Dioxin Discharges in TRI

Discharges of dioxin and dioxin-like compounds decreased by approximately 295,000 TWPE from TRI 2004 to TRI 2007. However, dioxin and dioxin-like compounds contributed 69 percent of the category TRI TWPE for 2007. Approximately 94 percent of the dioxin and dioxin-like compound discharges are from Dow Chemical Co.'s Midland, MI facility. As part of the 2006 annual review, EPA contacted Dow Midland and determined the discharges of dioxin and dioxin-like compounds were from mostly historical processes and waste management units that are no longer in operation at the site. Dow stated that a very small portion of the dioxin and dioxin-like compounds may be from an on-site incinerator (U.S. EPA, 2006). EPA continues to follow up with the Dow Midland facility regarding these dioxin discharges.

10.2.2.2 OCPSF Category Copper Discharges in DMR

Copper accounted for 29 percent of the OCPSF Category DMR 2007 TWPE. The majority (87 percent) of the copper discharges were from GE Silicones, LLC in Friendly, WV. EPA contacted GE Silicones as part of the 2009 annual review. GE Silicones indicated that the copper concentration was measured in µg/L rather than mg/L (Martin, 2009). As a result, the discharges of copper in DMR decrease from 119,475 TWPE to 15,196 TWPE and the OCPSF Category 2007 DMR TWPE decreased to 308,947 TWPE.

10.3 OCPSF Category Potential New Subcategories

During the 2009 review, EPA did not identify any potential new subcategories for the OCPSF Point Source Category.

10.4 OCPSF Category Issues Identified and Additional Review

EPA's estimate of the toxicity of OCPSF Point Source Category discharges is largely due to the TRI-reported discharges of dioxin and dioxin-like compounds and DMR-reported discharges of copper. During the 2009 annual review, EPA did not obtain any information to change its conclusions that have previously been made regarding the wastewater discharges from the OCPSF manufacturing facilities. Therefore, the conclusions of the OCPSF Chemicals Category are as follows:

- EPA determined there is a units error (1,000 times larger) for the copper concentrations reported to the 2007 DMR by GE Silicones in Friendly, WV. Correcting this units error decreases the OCPSF Category 2007 TWPE to 308,947 TWPE.

Further review of this category may focus on the following issues:

- In future years, EPA may analyze the TRI-reported dioxin discharges, including facilities dominating the TWPE, the methods used to estimate reported discharge, process sources, and concentrations discharged.

EPA prioritizes point source categories with existing regulations for potential revision based on the greatest estimated toxicity to human health and the environment, measured as TWPE. Based on the above conclusions, EPA is assigning this category with a lower priority for revision (i.e., this category is marked with "(3)" in the "Findings" column in Table V-1 in the Federal Register notice that presents the 2009 annual review of existing effluent guidelines and pretreatment standards).

10.5 OCPSF Category References

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6. U.S. EPA. 2006. *Technical Support Document for the 2006 Effluent Guidelines Program Plan.* EPA-821-R-06-018. Washington, DC. (December). Docket OW-2004-0032-2782.

7. U.S. EPA. 2007. *Technical Support Document for the Preliminary 2008 Effluent Guidelines Program Plan*. EPA-821-R-07-007. Washington, DC. (October). EPA-HQ-OW-2006-0771-0819.

8. U.S. EPA. 2008. *Technical Support Document for the 2008 Effluent Guidelines Program Plan*. EPA-821-R-08-015 Washington, DC. (August). EPA-HQ-OW-2006-0771-1701.

11. PETROLEUM REFINING (40 CFR PART 419)

EPA identified the Petroleum Refining Category (40 CFR Part 419) for preliminary category review as part of the Preliminary 2010 Effluent Guidelines Program Plan. This industry was reviewed previously in each of EPA's Preliminary and Final Effluent Guidelines Program Plans from 2004 to 2008 (U.S. EPA, 2004; U.S. EPA, 2005; U.S. EPA, 2006; U.S. EPA, 2007; U.S. EPA, 2008). This section describes the results of EPA's 2009 preliminary category review of the Petroleum Refining Category.

11.1 Petroleum Refining Category Background

This section provides background on the Petroleum Refining Category including a brief profile of the petroleum refining industry and background on 40 CFR Part 419.

11.1.1 Petroleum Refining Industry Profile

The petroleum refining industry includes facilities that produce gasoline, kerosene, distillate fuel oils, residual fuel oils, and lubricants through fractionation or straight distillation of crude oil, redistillation of unfinished petroleum derivatives, cracking, or other processes. EPA considered the following six NAICS codes as part of the Petroleum Refining Category:

- 324110: Petroleum Refineries;
- 324191: Petroleum Lubricating Oil and Grease Manufacturing;
- 324199: All Other Petroleum and Coal Products Manufacturing;
- 325998PR: All Other Miscellaneous Chemical Product and Preparation Manufacturing;
- 424710: Petroleum Bulk Stations and Terminals; and
- 486110: Pipeline Transportation of Crude Oil.

Wastewater generated by facilities in NAICS code 325998 can be regulated under multiple categories. EPA reviewed available information about pollutant loads and manufacturing operations for facilities reporting this NAICS code. EPA assigned the extension "PR" to the end of the NAICS codes of facilities that likely primarily generate wastewater regulated by the Petroleum Refining ELGs. Most facilities in NAICS code 325998 are grouped under the Organic Chemicals, Plastics, and Synthetic Fibers Point Source Category.

This list of NAICS codes includes facilities that EPA determined are potential new subcategories to the Petroleum Refining Category. As part of the 2004 annual review, EPA reviewed industries with SIC codes not clearly subject to existing ELGs. EPA concluded that the processes, operations, wastewaters, and pollutants of facilities in the following SIC codes are similar to those of the Petroleum Refining Category (U.S. EPA, 2004):[25]

[25] The tables in this section include discharge information from facilities reporting these SIC codes and the corresponding NAICS codes; however, these facilities contribute negligible amounts of TWPE. Consistent with the conclusions drawn during the 2004 detailed study (U.S. EPA, 2004) and 2006 review (U.S. EPA, 2006), EPA found that large numbers of these facilities discharge no wastewater and only a small number of facilities discharge TWPE greater than zero.

- 2911: Petroleum Refining;
- 2992: Lubricating Oils and Greases;
- 4612: Crude Petroleum Pipelines; and
- 5171: Petroleum Bulk Stations and Terminals (except petroleum sold via retail method).

As part of the 2009 annual review, EPA reclassified these SIC codes as equivalent NAICS codes for use with the U.S. Economic Census and 2007 TRI data that are reported by NAICS code. However, there is not a direct relationship between one SIC and one NAICS codes. As a result, EPA included the following NAICS codes in the 2009 annual review of the Petroleum Refining Category because they contain facilities with operations that are similar to the SIC codes above:

- 324191: Petroleum Lubricating Oil and Grease Manufacturing;
- 324199: All Other Petroleum and Coal Products Manufacturing;
- 325998PR: All Other Miscellaneous Chemical Product and Preparation Manufacturing;
- 424710: Petroleum Bulk Stations and Terminals; and
- 486110: Pipeline Transportation of Crude Oil.

Table 11-1 lists the number of facilities for the six NAICS codes with operations in the Petroleum Refining Category. Because facilities report SIC codes in *DMRLoads2007*, and the U.S. Economic Census and TRI report data by NAICS code, EPA reclassified the 2007 DMR by the equivalent NAICS codes.

Table 11-1. Number of Petroleum Refining Facilities

NAICS Code	Number of Facilities		
	2002 U.S. Economic Census	2007 DMR [a]	2007 TRI [b]
324110: Petroleum Refineries	203	259	160
324199: All Other Petroleum and Coal Products Manufacturing	82		38
324191: Petroleum Lubricating Oil and Grease Manufacturing	412	50	115
325998PR: All Other Miscellaneous Chemical Product and Preparation Manufacturing	NA		2
424710: Petroleum Bulk Stations and Terminals;	4,836	1,040	465
486110: Pipeline Transportation of Crude Oil	252	44	0
Total	**5,785**	**1,393**	**780**

Source: U.S. Economic Census, 2002 (U.S. Census, 2002); *TRIReleases2007_v2*; *DMRLoads2007_v3*.
a – Major and minor dischargers. Also, DMR data are reported by SIC code; therefore, EPA used an NAICS to SIC crosswalk for comparison purposes.
b – Releases to any media.
NA – Not applicable. These facility-specific NAICS codes do not correspond to NAICS codes in the 2002 U.S. Economic Census.

11.1.2 40 CFR Part 419

EPA first promulgated ELGs for the Petroleum Refining Category (40 CFR Part 419) on October 18, 1982 (47 FR 46446). The five subcategories established all have limitations or standards set for BPT, BAT, BCT, PSES, NSPS, and PSNS. EPA established numerical limitations for ammonia as nitrogen, hexavalent chromium, phenolic compounds, sulfide, and total chromium in at least one subcategory. Section 7 of the 2004 Technical Support Document provides more information on the existing regulations for the Petroleum Refining Category (U.S. EPA, 2004).

11.2 Petroleum Refining Category 2009 Annual Review

This subsection discusses EPA's 2009 annual review of the Petroleum Refining Category including the screening-level review and category-specific review.

11.2.1 Petroleum Refining 2009 Screening-Level Review

Table 11-2 compares the Petroleum Refining Category TWPE for 2004 and 2007, calculated using *TRIReleases2004_v3*, *PCSLoads2004_v4*, *TRIReleases2007_v2*, and *DMRLoads2007_v3*. The combined DMR and TRI TWPE decreased from 2004 to 2007. The 2007 DMR TWPE accounts for approximately 70 percent of the combined 2007 TWPE.

Table 11-2. Petroleum Refining Category TRI and DMR Discharges for 2004 and 2007

Year of Discharge	Year of Review	Petroleum Refining Category	
		TRI TWPE [a]	DMR TWPE [b]
2004	2007	669,434	818,705
2007	2009	171,756	402,506

Source: *PCSLoads2004_v4*; *TRIReleases2004_v3*; *TRIReleases2007_v2*; and *DMRLoads2007_v3*.
a – Discharges include transfers to POTWs and account for POTW removals.
b – Discharges include only major dischargers.

11.2.2 Petroleum Refining Category 2009 Pollutants of Concern

Table 11-3 lists the five chemicals with the highest TWPE in *TRIReleases2007_v2* and *TRIReleases2004_v3*, while Table 11-4 lists the five chemicals with the highest TWPE in *DMRLoads2007_v3* and *PCSLoads2004_v4*.

Table 11-3. 2009 Review: Petroleum Refining Category Top TRI Pollutants

Pollutant	2004 [a]			2007 [a]		
	Rank	Number of Facilities Reporting Pollutant	TWPE	Rank	Number of Facilities Reporting Pollutant	TWPE
Dioxin and Dioxin Like Compounds	1	17	558,877	1	9	94,472
Polycyclic Aromatic Compounds	2	65	26,110	2	43	31,021
Nitrate Compounds	4	63	12,497	3	44	9,396

Table 11-3. 2009 Review: Petroleum Refining Category Top TRI Pollutants

Pollutant	2004 [a]			2007 [a]		
	Rank	Number of Facilities Reporting Pollutant	TWPE	Rank	Number of Facilities Reporting Pollutant	TWPE
Lead and Lead Compounds	3	108	19,947	4	86	9,386
Nickel and Nickel Compounds	11	46	1,865	5	45	5,965
Mercury and Mercury Compounds	5	61	11,978	6	45	5,355
Petroleum Refining Category Total	**NA**	**325 [b]**	**669,434**	**NA**	**232 [b]**	**171,756**

Source: *TRIReleases2004_v3*; *TRIReleases2007_v2*.
a – Discharges include transfers to POTWs and account for POTW removals.
b – Number of facilities reporting TWPE greater than zero.
NA – Not applicable.

Table 11-4. 2009 Review: Petroleum Refining Category Top DMR Pollutants

Pollutant	2004			2007		
	Rank	Number of Facilities Reporting Pollutant	TWPE	Rank	Number of Facilities Reporting Pollutant	TWPE
Benzo(a)pyrene	50	1	1.34	1	6	99,179
Copper	15	20	2,479	2	25	81,430
Chlorine	3	16	51,368	3	14	65,077
Cyanide	12	13	3,308	4	21	35,965
Chloride	9	13	8,384	5	13	31,474
TCDD Equivalents	1	1	535,673	13	2	3,894
Sulfide	2	71	115,724	NR	NR	NR
Aluminum	4	9	34,326	6	8	20,835
Fluoride	5	11	15,124	8	13	15,503
Petroleum Refining Category Total	**NA**	**100 [a]**	**818,705**	**NA**	**100 [a]**	**402,506**

Source: *PCSLoads2004_v4*; and *DMRLoads2007_v3*.
a – Number of facilities reporting TWPE greater than zero.
NA – Not applicable.
NR – Not reported.

EPA identified the Petroleum Refining Category pollutants of concern based on relative TWPE. EPA focused the 2009 annual review on discharges of dioxin and dioxin-like compounds and polycyclic aromatic compounds (PACs) from 2007 TRI and discharges of benzo(a)pyrene, one of the PACs, from 2007 DMR. Discharges of dioxin and dioxin-like compounds decreased by approximately 464,000 TWPE from TRI 2004 to TRI 2007, while discharges of PACs increased by approximately 5,000 TWPE from TRI 2004 to TRI 2007. EPA did not investigate the other top pollutants as part of the 2009 annual review because the TWPE levels of other top pollutants are consistent with findings in past years of review of this category, including similar facilities and pollutants. As a result, EPA does not plan to review these pollutants in detail.

11.2.2.1 Petroleum Refining Category Dioxin and Dioxin-like Compound Discharges in TRI

Dioxin and dioxin-like compounds TRI TWPE decreased by approximately 464,000 TWPE from TRI 2004 to TRI 2007. However, dioxin and dioxin-like compounds still contributed 55 percent of the category TRI TWPE for 2007. Table 11-5, at the end of this section, lists all of the dioxin and dioxin-like compound discharges reported to TRI from 2002 to 2007. Fifteen facilities reported discharges of dioxin or dioxin-like compounds to TRI in 2005 and nine facilities reported discharges in TRI 2007. Of the nine refineries reporting discharges in 2007, only five of these refineries reported dioxin discharges based on analytical measurements (i.e., see the "Basis of Estimate" field noted as "M" in Table 11-5).

The BP Products North America, Inc. Toledo Refinery in Oregon, OH accounted for 44 percent of dioxin and dioxin-like compound discharges in TRI 2007. Chevron Products Co. Richmond Refinery in Richmond, CA also contributed largely to the dioxin and dioxin-like compound discharges (35 percent). During the 2004 annual review, EPA concluded that dioxin and dioxin like compounds are produced during catalytic reforming and catalyst regeneration operations at petroleum refineries. EPA also determined only two facilities detected dioxin and dioxin-like compounds above the Method 1613B minimum level, and both of these facilities measured dioxin at the point immediately following catalytic regeneration and prior to wastewater treatment during the detailed study (U.S. EPA, 2004).

