United States Environmental Protection Agency

Technical Support Document for the 2006 Effluent Guidelines Program Plan

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December 2006

EPA-821R-06-018

PART III: REVIEW OF INDUSTRIAL DISCHARGES NOT COVERED BY CATEGORICAL REGULATIONS

19.0 REVIEW OF INDIRECT DISCHARGERS WITHOUT CATEGORICAL PRETREATMENT STANDARDS TO IDENTIFY POTENTIAL NEW CATEGORIES FOR PRETREATMENT STANDARDS

To identify candidates for categorical pretreatment standards under CWA sections 304(g) and 307(b), EPA reviewed eight industries that are composed entirely or almost entirely of indirect discharge facilities and that are not currently subject to categorical pretreatment standards. Table 19-1 lists the industries EPA reviewed (in alphabetical order), which were identified using stakeholder comments and pollutant discharge information.

Table 19-1. Industries Included in EPA's 2006 Review of Possible New Candidates for Categorical Pretreatment Standards

No.	Industry
1.	Food Service Establishments
2.	Health Services Industry
3.	Independent and Stand-Alone Laboratories
4.	Industrial Container and Drum Cleaning
5.	Industrial Laundries
6.	Photoprocessing
7.	Printing and Publishing
8.	Tobacco Products

19.1 Overview of EPA's 2006 Review of Possible New Candidates for Categorical Pretreatment Standards

As noted in 40 CFR §403.2, the three principal objectives of the National Pretreatment Program are to: (1) prevent the wide-scale introduction of pollutants into POTWs that will interfere with POTW operations, including use or disposal of municipal sludge; (2) prevent the introduction of pollutants into POTWs that will pass through the treatment works or will otherwise be incompatible with the treatment works; and (3) improve opportunities to recycle and reclaim municipal and industrial wastewaters and sludges (U.S. EPA, 1999).

All indirect dischargers are subject to general pretreatment standards (40 CFR 403), which includes a prohibition on discharges causing pass through or interference. See 40 CFR 403.5. The general pretreatment standards are implemented in the form of local limits developed either by POTWs with approved pretreatment programs, or POTWS that have experienced interference or pass through. In the United States, there are approximately 1,500 POTWs with approved pretreatment programs and 13,500 small POTWs that are not required to develop and implement pretreatment programs.

In addition, EPA establishes technology-based national regulations, termed "categorical pretreatment standards," for categories of industries discharging pollutants to POTWs that may pass through, interfere with or otherwise be incompatible with POTW operations. These are analogous to effluent limitations guidelines for direct dischargers. Generally, categorical pretreatment standards are designed such that wastewaters from direct and indirect industrial dischargers are subject to similar levels of treatment. To date, EPA has promulgated such categorical pretreatment standards for 35 industrial categories.

The CWA also establishes review requirements for categorical pretreatment standards. Section 307(b) requires EPA to revise its categorical pretreatment standards for indirect dischargers “from time to time, as control technology, processes, operating methods, or other alternatives change.” Section 304(g) requires EPA to annually review these categorical pretreatment standards and revise them “if appropriate.”Although section 307(b) only requires EPA to review existing categorical pretreatment standards “from time to time,” section 304(g) requires an annual review. Therefore, EPA meets its 304(g) and 307(b) review requirements by reviewing all industrial categories subject to existing categorical pretreatment standards on an annual basis to identify potential candidates for revision. EPA conducts its annual review of existing categorical pretreatment standards concurrent with its review of existing effluent guidelines. These reviews are detailed in Sections 5.0-18.0 of this TSD.

Finally, the CWA also requires EPA to promulgate pretreatment standards for categories of dischargers that discharge pollutants not susceptible to treatment by POTWs or that would interfere with the operation of POTWs. However, it does not provide a timing requirement for the promulgation of such new pretreatment standards. EPA, in its discretion, periodically evaluates indirect dischargers not subject to categorical pretreatment standards to identify potential candidates for new pretreatment standards.

The remainder of this section discusses and provides results of EPA’s evaluation of categories of indirect dischargers not currently subject to categorical pretreatment standards.

19.2 EPA’s Evaluation of "Pass Through Potential" of Toxic and Nonconventional Pollutants through POTW Operations

Categorical pretreatment standards are designed to prevent the discharge of pollutants that “interfere with, pass through, or otherwise [are] incompatible with” the operation of POTWs. See 33 U.S.C.§ 1371(b)(1). In establishing pretreatment standards, Congress had two objectives: (1) that standards for indirect dischargers be equivalent to standards for direct dischargers, and (2) that the treatment capability and performance of POTWs be recognized and taken into account in regulating the discharge of pollutants from indirect dischargers. EPA’s approach in establishing categorical pretreatment standards is consistent with both objectives.

Historically, for most categorical pretreatment standard rulemakings, EPA determines the “pass through potential” by comparing the percentage of the pollutant removed by well-operated POTWs achieving secondary treatment with the percentage of the pollutant removed by wastewater treatment options that EPA is evaluating as the bases for categorical pretreatment standards. See 46 FR 9408 (January 28, 1981).). If the median percentage removed by well-operated POTWs is less than the median percentage removed by direct discharging facilities using BAT, then EPA generally deems the pollutant to “pass through” and develops pretreatment standards for facilities that indirectly discharge the pollutant.

For some of the industries evaluated in this review (i.e., ICDC and Tobacco Products industries), EPA evaluated pass through potential using the traditional method mentioned above. Specifically, EPA compared each industry's "current loadings" to the "potential post-regulatory loadings." Current loadings are the pollutant loadings discharged to surface waters, accounting for POTW removals. Potential post-regulatory loadings are the pollutant loadings that would be discharged to surface waters upon compliance with pretreatment standards based on the BAT. EPA relied on wastewater sampling data and site visits to characterize the toxic pollutant discharges from both industries. Sections 19.5 and 19.9 discuss EPA's data collection and analyses in more detail.

However, for the remaining six categories, EPA was unable to gather the data needed for a comprehensive analysis of the availability and performance (*e.g.*, percentage of the pollutants removed) of treatment or process technologies that might reduce toxic pollutant discharges beyond that of technologies already in place at these facilities. Instead, EPA evaluated the "pass through potential" as measured by the total annual TWPE discharged by the industrial sector and the average TWPE discharge among facilities that discharge to POTWs. EPA relied on data from TRI, PCS, state pretreatment programs, industry trade groups, and contacts made to facilities to characterize toxic pollutant discharges from these six industries.

EPA relied on a similar evaluation of pass through potential in its prior decision not to promulgate national categorical pretreatment standards for the Industrial Laundries industry. See August 18, 1999 (64 FR 45071). EPA noted in this 1999 final action that, "While EPA has broad discretion to promulgate such [national categorical pretreatment] standards, EPA retains discretion not to do so where the total pounds removed do not warrant national regulation and there is not a significant concern with pass through and interference at the POTW." See 64 FR 45077 (August 18, 1999).