11.2.2.2 Petroleum Refining Category PAC Discharges in TRI and DMR

Polycyclic aromatic compound (PACs) discharges increased by 16 percent from TRI 2004 to TRI 2007. Table 11-6, at the end of this section, lists the PACs reported to TRI from 2002 to 2007. Thirty-nine facilities reported PAC discharges to TRI in 2005 and 36 facilities reported PAC discharges to TRI in 2007. Valero Refining in Texas City, TX contributed 34 percent of the PAC discharges for TRI 2007. EPA examined PAC discharges from petroleum refineries extensively for its detailed and previous preliminary studies. From these previous studies, EPA concluded that petroleum refinery PAC discharges in TRI are either based on one-half the detection limit multiplied by the flow or are estimated using emission factors. Therefore, there is little evidence that PACs are being discharged to surface waters in concentrations above the detection limit (U.S. EPA, 2004).

The PAC discharges contained in DMR are reported as individual compounds, rather than as PACs like in TRI. Benzo(a)pyrene is one of the individual compounds that are included in PACs. Benzo(a)pyrene accounted for 25 percent of the DMR 2007 TWPE. The majority (97 percent) of the benzo(a)pyrene discharges come from Calcasieu Refinery Company in Lake Charles, LA.

11.3 Petroleum Refining Category Potential New Subcategories

During the 2009 review, EPA did not identify any potential new subcategories for the Petroleum Refinery Category.

11.4 Petroleum Refining Category Issues Identified and Additional Review

EPA's estimate of the toxicity of Petroleum Refining Category discharges are largely due to the TRI-reported discharges of dioxin and dioxin-like compounds and PACs and DMR-reported discharges of benzo(a)pyrene. During the 2009 annual review, EPA did not obtain any information to change its conclusions that have previously been made regarding the wastewater discharges from the petroleum refineries. Therefore, the conclusions of the Petroleum Refining Category are as follows:

- EPA previously determined that dioxin and dioxin-like compounds are produced during catalytic reforming and catalyst regeneration operations at petroleum refineries. Most facilities reporting dioxin and dioxin-like compounds in TRI never detected dioxin and dioxin-like compounds in their process wastewater effluent.

  Of the 325 identified U.S. petroleum refineries in TRI 2004 that report TWPE greater than zero, 17 report discharges of dioxin and dioxin-like compounds to TRI in 2004. Of the 232 refineries in TRI 2007 that report TWPE greater than zero, nine report discharges of dioxin and dioxin-like compounds to TRI in 2007. Of the nine refineries reporting discharges in 2007, only five of these refineries reported dioxin discharges based on analytical measurements (i.e., see the "Basis of Estimate" field noted as "M" in Table 11-5).

- Petroleum refineries report PAC discharges to TRI; however, these discharges are estimated either based on half the detection limit multiplied by the flow or using emission factors. EPA previously determined that there is little evidence that PACs are being discharged to surface waters in concentrations above the detection limit.

Further review of this category may focus on the following issues:

- In future years, EPA may analyze the DMR-reported benzo(a)pyrene discharges, including the methods used to estimate reported discharge, process sources, and concentrations discharged.

EPA prioritizes point source categories with existing regulations for potential revision based on the greatest estimated toxicity to human health and the environment, measured as TWPE. Based on the above conclusions, EPA is assigning this category with a lower priority for revision (i.e., this category is marked with "(3)" in the "Findings" column in Table V-1 in the Federal Register notice that presents the 2009 annual review of existing effluent guidelines and pretreatment standards).

11.5 Petroleum Refining Category References

1. U.S. Economic Census. 2002. Available online at: http://www.census.gov/econ/census02.

2. U.S. EPA. 2004. *Technical Support Document for the 2004 Effluent Guidelines Program Plan*. EPA 821-R-04-014. Washington, DC. (August). EPA-HQ-OW-2003-0074-1346 through 1352

3. U.S. EPA. 2005. *Preliminary 2005 Review of Prioritized Categories of Industrial Dischargers.* EPA-821-B-05-004. Washington, DC. (August). EPA-HQ-OW-2004-0032-0053.

4. U.S. EPA. 2006. *Technical Support Document for the 2006 Effluent Guidelines Program Plan.* EPA-821-R-06-018. Washington, DC. (December). EPA-HQ-OW-2004-0032-2782.

5. U.S. EPA. 2007. *Technical Support Document for the Preliminary 2008 Effluent Guidelines Program Plan.* EPA-821-R-07-007. Washington, DC. (October). EPA-HQ-OW-2006-0771-0819.

6. U.S. EPA. 2008. *Technical Support Document for the 2008 Effluent Guidelines Program Plan.* EPA-821-R-08-015 Washington, DC. (August). EPA-HQ-OW-2006-0771-1701.

Table 11-5. Dioxin and Dioxin-Like Discharges from Petroleum Refineries Reported to TRI in 2002–2007

TRI ID	Facility Name	Location	2007			2005			2004			2003			2002		
			Grams Released	TWPE	Basis Of Estimate	Grams Released	TWPE	Basis of Estimate	Grams Released	TWPE	Basis of Estimate	Grams Released	TWPE	Basis of Estimate	Grams Released	TWPE	Basis of Estimate
43616-SHLCM-4001C	BP Products North America Inc Toledo Refinery	Oregon, OH	0.29	41,963	O	0.331	47,084	O	0.34	47,795	M	0.38	54,054	M	0.36	51,209	M
94802-CHVRN-841ST	Chevron Products Co. Richmond Refinery (a, b)	Richmond, CA	0.32	33,397	M2	0.94	121,521	M	1.35	141,106	O	0.68	36,798	O	0.76	19,229	O
77536-DRPRK-5900H	Shell Oil Co - Deer Park Refining LP	Deer Park, TX	0.14	13,306	M2	0.114	10,850	M	0.16	15,477	M	0.15	14,581	O	NR	NR	NR
74603-CNCPN-1000S	ConocoPhillips Ponca City Refinery	Ponca City, OK	0.09	2,438	O	0.141	11,601	O	0.28	25,485	O	0.28	21,901	O	0.44	31,071	O
94553-SHLLL-38485P	Shell Oil Products US Martinez Refinery	Martinez, CA	0.03	1,657	M2	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
62454-MRTHN-MARAT	Marathon Ashland Petroleum LLC Illinois Refining Div	Robinson, IL	0.04	1,094	O	0.0404	3,314	O	0.04	3,604	O	0.0404	3,128	O	0.04	2,796	O
84116-CVRN-2351N	Chevron Products Co. Salt Lake City Refinery	Salt Lake City, UT	0.02	541	M2	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
70602-CTGPT-HIGHW	Citgo Petroleum Corp	Westlake, LA	0.002	69	O	0.00256	210	E	0.0026	231	E	0.0026	199	E	0.0026	179	E
19706-TXCDL-2000W	Premcor Refining Group Inc	Delaware City, DE	0.0001	3.13	O	0.0000965	2	O	0.022	559	O	0.022	559	O	NR	NR	NR
90245-CHVRN-324WE	Chevron Products Co. Div Of Chevron USA Inc.	El Segundo, CA	0	0	M2	0.158	16,221	M	0.2	20,533	M	0.34	35,317	M	0.11	11,191	M
00851-HSSLV-LIMET	Hovensa LLC	Christiansted, VI	NR	NR	NR	2.2	180,442	E	1.7	148,653	C	1.1	85,167	C	0.034	2,342	C
98221-SHLLL-WESTM	Tesoro Refining & Marketing Co	Anacortes, WA	NR	NR	NR	1.94	55,248	M	1.95	54,406	M	1.7	47,382	M	1.6	45,504	M
70669-CNCLK-OLDSP	ConocoPhillips Lake Charles Refinery	Westlake, LA	NR	NR	NR	0.539	48,580	O	0.54	48,580	O	0.54	48,580	O	0.54	48,580	O

Table 11-5. Dioxin and Dioxin-Like Discharges from Petroleum Refineries Reported to TRI in 2002–2007

TRI ID	Facility Name	Location	2007			2005			2004			2003			2002		
			Grams Released	TWPE	Basis Of Estimate	Grams Released	TWPE	Basis of Estimate	Grams Released	TWPE	Basis of Estimate	Grams Released	TWPE	Basis of Estimate	Grams Released	TWPE	Basis of Estimate
80022-CNCDN-5801B	Suncor Energy Commerce City Refinery	Commerce City, CO	NR	NR	NR	0.111	9,104	M	0.037	3,333	M	0.074	5,729	E	0.095	6,640	E
08066-MBLLC-BILLI	Valero Refining Co New Jersey	Paulsboro, NJ	NR	NR	NR	0.0879	7,209	O	0.18	15,838	O	0.088	6,813	O	0.088	6,151	O
39567-CHVRN-POBOX	Chevron Products Co Pascagoula Refinery	NR	NR	NR	NR	0.099	4,234	O	0.12	5,217	O	0.099	4,234	O	0.086	3,678	O
00654-PHLPS-PHILI	Chevron Phillips Chemical Puerto Rico Core Inc.	Guayama, PR	NR	NR	NR	0.0054	443	E	0.0035	318	E	0.006	461	E	NR	NR	NR
46394-MCLC - 2815I	Bp Products North America Whiting Business Unit	Whiting, IN	NR	NR	NR	NR	NR	NR	0.000011	1.8	O	NR	NR	NR	NR	NR	NR
60434-MBLJL-INTER	ExxonMobil Oil Corp Joliet Refinery	Channahon, IL	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.0007	64	O	0.43	39,602	O
99611-TSRLS-MILE2	Tesoro Alaska - Kenai Refinery (a, b)	Kenai, AK	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.0006	46	M	NR	NR	NR
07036-XXN - 1400P	ConocoPhillips Co. Bayway Refinery	Linden, NJ	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.25	5,229	M
77590-MRTHN-FOOTO	Marathon Ashland Petroleum L.L.C.	Texas City, TX	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.0044	304	O
Indirect																	
90748-NCLLS-1660W	ConocoPhillips Co La Refinery Wilmington Plant (a)	Wilmington, CA	NR	NR	NR	NR	NR	NR	0.27	27,738	M	0.088	9,015	M	0.28	22,320	M

Source: *TRIReleases2007_v2*; *TRIReleases2005_v2*; *TRIReleases2004_v3*; *TRIReleases2003_v2*; *TRIReleases2002_v4*; Memorandum: Revisions to TWFs for Dioxin and its Congeners and Recalculated TWPEs for OCPSF and Petroleum Refining (Zipf, 2004).

a – Dioxin and dioxin-like compounds were detected above the Method 1613B minimum level.

b – Dioxin and dioxin-like compounds were sampled after the catalytic regeneration and prior to the wastewater treatment plant.

NR – Not reported.

For indirect discharges, the mass shown is the mass transferred to the POTW that is ultimately discharged to surface waters, accounting for an estimated 83% removal of dioxin and dioxin-like compounds by the POTW.

The TWPEs in this table were calculated using the 2006 TWFs (the 2006 dioxin and dioxin-like compound TWFs did not change from the August or December 2004 TWFs).

Refineries reported basis of estimate in TRI as: M – Monitoring data/measurements; M2 – Periodic monitoring data/measurements; C – Mass balance calculations; E – Published emission factors; and O – Other approaches (e.g., engineering calculations).

Table 11-6. PAC Discharges from Petroleum Refineries Reported to TRI in 2002–2007

TRI ID	Facility Name	Location	2007			2005			2004			2003			2002		
			Pounds Released	TWPE	Basis of Estimate	Pounds Released	TWPE	Basis of Estimate	Pounds Released	TWPE	Basis of Estimate	Pounds Released	TWPE	Basis of Estimate	Pounds Released	TWPE	Basis of Estimate
77592TXSCTLOOP1	Valero Refining - Texas LP	Texas City, TX	418	10,624	M2	0.5	12.7	M	0.2	5	M	NR	NR	NR	69	1754	M
96707CHVRN91480	Chevron Products Co - Hawaii Refinery	Kapolei, HI	260	6,608	M2	270	6862.6	M	270	6863	M	261	6629	M	277	7041	M
77590MCLC24015	BP Products North American Inc. Texas City Refinery	Texas City, TX	110	2,796	M2	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
90245CHVRN324WE	Chevron Products Co Div of Chevron USA Inc	El Segundo, CA	81.5	2,011	M2	137.4	3492.3	M	113	2882	M	117	2974	M	287	7287	M
84116CHVRN2351N	Chevron Products Co Salt Lake Refinery	Salt Lake City, UT	61	1,550	M2	60	1525	M	59	1500	M	59	1500	M	59	1500	M
70037LLNCRHIGHW	ConocoPhillips Co - Alliance Refinery	Belle Chasse, LA	43.4	1,103	O	43.8	1114.3	M	49	1233	M	34.9	887	M	31	788	M
60439NCLCR135TH	PDV Midwest Refining LLC Lemont Refinery	Lemont, IL	35.96	914	O	32.1	814.9	M	NR	NR	NR	NR	NR	NR	NR	NR	NR
74603CNCPN1000S	ConocoPhillips Co Ponca City Refinery	Ponca City, OK	32	813	O	8	203.3	O	8	203	O	8	203	O	8	203	O
77590MRTHNFOOTO	Marathon Petroleum Co LLC	Texas City, TX	31.5	801	M2	34.6	879.4	M	29	742	M	30	768	M	93	2369	M
62454MRTHNMARAT	Marathon Ashland Petroleum LLC Illinois Refining Div	Robinson, IL	24.7	628	O	24	610	O	28	712	O	1	25	O	21	534	O
70750HLLPTHWY10	Valero Refining Co Louisiana	Krotz Springs, LA	22.4	569	M2	23	584.6	O	22	567	O	19	483	O	19	483	O
94802CHVRN841ST	Chevron Products Co Richmond Refinery	Richmond, CA	16	407	M2	19	482.9	M	19.3	491	M	15	376	M	14	351	M
77017LYNDL12000	Lyondell-Citgo Refining LP	Houston, TX	13.57	345	M2	3	76.3	M	0	0	M	NR	NR	NR	17	429	M
62084SHLLLRTE11	ConocoPhillips Co Wood River Refinery	Roxana, IL	9	229	O	11	279.6	O	11	280	O	10	254	O	8.9	226	O
70047TRNSM14902	Valero Refining New Orleans LLC	New Sarpy, LA	7	178	O	9	228.8	O	9	229	O	9	229	O	9	229	O
07036XXN1400P	ConocoPhillips Co Bayway Refinery	Linden, NJ	5.6	142	O	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR

Table 11-6. PAC Discharges from Petroleum Refineries Reported to TRI in 2002–2007