EPA solicited comment on this evaluation for determining the "pass through potential" for industrial categories comprised entirely or nearly entirely of indirect dischargers. See 70, FR 51054 (August 29, 2005). In response to this solicitation, EPA only received two comments on this methodology and both comments were supportive of EPA's approach (see OW-2004-0032-1042, 1051).

19.3 EPA's Evaluation of "Interference Potential" of Industrial Indirect Discharges

For each of the eight industries in this review, EPA evaluated the "interference potential" of the indirect industrial discharges. The term "interference" means a discharge which, alone or in conjunction with a discharge or discharges from other sources: (1) inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal; and (2) therefore is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or of the prevention of sewage sludge use or disposal in compliance with applicable regulations or permits. See 40 CFR 403.3(i). To determine the interference potential, EPA generally evaluates the industrial indirect discharges in terms of: (1) the compatibility of industrial wastewaters and domestic wastewaters (e.g., type of pollutants discharged in industrial wastewaters compared to pollutants typically found in domestic wastewaters); (2) concentrations of pollutants discharged in industrial wastewaters that might cause interference with the POTW collection system (e.g., fats, oil, and grease (FOG) discharges causing blockages in the POTW collection system, hydrogen sulfide corrosion in the POTW collection system), the POTW treatment system (e.g., high ammonia mass discharges inhibiting the POTW treatment system, high oil and grease mass discharges can also promote the growth of filamentous bacteria that inhibit the performance of POTWs using trickling filters), or biosolids disposal options; and (3) the potential for variable pollutant loadings to cause interference with POTW operations (e.g., batch discharges or slug loadings from industrial facilities interfering with normal POTW operations).

EPA relied on readily available information from the literature and stakeholders to evaluate the severity, duration, and frequency of interference incidents caused by industrial indirect discharges. As part of its evaluation, EPA reviewed data from its report to Congress on one type of interference incidents, blockages in the POTW collection system leading to combined sewer overflows (CSOs) and sanitary sewer overflows (SSOs) (U.S. EPA, 2004b).

EPA received comments from stakeholders during its review indicating that even with current authority provided in the general pretreatment regulations, some POTWs have difficulty controlling interference from some categories of indirect industrial dischargers (see OW-2004-0032-0020, 1090). EPA notes, however, that to a large extent, interference problems vary from POTW to POTW. Pollutants that interfere with the operation of one POTW may not adversely affect the operation of another. These differences are attributable to several factors including the varying sensitivities of different POTWs and the constituent composition of wastewater collected and treated by the POTW. See 46 FR 9406 (January 28, 1981).

EPA also notes that the national pretreatment program already provides the necessary regulatory tools and authority to local pretreatment programs for controlling interference problems – e.g., categorical pretreatment standards (40 CFR Parts 405-471) and general pretreatment standards (40 CFR 403). Under the provisions of Part 403.5(c)(1) & (2), in defined circumstances, a POTW must establish specific local limits for industrial users to guard against interference with the operation of the municipal treatment works. See 46 FR 9406 (January 28, 1981). Consequently, pretreatment programs must correct interference incidents with enforcement and oversight activities. The interference incidents identified by commenters do not necessarily indicate the need for additional categorical pretreatment standards, but they may indicate the need for additional oversight and enforcement.

19.4 Category-Specific Evaluations

Stakeholder comments and pollutant discharge information have helped EPA to identify industries that are composed entirely or nearly entirely of indirect dischargers. EPA has grouped these industries into the following eight possible new categories: Food Service Establishments; Industrial Laundries; Photoprocessing; Printing and Publishing; Independent and Stand-Alone Laboratories; Industrial Container and Drum Cleaning; Tobacco Products, and Health Services Industry. EPA is including within the Health Services Industry the following activities: Independent and Stand Alone Medical and Dental Laboratories, Offices and Clinics of Doctors of Medicine, Offices and Clinics of Dentists, Nursing and Personal Care Facilities, Veterinary Care Services, and Hospitals and Clinics. Data sources for these reviews include

TRI, PCS[16], EPA reports and studies, periodicals and textbooks, EPA pretreatment coordinators and permitting authorities, and industry-supplied information. The following sections (19.5 through 19.12) summarize the information obtained for each industry reviewed. Table 19-2 below summarizes EPA's conclusions for each industry reviewed and provides the sources of detailed discussions of the industry reviews.

19.5 Food Service Establishments

Food service establishments include facilities that prepare meals, snacks, and beverages to customer order for immediate on-premises and off-premises consumption. EPA reviewed wastewater discharges from the Food Service Establishments industry because of comments received in response to the 2004 Final Plan and the Preliminary 2006 Plan. This section briefly discusses EPA's findings on the Food Service Establishments industry.

19.5.1 Comments Received

In response to the 2004 Plan, the Metropolitan Council Environmental Services (MCES) raised concerns about the interferences caused by FOG discharges from food service establishments (OW-2003-0074-0670), and the NRDC included food service establishments in a list of industries that it believes meet the criteria of Section 304(m)(1)(B) and therefore should have been identified for an effluent guidelines rulemaking (OW-2003-0074-0733). In response to the 2006 Preliminary Plan, two POTWs and the National Association of Clean Water Agencies (NACWA) submitted comments that categorical pretreatment standards are not necessary for the Food Service Establishments industry (OW-2004-0032-1042, 1086, 1078, 1093).

19.5.2 Industry Profile

Food Service Establishments include facilities in SIC codes 5812, Eating Places, and 5813, Drinking Places. Of the approximately 509,000 food service establishments (approximately 460,000 eating places and 48,900 drinking places) in the United States, only 57 reported discharges to PCS in 2000 (all minor dischargers). The direct discharge facilities in the 2000 PCS represent 0.01 percent of the industry, supporting the likelihood that most food establishments are indirect dischargers. No food establishments reported to TRI in 2000 (Matuszko, 2005a).

[16] Although PCS only contains information for direct dischargers, this information can be useful in gaining some understanding of the types of discharges from a particular industry.