TRI ID	Facility Name	Location	2007			2005			2004			2003			2002		
			Pounds Released	TWPE	Basis of Estimate	Pounds Released	TWPE	Basis of Estimate	Pounds Released	TWPE	Basis of Estimate	Pounds Released	TWPE	Basis of Estimate	Pounds Released	TWPE	Basis of Estimate
78410KCHR FSUNTI	Flint Hills Resources LP - West Plant	Corpus Christi, TX	5.4	137	M2	10.6	269.4	M	16	412	M	8	203	M	1771	45014	M
99611TSRL SMILE2	Tesoro Alaska - Kenai Refinery	Kenai, AK	5	127	O	19	482.9	O	18.9	480	O	19	480	O	19	480	O
70051MRT HNHWY61	Marathon Petroleum Corp Garyville	Garyville, LA	5	127	C	5	127.1	C	5	127	C	5	127	C	NR	NR	NR
46268MRT HN4955R	Marathon Petroleum Co LLC Indianapolis In Terminal	Indianapolis, IN	4.2	107	M2	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
19706TXCD L2000W	Premcor Refining Group Inc	Delaware City, DE	4	102	O	3.4	86.4	O	4	102	O	3.2	81	O	1.4	36	O
93420NCLS N2555W	ConocoPhillips Co Santa Maria Refinery	Arroyo Grande, CA	3	76	E2	2	50.8	O	2	51	O	2	51	O	0.8	20	O
15062MNSS N345DO	Koppers Inc.Monessen Coke Plant	Monessen, Pa	2.9	74	O	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
46394MCL C 2815I	BP Products North America Whiting	Whiting, IN	2.5	63.5	O	3.6	91.5	O	1	25	O	1	25	O	NR	NR	NR
6746ONTN LC2000M	National CO-OP Refinery Assoc.	McPherson, KS	2.4	61	M2	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
94804RCPR D1306C	BP Richmond Terminal	Richmond, CA	1.18	30	O	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
98221PGTS N600ST	Shell Oil Products US Puget Sound Refinery	Anacortes, WA	1	25.4	E1	1	25.4	O	1	25	O	0.9	23	O	1.08	27	O
62048CLRK HAWTH	Permcor Hartfor Distribution Center	Hartford, IL	0.8	20	M1	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
94553TSCC RAVONR	Tesoro Refining and Marketing Co	Martinez, CA	0.6	15.2	M2	0.6	15.3	M	0.5	13	M	0.6	15	M	1.3	33	M
48458FLNT MG6065	Marathon Petroleum Co LLC Flint MI Terminal	Mount Morrison, MI	0.4	10.2	M2	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
19061BPLC MPOSTR	ConocoPhillips Co. Trainer Refinery	Trainer, PA	0.3	7.62	O	0.1	3.6	O	0.2	5	O	0.2	5	O	0.41	10	O
627219PHL LP2400E	ConocoPhillips CO Wichita Terminal	Wichita, KS	0.01	0.25	O	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
53224MLW KF9343N	Flint Hills Resources LP - Milwaulki Terminal	Milwaulki, WI	0.01	0.25	O	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR

Table 11-6. PAC Discharges from Petroleum Refineries Reported to TRI in 2002–2007

TRI ID	Facility Name	Location	2007			2005			2004			2003			2002		
			Pounds Released	TWPE	Basis of Estimate	Pounds Released	TWPE	Basis of Estimate	Pounds Released	TWPE	Basis of Estimate	Pounds Released	TWPE	Basis of Estimate	Pounds Released	TWPE	Basis of Estimate
72303WLL MS1282S	Premcor Wests Memphis Terminal	West Memphis, AR	0.0029	0.074	C	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
66155PHLL P2029F	ConocoPhillips Co Kansas City Terminal	Kansas City, KS	0.0006	0.014	O	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
76304CNCN C1214N	CoconoPhillips - Wichita Falls Products/Crude Terminal	Wichita Falls, TX	0.0004	0.011	O	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
44711SHLN D2408G	Marathon Petroleum Co LLC Ohio Refining Div	Canton, OH	NR	NR	NR	149	3787.1	M	NR	NR	NR	NR	NR	NR	NR	NR	NR
39567CHVR NPOBOX	Chevron Products Co Pascagoula Refinery	Pascagoula, MS	NR	NR	NR	126.1	3205.1	O	115	2923	O	115	2923	O	110	2796	O
55071SHLN D100WT	Marathon Petroleum Co LLC Saint Paul Park Refiner	Saint Paul Park, MN	NR	NR	NR	95.7	2431.1	M	24	616	M	NR	NR	NR	NR	NR	NR
70075MRP HY2500E	Murphy Oil USA Inc Meraux Refinery	Meraux, LA	NR	NR	NR	66	1677.5	O	NR	NR	NR	NR	NR	NR	NR	NR	NR
70669CNCL KOLDSP	ConocoPhillips Co Lake Charles Refinery	Westlake, LA	NR	NR	NR	41	1042.1	O	43	1093	O	51	1296	O	31	788	O
79008PHLL PSTATE	ConocoPhillips Co	Borger, TX	NR	NR	NR	39	991.3	M	43	1093	M	NR	NR	NR	NR	NR	NR
80022CNCD N5801B	Suncor Energy Commerce City Refinery	Commerce City, CO	NR	NR	NR	19	482.9	O	28	712	O	53	1347	O	9	229	O
70079MTV NR15536	Motiva Enterprises LLC Convent Refinery	Norco, LA	NR	NR	NR	1.4	35.6	O	NR	NR	NR	NR	NR	NR	NR	NR	NR
08861CHVR N1200S	Chevron Products Co	Perth Amboy, NJ	NR	NR	NR	0.6	15.3	O	0.9	23	O	0.6	15	O	0.8	20	O
78408STH WS1700N	Flint Hills Resources LP - East Plant	Corpus Christi, TX	NR	NR	NR	0.5	12.7	M	0.6	15	M	1	25	M	NR	NR	NR
90749RCPR D1801E	BP West Coast Products LLC Carson	Carson, CA	NR	NR	NR	0.1	2.5	M	NR	NR	NR	NR	NR	NR	NR	NR	NR
73098KRR MC906SO	Wynnewood Refining Co	Wynnewood, OK	NR	NR	NR	NR	NR	NR	10	254	O	10	254	O	10	254	O
70606CLCS RWESTE	Calcasieu Refining Co	Lake Charles, LA	NR	NR	NR	NR	NR	NR	2	51	O	182	4626	O	191	4855	O

Table 11-6. PAC Discharges from Petroleum Refineries Reported to TRI in 2002–2007

TRI ID	Facility Name	Location	2007			2005			2004			2003			2002		
			Pounds Released	TWPE	Basis of Estimate	Pounds Released	TWPE	Basis of Estimate	Pounds Released	TWPE	Basis of Estimate	Pounds Released	TWPE	Basis of Estimate	Pounds Released	TWPE	Basis of Estimate
70143TNNCL500WE	Chalmette Refining Co	Chalmette, LA	NR	NR	NR	NR	NR	NR	1	25	O	11	280	O	NR	NR	NR
67042TXCRF1401S	Frontier El Dorado Refining Co	El Dorado, KS	NR	NR	NR	NR	NR	NR	0.7	18	O	0.7	18	O	1	25	O
74107SNCLR902W2	Sinclair Oil Corp Tulsa Refinery	Tulsa, OK	NR	NR	NR	NR	NR	NR	NR	NR	NR	18	450	M	17	437	M
70723TXCRFFOOTO	Motiva Enterprises LLC Convent Refinery	Convent, LA	NR	NR	NR	NR	NR	NR	NR	NR	NR	2	51	O	2.3	59	O
59101CNCBL401SO	ConocoPhillips Co Billings Refinery	Billings, MT	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.4	10	M	8	203	M
42501THSMR501RE	Somerset Refinery Inc	Somerset, KY	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.08	2	M	0.01	0	M
94572NCLSNOLDHI	ConocoPhillips San Francisco Refinery	Rodeo, CA	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	8	203	M
82701WYMNG740WE	Wyoming Refining Co	Newcastle, WY	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	1.06	27	E
Indirect																	
48217MRTHN1300S	Marathon Petroleum Co LLC Michigan Refining Div	Detroit, MI	8.97	228	M2	94	175.8	M	98	184	M	92	172	M	93	174	M
1420SFTK60KAT	Safety-Kleen Systems, Inc Buffalo Oil Recovery Factory	Buffalo, NY	0.66	17	M2	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
79905LPSRF6500T	Western Refining Co El Paso Refinery	El Paso, TX	0.44	11.2	O	54	101	O	51	95	O	55	102	O	24	45	O
19145TLNTC3144P	Sunoco, Inc (R&M) Philadelphia Refinery	Philadelphia, PA	0.07	1.87	M2	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
36611BLCHRVIADU	Gulf Atlantic Operations LLC	Chickasaw, AL	0.03	0.67	C	0	0	M	0	0	C	0.009	0	C	NR	NR	NR
79604RDRFNNORTH	Delek Marketing and Supply	Abilene, TX	0.002	0.056	O	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
76040KCHPT12550	Flint Hills Resources LP Fort Worth Terminal	Euless, TX	0.000006	0.00015	O	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
90744TXCRF2101E	Shell Oil Products US Los Angeles Refinery	Wilmington, CA	NR	NR	NR	7.3	13.7	M	7.6	14	M	13	24	M	43	80	M
93307KRNLRRR677	Kern Oil Refining Co	Bakersfield, CA	NR	NR	NR	0.3	0.5	O	0.3	1	O	0.28	1	M	0.28	1	M

Table 11-6. PAC Discharges from Petroleum Refineries Reported to TRI in 2002–2007

TRI ID	Facility Name	Location	2007			2005			2004			2003			2002		
			Pounds Released	TWPE	Basis of Estimate	Pounds Released	TWPE	Basis of Estimate	Pounds Released	TWPE	Basis of Estimate	Pounds Released	TWPE	Basis of Estimate	Pounds Released	TWPE	Basis of Estimate
77017LYNDL12000	Lyondell-Citgo Refining LP	Houston, TX	NR	NR	NR	NR	NR	NR	NR	NR	NR	155	3928	O	146	3718	M
77506CRWNC111RE	Crown Central Petroleum Corp Houston Refinery	Pasadena, TX	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	4.6	117	O
79905CHVRN6501T	Chevron El Paso Refinery	El Paso, TX	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	1.8	45	O

Source: *TRIReleases2007_v2*; *TRIReleases2005_v2; TRIReleases2004_v3; TRIReleases2003_v2*; *TRIReleases2002_v4*.
NR – Not reported.
a – For indirect dischargers, the mass shown is the mass transferred to the POTW that is ultimately discharged to surface waters, accounting for an estimated 92.64% removal of PACs by the POTW.
Refineries reported basis of estimate in TRI as: M – Monitoring data/measurements; M1 – Constant monitory data/measurements; M2 – Periodic monitoring data/measurements; C – Mass balance calculations; E – Published emission factors; E1 – Published emission factors; E2 – Site specific emission factors; and O – Other approaches (e.g., engineering calculations).
The 2002 TWPE was calculated using the December 2004 TWFs.
The 2003 TWPE was calculated using the April 2006 TWFs.

12. PULP, PAPER, AND PAPERBOARD (40 CFR PART 430)

EPA identified the Pulp, Paper, and Paperboard (Pulp and Paper) Category (40 CFR Part 430) for preliminary category review as part of the Preliminary 2010 Effluent Guidelines Program Plan. EPA previously reviewed discharges from pulp and paper facilities as part of the Preliminary and Final Effluent Guidelines Program Plans in 2004 and 2007 (U.S. EPA, 2004; U.S. EPA, 2007b). EPA also conducted a detailed study of this industry in support of the 2006 Final Effluent Guidelines Program Plan (U.S. EPA, 2006a; U.S. EPA, 2006b). This section summarizes the results of EPA's 2009 annual category review of the Pulp and Paper Category.

12.1 Pulp, Paper, and Paperboard Category Background

This subsection provides background on the Pulp and Paper Category including a brief profile of the pulp, paper, and paperboard manufacturing industry and background on 40 CFR Part 430.

12.1.1 Pulp, Paper, and Paperboard Industry Profile

The pulp and paper manufacturing industry includes facilities that manufacture pulp from wood and other fibers, produce paper and paperboard from pulp, or convert paper and paperboard into products, such as boxes, bags, and envelopes. EPA considered the following 15 NAICS codes as part of the Pulp and Paper Category:[26]

- 321113-1: Sawmills;
- 322110: Pulp Mills;
- 322121: Paper (except Newsprint) Mills;
- 322122: Newsprint Mills;
- 322130: Paperboard Mills;
- 322211: Corrugated and Solid Fiber Box Manufacturing;
- 322212: Folding Paperboard Box Manufacturing;
- 322214: Fiber Can, Tube, Drum, and Similar Products Manufacturing;
- 322215: Nonfolding Sanitary Food Container Manufacturing;
- 322221: Coated and Laminated Packaging Paper Manufacturing;
- 322222: Coated and Laminated Paper Manufacturing;
- 322224: Uncoated Paper and Multiwall Bag Manufacturing;
- 322231: Die-Cut Paper and Paperboard Office Supplies Manufacturing;
- 322291: Sanitary Paper Product Manufacturing; and
- 322299: All Other Converted Paper Product Manufacturing.

Wastewater generated by facilities in NAICS code 321113 can be regulated under multiple categories. EPA reviewed available information about pollutant loads and manufacturing operations for facilities reporting this NAICS code. EPA assigned the extension "-1" to the end of the NAICS codes of facilities that likely primarily generate wastewater

[26] EPA identified an error in the *TRIReleases2007_v2* database, and pollutant loads associated with NAICS code 326112 are currently associated with the Pulp and Paper Category rather than the Plastics Molding and Forming Category (40 CFR Part 463). EPA is choosing to correct future versions of the database, because the TWPE associated with the NAICS code is negligible (total of 1,654 TWPE for TRI 2007).

regulated by the Pulp and Paper ELGs. Most facilities in NAICS 321113 are grouped under the Timber Products Processing Category (40 CFR Part 429).

This list of NAICS codes includes facilities that EPA determined are potential new subcategories to the Pulp and Paper Category. As part of the 2004 annual review, EPA reviewed industries with SIC codes not clearly subject to existing ELGs. EPA concluded that the processes, operations, wastewaters, and pollutants of facilities in the following SIC codes are similar to those of the Pulp and Paper Category (U.S. EPA, 2004):[27]

- 2653: Corrugated and Solid Fiber Boxes;
- 2655: Fiber Cans, Tubes, Drums, and Similar Products;
- 2656: Sanitary Food Containers, Except Folding;
- 2657: Folding Paperboard Boxes, Including Sanitary;
- 2671: Packaging Paper and Plastics Film, Coated and Laminated;
- 2672: Coated and Laminated Paper, Not Elsewhere Classified;
- 2674: Uncoated Paper and Multiwall Bags; and
- 2679: Converted Paper and Paperboard Products, Not Elsewhere Classified.

As part of the 2009 annual review, EPA reclassified these SIC codes as equivalent NAICS codes for use with the U.S. Economic Census and 2007 TRI data that are reported by NAICS code. However, there is not a direct relationship between one SIC and one NAICS code. As a result, EPA included the following NAICS codes in the 2009 annual review of the Pulp and Paper Category because they contain facilities with operations that are similar to the SIC codes above:

- 322211: Corrugated and Solid Fiber Box Manufacturing;
- 322212: Folding Paperboard Box Manufacturing;
- 322214: Fiber Can, Tube, Drum, and Similar Products Manufacturing;
- 322215: Nonfolding Sanitary Food Container Manufacturing;
- 322221: Coated and Laminated Packaging Paper Manufacturing;
- 322222: Coated and Laminated Paper Manufacturing;
- 322224: Uncoated Paper and Multiwall Bag Manufacturing;
- 322231: Die-Cut Paper and Paperboard Office Supplies Manufacturing;
- 322299: All Other Converted Paper Product Manufacturing; and
- 326112: Plastics Packaging Film and Sheet (including Laminated) Manufacturing.