Table 19-2. Summary of EPA's 2006 CWA Sections 304(g) and 307(b) Review

No.	Industry	Type of Pass Through Evaluation	Determination	Section Including Summarized Industry Review Information	Source of Detailed Information
1.	Food Service Establishments	Abbreviated	Low pass through potential: Categorical pretreatment standards unwarranted	Section 19.5	DCN 02103
2.	Health Services Industry	Abbreviated	Not enough information: Conduct detailed study	Section 19.6	DCN 02293
3.	Independent and Stand-Alone Laboratories	Abbreviated	Low pass through potential: Categorical pretreatment standards unwarranted	Section 19.7	DCN 02101
4.	Industrial Container and Drum Cleaning	Traditional	Low pass through potential: Categorical pretreatment standards unwarranted	Section 19.8	DCN 03415
5.	Industrial Laundries	Abbreviated	Low pass through potential: Categorical pretreatment standards unwarranted	Section 19.9	DCN 02102
6.	Photoprocessing	Abbreviated	Low pass through potential: Categorical pretreatment standards unwarranted	Section 19.10	DCN 02096
7.	Printing and Publishing	Abbreviated	Low pass through potential: Categorical pretreatment standards unwarranted	Section 19.11	DCN 02294
8.	Tobacco Products	Traditional	Low pass through potential: Categorical pretreatment standards unwarranted	Section 19.12	DCN 03395

19.5.3 Wastewater Characteristics

Food establishments use water for food preparation (washing, cooking, drinking water, ice, sinks), clean up (dishwashing, floor, and rack washing), sanitation (toilets), and landscaping (irrigation, parking lot spraying, etc). Using an average wastewater flow range of 3 gallons per day per meal (Tchobanoglous, 1991) and an estimate that Americans eat close to seven million meals per day from food service establishments (AFTS, 2004), EPA estimates that the food service industry generates 21 MGD of wastewater nationally, not including toilet waste (Matuszko, 2005a).

During this study, EPA could not locate nor did commenters provide a readily available source of discharge data for food service establishments that discharge to POTWs. No TRI data are available regarding pollutants in treated wastewater from food service establishments. As a result, EPA obtained data on food service establishments from *PCSLoads2000_v6.* Because PCS data are for direct dischargers, they may or may not be representative of indirect discharging facilities (particularly for conventional pollutants and/or treatment chemicals such as chlorine). Nevertheless, the data provide some indication of the level and types of pollutants that may be present in discharges from food service establishments. From *PCSLoads2000_v6*, EPA estimates relatively low TWPE per facility (less than 1 TWPE per year per facility). The pollutants discharged from the industry in the largest amounts, in terms of TWPE, were total residual chlorine (TRC) (14 TWPE per year) and ammonia as nitrogen (1.9 TWPE per year). Table 19-3 summarizes data on pollutant discharges reported from food service establishments.

Table 19-3. Summary of Wastewater Discharges from the Food Service Establishments Industry

Data Source	Total Annual TWPE Before POTW Removal	Number of Facilities Reporting	Annual TWPE per Facility Before POTW Removal
PCSLoads2000_v6	16	57	<1

Source: *PCSLoads2000_v6*

19.5.4 Pass Through and Interference

Based on the available data on food service establishment wastewater characteristics, EPA found that the total TWPE discharged from food service establishments to POTWs is low (<1 TWPE/facility/year). Additionally, EPA expects the main toxic pollutants identified in food service establishment wastewaters will not pass through POTWs because they are typically removed through POTW treatment. For example, chlorine, the pollutant discharged in the largest quantity, has a POTW pollutant removal efficiency of 100 percent. Therefore, EPA's review of current information indicates that there is little to no pass through potential of toxic and nonconventional pollutants from the Food Service Establishments.

EPA also collected data about discharges to POTWs through inquiries to EPA Regional pretreatment coordinators and internet queries. These data sources show that FOG is the predominant pollutant of concern for food service establishments. FOG discharges from the food service industry can interfere with POTW operations by causing the following:

- Blockages in the POTW collection system leading to combined sewer overflows (CSOs) and sanitary sewer overflows (SSOs) (U.S. EPA, 2004b);
- POTW treatment interference from *Nocardia* filamentous foaming; and
- Damage to collection systems from hydrogen sulfide generation (WEF, 2004).

Food service establishments generate FOG as byproducts from food preparation. FOG captured on site is generally classified into two broad categories: yellow grease and grease trap waste (Wiltsee, 1998). Yellow grease is derived from used cooking oil and waste greases that are separated and collected at the point of use by the food service establishment.

Food service establishments can adopt a variety of best management practices (BMPs) or install interceptor/collector devices to control and capture the FOG material before discharge to the POTW collection system (IRAC, 2004b; ASCE, 2004). For example, instead of discharging yellow grease to POTWs, food service establishments usually accumulate this material for re-sale or re-use in the manufacture of tallow, animal feed supplements, fuels, or other products (U.S. EPA, 2004a).

Additionally, food service establishments can install interceptor/collector devices (e.g., grease traps in sinks and dish washer drain lines) to accumulate grease on site and prevent it from entering the POTW collection system. Proper design, installation, and maintenance procedures are critical for these devices to control and capture the FOG (IRAC, 2004a; TDEC, 2002). For example, devices must allow emulsified FOG to cool and separate in a non-turbulent environment (TDEC, 2002). Additionally, food service establishments must service their interceptor/collector devices at regular intervals (Wiltsee, 1998; Engle, 2005a; Engle, 2005b; CAL FOG, 2004). The required maintenance frequency for interceptor/collector devices "depends greatly on the amount of FOG a facility generates as well as any best management practices (BMPs) that reduce the FOG discharged into its sanitary sewer system. In many cases, an establishment that implements BMPs will realize financial benefit through a reduction in their required grease interceptor and trap maintenance frequency" (WEF, 2004). The annual production of collected grease trap waste and uncollected grease entering sewage treatment plants can be significant and ranges from 800 to 17,000 pounds/year per restaurant (Wiltsee, 1998).

Information collected from control authorities and stakeholders indicate that a growing number of control authorities are using their existing authority (e.g., local limits to implement general pretreatment standards in Part 403) to establish and enforce more FOG regulatory controls (e.g., numeric pretreatment limits, best management practices including the use of interceptor/collector devices) for food service establishments to reduce interferences with POTW operations. For example, since identifying a 73% non-compliance rate with its grease trap ordinance among restaurants, New York City instituted a $1,000-per-day fine for FOG violations (Engle, 2005a). Other municipal wastewater authorities address FOG discharges, "by imposing mandatory measures of assorted kinds, including inspections, periodic grease pumping, stiff penalties, and even criminal citations for violators, along with 'strong waste' monthly surcharges added to restaurant sewer bills. Surcharges are reportedly ranging from $100 to as high as $700 and more, the fees being deemed necessary to cover the cost of inspections and upgraded infrastructure" (Engle, 2005a). Pretreatment programs also develop and use inspection checklists for both food service establishments and municipal pretreatment inspectors to control FOG discharges (IRAC, 2004b).

Additionally, EPA identified typical numeric local limits controlling oil and grease in the range of 50 mg/L to 450 mg/L with 100 mg/L as the most common reported numeric pretreatment limit (LaDuca, 2001). Finally, EPA expects that blockages from FOG discharges will decrease as utilities incorporate Capacity, Management, Operations, and Maintenance (CMOM)[17] program activities into their daily practices. Collection system owners or operators that adopt CMOM program activities are likely to reduce the occurrence of sewer overflows, improve their operations, and maintain compliance with their NPDES permit (U.S. EPA, 2005a).

Current information indicates that although FOG may present some interference potential, local outreach and regulatory controls can address FOG sufficiently. EPA also notes that under the provisions of Part 403.5(c)(1) & (2), in defined circumstances, a POTW must correct interference incidents with enforcement and oversight activities.

19.5.5 Findings of EPA's Review of the Food Services Establishments Industry

Based on the available information, EPA found that there was low potential for pass through of toxic and non-conventional pollutants from food service establishments (as measured by hazard per facility). In addition, interference from conventional-type pollutants can be adequately addressed by local limits established to implement the general pretreatment standards under Part 403 and enforcement of those limits. For these reasons, EPA concludes that development of categorical pretreatment standards for food service establishments is not warranted at this time.

19.6 Health Services Industry

The Health Services Industry includes establishments engaged in various aspects of human health (e.g. hospitals, dentists, medical/dental laboratories) and animal health (e.g. veterinarians). EPA reviewed wastewater discharges from the Health Services Industry in response to comments made on the 2004 Final Plan and the 2006 Preliminary Plan. This section briefly discusses EPA's current findings on the Health Services Industry.

19.6.1 Comments Received

In response to the 2004 Plan, MCES raised concerns about mercury discharges from dental facilities and suggested that EPA provide guidance regarding amalgam separator

[17] EPA has provided guidance to owners/operators of sanitary sewer collection systems through CMOM program guidelines to reduce sanitary sewer overflows (SSOs) (U.S. EPA, 2005a).

programs (OW-2003-0074-0670). NRDC included dental facilities in a list of industries that it believes meet the criteria of Section 304(m)(1)(B) and therefore should have been identified for an effluent guidelines rulemaking (OW-2003-0074-0733)[18]. EPA also received stakeholder comments in response to the 2006 Preliminary Plan. King County Wastewater Treatment Division, Hampton Roads Sanitation District, and NACWA indicated that discharges from the Health Services Industry are sufficiently controlled by local limits and general pretreatment standards (OW-2004-0032-1042, 1086, and 1093); Washington State Department of Ecology indicated that categorical pretreatment standards are necessary to control discharges from dental facilities (OW-2004-0032-1036); and Arkansas Department of Environmental Quality recommended that EPA study hospitals and dental facilities, with particular focus on emerging pollutants of concern, and laboratory and pharmaceutical "exotics" (OW-2004-0032-0678).

19.6.2 Industry Profile

Health services establishments fall under SIC Major Group 80 Health Services and Industry Group 074 Veterinary Services. According to the 2002 Census, there are over 475,000 facilities in the Health Services Industry (Mott and Kaplan, 2005). For this study, EPA included within the Health Services Industry the following six industrial sectors: independent and stand-alone medical and dental laboratories, offices and clinics of doctors of medicine, offices and clinics of dentists, nursing and personal care facilities, veterinary care services, and hospitals and clinics. EPA included medical and dental laboratories in its review of the Health Services Industry, and not in its review of the Independent and Stand-Alone Laboratories industry (discussed in Section 19.7), because medical and dental laboratories have similar wastewater characteristics as hospitals and dental facilities. Additionally, medical and dental laboratories are often co-located with hospitals and dental facilities.

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

In 1976, EPA promulgated 40 CFR Part 460 which only applies to effluent discharges to surface water from hospitals with greater than 1,000 occupied beds. 40 CFR Part 460 did not establish pretreatment standards for indirect discharging facilities.

Nearly all facilities within the Health Services Industry are indirect dischargers (i.e., no discharge data reported in PCS) and few facilities report to TRI (only Federal facilities in the healthcare industry are required to report to TRI) (U.S. EPA, 2005b). For 2002, PCS only has data for two facilities which are considered "major" sources of pollutants.

19.6.3 Wastewater Characteristics

EPA obtained relatively little information on the pollutant discharges from the Health Services Industry during its screening-level reviews because TRI and PCS data for this industry are sparse. In 1989, EPA published a Preliminary Data Summary (PDS) for the

[18] EPA did not identify this industry as a potential new category under section 304(m)(1)(B), as that provision applies only to direct discharging industries subject to effluent guidelines – not to indirect dischargers.

Hospitals Point Source Category (U.S. EPA, 1989). Also, EPA's Office of Enforcement and Compliance Assistance (OECA) published a Healthcare Sector Notebook in 2005 (U.S. EPA, 2005b). In addition, for some portions of this industry such as dental facilities, industry and POTWs have conducted studies to estimate discharges (Stone, 2004). The memorandum entitled, "Industry Sectors Being Evaluated under Proposed 'Health Services Industry' Category" includes a detailed examination of the type of operations performed, pollutants and wastewaters generated, and available pollution prevention and treatment options for the Health Services Industry (Johnston, 2005a). This section provides a summary of EPA's findings on the wastewater characteristics of the Health Services Industry.

Based on preliminary information, the major pollutants of concern in discharges from health care service establishments include mercury, silver, pharmaceuticals, endocrine-disrupting compounds, and biohazards (U.S. EPA, 2005b). The majority of the silver originates from silver-based photographic materials used in photograph and X-ray processing, which may be discharged in wastewaters from dental clinics and hospitals. The majority of the mercury originates from the following sources: amalgam used in dental facilities; and medical equipment, laboratory reagents, and cleaning supplies used in healthcare facilities. (Johnston, 2005a; Johnston, 2005b) EPA found little to no quantitative information on wastewater discharges of emerging pollutants of concern such as pharmaceuticals, EDCs and biohazards.

19.6.4 Pass Through and Interference Potential

POTW pollutant removal efficiencies for silver and mercury are relatively high (88% and 90%, respectively), but EPA only has limited data on the amount of pollutant discharges from the Health Services Industry and POTW removal efficiencies of other pollutants of concern, including pharmaceuticals such as antibiotics, hormones, and endocrine-disrupting compounds. As a result, EPA does not have enough information at this time to determine if the pollutants discharged from the Health Services Industry are likely to pass through POTWs.

Based on limited data available, EPA did not identify any pollutants discharged from the Health Services Industry that will interfere with the operations of POTWs. Hospital laundry facilities discharge a certain amount of organic material, FOG, and an alternating range of pH (alkaline detergent followed by an acidic sanitizer). Depending upon the processes employed, the hospital laundry waste stream can have elevated temperatures and pH extremes and can contain starch, particulate (including lint), proteins (blood products), detergents, and oxidizers (bleach or other disinfectant). However, these laundry-related wastes are diluted by the large volume of other hospital wastewater. The majority of hospital wastewater (77 percent) results from cooling (53 percent) and domestic sewage (24 percent), which do not present interference problems. Also, BOD and COD concentrations from hospital laundry wastewater are usually in the normal range for domestic sewage (Johnston, 2005b).