Table 12-1 lists the 15 NAICS codes with operations in the Pulp and Paper Category. Because facilities report SIC code in *DMRLoads2007*, and the U.S. Economic Census and TRI report data by NAICS code, EPA reclassified the 2007 DMR by the equivalent NAICS code.

[27] The tables in this section include discharge information from facilities reporting these SIC codes and the corresponding NAICS codes; however, these facilities contribute negligible amounts of TWPE. Consistent with the conclusions drawn during the 2004 detailed study (U.S. EPA, 2004) and 2006 review (U.S. EPA, 2006), EPA found that large numbers of these facilities discharge no wastewater and only a small number of facilities discharge TWPE greater than zero.

Table 12-1. Number of Pulp and Paper Manufacturing Facilities

NAICS Code	2002 U.S. Economic Census	2007 DMR [a]	2007 TRI [b]
322110 Pulp Mills	31	336	45
322121 Paper (except Newsprint) Mills	306		135
322122 Newsprint Mills	21		13
322130 Paperboard Mills	203		103
322291 Sanitary Paper Product Manufacturing	145		6
322211 Corrugated and Solid Fiber Box Manufacturing	1,718	75	8
322222 Coated and Laminated Paper Manufacturing	545		77
322231 Die-Cut Paper and Paperboard Office Supplies Manufacturing	251		1
322299 All Other Converted Paper Product Manufacturing	580		25
322212 Folding Paperboard Box Manufacturing	494	7	6
322214 Fiber Can, Tube, Drum, and Similar Products Manufacturing	262	4	3
322215 Nonfolding Sanitary Food Container Manufacturing	73	8	2
322221 Coated and Laminated Packaging Paper Manufacturing	115	19	22
322224 Uncoated Paper and Multiwall Bag Manufacturing	123	0	1
321113-1 Sawmills	NA	NA	1
Total	**4,867**	**448**	**464**

Source: U.S. Economic Census, 2002 (U.S. Census, 2002); *TRIReleases2007_v2*; and *DMRLoads2007_v2*.
a – Major and minor dischargers. Also, DMR data are reported by SIC code; therefore, EPA used an NAICS to SIC code crosswalk for comparison purposes.
b – Releases to any media.
NA – Not applicable. This facility-specific NAICS code that EPA assigned does not correspond to a NAICS code in the 2002 U.S. Economic Census or an SIC code in *DMRLoads2007*.

12.1.2 40 CFR Part 430

Between 1974 and 1986, EPA promulgated ELGs for the Pulp and Paper Category. For these regulations, EPA divided the industry into 25 subcategories, based on the products made and processes used at the mills.

A 1988 legal suit obligated EPA to address discharges of polychlorinated dibenzo-(p)-dioxins and polychlorinated dibenzofurans[28] from 104 bleaching pulp mills, including nine dissolving pulp mills. While meeting that obligation, EPA also reviewed ELGs for the entire Pulp and Paper Category. As part of that review, EPA reorganized the category into 12

[28] Polychlorinated dibenzo-p-dioxins (CDDs) and polychlorinated dibenzofurans (CDFs) constitute a group of persistent, bioaccumulative, and toxic chemicals. Facilities are required to report to EPA's TRI the total mass of 17 of these CDDs and CDFs released to the environment every year. In this report, EPA uses the term "dioxin and dioxin-like compounds" to refer to the total mass of the 17 CDDs and CDFs, as reported to TRI. For discharges from certain mills in the Pulp and Paper Category, EPA promulgated ELGs for two specific dioxins: 2,3,7,8-tetrachlorodibenzo-p-dioxin and 2,3,7,8-tetrachlorodibenzofuran. In this report, these compounds are referred to as TCDD and TCDF, respectively. See Section 3.2 of the Pulp and Paper Detailed Study Report (U.S. EPA, 2006b) for a discussion of dioxin and dioxin-like compounds.

subcategories. Although the Pulp and Paper Category regulations apply to all facilities in SIC codes 2611, 2621, and 2631 or NAICS code 322110, 322121, 322122, and 322130, the 12 subcategories are organized by process used and product produced and do not correspond to SIC codes or NAICS codes.

During its response to the 1988 legal suit, EPA decided to review and revise the Pulp and Paper Category regulations in three phases. Table 12-2 presents these three phases and the subcategories EPA planned to address in each phase.

In revising the Pulp and Paper Category regulations, EPA first addressed two subcategories, Subpart B (Bleached Papergrade Kraft and Soda) and Subpart E (Papergrade Sulfite), because these subparts applied to the majority of the 104 mills identified in the 1988 suit.[29] Subparts B and E became known as Phase I; EPA promulgated revised ELGs for these subparts on April 15, 1998 (63 FR 18504). EPA promulgated the Phase I ELGs at the same time as it promulgated National Emissions Standards for Hazardous Air Pollutants (NESHAPs) for kraft and sulfite pulp mills (63 FR 18754). Because these water and air regulations were developed, analyzed, and promulgated jointly, they are called the Cluster Rules.

Table 12-2. Relationship Between Pulp and Paper Regulatory Phases and Subcategories

Phase	Subpart	Subcategory
I	B	Bleached Papergrade Kraft and Soda
	E	Papergrade Sulfite
II	C	Unbleached Kraft
	F	Semi-Chemical
	G	Groundwood, Chemi-Mechanical, and Chemi-Thermo-Mechanical
	H	Non-Wood Chemical Pulp
	I	Secondary Fiber Deink
	J	Secondary Fiber Non-Deink
	K	Fine and Lightweight Papers from Purchased Pulp
	L	Tissue, Filter, Non-Woven and Paperboard from Purchased Pulp
III	A	Dissolving Kraft
	D	Dissolving Sulfite

Note: EPA promulgated revised ELGs for Phase I, known as the Cluster Rules on April 15, 1998. EPA has not promulgated revised ELGs for Phase II or Phase III.

Eight subcategories are known as Phase II and are listed in Table 12-2. EPA has not revised the ELGs for these subcategories, which were promulgated between 1974 and 1986.

Phase III affected the two dissolving pulp subcategories (Subpart A, Dissolving Kraft, and Subpart D, Dissolving Sulfite). EPA did not promulgate revised ELGs addressing TCDD and TCDF for Phase III in 1998, because the affected companies were undertaking a multiyear laboratory study and mill trial to develop alternative bleaching technologies. EPA anticipated that final ELGs would be based on different technologies than those that served as the basis for

[29] The remainder of the 104 mills identified in the 1988 suit were in Subpart A, Dissolving Kraft, and Subpart D, Dissolving Sulfite. These two subparts became known as Phase III.

the Phase I regulations. As of August 2006, there were only three operating mills in these two subcategories. As part of its 2004 and 2006 Effluent Guidelines Program Plans, EPA determined that rather than promulgate revised ELGs for Phase III mills (see 58 FR 44078, December 17, 1993), EPA would support NPDES permit writers individually in developing permit-specific effluent limitations to control TCDD and TCDF releases from these three mills (see 69 FR 53716, September 2, 2004; 71 FR 76651–76652, December 21, 2006). In 2007, EPA developed and distributed to Georgia and Florida state regulatory agencies a technical document for NPDES permit writers in order to support the development of effluent limitations for facilities in the Dissolving Kraft (Subpart A) and Dissolving Sulfite (Subpart D) subcategories of the Pulp and Paper Category (40 CFR Part 430) (U.S. EPA, 2007a). In future annual reviews, EPA intends to re-evaluate each category based on the information available at the time and to evaluate the effectiveness of this BPJ permit-based support.

12.2 Pulp, Paper, and Paperboard Category 2009 Annual Review

This section discusses EPA's 2009 annual review of the Pulp and Paper Category including the screening-level review and category-specific review.

12.2.1 Pulp, Paper, and Paperboard 2009 Screening-Level Review

Table 12-3 compares the Pulp and Paper Category TWPE for 2004 and 2007, calculated using *TRIReleases2004_v3*, *PCSLoads2004_v4*, *TRIReleases2007_v2*, and *DMRLoads2007_v3*. The combined DMR and TRI TWPE increased from 2004 to 2007 due to the increase in DMR TWPE. The 2007 DMR TWPE accounts for approximately 86 percent of the combined 2007 TWPE.

Table 12-3. Pulp and Paper Manufacturing Point Source Category TRI and DMR Discharges for 2004 and 2007

Year of Discharge	Year of Review	Pulp and Paper Manufacturing Category	
		TRI TWPE [a]	DMR TWPE [b]
2004	2007	668,518	164,787
2007	2009	459,959 [c]	2,726,865 [d]

Source: *PCSLoads2004_v4*; *TRIReleases2004_v3*; *TRIReleases2007_v2*; and *DMRLoads2007_v3*.
a – Discharges include transfers to POTWs and account for POTW removals.
b – Discharges include only major dischargers.
c – Includes discharges from facilities reporting NAICS code 326112. These discharges should be associated with the Plastics Molding and Forming Category (40 CFR Part 463). EPA will correct future versions of the database because the TWPE is negligible.
d – For the Pulp, Paper, and Paperboard Category, EPA contacted facilities to verify the concentrations of dioxin and dioxin-like compounds in PCS and ICIS-NPDES. EPA found that, for all facilities contacted, there were either units errors (e.g., reported as ng/L but in the database as mg/L) or missing non-detect indicators. The new Pulp, Paper, and Paperboard Category total TWPE is 252,163. See Section 12.2.2.1 for additional details on the facilities-specific corrections.

12.2.2 Pulp, Paper, and Paperboard Category 2009 Pollutants of Concern

Table 12-4 compares the five pollutants with the highest TWPE in *TRIReleases2007_v2* and *TRIReleases2004_v3*, while Table 12-5 lists the five pollutants with the highest TWPE in *DMRLoads2007_v3* and *PCSLoads2004_v4*.

Table 12-4. 2009 Review: Pulp and Paper Category Top TRI Pollutants

Pollutant	2004 [a]			2007 [a]		
	Rank	Number of Facilities Reporting Pollutant	TWPE	Rank	Number of Facilities Reporting Pollutant	TWPE
Manganese and Manganese Compounds	1	117	316,479	1	79	231,089
Dioxin and Dioxin Like Compounds	2	64	177,587	2	42	86,425
Lead and Lead Compounds	3	189	61,578	3	140	44,781
Polycyclic Aromatic Compounds	4	77	42,625	4	30	20,085
Mercury and Mercury Compounds	8	87	8,036	5	61	14,609
Zinc and Zinc Compounds	5	83	16,232	6	62	13,143
Pulp and Paper Category Total	**NA**	**282 [b]**	**668,518**	**NA**	**198 [b]**	**459,959 [c]**

Source: *TRIReleases2004_v3*; and *TRIReleases2007_v2*.
a – Discharges include transfers to POTWs and account for POTW removals.
b – Number of facilities reporting TWPE greater than zero.
c – Includes discharges from facilities reporting NAICS code 326112. These discharges should be associated with the Plastics Molding and Forming Category (40 CFR Part 463). EPA will correct future versions of the database because the TWPE is negligible.
NA – Not applicable.

Table 12-5. 2009 Review: Pulp and Paper Category Top DMR Pollutants

Pollutant	2004			2007		
	Rank	Number of Facilities Reporting Pollutant	TWPE	Rank	Number of Facilities Reporting Pollutant	TWPE
2,3,7,8-Tetrachlorodibenzo-p-dioxin [a]	4	1	8,644	1	10	1,926,776 [b]
TCDD equivalents	NR	NR	NR	2	1	564,713 [c]
Aluminum	1	26	64,266	3	25	81,660
4,5,6-Trichloroguaiacol	NR	NR	NR	4	7	25,174
Chlorine	2	22	28,083	5	24	23,022
Sulfide	3	1	14,071	NR	NR	NR
Iron	5	12	7,736	21	13	1,375
Pulp and Paper Category Total	**NA**	**150 [d]**	**164,787**	**NA**	**160 [d]**	**2,726,865 [e]**

Source: *PCSLoads2004_v4*; and *DMRLoads2007_v3*.
a – As part of the 2009 annual review, EPA revised the parameter grouping name for dioxin and dioxin-like compounds. The parameter grouping in *PCSLoads2004_v4* is named "dioxin," while the parameter grouping in *DMRLoads2007_v3* is named "2,3,7,8-tetrachlorodibenzo-p-dioxin."
b – For the Pulp, Paper, and Paperboard Category, EPA contacted facilities to verify the concentrations of 2,3,7,8-Tetrachlorodibenzo-p-dioxin in PCS and ICIS-NPDES. EPA found that, for all facilities contacted, there were either

units errors (e.g., reported as ng/L but in the database as mg/L) or missing non-detect indicators. The new Pulp, Paper, and Paperboard Category 2,3,7,8-Tetrachlorodibenzo-p-dioxin TWPE is 19,827. See Section 12.2.2.1 for additional details on the facilities-specific corrections.
c – EPA contacted Westvaco Texas in Evadale, TX (TX0003891) in the Pulp, Paper, and Paperboard Category and identified a missing non-detect indicator causing the TCDD equivalents TWPE to be 1,000 times higher than actual in *DMRLoads2007_v3* (Davis, 2009). The new LBY and TWPE reported for Westvaco Texas' TCDD equivalents are both 0. The new TCDD equivalents TWPE is 0.
d – Number of facilities reporting TWPE greater than zero.
e – The new Pulp, Paper, and Paperboard Category total TWPE is 252,163.
NA – Not applicable.
NR – Not reported.

EPA identified the Pulp and Paper Category pollutants of concern based on relative TWPE. EPA focused the 2009 annual review on discharges of dioxin and dioxin-like compounds, including 2,3,7,8-tetrachlorodibenzo-p-dioxin and TCDD equivalents, from 2007 TRI and DMR and discharges of manganese and manganese compounds from 2007 TRI. EPA did not investigate the other top pollutants as part of the 2009 annual review because the remaining combined TWPE is such a small percentage (15 percent) of the combined Pulp and Paper Category 2007 TWPE.

12.2.2.1 Pulp and Paper Category Dioxin and Dioxin-Like Compound Discharges in TRI and DMR

EPA reviewed 2007 TRI and DMR data on dioxin and dioxin-like compounds from pulp and paper facilities for the 2009 annual review. Approximately 60 percent of the total 2007 dioxin and dioxin-like compound TWPE is from discharges in DMR.

Discharges of 2,3,7,8-tetrachlorodibenzo-*p*-dioxin (TCDD) accounted for approximately 73 percent of the 2007 DMR TWPE. The majority (45 percent) of the total TCDD discharges were from Rayonier Performance Fibers in Jesup, Georgia. Discharges of TCDD equivalents accounted for approximately 21 percent of the 2007 DMR TWPE. Table 12-6 includes the pulp and paper facilities with non-zero TCDD or TCDD equivalents TWPE in DMR 2007.

Only one facility, Westvaco Texas L.P., in Evadale, Texas, reported TCDD equivalents. When EPA contacted Westvaco Texas about the TCDD equivalents, the facility contact said that all four quarterly TCDD equivalents were reported below the detection limit. However, the database did not have the "<" for the fourth quarter (Davis, 2009). EPA will incorporate this change into future versions of the *DMRLoads2007* database. The change will result in zero grams of TCDD equivalents for 2007 for Westvaco Texas.

Table 12-6. Pulp and Paper Category Facilities with TCDD Discharges in DMR 2007

NPID	Facility Name (Location) [a]	Grams Discharged	TWPE
GA0003620	Rayonier Performance Fibers (Jesup, GA)	0.56 [d]	862,655 [d]
GA0003654	Brunswick Cellulose, Inc. (Brunswick, GA)	0.41 [e]	630,800 [e]
TX0003891	Westvaco Texas, L.P. (Evadale, TX) [b]	0.36 [f]	564,713 [f]
MD0021687	Upper Potomac River Comm (Westernport, MD) [c]	0.19 [g]	301,278 [g]
NY0004413	International Paper Company (Ticonderoga, NY)	0.04 [h]	67,866 [h]
AR0035823	Potlatch Forest Products Corp (Arkansas City, AR)	0.02 [i]	25,329 [i]
ID0001163	Potlatch Corporation (Lewiston, ID)	0.01	19,827
NC0000680	Domtar Paper Company, LLC (Plymouth Town , NC)	0.007 [j]	10,117 [j]
PA0008265	Appleton Papers Inc (Roaring Springs, PA)	0.003 [k]	4,330 [k]
ME0001872	Domtar Maine Corporation (Baileyville, ME)	0.002 [l]	3,076 [l]
ME0002054	Rumford Paper Company (Rumford Center, ME)	0.001 [m]	1,498 [m]

Source: *DMRLoads2007_v3*.
a – Only includes facilities reporting non-zero discharges of TCDD.
b – Discharges reported by Westvaco Texas, L.P. are TCDD equivalents rather than TCDD.
c – The Upper Potomac River Commission is a POTW that predominately treats discharges from Luke Paper Company's pulp mill in Luke, MD.
d – Facility indicated all quarterly TCDD concentrations were below the detection limit but the "<" signs were missing from the database (Schwartz, 2009). EPA will incorporate this change into future versions of the *DMRLoads2007* database. As a result, EPA estimates 0 grams and 0 TWPE for this facility.
e – Facility indicated all quarterly TCDD concentrations were below the detection limit but the "<" signs were missing from the database. (Schwartz, 2009). EPA will incorporate this change into future versions of the *DMRLoads2007* database. As a result, EPA estimates 0 grams and 0 TWPE for this facility.
f – Facility indicated all quarterly TCDD equivalents were below the detection limit but the "<" signs were missing from the database (Davis, 2009). EPA will incorporate this change into future versions of the *DMRLoads2007* database. As a result, EPA estimates 0 grams and 0 TWPE for this facility.
g – Facility documented that all monthly TCDD discharges were below the detection limit but the "<" signs were missing from the database (Schwartz, 2009). EPA will incorporate this change into future versions of the *DMRLoads2007* database. As a result, EPA estimates 0 grams and 0 TWPE for this facility.
h – Facility documented that all monthly TCDD discharges were below the detection limit but the "<" signs were missing from the database (Schwartz, 2009). EPA will incorporate this change into future versions of the *DMRLoads2007* database. As a result, EPA estimates 0 grams and 0 TWPE for this facility.
i – Facility indicated all semi-annual TCDD concentrations were below the detection limit but the "<" signs were missing from the database (Schwartz, 2009). EPA will incorporate this change into future versions of the *DMRLoads2007* database. As a result, EPA estimates 0 grams and 0 TWPE for this facility.
j – Facility documented that they switched the TCDF and TCDD concentrations in their reports. Additionally, all TCDF and TCDD concentrations were below the detection limit with missing "<" signs in the database (Schwartz, 2009). EPA will incorporate this change into future versions of the *DMRLoads2007* database. As a result, EPA estimates 0 grams and 0 TWPE for this facility.
k – Facility documented that all monthly TCDD discharges were below the detection limit but the "<" signs were missing from the database (Schwartz, 2009). EPA will incorporate this change into future versions of the *DMRLoads2007* database. As a result, EPA estimates 0 grams and 0 TWPE for this facility.
l – Facility documented that all monthly TCDD discharges were below the detection limit but the "<" signs were missing from the database (Schwartz, 2009). EPA will incorporate this change into future versions of the *DMRLoads2007* database. As a result, EPA estimates 0 grams and 0 TWPE for this facility.
m – Facility documented that the annual TCDD discharge was reported below the detection limit but the "<" sign was missing from the database (Schwartz, 2009). EPA will incorporate this change into future versions of the *DMRLoads2007* database. As a result, EPA estimates 0 grams and 0 TWPE for this facility.

EPA followed up with additional facilities regarding reported dioxin discharges and will incorporate these changes into future versions of the *DMRLoads2007* database:

- Appleton Papers, Inc., in Roaring Spring, PA, documented that all monthly TCDD concentrations were non-detect and missing the "<" in the database (Schwartz, 2009). After the correction, EPA estimates zero pounds and zero TWPE of TCDD discharged in 2007 for Appleton Papers, Inc.

- Brunswick Cellulose, Inc., in Brunswick, GA, documented that all quarterly TCDD concentrations were non-detect and missing the "<" in the database (Schwartz, 2009). After the correction, EPA estimates zero pounds and zero TWPE of TCDD discharged in 2007 for Brunswick Cellulose, Inc.

- Clearwater Paper Corporation (previously Potlatch Corporation), in Arkansas City, AR, documented that all quarterly TCDD concentrations were non-detect and missing the "<" in the database (Schwartz, 2009). After the correction, EPA estimates zero pounds and zero TWPE of TCDD discharged in 2007 for Clearwater Paper Corporation.

- Domtar Maine Corporation, in Baileyville, ME, documented that all monthly TCDD concentrations were non-detect and missing the "<" in the database (Schwartz, 2009). After the correction, EPA estimates zero pounds and zero TWPE of TCDD discharged in 2007 for Domtar Maine Corporation.

- Domtar Paper Company, LLC, in Plymouth Town, NC, documented that all monthly TCDD concentrations in 2007 were non-detect and missing the "<" in the database (Schwartz, 2009). After the correction, EPA estimates zero pounds and zero TWPE of TCDD discharged in 2007 for Domtar Paper Company, LLC.

- International Paper Company, in Ticonderoga, NY, documented that all twelve monthly TCDD concentrations in 2007 were not detected, and the DMR data were missing the "<" (Schwartz, 2009). After the correction, EPA estimates zero pounds and zero TWPE of TCDD discharged in 2007 for the International Paper Company.

- Rayonier Performance Fibers, in Jesup, GA, documented that all quarterly TCDD concentrations were non-detect and missing the "<" in the database (Schwartz, 2009). After the correction, EPA estimates zero pounds and zero TWPE of TCDD discharged in 2007 for Rayonier Performance Fibers.

- Rumford Mill, in Rumford Center, ME, documented that the "<" was missing in the database for annual TCDD measurement in 2007 (Schwartz, 2009). After the correction, EPA estimates zero pounds and zero TWPE of TCDD discharged in 2007 for Rumford Mills.

- Upper Potomac River Commission, in Rumford Center, ME, documented that all twelve monthly TCDD concentrations in 2007 were reported non-detect and missing the "<" in the database (Schwartz, 2009). After the correction, EPA estimates zero pounds and zero TWPE of TCDD discharged in 2007 for Upper Potomac River Commission.

From 2004 to 2007 TRI, reported discharges of dioxin and dioxin-like compounds decreased by approximately 91,000 TWPE. However, dioxin and dioxin-like compounds contributed to about 22 percent of the TRI TWPE in 2007. Table 12-7, at the end of this section, lists all the mills that reported dioxin and dioxin-like compound discharges to TRI at least once from 2002 to 2007. As part of the Pulp and Paper Category Detailed Study, EPA determined that the majority of the underlying data that estimated releases of dioxin and dioxin-like compounds reported to TRI were estimated using pollutant concentrations below the Method 1613B minimum level. Therefore, there is substantial uncertainty about the magnitude of these reported discharges. TRI-reported discharges of dioxin and dioxin-like compounds for the Pulp and Paper Category are most likely significantly overestimated, and thus do not accurately reflect current industry discharges (U.S. EPA, 2006a).

12.2.2.2 Pulp and Paper Category Manganese and Manganese Compound Discharges in TRI

Reported discharges of manganese and manganese compounds decreased by approximately 85,000 TWPE from TRI 2004 to TRI 2007. However, manganese and manganese compounds contributed 58 percent of the TRI TWPE for 2007. EPA examined reported manganese and manganese compound discharges from pulp and paper facilities during the Pulp and Paper Detailed Study for the 2006 Plan and its previous preliminary studies. EPA obtained discharge data in Form 2C of NPDES permit applications for 40 mills. EPA concluded that typical metals discharges from pulp and paper mills were at concentrations that were too low to treat using end-of-pipe treatment technologies for large plant flow rates (U.S. EPA, 2006a). Although EPA has not reviewed new discharge concentration data, it has no new data to suggest that manganese concentrations are above the treatable levels.

12.3 Pulp, Paper, and Paperboard Category Potential New Subcategories

During the 2009 review, EPA did not identify any additional potential new subcategories for the Pulp and Paper Category.

12.4 Pulp, Paper, and Paperboard Category Issues Identified and Additional Review

The estimated toxicity of the Pulp and Paper Category discharges is largely due to the TRI-reported discharges of manganese and manganese compounds and dioxin and dioxin-like compounds and DMR-reported discharges of 2,3,7,8-tetrachlorodibenzo-p-dioxin and TCDD equivalents. Further review of this category may focus on the following issues:

- In future years, EPA may analyze the TRI-reported manganese and dioxin discharges, including facilities dominating the TWPE, the methods used to estimate reported discharge, and process sources; and concentrations discharged.

- In future years, EPA will continue to analyze the DMR-reported 2,3,7,8-tetrachlorodibenzo-p-dioxin and TCDD equivalents discharges, to verify that any estimated discharges are based on valid data.

EPA prioritizes point source categories with existing regulations for potential revision based on the greatest estimated toxicity to human health and the environment, measured as TWPE. Based on the above conclusions, EPA is assigning this category with a lower priority for revision (i.e., this category is marked with "(3)" in the "Findings" column in Table V-1 in the Federal Register notice that presents the 2009 annual review of existing effluent guidelines and pretreatment standards).

12.5 Pulp and Paper Category References

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2. McCuutchen, Kate. 2009. Notes from Telephone Conversation between Elizabeth Sabol, Eastern Research Group, Inc. and Kate McCuutchen, Blue Heron Paper Co. RE: Basis of Methylmercury Concentration Reported in 2007 in DMR. (July). EPA-HQ-OW-2008-0517 DCN 06546.

3. Schwartz, Jerry. 2009. Notes from email conversation between Carey Johnston, EPA and Jerry Schwartz, EPA. RE: Information in Response to EPA Questions on Data. EPA-HQ-OW-2008-0517 DCN 06700-06700A2.

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7. U.S. EPA. 2006b. *Final Report: Pulp, Paper, and Paperboard Detailed Study*. EPA-821-R-06-016. Washington, DC. (December). EPA-HQ-OW-2004-0032-2249.

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9. U.S. EPA. 2007b. *Technical Support Document for the Preliminary 2008 Effluent Guidelines Program Plan*. EPA-821-R-07-007. Washington, DC. (October). EPA-HQ-OW-2006-0771-0819.

Table 12-7. Dioxin and Dioxin-Like Discharges Reported by U.S. Pulp and Paper Manufacturing Facilities from 2002 to 2007

TRI ID	Facility Name	Location	2007			2005			2004			2003			2002		
			Grams Discharged	TWPE	Basis of Estimate	Grams Discharged	TWPE	Basis of Estimate	Grams Discharged	TWPE	Basis of Estimate	Grams Discharged	TWPE	Basis of Estimate	Grams Discharged	TWPE	Basis of Estimate
71635-GRGPC-PAPER	Georgia-Pacific Crossett Ops.	Crossett, AR	5.60	10,043	E1	4.87	8,740	E	5.49	9,850	E	5.49	9,850	E	4.9	8,867	E
99363-BSCSC-POBOX	Boise White Paper LLC	Wallula, WA	5.58	10,014	O	0.083	149	O	0.83	1,496	O	0.14	242	O	0.13	235	O
27962-WYRHS-TROWB	Domtar Paper Co Plymouth Mill	Plymouth, NC	4.33	7,777	E1	0.989	1,770	E	0.91	1,638	E	0.82	1,470	E	0.74	1,334	E
71611-NTRNT-FAIRF	Evergreen Packaging	Pine Bluff, AR	3.40	6,101	O	3.7	6,640	O	3.6	6,459	O	0.018	32	E	0.018	32	E
36916-JMSRV-ROUTE	Georgia-Pacific Consumer Products LP	Pennington, AL	3.20	5,742	E1	3.6	6,460	M	3.3	5,921	M	5.32	9,551	M	5.3	9,555	M
36769-MCMLL-HIGHW	Weyerhaeuser USA Inc Pine Hill Operations	Pine Hill, AL	2.95	5,286	M2	3.36	6,020	E	2.43	4,369	E	2.34	4,197	E	NR	NR	NR
70791-GRGPC-ZACHA	Georgia-Pacific Consumer Products LLC	Zachary, LA	2.77	4,974	E1	2.77	4,970	E	2.77	4,974	E	3.32	63,803	E	3.3	63,803	E
75504-NTRNT-POBOX	International Paper Texarkana Mill	Queen City, TX	2.68	4,809	M2	0.68	1,220	M	3.87	6,944	M	2.36	4,235	M	0.11	197	M
36545-BSCSC-307WE	Boise White Paper LLC	Jackson, AL	2.21	3,965	E1	2.1	3,770	E	2.1	3,768	E	1.98	3,553	E	2.01	3,615	E
36732-GLFST-HIGHW	Rock-Tenn Mill Co LLC	Demopolis, AL	1.84	3,301	E1	0.292	524	E	0.32	575	E	0.23	416	E	0.23	410	E
28560-WYRHS-STREE	Weyerhaeuser	Vanceboro, NC	1.71	3,069	E1	1.7	3,050	E	1.74	3,119	E	1.82	3,257	E	1.6	2,924	E

Table 12-7. Dioxin and Dioxin-Like Discharges Reported by U.S. Pulp and Paper Manufacturing Facilities from 2002 to 2007