19.6.5 Findings of EPA's CWA Sections 304(g) and 307(b) Review of the Health Services Industry

EPA found that it does not have readily available information to make an informed decision as to whether toxic and non-conventional discharges associated with the health service industries pass through POTWs. For this reason, EPA plans to conduct a detailed study of this industry during the 2007-2008 review cycle. In this detailed study, EPA will attempt to better quantify pollutant discharges in wastewater discharged by health service facilities including endocrine-disrupting compounds. EPA will also investigate whether there are technologies, process changes or pollution prevention alternatives that would significantly reduce discharges to POTWs. Finally, EPA will attempt to evaluate the pass through and interference potential of such discharges.

19.7 Independent and Stand-Alone Laboratories

Independent and stand-alone laboratories include facilities that conduct commercial physical and biological research and laboratories that perform various types of testing. EPA reviewed wastewater discharges from the Independent and Stand-Alone Laboratories Industry in response to comments made on the 2004 Final Plan and the 2006 Preliminary Plan. This section briefly discusses EPA's findings on the Independent and Stand-Alone Laboratories industry.

19.7.1 Comments Received

In response to the 2004 Plan, MCES commented that inspections of Independent and Stand-Alone Laboratories indicate that the wastewater discharges do not warrant regulation (OW-2003-0074-0670), and NRDC included independent and stand-alone laboratories in a list of industries that it believes meet the criteria of Section 304(m)(1)(B) and therefore should have been identified for an effluent guidelines rulemaking (OW-2003-0074-0733)[19]. EPA received no stakeholder comments in response to the 2006 Preliminary Plan about the Independent and Stand-Alone Laboratories industry.

19.7.2 Industry Profile

Independent and stand-alone laboratories are establishments classified under SIC codes 8731 and 8734. Typical operations at independent and stand-alone laboratories include the following: contract research in the healthcare, chemical, natural resources, energy, or manufacturing industries (SIC code 8731); or commercial testing labs in the environmental, material science, healthcare, industrial hygiene, food, and engineering sectors (SIC code 8734) (e.g., forensic laboratories, pollution testing, hydrostatic testing, and radiation dosimetry). EPA did not include medical and dental laboratories in its review of the Independent and Stand-Alone Laboratories industry. EPA included these laboratories in its review of the Health Services Industry, as described in Section 19.3, because medical and dental laboratories have similar wastewater characteristics as hospitals and dental facilities and are often co-located with hospitals and dental facilities.

According to the 2002 Census, SIC code 8731 included 9,173 facilities, and SIC code 8734 included 5,488 facilities. Of these 14,661 independent and stand-alone laboratories, only 0.5 percent (44 facilities) reported discharges to PCS in 2000 (7 major dischargers). Four laboratories reported to TRI in 2000 (one reported direct-only discharges, one reported indirect-

[19] EPA did not identify this industry as a potential new category under section 304(m)(1)(B), as that provision applies only to direct discharging industries subject to effluent guidelines – not to indirect dischargers.

only discharges, one reported both direct and indirect discharges, and one reported no discharge) (Matuszko, 2005b).

19.7.3 Wastewater Characteristics

Laboratory operations typically use low quantities of a wide variety of substances. Operations are also highly variable. As a result, laboratories typically generate a small quantity of a large variety of pollutants.

During this study, EPA could not locate nor did commenters provide a readily available source of discharge data for independent and stand-alone laboratories that discharge to POTWs. TRI contains information on only a single indirect discharging independent and stand alone laboratory. As a result, EPA obtained data on independent and stand-alone laboratories from *PCSLoads2000_v6.* Because PCS data are for direct dischargers, they may or may not be representative of indirect discharging facilities (particularly for conventional pollutants and/or treatment chemicals such as chlorine). Nevertheless, the data provide some indication of the level and types of pollutants that may be present in discharges from independent and stand-alone laboratories. From *PCSLoads2000_v6*, EPA estimates that for SIC codes 8731 and 8734, the industry discharges approximately 34 TWPE and 1 TWPE per year per facility, respectively. The average facility TWPE for SIC code 8731 is largely driven by four facilities that contribute over 95% of the total SIC code 8731 TWPE. If these facilities are considered separately, the average TWPE for facilities in SIC code 8731 is approximately less than 1 TWPE/year. The median flow rate for independent and stand-alone laboratories in SIC code 8731 is 57 MGY. The median flow rate for laboratories in SIC code 8734 is 36 MGY. Table 19-4 summarizes data from *PCSLoads2000_v6.* EPA did not include TRI data in Table 19-4 because only three laboratories had wastewater data in *TRIReleases2000_v6* (a fourth laboratory had no reported water discharges in the 2000 TRI).

Table 19-4. Summary of Wastewater Discharges from the Independent and Stand-Alone Laboratories Industry

Data Source	Total Annual TWPE Before POTW Removal	Number of Facilities Reporting	Annual TWPE per Facility Before POTW Removal
PCSLoads2000_v6	1,200	44	27

Source: *PCSLoads2000_v6*

From *PCSLoads2000_v6,* metals (iron, copper, lead, and silver) and chlorine are the pollutants with the largest discharge in terms of TWPE. Iron is the pollutant with the largest discharge, in terms of TWPE (68% of total TWPE).

19.7.4 Pass Through and Interference Potential

As indicated above, the main pollutants driving the TWPE reported to PCS in 2000 are metals and chlorine. POTW percent removals for these pollutants range from 77 (lead) to 100% (chlorine). Accounting for treatment at the POTWs reduces the TWPE associated with these pollutants substantially. For the industry, the average annual TWPE would be reduced to 5 TWPE per lab, and for SIC code 8731, it would be reduced to less than 10 TWPE per lab.

EPA did not locate nor did commenters provide any data relating to the interferences from Independent and Stand-Alone Laboratory discharges.

19.7.5 Findings of EPA's CWA Sections 304(g) and 307(b) Review of the Independent and Stand-Alone Laboratories Industry

Based on the available information, EPA concludes that overall the pass through potential of toxic and non-conventional pollutants from independent and stand-alone laboratories is low (as measured by hazard per facility). For these reasons, EPA concludes that development of categorical pretreatment standards for independent and stand-alone laboratories is not warranted at this time.

19.8 Industrial Container and Drum Cleaning

The Industrial Container and Drum Cleaning (ICDC) industry includes facilities that clean and recondition metal and plastic drums and intermediate bulk containers for resale, reuse, or disposal. EPA collected data and compiled a Preliminary Data Summary for Industrial Container Drum Cleaning Facilities (PDS) in 2002 (U.S. EPA, 2002). The PDS identified approximately 291 ICDC facilities, all of which discharge indirectly to a POTW.

19.8.1 Comments Received

The Metropolitan Sewer District of Greater Cincinnati (MSD) commented on EPA's Preliminary 2004 and 2006 ELG Plans (OW-2003-0074-0741; OW-2004-0032-1051). They recommended that EPA evaluate the need for ELGs for the drum reconditioning and tote recycling industry. They explained that they had consistent compliance problems with all six drum reconditioning facilities in their district. MSD commented that in discharges from this industry they had found levels of mercury, petroleum oil and grease, pH and zinc that were outside of the acceptable local limits. MSD also suggested that EPA's recent promulgation of ELGs for the Transportation and Equipment Cleaning (TEC) industry changed the operating procedures for the ICDC industry. They suggested that as a result of these changes totes and drums are now more attractive shipping containers than tank trucks, because their discharges are not controlled by an effluent guideline. Washington State Department of Ecology also commented that the ICDC industry is an appropriate category to study.