TRI ID	Facility Name	Location	2007			2005			2004			2003			2002		
			Grams Discharged	TWPE	Basis of Estimate	Grams Discharged	TWPE	Basis of Estimate	Grams Discharged	TWPE	Basis of Estimate	Grams Discharged	TWPE	Basis of Estimate	Grams Discharged	TWPE	Basis of Estimate
28456-FDRLP-RIEGE	International Paper Riegelwood Mill	Riegelwood, NC	0.0304	3,069	E1	0.0304	55	E	0.0305	55	E	0.0304	55	E	0.03	54	E
17362-PHGLT-228SO	P. H. Glatfelter Co Spring Grove Mill	Spring Grove, PA	1.02	1,830	E1	0.946	1,700	E	0.9	1,616	E	0.92	1,653	E	0.86	1,549	E
29512-WLLMT-HWY91	Weyerhaeuser Co	Bennettsville, SC	0.86	1,537	O	0.9563	1,715	O	NR	NR	NR	NR	NR	NR	NR	NR	NR
37309-BWTRS-ROUTE	Abitibowater Calhoun Operations	Calhoun, TN	0.73	1,319	E1	0.87	1,560	M	0.94	1,690	M	0.91	1,626	M	0.85	1,528	M
31407-STNCN-1BONN	Weyerhaeuser Port Wentworth	Port Wentworth, GA	0.61	1,094	E1	0.679	1,220	E	0.69	1,239	E	0.72	1,284	E	NR	NR	NR
12883-NTRNT-SHORE	International Paper	Ticonderoga, NY	0.44	790	M2	0.46	826	E	0.46	834	E	0.46	817	E	0.46	820	E
83501-PTLTC-805MI	Potlatch Corp Lewiston Idaho	Lewiston, ID	0.44	789	M2	0.441	792	E	4.18	7,501	E	4.18	7,505	E	4.3	7,657	E
70775-JMSRV-ENDOF	Tembec USA LLC	Saint Francisville, LA	0.22	400	E1	0.48	861	E	0.502	901	E	0.5	899	E	0.49	873	E
71220-NTRNT-705CO	International Paper Co Louisiana Mill	Bastrop, LA	0.19	342	E1	0.175	314	E	0.16	280	E	0.22	399	M	0.21	380	M
31521-BRNSW-14W9T	Brunswick Cellulose Inc	Brunswick, GA	0.19	341	E1	0.186	335	E	0.19	335	E	0.19	335	E	NR	NR	NR
04976-SDWRR-RFD3U	S.D. Warren Co	Skowhegan, ME	0.15	269	E2	0.168	302	O	0.17	305	O	0.18	323	O	0.18	329	O
01238-KMBRL-GREYL	Schweitzer Mauduit International Inc	Lee, MA	0.14	244	O	0.156	280	O	0.17	303	O	0.153	275	O	0.15	269	O

Table 12-7. Dioxin and Dioxin-Like Discharges Reported by U.S. Pulp and Paper Manufacturing Facilities from 2002 to 2007

TRI ID	Facility Name	Location	2007			2005			2004			2003			2002		
			Grams Discharged	TWPE	Basis of Estimate	Grams Discharged	TWPE	Basis of Estimate	Grams Discharged	TWPE	Basis of Estimate	Grams Discharged	TWPE	Basis of Estimate	Grams Discharged	TWPE	Basis of Estimate
70634-BSSTH-USHIG	Boise Packaging & Newsprint LLC	Deridder, LA	0.12	215	E1	0.19	341	E	0.22	395	E	0.26	467	E	0.31	556	E
98421-SMPSN-801PO	Simpson Tacoma Kraft Co.	Tacoma, WA	0.12	208	E1	0.154	277	E	0.135	242	E	0.13	240	E	0.13	232	E
45601-MDCRP-401SP	P.H. Glatfelter Co Chillicothe Facility	Chillicothe, OH	0.07	118	M2	0.0554	99	M	0.082	147	M	0.0858	154	M	0.099	178	M
18629-PRCTR-ROUTE	Procter & Gamble Paper Products Co	Mehoopany, PA	0.02	29	E1	0.087	156	E	0.012	22	C	0.018	33	O	0.0195	35	O
98550-GRYSH-23RDR	Grays Harbor Paper Lp	Hoquiam, WA	0.02	27	C	0.142	255	C	0.012	22	C	0.012	21	C	0.016	29	C
63702-PRCTR-POBOX	Procter & Gamble Paper Products Co	Jackson, MO	0.004	8.80	O	0.0042	8	O	0.0051	9.2	O	0.0047	8.4	O	0.0059	11	O
31068-BCKYC-OLDST	Weyerhaeuser Co	Oglethorpe, GA	0.001	1.79	O	0.001	2	O	0.0005	0.9	O	0.0005	0.9	O	0.0006	1.1	O
39703-CLMBS-CARSO	Columbus Cellulose Fibers	Columbus, MS	0.0008	1.44	M2	0.0007	1	M	0.0007	1.3	M	0.0018	3.2	M	0.0017	3.1	M
54308-THPRC-501EA	Procter & Gamble Paper Products Co	Green Bay, WI	0.0008	1.00	C	0.0003	1	C	0.0005	0.9	C	0.0006	1.1	C	0.0007	1.3	C
37662-MDPPR-POBOX	Weyerhaeuser Co Kingsport Paper Mill	Kingsport, TN	NR	NR	NR	3.45	6,190	M	3.4	6,101	M	2.5	4,486	M	2.2	3,894	M
98201-SCTTP-2600F	Kimberly-Clark Worldwide	Everett, WA	NR	NR	NR	1.33	2,380	C	2.7	4,846	C	3	472,778	C	8.2	1,104,866	C
32347-BCKYC-ROUTE	Buckeye Florida Lp	Perry, FL	NR	NR	NR	1.32	2,380	M	1.3	2,330	M	1.27	2,282	M	1.3	2,303	M

Table 12-7. Dioxin and Dioxin-Like Discharges Reported by U.S. Pulp and Paper Manufacturing Facilities from 2002 to 2007

TRI ID	Facility Name	Location	2007			2005			2004			2003			2002		
			Grams Discharged	TWPE	Basis of Estimate	Grams Discharged	TWPE	Basis of Estimate	Grams Discharged	TWPE	Basis of Estimate	Grams Discharged	TWPE	Basis of Estimate	Grams Discharged	TWPE	Basis of Estimate
71822-NKSPP-HIGHW	Domtar Industries Inc Ashdown Mill	Ashdown, AR	NR	NR	NR	38.4	69,000	M	40.96	73,494	M	40	1,511,611	M	1.8	3,203	E
98362-DSHWM-MARIN	Nippon Paper Industries USA Co. Ltd.	Port Angeles, WA	NR	NR	NR	0.92	1,650	M	1.82	3,266	M	1.8	282	M	1.8	290	M
32533-CHMPN-375MU	International Paper Pensacola Mill	Cantonment, FL	NR	NR	NR	0.8	1,440	E	0.93	1,669	E	0.93	1,669	E	0.8	1,435	E
29442-NTRNT-KAMIN	International Paper Georgetown Mill	Georgetown, SC	NR	NR	NR	0.753	1,350	C	0.75	1,351	C	0.77	1,380	C	0.78	1,395	C
04694-GRGPC-MILLA	Domtar Maine Corp	Baileyville, ME	NR	NR	NR	0.615	1,100	M	0.82	1,463	M	NR	NR	NR	3.15	5,654	E
32034-TTRYN-FOOTO	Rayonier Performance Fibers LLC	Fernandina Beach, FL	NR	NR	NR	0.56	1,000	M	1	1,794	M	NR	NR	NR	0.14	251	M
71654-PTLTC-HIGHW	Potlatch Corp	Arkansas City, AR	NR	NR	NR	0.204	365	O	0.97	1,737	O	0.92	1,646	O	0.57	1,026	O
29044-NNCMP-ROUTE	International Paper	Eastover, SC	NR	NR	NR	0.183	328	O	0.16	282	O	0.16	290	O	0.16	281	O
54474-WYRHS-200GR	Weyerhaeuser	Rothschild, WI	NR	NR	NR	0.042	75	M	0.048	86	M	0.12	206	M	0.152	273	M
98537-WYRHS-700EA	Weyerhaeuser Pulp Mill	Cosmopolis, WA	NR	NR	NR	0.01	18	O	0.01	18	O	0.0093	17	O	0.014	25	O
12502-SCHWT-2424R	Schweitzer-Mauduit International Inc	Ancram, NY	NR	NR	NR	0.004	7	E	0.008	14	E	0.02	36	O	0.02	36	O
98632-WYRHS-3401I	Weyerhaeuser Co	Longview, WA	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.025	45	O	0.02	36	O

Table 12-7. Dioxin and Dioxin-Like Discharges Reported by U.S. Pulp and Paper Manufacturing Facilities from 2002 to 2007

TRI ID	Facility Name	Location	2007			2005			2004			2003			2002		
			Grams Discharged	TWPE	Basis of Estimate	Grams Discharged	TWPE	Basis of Estimate	Grams Discharged	TWPE	Basis of Estimate	Grams Discharged	TWPE	Basis of Estimate	Grams Discharged	TWPE	Basis of Estimate
98607-JMSRV-NE4TH	Fort James Camas LLC	Camas, WA	NR	NR	NR	NR	NR	NR	NR	NR	NR	1.06	1,902	E	3.58	6,427	E
97068-JMSRV-4800M	West Linn Paper Co	West Linn, OR	NR	NR	NR	NR	NR	NR	0.006	11	C	0.35	4,139	C	0.502	7.2	C
39120-NTRNT-312LO	International Paper - Natchez	Natchez, MS	NR	NR	NR	NR	NR	NR	NR	NR	NR	1.17	2,099	E	0.81	1,453	E
36701-HMMRM-RIVER	International Paper Riverdale Mill	Selma, AL	NR	NR	NR	NR	NR	NR	0.108	194	E	0.12	208	E	0.12	210	E
36426-CNTNR-HIGHW	Smurfit-Stone Container Enterprises Inc	Brewton, AL	NR	NR	NR	NR	NR	NR	2.5	4,486	E	2.2	3,947	E	2.4	4,306	E
35618-CHMPN-POBOX	International Paper Courtland Mill	Courtland, AL	NR	NR	NR	NR	NR	NR	0.094	168	E	0.088	158	E	0.072	130	E
31558-GLMNP-1000O	Durango-Georgia Paper Co.	Saint Marys, GA	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	3.4	6,062	O
31520-BRNSW-WEST9	Georgia-Pacific Corp. Brunswick Ops.	Brunswick, GA	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.2	360	E
29704-BWTRC-5300C	Bowater Coated & Specialty Papers Div	Catawba, SC	NR	NR	NR	NR	NR	NR	NR	NR	NR	5.58	261,826	M	3.7	217,867	M
28358-LPHCL-1000E	Buckeye Lumberton Inc.	Lumberton, NC	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.1	1,525	M
23851-NNCMP-HIGHW	International Paper-Franklin Mill	Franklin, VA	NR	NR	NR	NR	NR	NR	2.28	4,086	E	2.27	4,066	E	2.1	3,760	E

Table 12-7. Dioxin and Dioxin-Like Discharges Reported by U.S. Pulp and Paper Manufacturing Facilities from 2002 to 2007

TRI ID	Facility Name	Location	2007			2005			2004			2003			2002		
			Grams Discharged	TWPE	Basis of Estimate	Grams Discharged	TWPE	Basis of Estimate	Grams Discharged	TWPE	Basis of Estimate	Grams Discharged	TWPE	Basis of Estimate	Grams Discharged	TWPE	Basis of Estimate
13142-SCHLL-CENTE	Felix Schoeller Technical Papers Inc.	Pulaski, NY	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.0011	26	C
04462-GRTNR-1KATA	Great Northern Paper Inc.	Millinocket, ME	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.037	66	O
04239-NTRNT-RILEY	International Paper	Jay, ME	NR	NR	NR	NR	NR	NR	0.002	3.6	M	0.02	36	M	0.021	38	M
Indirect																	
55744-BLNDN-115SW	Upm Blandin Paper Co	Grand Rapids, MN	2.11	3,782	E1	2.261	4,060	M	2	3,599	M	2.21	60	M	3.2	86	M
07407-MRCLP-1MARK	Marcal Paper Mills Inc.	Elmwood Park, NJ	0.16	1,315	M2	0.02499	45	M	0.00799	14	M	0.014	26	M	0.012	22	M
23860-STNHP-910IN	Smurfit-Stone Container Corp	Hopewell, VA	0.023	412	C	0.221	397	O	0.21	378	O	NR	NR	NR	NR	NR	NR
32401-STNCN-1EVER	Smurfit-Stone Container Corp	Panama City, FL	0.082	146	E1	0.0782	140	E	0.078	140	E	0.066	119	E	0.078	140	E
31702-THPRC-USROU	Procter & Gamble Paper Pro Ducts Co	Albany, GA	0.001	109	O	0.001989	4	O	0.0036	6.4	O	0.0032	5.7	O	0.004	7.1	O
55720-PTLTC-NORTH	Sappi Cloquet LLC	Cloquet, MN	0.04	78	M2	0.04811	86	E	0.044	78	E	0.041	0.18	E	0.041	0.18	E
49443-SDWRR-2400L	S. D. Warren Co	Muskegon, MI	NR	NR	NR	0.023945	43	E	0.042	75	E	0.05	90	E	0.03	54	E
52402-CDRRV-4600C	Cedar River Paper A Weyerhaeuser Business	Cedar Rapids, IA	NR	NR	NR	0.46631	837	O	0.35	636	O	NR	NR	NR	NR	NR	NR
01236-FXRVR-295PA	Fox River Paper Co Rising Paper Div	Housatonic, MA	NR	NR	NR	0.00697	13	O	0.0073	13	O	0.012	22	O	NR	NR	NR

Table 12-7. Dioxin and Dioxin-Like Discharges Reported by U.S. Pulp and Paper Manufacturing Facilities from 2002 to 2007

TRI ID	Facility Name	Location	2007			2005			2004			2003			2002		
			Grams Discharged	TWPE	Basis of Estimate	Grams Discharged	TWPE	Basis of Estimate	Grams Discharged	TWPE	Basis of Estimate	Grams Discharged	TWPE	Basis of Estimate	Grams Discharged	TWPE	Basis of Estimate
54308-THPRC-501EA	Procter & Gamble Paper Products Co	Green Bay, WI	NR	NR	NR	0.00034	1	C	0.00051	0.9	C	0.00068	1.2	C	0.00085	1.5	C
93030-PRCTR-800NO	Procter & Gamble Paper Products Co	Oxnard, CA	NR	NR	NR	0.0000214	0	C	0.0034	6.1	C	0.0002	0.43	C	0.00024	0.43	O

Source: *TRIReleases2005_v2*; *TRIReleases2004_v3*; *TRIReleases2003_v2*; *TRIReleases2002_v4*.
NR – Not reported.
For indirect discharges, the mass shown is the mass transferred to the POTW that is ultimately discharged to surface waters, accounting for an estimated 83 percent removal of dioxin and dioxin-like compounds by the POTW.
The TWPEs in this table were calculated using the 2006 TWFs (the 2006 dioxin and dioxin-like compound TWFs did not change from the August or December 2004 TWFs).
Facilities reported basis of estimate in TRI as: M – Monitoring/data measurements; M1 – Continuous monitoring data or measurements for the EPCRA section 313 chemical; M2 – Periodic or random monitoring data or measurements for the EPCRA section 313 chemical; C – Mass balance calculations; E1 – Published emission factors; E2 – Site specific emission factors; and O – Other approaches (e.g., engineering calculations).

PART III: DETAILED STUDIES

13. HEALTH CARE INDUSTRY AND HOSPITALS CATEGORY (40 CFR PART 460)

To date, scientists have identified numerous pharmaceutical compounds at discernable concentrations in our nation's rivers, lakes, and streams (U.S. EPA, 2008). To address this issue at the source, EPA is studying how the drugs are entering waterways and what factors contribute to the current situation. Towards this end, EPA initiated a study on pharmaceutical disposal practices at health care facilities including hospitals, hospices, long-term care facilities, health care clinics, doctor's offices, and veterinary facilities. Unused pharmaceuticals include dispensed prescriptions that patients do not use as well as materials that are beyond their expiration dates. Another potential source of unused pharmaceuticals is the residuals remaining in used and partially used dispensers, containers, and devices. In particular, the medications contained in the dispensers, containers and devices may be sewered (e.g., intravenous (IV) bags emptied into sink).[30] For many years, a standard practice at many health care facilities was to dispose of unused pharmaceuticals by flushing them down the toilet or drain.

13.1 Activities for Study of Unused Pharmaceutical Management

For the Final 2008 Plan EPA completed an interim technical report for the Health Care Industry (U.S. EPA, 2008). The interim technical report focused on hospitals and long-term care facilities (LTCFs) because these facilities are likely responsible for the largest amounts of unused pharmaceuticals being disposed into sewage collection systems within this industry sector. In 2005, there were about 7,000 hospitals and 35,000 LTCFs in the United States (U.S. EPA, 2008). EPA is continuing its detailed study to investigate the following questions:

- What are the current industry practices for disposing of unused pharmaceuticals?
- Which pharmaceuticals are being disposed of and at what quantities?
- What are the options for disposing of unused pharmaceuticals other than down the drain or toilet?
- What factors influence disposal decisions?
- Do disposal practices differ within industry sectors?
- What BMPs could facilities implement to reduce the generation of unused pharmaceuticals?
- What reductions in the quantities of pharmaceuticals discharged to POTWs would be achieved by implementing BMPs or alternative disposal methods?
- What are the costs of current disposal practices compared to the costs of implementing BMPs or alternative disposal methods?

Since the publication of the Final 2008 Plan, EPA also reviewed comments received on the first Federal Register notice for the Health Care Industry Information Collection Request (ICR) published on August 12, 2008 (73 FRN 46903). The ICR was originally developed to collect technical and economic information on unused pharmaceutical management and to identify technologies and BMPs that reduce or eliminate the discharge of unused pharmaceuticals to POTWs. EPA received 31 comments and conducted outreach meetings with industry to obtain further comments on the survey design and instrument.

[30] As a point of clarification, the term "unused pharmaceuticals" does not include excreted pharmaceuticals.

Commenters included hospitals and clinics, health care trade associations, pharmacists associations, reverse distributors, pharmaceutical manufacturers, individuals, and municipal wastewater treatment plants and their associations. Following publication of the first Federal Register notice for the ICR, EPA conducted three hour-long teleconferences in September 2008 with 259 stakeholders to provide an overview of the project, scope of the survey instrument, potential recipients, and schedule. These meetings solicited early feedback from participants to facilitate the development of a subsequent draft of the survey instrument and population and sample frames. These teleconferences also identified interested stakeholders for the site visits/additional outreach meetings. Overall, the comments received were supportive of the survey. Most commenters had a number of suggestions on how to improve the survey. Improvements suggested were to expand the scope of sectors receiving the survey, to shorten the survey, and to tailor the survey to each health care sector. There were a few health care organizations who felt a survey was not necessary for a variety of reasons including burden to the facilities, that they are already practicing BMPs, or that they would favor the more immediate issuance of EPA guidance.

In addition to exploring the use of an industry survey, EPA has continued to study the issue of how health care facilities are managing and disposing of unused pharmaceuticals and POTW treatment effectiveness in an effort to identify the root cause and potential solutions to address the issue of pharmaceuticals in our waterways. Since the publication of the Final 2008 Plan, EPA conducted site visits to three additional hospitals in three States, four LTCFs in three States, a veterinary hospital, a long-term care pharmacy, a hospice, a hematology/oncology clinic, and a waste management vendor facility to obtain more detailed information on how pharmaceuticals are managed, tracked, and disposed as well as influences on behavior (U.S. EPA, 2009). During each site visit, EPA collected general site information and specific unused pharmaceutical management and disposal information. The objectives of these site visits included:

- Collect information on the amount of unused pharmaceuticals disposed;
- Observe pharmaceutical waste management practices;
- Identify common industry disposal practices, guidance, and regulatory requirements;
- Identify challenges with the generation and disposal of unused, unwanted, and expired pharmaceuticals;
- Identify BMPs and their costs;
- Understand potential impacts of pharmaceuticals in water; and
- Gather information about how hospitals, LTCFs, or other facilities operate.

Additionally, EPA contacted other types of health care facilities (e.g., medical and dental offices, university and prison health clinics, and veterinary clinics) to learn about their unused pharmaceutical disposal practices. EPA also reviewed studies on POTW pharmaceutical treatment effectiveness and the potential pathways for unused pharmaceuticals to be released into the environment (ERG, 2009).

In summary, since the study began in 2007 EPA has worked with a wide range of stakeholders (e.g., industry representatives; Federal, State, and Tribal representatives; waste management and disposal companies; and other interested parties) to obtain the best available information on the industry and its unused pharmaceutical management practices. In total, EPA

met or spoke with over 700 different people during the outreach and data collection activities from 2007 through 2009 (U.S. EPA, 2009). Based on its outreach and data gathering, the Agency estimates that hospitals and LTCFs have the greatest amounts of unused pharmaceuticals as compared with other health care sectors (e.g., dentists, retail pharmacies).

EPA's outreach has also identified that there is near universal interest from stakeholders to better manage unused pharmaceuticals at health care facilities. There is also general interest in more quickly advancing the use of best practices for managing unused pharmaceuticals at health care facilities. This considerable outreach and data collection has led EPA to re-consider the use of an industry survey for this sector. The survey would be an effective but potentially time-consuming tool for gathering facility-specific data on the management of unused pharmaceuticals. EPA estimates that it has gathered sufficient data from its site visits and outreach to begin the development of best practices for unused pharmaceutical management at health care facilities. During the next year, EPA will continue to work with a variety of stakeholders in the development of these best practices and the means for their dissemination and adoption. EPA expects to complete the development of these best practices for the Final 2010 Plan.

13.2 Preliminary Findings from the Health Care Industry – Unused Pharmaceuticals Detailed Study

EPA's seven preliminary findings on the management of unused pharmaceutical at health care facilities include the following:

1. Federal regulations often impact the management of pharmaceutical waste. These regulations can influence the options health care facilities have for disposing of unused pharmaceuticals.

- ***Some federal regulations may inadvertently encourage disposal of unused pharmaceuticals via the sewer.*** The Controlled Substances Act (CSA), enforced by the Drug Enforcement Administration (DEA), establishes a closed distribution system for controlled substances. The CSA prohibits the return of controlled substances from end-users to any person except, in certain cases, a law-enforcement agent. Disposal of controlled substances is carefully regulated to ensure that the substance is destroyed or rendered unrecoverable. One acceptable method of destruction is witnessed disposal of controlled substances in a drain or toilet.

- ***Fewer disposal opportunities exist for LTCFs because they are often not DEA registrants and cannot return controlled substances to their supply pharmacy or use reverse distributors.*** Hospitals typically are DEA registrants because they have on-site pharmacies and they are able to use reverse distributors to manage all or a portion of their unused controlled substances. It is common practice for hospital pharmacies to return some unopened, expired packages of controlled substances to a reverse distributor for credit from the manufacturer and subsequent disposal. Hospitals can also send controlled substances that are considered waste (e.g., pharmaceuticals in an intravenous bag, drug samples brought into the hospital) to a reverse distributor or other waste management

company that is a DEA registrant. Also, hospitals typically do not prescribe medication far in advance or in large quantities, as is often done for residents at LTCFs. As a result, the potential for pharmaceuticals to be wasted at hospitals is reduced.

- ***Some unused pharmaceuticals are regulated as hazardous wastes and subject to the nation's hazardous waste disposal requirements.*** Pharmaceutical wastes may be hazardous waste (under the Resource Conservation and Recovery Act (RCRA)) if: (1) the pharmaceutical or its sole active ingredient is specifically listed in 40 CFR Part 261.33(e) or (f) (commonly referred to as the P or U lists, respectively); and/or (2) the waste exhibits one or more characteristics of hazardous waste (ignitability, corrosivity, reactivity, or toxicity as defined in 40 CFR Parts 261.21-24, respectively). Common pharmaceutical wastes that are RCRA hazardous waste when disposed of include epinephrine, nitroglycerin, warfarin, nicotine, and some chemotherapeutic agents.[31] Health care facilities must determine if these wastes are RCRA hazardous wastes, and if so, must comply with all applicable RCRA Subtitle C requirements, including many special storage, handling and transportation requirements. In addition, hospitals typically have pre-existing arrangements for disposal of unused pharmaceuticals as hazardous waste that LTCFs do not have (Leusch, 2005).

- ***Medicare and Medicaid requirements also influence hospital disposal practices.*** The Centers for Medicare and Medicaid Services (CMS), the federal agency within the Department of Health and Human Services, administers the Medicare and Medicaid programs. Its primary role is to provide payment for medical products and services through these programs. Medicare provides health insurance to elderly and disabled Americans, while Medicaid provides health insurance for low income Americans, including long-term care coverage. LTCFs tend to contract with long-term care pharmacies to obtain medications. Long-term care (LTC) pharmacies primarily dispense a 30-day supply of medication for each prescription. This practice results from the policies set by Medicare, Medicaid, and private insurance (i.e., maximizing patient co-payment). The dispensing of 30-day or more quantities can lead to greater unused pharmaceutical waste, when prescriptions are either changed or discontinued. Additionally, EPA identified a barrier for reuse of pharmaceuticals returned to LTC pharmacies that were purchased under Medicare Part D or private insurance. Specifically, there is no system in place that allows the payer to give back partial credit to both the insurance provider (e.g., Medicare Part D) and the patient (who paid a co-pay for the pharmaceutical). While Medicare Part D and private insurance provider requirements do not prohibit crediting to both parties; there is not a system in place for that kind of reimbursement that EPA could identify (U.S. EPA, 2009a). The result is that these unused medications are often disposed.

[31] The Agency clarified its regulation at 40 CFR 261.33, explaining that epinephrine salts are not included in the epinephrine P042 listing (since the listing only specifies epinephrine and not epinephrine salts); the salts, therefore, would be hazardous only if the waste epinephrine salt exhibited one or more of the hazardous waste characteristics (see "Scope of Hazardous Waste Listing P042 (Epinephrine)," October 15, 2007, RCRA Online# 14778)."

2. **State and local regulations and guidance often require special handling of pharmaceutical waste. These laws and regulations can influence the options health care facilities have for disposing of unused pharmaceuticals.**

- ***State regulations and guidance vary widely and influence disposal practices.*** State regulations on the disposal of unused pharmaceuticals and controlled substances vary widely (The Lewin Group, 2004; APhA, 2006; ERG, 2009a). Generally, the existing guidance from the States suggests that health care facilities limit disposal of pharmaceuticals to sewers (either by using alternative technologies/practices or limiting the types and quantity of drugs going down the drain.) In some States (California and Washington), facilities are encouraged to contact the POTW prior to this disposal of unused pharmaceuticals via the sewer. Also, many State regulations require both hospitals and LTCFs to destroy unused pharmaceuticals but often do not specify the process of destruction; however, many States (33 States according to APhA, 2006) have requirements for the types of facility personnel required to conduct and oversee the destruction.

- ***Some States have hazardous waste regulations that are more stringent than EPA (H2E, 2006).*** Some States, including California, Minnesota, and Washington, have more stringent hazardous waste regulations that may impact pharmaceutical waste management. Some waste pharmaceuticals might be regulated as hazardous waste under State law but not RCRA. For example, Minnesota requires that all chemotherapy drug wastes be managed as hazardous waste.

- ***Many States allow re-use of uncontaminated pharmaceuticals (excluding controlled substances) that have been in a controlled environment, such as an automatic dispensing system (The Lewin Group, 2004).*** In its 2009 Survey of Pharmacy Law, the National Association of Boards of Pharmacy (NABP) provides summary statistics on the number of States that (1) allow drug repository/donation programs and (2) permit the return and reuse of medications. According to NABP, 32 States allow drug repository/donation programs. Some of these States limit the program to specific situations (e.g., Minnesota's program applies to chemotherapy agents only) or exclude controlled substances from the repository/donation program.

  According to NABP, 30 States permit the return and reuse of medications. As above, many of these States limit return and reuse activities. For example, Ohio allows return and reuse only if the medication is unit-dosed and not a controlled substance; and Oregon allows return and reuse only in "long-term care pharmacies where drugs have remained in the control of facility staff and are packaged in tamper-resistant containers (NABP, 2009). State regulations for reuse of medications vary widely.

3. **After getting credit from the manufacturer for the facility, reverse distributors send most creditable pharmaceuticals off-site for some type of disposal (e.g., incinerator, landfill, etc.), not back to pharmaceutical companies for reuse or recycling.** Reverse distributors also often take non-

creditable pharmaceutical waste for off-site disposal, including controlled substances from hospitals. People often think that reverse distributors are returning all of the creditable pharmaceuticals to the manufacturer for reuse/recycling or destruction. However, most creditable pharmaceuticals are in fact sent off-site to an incinerator (Chapman, 2003).

4. **Sometimes pharmaceuticals are being disposed with State Regulated Medical Waste (RMW) and sent to steam sterilizers or autoclaves.** In general, EPA found that State RMW regulations apply to only those wastes that are considered to be potentially infectious. Unused pharmaceuticals would not typically fall into this category. The majority of State RMW regulations make no mention of unused pharmaceuticals and do not specifically prohibit health care facilities from disposing unused pharmaceuticals with their RMW. Four States specifically included chemotherapy agents as RMW or stated that these chemotherapy agents may be handled in a similar manner at RMW (ERG, 2009a). EPA visited a hospital in January 2009 that, in 2008, had been disposing of all of their unused pharmaceuticals in their on-site autoclave with their infectious RMW. This autoclave waste was also shredded and there was a wastewater discharge to the sewer from the autoclave. This is another way EPA identified that pharmaceuticals are being discharged to sewers from hospitals. Also, on site visits to hospitals and LTCFs, EPA often found that nurses would dispose of unused medications in RMW red bags or red sharps containers, even if that was not the official facility policy. RMW is often sent off-site for treatment to an autoclave or steam sterilizer that has a wastewater discharge to a POTW.

5. **The current disposal practices identified for waste pharmaceuticals depend greatly on the type of pharmaceutical (e.g., controlled substance, RCRA hazardous, chemotherapeutic, etc.), the form of the pharmaceutical (e.g., IV liquid or pill), where the waste is generated (e.g., at the pharmacy or on the patient floor) and whether or not the pharmaceutical is out of its original packaging.** Facilities typically use a combination of commercial waste haulers to dispose of their waste and local municipal trash companies. From site visits as well as meetings with waste management companies, EPA observed the following typical disposal practices:

- ***Reverse Distributor*.** Most hospitals and LTC pharmacies send unopened expired or short-dated pharmaceuticals to a reverse distributor to receive credit. The reverse distributor then usually sends the pharmaceuticals off-site for disposal.