19.8.2 Industry Profile

ICDC facilities often report under SIC code 7699: Repair Shops and Related Services. However, SIC code 7699 encompasses a wide range of operations, of which drum cleaning and reconditioning is only a small subset (U.S. EPA, 2002). As a result, data for SIC code 7699 from TRI, PCS and the U.S. Economic Census are not representative of ICDC facilities and, therefore, are not presented.

Operations at ICDC facilities are classified into three categories:

- Drum washing;
- Drum burning; and
- Intermediate Bulk Container cleaning/reconditioning.

Drums, which may be constructed of steel or plastic, typically contain oil and petroleum, industrial chemicals, paint and ink, cleaning solvents, resins, adhesives, food, or pesticides. Intermediate bulk containers may contain oil and petroleum, chemicals, or food.

Based on 1994 data, there are a total of 291 ICDC facilities in the U.S., of which 173 also clean transportation equipment (U.S. EPA, 2002). Additional information about the ICDC industry is available from the Reusable Industrial Packaging Association (RIPA), a trade association which represents the industrial container and reconditioning industry in North America. The RIPA web page listed 92 reconditioner members as of 2004 (RIPA, 2004). Also, according to RIPA, the majority of container reconditioners are small businesses as defined by the SBA for SIC code 7699 (RIPA, 2000).

19.8.3 Wastewater Characteristics

Because neither the PCS nor TRI database contains any information specific to discharging ICDC facilities, EPA used information from the 2002 PDS to characterize wastewater generation and pollutants of concern and their concentrations in untreated ICDC wastewaters. According to the 2002 PDS, the ICDC industry generates approximately 280 to 290 million gallons of wastewater per year. The greatest source of wastewater is rinse water. Other sources include: interior preflushes and washes; spent cleaning solutions; exterior washwater; leak testing wastewater; compressor condensate; boiler blowdown; acid washing emissions scrubber water; and label removal.

EPA conducted site visits at three ICDC facilities in 2000 and analyzed wastewater samples collected at these facilities. EPA also collected samples of untreated wastewater (raw wastewater) from four steel drum reconditioning facilities in the 1980s. These data are the basis for EPA's raw wastewater quality estimates for this industry. EPA did not analyze any of the samples collected in the 1980's for dioxins[20]. However, EPA detected dioxins in wastewater samples collected at all three facilities in 2000.

Using information provided in the PDS, EPA estimated the number of ICDC facilities and how they manage their wastewater. These estimates are presented in Table 19-5.

[20] The term dioxins used in this section refers to polychlorinated dibenzo-p-dioxins (CDDs) and polychlorinated dibenzofurans (CDFs), a group of persistent, bioaccumulative, and toxic chemicals. The most toxic of this family of compounds is 2,3,7,8-tetrachlrodibenzo-*p*-dioxin, which is often referred to as 'dioxin.' However, there are 16 other CDDs and CDFs compounds (called congeners) which, like TCDD, include chlorine substitution of hydrogen atoms at the 2, 3, 7, and 8 positions on the benzene rings. In this section, EPA uses the term dioxins to refer to all 17 of the 2,3,7,8-substituted CDDs and CDFs.

Table 19-5. Estimated Number of ICDC Facilities, by Discharge and Treatment

Description	Number of Facilities
Total number of ICDC facilities	291
Do not discharge wastewater because they either completely reuse all wastewater generated or they contract for off-site treatment and disposal.	104
Discharge to POTWs (total)	187
Discharge to POTWs (with pretreatment)	104
Discharge to POTWs (no pretreatment)	83

Using these assumptions about the number of ICDC facilities that discharge and pretreat their wastewaters and sampling data summarized in the PDS, EPA estimated the amount of pollutants discharged to POTWs and to receiving streams. As shown in Tables 19-5 and 19-6, EPA estimated that 187 facilities discharge 28,445 TWPE to their POTWs, including 12,032 TWPE from dioxins. EPA further estimated that the POTWs remove more than 80% of the discharged pollutants, so that baseline discharge for the entire ICDC industry to surface water is approximately 5,000 TWPE. Dioxins account for about 40% (2,000 TWPE) and metals (particularly lead) account for approximately 58% of the baseline load discharged to surface water (Matuszko, 2006).

19.8.4 ICDC On-Site Wastewater Pretreatment

EPA's PDS reported that pretreatment used by ICDC facilities generally consists of oil/water separation or chemical precipitation followed by air flotation (U.S. EPA, 2002). Because EPA lacks effectiveness data for a wide range of pollutants for these treatment technologies as applied to ICDC wastewaters, EPA used performance data from facilities in the Transportation Equipment Cleaning (TEC) Category. EPA used data from TEC facilities that employ technology equivalent to the basis for the PSES for the tank truck cleaning subcategory (oil/water separation, chemical oxidation, neutralization, coagulation, clarification). EPA used these data because ICDC wastewaters are similar to wastewaters from the TEC tank truck subcategory and ICDC pretreatment is similar to TEC tank truck subcategory pretreatment (U.S. EPA, 2002).

However, EPA does not have any information from the TEC rulemaking to characterize the removal of dioxins and furans by this technology basis. In the absence of TEC data, EPA assumed that pretreatment used by ICDC facilities reduces concentrations of dioxins to below the limits of detection, which EPA assumed to be zero for these calculations. This approach reflects conclusions EPA previously made during its 2004 detailed study of the Petroleum Refining Category.[5] During that study, EPA concluded that dioxins can be removed to non-detect levels from refinery wastewaters using oil/water separators.[6]

[5]Results of EPA's detailed study of the Petroleum Refining Category are presented in the *Technical Support Document for the 2004 Effluent Guidelines Program Plan*, Section 7 (U.S. EPA, 2004c).

[6]From *Technical Support Document for the 2004 Effluent Guidelines Program Plan* pp 7-61 to 7-62 (U.S. EPA, 2004c).

19.8.5 Pass Through and Interference Potential

EPA used the traditional pass through evaluation described in Section 19.1 to identify whether there is a significant pass through potential of toxic pollutants and nonconventional pollutants. Specifically, EPA compared toxic pollutant loadings currently discharged to POTWs and surface waters (baseline loadings) to toxic pollutant loadings that would be discharged to POTWs and surface waters upon compliance with pretreatment standards. EPA assumed that ICDC pollutant concentrations would be equivalent to those achieved with the PSES technology basis for TEC Subpart A (Tank Trucks Chemical and Petroleum Cargoes) for all pollutants other than dioxins. As explained above, EPA assumed the technology basis would reduce dioxin concentrations to less than limits of detection (or zero, for these calculations). Table 19-6 summarizes the current baseline loads, the resulting loads if all ICDC facilities pretreated, and the current quantity of toxic pollutants that pass through.

Table 19-6. Estimated Pollutant Loads Discharged by 187 ICDC Facilities

	TWPE without dioxins	TWPE from dioxins	TWPE (total)	TWPE per facility
Baseline load discharged to POTWs	16,413	12,032	28,445	152
Baseline load discharged to surface water	3,007	2,046	5,052	27.0
Load discharged to surface water if all ICDC wastewaters were pretreated	125	0	125	0.67
Additional Pollutants Removed (if all facilities pretreated)	2,882	2,046	4,927	26.3

Source: "Industrial Container and Drum Cleaning Facilities" (Matuszko, 2006).

As shown above, on a per facility basis, EPA estimates ICDC facilities currently annually discharge approximately 27 TWPE (accounting for POTW removals). As shown in Table 19-6, if all ICDC facilities pretreated, this would reduce the pass through on a per facility basis to less than 1 TWPE. EPA performed an analysis of the annual costs to the industry for all ICDC facilities to pretreat their wastewater prior to discharge to the POTW. EPA found that the costs to pretreat significantly exceed the incremental pollutant reductions (>$500/TWPE).

As to interference potential, although MSD noted that ICDC facilities discharging to their treatment system violated local limits, they did not provide information relating to the interference potential from the ICDC industry. EPA did not identify any other information about discharges of ICDC facilities interfering with the operations of POTWs.

19.8.6 Findings of EPA's Review of the ICDC Industry

EPA estimates that the pass through potential of the ICDC industry as a whole approximates 5,000 TWPE annually. EPA performed a pass through analysis assuming all ICDC facilities would employ treatment technology equivalent to the PSES technology basis for the TEC Truck Subcategory. EPA found that the incremental pollutant removals would be small in comparison to the costs of achieving such removals. Furthermore, EPA did not identify any significant interference concerns. Consequently, EPA has concluded that pretreatment standards are not warranted for the ICDC industry at this time because the total incremental toxic pound reductions for the category as a whole are small and because incremental removals on a per facility basis are also small relative to the associated treatment costs.

19.9 Industrial Laundries

Industrial laundries include establishments that are engaged in the following: operating mechanical laundries; or supplying laundered or drycleaned textiles to industrial, commercial, and government users.

In 1999, EPA concluded rulemaking for facilities in the Industrial Laundries point source category. See 64 FR 45071 (August 18, 1999). EPA determined that all facilities in this industry discharge indirectly to POTWs and that indirect discharges from industrial laundries did not warrant national regulation because of the small amount of pollutants removed by the pretreatment options that were found to be economically achievable. At that time, EPA estimated the total annual TWPE for industrial laundries to be 88,000 and that the amount of pollution that would be removed through pretreatment standards would be less than 32 TWPE per facility annually (accounting for POTW removals). In addition, EPA found that POTWs were generally not experiencing problems with discharges from this industry, and that such discharges were unlikely to present a problem at the national level. EPA found that to the extent that isolated problem discharges occur, existing pretreatment authority is available to control these isolated discharges. EPA concluded that for this industry, the best way to control effluent discharges of certain organic pollutants is to remove the pollutants which are contained on the laundry items before they are washed, rather than establishing categorical pretreatment standards for discharges from this industry.

In addition, at the time of EPA's final decision, representatives from this industry agreed to a voluntary pollutant reduction program. The industry refers to this program as the Laundry Environmental Stewardship Program or LaundryESP®. The industry designed this program to encourage improvement in four areas: water usage; energy usage; pollutant discharges to the sewer; and use of wash chemicals with a more positive environmental profile. As part of this program, the industry has been collecting information from program participants in four improvement areas. In 2004, the industry collated this information and provided a summary of the results to date.

EPA conducted a review of discharges from the Industrial Laundries industry based on comment received in response to the 2004 Final Plan. EPA used the information from the 2004 summary information from the LaundryESP® program as the primary information source to update the data collected for the 1999 final action. This section briefly discusses EPA's findings on the Industrial Laundries industry.

19.9.1 Comments Received

In response to the 2004 Plan, MCES commented that little benefit would be attained from categorical standards for industrial laundries (OW-2003-0074-0670), and the Uniform and Textile Service Association (UTSA) provided information on LaundryESP®, a voluntary program that they believe has been successful at raising the environmental performance of industrial laundries (OW-2003-0074-0720). EPA also received stakeholder comments in response to the 2006 Preliminary Plan. UTSA and King County Wastewater Treatment Division agreed with EPA's conclusion that categorical pretreatment standards are not necessary for the Industrial Laundries industry (OW-2004-0032-1064 and 1042), while the Arkansas DEQ recommended that EPA revisit pretreatment standards for the industry (OW-2004-0032-0678).

19.9.2 Industry Profile

Industrial laundries primarily include facilities in SIC codes 7211 and 7218. Brief descriptions of these SIC codes are as follows:

- 7211: Establishments primarily engaged in operating mechanical laundries with steam or other power.
- 7218: Establishments primarily engaged in supplying laundered or drycleaned work uniforms, wiping towels, protective apparel (gloves, flame resistant clothing, etc.), dust control items (treated mats or rugs, mops, cloths, etc.), and similar items to industrial, commercial, and government users.

According to 1997 U.S. Census Bureau data, there are approximately 3,100 industrial laundry facilities in the United States. From data collected for the 1999 Final Action, there are 1,700 U.S. industrial laundries. No industrial laundry facilities reported to TRI or PCS in 2000 (Matuszko, 2005c).

19.9.3 Wastewater Characteristics

The LaundryESP® program established goals to reduce water and energy usage by 10 to 25 percent per pound of textile processed, a reduction of 20,000 TWPE of pollutants discharged, and 10 to 25 percent substitution of wash chemicals with chemicals with a more positive environmental profile. The results of this program's review are summarized below.

As of 2002, 750 industrial laundry facilities were participating in the LaundryESP®. According to industry documents, this participation accounts for nearly 70 percent of the industry's revenue (2002). From 1997-2002, the industry conducted three facility surveys, one pollutant data survey, and three wash chemical surveys (Matuszko, 2005c).

A review of the 2002 LaundryESP® data by the UTSA and the Textile Rental Service Association (TRSA) indicated that 326 of the 562 reporting facilities (58 percent) used one or more of the following wastewater treatment systems: air stripping, carbon absorption, centrifuging, chemical emulsion breaking, dissolved air flotation, induced air flotation, microfiltration, oil skimming, oil/water separation, pH adjustment, polishing filters, reverse osmosis, rotary screening, and ultrafiltration (Matuszko, 2005c).