- ***Sewer/POTW*.** Facilities tend to dispose of partially-used intravenous (IV) medications from the patient floor down the drain. All facilities from outreach meetings and site visits contacted disposed of partially-used non-pharmaceutical IV waste down the drain, such as electrolytes and total parenteral nutrition. All facilities also disposed of partially-used IVs containing controlled substances (e.g., a fentanyl IV stopped midstream) down the drain. Some facilities disposed of any partially-used IVs down the drain. Other facilities disposed of chemotherapy IVs as hazardous waste instead, using a resealable bag system and sorting containers. Some facilities also disposed of all controlled substances in the

form of pills down the drain; however, many facilities implemented management practices to avoid such releases. These facilities would render the controlled substances unrecognizable by crushing them and mixing them with materials such as kitty litter or sand and disposing with general trash.

- ***Municipal Waste Landfill.*** General trash and sterilized medical/infectious waste were disposed in municipal waste landfills. Facilities that render controlled substances unrecognizable by crushing them and mixing with materials such as kitty litter or sand, then dispose of the waste in the general trash.

- ***Autoclave/Steam Sterilizer.*** EPA observed autoclaves in place at four of the five hospitals visited. These four hospitals sterilized their medical/infectious waste using autoclaves/steam sterilizers, prior to disposing of such waste as general trash. One of these four hospitals processed their pharmaceutical waste through the autoclave/steam sterilizer, as well as their medical/infectious waste. Nurses on the hospital or LTCF patient floor would often put medications unused by the patient into the red bags or red sharps containers that would then go to the autoclaves/steam sterilizers.

- ***Thermal Destruction/ Medical Waste Incinerator.*** Two hospitals sent pharmaceutical waste for off-site thermal destruction (type of incinerator not specified), including nonhazardous pharmaceutical and trace chemotherapy drugs. Two hospitals disposed of nonhazardous pharmaceuticals in off-site medical waste incinerators. These hospitals also disposed of trace chemotherapeutic waste in medical waste incinerators.

- ***Hazardous Waste Landfill.*** One hospital sent hazardous waste to this type of landfill, including pharmaceutical hazardous waste.

- ***Hazardous Waste Incineration.*** Hospitals sent RCRA hazardous waste pharmaceuticals to this type of incinerator, including hazardous pharmaceutical waste and dual waste.

From an outreach meeting with a waste management vendor, EPA gathered some general statistics on the disposal of unused pharmaceuticals from health care facilities (U.S. EPA, 2009b). Specifically, the data show that the total amount of unused pharmaceuticals at a hospital range from 10 – 20 pounds/bed-month total, with about 10 – 20 percent of that volume being hazardous waste. Also, most of the time (approximately 90 percent), unused pharmaceuticals in (nonhazardous) IV bags are poured down the drain.

6. **Organization size, ease and access of disposal, and cost are also factors influencing the disposal of unused pharmaceuticals.** Some facilities use flushing to sewers as a primary means of disposal since it is both easy and complies with CSA requirements for destruction. Facilities are most likely to flush pharmaceuticals if they do not have an on-site pharmacy and/or do not have a pre-existing contract with a hazardous waste hauler to dispose of the pharmaceuticals. For example, small rural hospitals often don't have full-time pharmacists and do not use reverse distributors (Lewis, 2009). In the past, public

health agencies and health-related non-government organizations guided the public to destroy unused medications by flushing them down the toilet. Many LTCFs have adopted this method for destruction of unused controlled substances. Many LTCFs have also extended this practice to include flushing all unused medications – controlled and non controlled substances (Leusch, 2005).

7. **Best management practices, if widely implemented, have the potential to reduce the amount of unused pharmaceuticals entering our nation's waters from disposal.** Three organizations provide guidance in the form of BMPs to medical facilities on managing pharmaceutical waste: Hospitals for a Healthy Environment (re-named as Practice Greenhealth), Product Stewardship Institute (PSI), and the Joint Commission (formerly the Joint Commission on Accreditation of Healthcare Organizations (JCAHO)). The guidelines provided by these organizations all aim to reduce health and environmental impacts due to current disposal practices of pharmaceutical waste, as discussed in Section 5.2 of the Interim Technical Report (U.S. EPA, 2008). Examples of model BMPs identified to date include waste minimization and reverse distribution systems used by hospitals in California, Minnesota, and Washington. Waste minimization techniques include maintaining inventories of high-use pharmaceuticals and identifying those that are close to expiring. Short-dated pharmaceuticals are redistributed to other areas of the hospitals where they are needed. Dispensed pharmaceuticals can also go unused at a hospital or LTCF if the patient has an allergic or adverse reaction to the medication, no longer requires treatment, refuses treatment, or the medication expires. Hospitals and LTCFs can reduce the amount of pharmaceutical waste generated by limiting the amount of pharmaceuticals dispensed to patients and residents at one time. This can be accomplished by using unit dose packaging, limited quantity dispensing, automatic dispensing systems, and standardized medication dosages (U.S. EPA, 2008). Hospitals and LTCFs have the option of hiring reverse distributors to manage their unused and/or expired medication that the facility believes it could receive credit from the manufacturer. The reverse distributor determines which medications may receive credit from the manufacturer and arranges for disposal of the unused medications (or in limited cases, sends the unused pharmaceuticals back to the manufacturer).

EPA is concerned about pharmaceuticals in the environment and is working on this issue in many different areas. Over the last few years, EPA has increased its work in a number of areas to better understand pharmaceuticals. EPA has an overall strategy to address the risks associated with emerging contaminants. This four-pronged strategy is aimed at improving science, improving public understanding, identifying partnership and stewardship opportunities, and taking regulatory action as appropriate. EPA is focused on learning more about the occurrence and health effects of pharmaceuticals in water. In addition, EPA is working to better understand what treatment technologies may remove them from wastewater and drinking water. EPA is developing analytical methods to improve detection capabilities. EPA is conducting national studies to help direct the Agency's course of action. EPA is also partnering with government agencies, stakeholders, and the private sector, and increasing public awareness about product stewardship and pollution prevention (Grumbles, 2008). Additionally, the Agency is considering amending its hazardous waste regulations to add hazardous pharmaceutical wastes to the

universal waste system to facilitate its oversight of the disposal of pharmaceutical waste (40 CFR Part 273) (see RIN 2050-AG39, April 30, 2007; 72 FR 23170). The inclusion of hazardous pharmaceutical wastes in the universal waste rule may encourage health care facilities to manage all their pharmaceutical wastes as universal wastes, even wastes that are not regulated as hazardous but which nonetheless pose hazards. Finally, EPA has identified the issue of pharmaceuticals in wastewater is part of the Agency's Strategic Plan (2006-2011) to meet its goals of clean and safe water.[32]

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14. OIL AND GAS EXTRACTION CATEGORY (40 CFR PART 435)

Coalbed methane (CBM) extraction activities accounted for about 7 percent of the total U.S. natural gas production (gross withdrawals) in 2007 and are expanding in multiple basins across the United States. Currently, the Department of Energy's Energy Information Administration expects CBM production to remain an important source of domestic natural gas over the next few decades.

CBM extraction requires removal of large amounts of water from underground coal seams before CBM can be released. CBM wells have a distinctive production history characterized by an early stage when large amounts of water are produced to reduce reservoir pressure which in turn encourages release of gas. This is followed by a stable stage when quantities of produced gas increase as the quantities of produced water decrease; and a late stage when the amount of gas produced declines and water production remains low (WY SGS, 2004).

The quantity and quality of water that is produced in association with CBM development varies from basin to basin, within a particular basin, from coal seam to coal seam, and over the lifetime of a CBM well. Pollutants often found in these wastewaters include chloride, sodium, sulfate, bicarbonate, fluoride, iron, barium, magnesium, ammonia, and arsenic. Total dissolved solids and electrical conductivity are bulk parameters that States typically use for quantifying and controlling the amount of pollutants in CBM produced waters.

EPA identified the CBM sector as a candidate for a detailed study in the Final 2006 Effluent Guidelines Program Plan (see December 21, 2006, 71 FR 76656). As part of that announcement EPA made it clear that it would conduct data collection through an information collection request (ICR) to support this detailed study. In accordance with the Paperwork Reduction Act, EPA obtained approval from the Office of Management and Budget for its "Coalbed Methane Extraction Sector Survey" on February 18, 2009. This approval followed two public comment periods on the survey (see 73 FR 4556, January 25, 2008; 73 FR 40757, July 15, 2008) and more than two years of outreach by EPA with interested stakeholders.

The approved mandatory survey, conducted under the authority of Section 308 of the Clean Water Act (33 U.S.C. Section 1318), includes two questionnaires. First, a screener questionnaire went to all CBM operators that have three or more CBM wells, approximately 300 operators. A detailed questionnaire will collect financial and technical data on approximately 773 CBM projects across the country.

EPA will use this ICR to collect technical and economic information from a wide range of CBM operations. EPA plans to collect information on geographical and geologic differences in the characteristics of CBM produced waters, environmental data, current regulatory controls, and availability and affordability of treatment technology options.

EPA is also conducting a literature review of environmental impacts and beneficial uses of produced water. The literature review is being conducted in four phases focusing on:

1. Scientific journal articles;
2. Documents retrieved from websites of state and federal agencies, universities, and non-governmental organizations; and
3. Environmentally sustainable beneficial uses of produced water.

Results of the first phase are included in the docket (ERG, 2009). Additionally, EPA will be reviewing current requirements for surface water discharge of produced water. Currently, regulatory controls for CBM produced waters vary from State to State and permit to permit (U.S. EPA, 2006; Ruckelshaus, 2005). The assessment of state permitting requirements for surface water discharge of produced water will examine factors such as the:

- Number of current permits;
- Proportion of discharges covered under individual versus general permits;
- Types of pollutants controlled; and
- Numeric concentration limits required.

This assessment will give EPA a better understanding of variations and consistencies among states in controlling CBM produced water discharges.

Finally, EPA is soliciting public comment on whether it should expand its detailed study of CBM extraction to include all oil and gas exploration, stimulation, and extraction techniques that result in contamination of surface and groundwater, including hydraulic fracturing in all formations.

14.1 Oil and Gas Extraction Category References

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15. STEAM ELECTRIC POWER GENERATING CATEGORY (40 CFR PART 423)

EPA has completed a multi-year study of the Steam Electric Power Generating Category and, based on the results, has determined that revising the current ELGs is warranted. EPA's decision to revise the current ELGs is largely driven by the high level of TWPE discharges from power plants and the expectation that these discharges will increase significantly in the next few years as new air pollution controls are installed. Over the course of the study, EPA has identified technologies that are available to significantly reduce these pollutant discharges.

The Steam Electric Power Generating ELGs (40 CFR Part 423) apply to a subset of the electric power industry, namely those facilities "primarily engaged in the generation of electricity for distribution and sale which results primarily from a process utilizing fossil-type fuel (coal, oil, or gas) or nuclear fuel in conjunction with water system as the thermodynamic medium" (see 40 CFR Part 423.10). EPA's most recent revisions to the ELGs for this category were promulgated in 1982 (see 47 FR 52290, November 19, 1982).

Since 2005, EPA has been carrying out an intensive review of wastewater discharges from power plants. As part of this effort, EPA has sampled wastewater from surface impoundments and advanced wastewater treatment systems, conducted on-site reviews of the operations at more than two dozen power plants, and issued a detailed questionnaire that obtained information on 30 power plants using authority granted under Section 308 of the Clean Water Act. EPA's data collection efforts have been primarily focused on four target areas:

1. Determining the pollutant characteristics of power plant wastewater;
2. Identifying treatment technologies for the wastewater generated by air pollution control equipment;
3. Characterizing the practices used by the industry to manage or eliminate discharges of fly ash and bottom ash wastewater; and
4. Identifying methods for managing power plant wastewater that allow recycling and reuse, rather than discharge to surface waters.

Much of the information collected thus far, including laboratory data from sampling, were made available to the public in an interim study report, *Steam Electric Power Generating Point Source Category: 2007/2008 Detailed Study Report*, (U.S. EPA, 2008) and the final study report, *Steam Electric Power Generating Point Source Category: Final Detailed Study Report* (U.S. EPA, 2009).

EPA's review of the wastewater characteristics indicates that most of the toxic pollutant loadings for this category are associated with metals and certain other elements present in wastewater discharges, and that the waste streams contributing the majority of these pollutants are associated with ash handling and wet flue gas desulfurization (FGD) systems. Other potential sources of these pollutants include coal pile runoff, metal cleaning wastes, coal washing, leachate from landfills and wastewater impoundments, and certain low-volume wastes.

Between July 2007 and October 2008, EPA conducted six sampling episodes to characterize untreated wastewaters generated by coal-fired power plants, including FGD wastewater, and fly ash and bottom ash transport water. EPA also collected samples to assess the effluent quality from different types of treatment systems currently in place at these operations.

Samples were analyzed for metals and other pollutants, such as total suspended solids and nitrogen. Sampling reports for the first five episodes are included in the docket for the 2008 Final Plan (ERG, 2008a; ERG, 2008b; ERG, 2008c; ERG, 2008d; ERG, 2008e), and the report for the final sampling episode is included in the docket for the Preliminary 2010 Plan (ERG, 2009). These reports discuss the specific sample points and analytes, the sample collection methods used, the field quality control samples collected, and the analytical results for the wastewater samples.

EPA expects that the use of wet FGD systems will increase substantially over the next decade as state and federal regulations are implemented to reduce air emissions. Metals and other pollutants are transferred from the flue gas to the wastewater produced by wet FGD systems. Based on results from the sampling and other data, EPA determined that there are unregulated toxic and conventional pollutants present in ash pond and FGD wastewater which can be reduced significantly with treatment technologies.

An increasing amount of evidence indicates that the characteristics of coal combustion wastewater have the potential to impact human health and the environment. Discharges of coal combustion wastewater have been associated with fish kills, reductions in the growth and survival of aquatic organisms, behavioral and physiological effects in wildlife and aquatic organisms, potential impacts to human health (e.g., drinking water contamination), and changes to the local habitat. Many of the pollutants commonly found in coal combustion wastewater (e.g., selenium, mercury, and arsenic) are known to cause environmental harm and potentially represent a human health risk. Although coal-fired power plants often dilute coal combustion wastewater with other large volume wastewater (e.g., cooling water) to reduce the pollutant concentrations prior to discharge, the effluent can contain large mass loads (i.e. total pounds) of pollutants. Some of the pollutants in these discharges, although present at low concentrations, can bioaccumulate and present an increased ecological threat due to their tendency to persist in the environment, resulting in slow ecological recovery times following exposure. In addition, leachate from impoundments and landfills containing coal combustion wastes can contain high concentrations of pollutants and has been identified as the source of ground water and surface water impacts.

Additional information about data collected and findings of the detailed study of the Steam Electric Power Generating industry is presented in the final study report, *Steam Electric Power Generating Point Source Category: Final Detailed Study Report* (U.S. EPA, 2009). The report includes data on the characteristics of wastewater from coal fired power plants, identifies the wastewater treatment technologies reviewed, presents an overview of the industry profile and predicted future trends in the use of air pollution controls, and describes environmental impacts that have been linked to coal combustion wastewater.

EPA expects to continue data collection by conducting wastewater sampling and issuing a survey that will obtain detailed technical and financial information. In particular, EPA intends to submit an Information Collection Request to the Office of Management and Budget this year for their review and approval under the Paperwork Reduction Act, 33 U.S.C. 3501, et seq.

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