The LaundryESP® data demonstrate that from 1997 to 2002 the participating facilities reduced water usage per pound of textile processed by 12.5 percent: from an average of 2.61 gallons/pound of textile processed to an average of 2.28 gallons/pound of textile processed. In addition, the industry reduced its water usage by 5.5 billion gallons from 1997 to 2002. Energy usage showed a similar trend with an 11.8 percent reduction in the energy use/pound of textile processed. The average energy usage dropped from 3,650 btu/lb to 3,219 btu/lb. The industry also saw a 100 percent increase (from 3 to 6 million lbs/yr) in the use of peroxide bleaches as wash chemicals which have fewer toxic byproducts than the standard wash chemicals (Matuszko, 2005c).

One way facilities have reduced water usage is through installation of tunnel washers, which have a built-in "reuse cycle" where the final rinse water is automatically cycled back to the first rinse. According to the industry, there is also an industry-wide increase in pollution prevention activities such as installation of more efficient washers and extractors, and use of detergents that allow for lower wash temperatures and a lower pH for the removal of oils and grease (Matuszko, 2005c).

The LaundryESP® database also demonstrated overall toxic pollutant reductions from 1998 to 2002. Table 19-7 summarizes the discharges from the industrial laundries industry as a whole from 1998 to 2002, based on information in the LaundryESP® database[1] (Matuszko, 2005c).

Table 19-7. Pollutant Discharges from Industrial Laundry Facilities (Measured as TWPE)

Year	TWPE
1998	40,677
1999	29,090
2000	32,830
2001	22,277
2002	23,162

Data Source: LaundryESP®; "Industrial Laundries" (Matuszko, 2005c).

19.9.4 Pass Through and Interference Potential

The industrial laundries industry has worked to reduce discharges since EPA's 1999 Final Action. Based on the approximately 750 laundries and 23,000 TWPE estimated for 2002 in Table 19-7, the average annual TWPE is less than 31 TWPE per facility, prior to treatment at the POTW.

In terms of interference potential, EPA did not locate nor did commenters provide any updated data relating to the interference potential from the Industrial Laundries industry.

[1]The industry calculated the TWPE estimates using information in its database and TWFs from the 1999 Industrial Laundries record.

19.9.5 Findings of EPA's Review of the Industrial Laundries Industry

Based on the industry's 2004 evaluation of the Laundry ESP program, EPA concludes that pollutant discharges from industrial laundries have decreased since its 1999 decision not to establish categorical pretreatment standards for this industry. Therefore, pass through and interference potential from industrial laundries continues to be low (as measured in hazard per facility), and development of categorical pretreatment standards for industrial laundries continues to be unwarranted at this time.

19.10 <u>Photoprocessing</u>

The Photoprocessing industry includes establishments that are engaged in providing the following services: portrait photography for the general public; commercial photography; commercial art or graphic design; or photo finishing.

In 1976, EPA promulgated a final rule establishing BPT for the Photographic Category (Part 459). BPT regulations under Part 459 limit direct discharges of wastewater for silver, cyanide, and pH. In 1997 published EPA a Preliminary Data Study for the Photoprocessing Industry (1997 PDS) (U.S. EPA, 1997). That study noted that most photoprocessing facilities are small (less than 10 employees), typically discharge less than 1,000 gallons/day of wastewater, and overwhelmingly discharge to POTWs. As a result, EPA reviewed discharges from photoprocessing facilities as part of the categories composed primarily of indirect dischargers. This section briefly discusses EPA's findings on the Photoprocessing industry.

19.10.1 Comments Received

EPA received no stakeholder comments in response to the 2004 Plan about the Photoprocessing industry. EPA received comments from the King County Wastewater Treatment Division in response to the 2006 Preliminary Plan, stating that categorical pretreatment standards are not necessary for the Photoprocessing industry (see OW-2004-0032-1042).

19.10.2 Industry Profile

The Photoprocessing industry includes facilities in SIC codes 7221, 7335, 7336, and 7384. The 1987 SIC Code Manual defines these SIC codes as follows:

- 7221: Establishments primarily engaged in still or video portrait photography for the general public. Included in this classification are school, home, and transient portrait photographers.

- 7335: Establishments engaged in providing commercial photography services for advertising agencies, publishers, and other business and industrial users.

- 7336: Establishments primarily engaged in providing commercial art or graphic design services for advertising agencies, publishers, and other business and industrial users. Included in this classification are producers of still and slide films.

- 7384: Establishments primarily engaged in developing film and photographic prints and enlargements. Data for retail outlets (kiosks), which are owned and operated by photo finishing laboratories for the pickup and delivery of film, are merged with data for the laboratory which owns them and are not treated as separate establishments.

The PCS database contains little information on this industry because it consists primarily of indirect dischargers. The PCS database contains discharge information for only one facility for the year 2000. No facilities in the photoprocessing industry reported to TRI in 2000 (Matuszko, 2005d). The TRI database contains little information on this industry, in part, because the majority of photoprocessing facilities have few employees and are not required to report to TRI.

19.10.3 Wastewater Characteristics

EPA obtained information on the photoprocessing industry's wastewater sources and characteristics from the 1997 PDS. Process water used in photoprocessing consists of (1) film and paper wash water; (2) solution make-up water; and (3) area and equipment wash water. According to the 1997 PDS, photoprocessors typically discharge less than 1,000 gallons of wastewater per day. The 1997 PDS also documents 296 million square feet of film and 4,130 million square feet of paper processed per year. EPA estimates that the total U.S. wastewater discharge for the Photoprocessing industry was 2,260 million gallons per year (MGY) in 1994 and 1,840 MGY in 2003 (Matuszko, 2005d).

Silver from silver-halide printing accounts for the majority of the TWPE associated with photoprocessing wastewater. Table 19-8 summarizes the wastewater discharges from the photoprocessing industry.

Table 19-8. Summary of Wastewater Discharges from the Photoprocessing Industry

Data Source	Total Annual TWPE[a]	Number of Facilities Estimated in Industry[b]	Annual TWPE per Facility
Raw Discharges (before POTW removal)	2,543,010	39,393	64.6
Treated Discharges (after POTW removal)	300,969	39,393	7.64

Source: "Photoprocessing" (Matuszko, 2005d).
[a]2003 estimates (using 1997 PDS pollutant concentrations and 2003 wastewater flows)
[b]Estimates from 2002 U.S. Census Bureau (U.S. Census, 2002)

The industry trend towards digital photography may decrease the discharge of silver-laden wastewater associated with silver-halide printing. The use of digital photography and digital printing increased in the U.S. from 2002 to 2004. In 2002, digital cameras were owned by 18 percent of adults. In 2003, digital cameras were owned in 30 to 50 percent of U.S.

households. In 2004, shipments of digital still cameras in the U.S. grew by roughly 30 percent, indicating digital camera use in 60 to 80 percent of U.S. households (Matuszko, 2005d).

Contrarily, pictures from digital cameras can still be printed using silver-halide technology, for better quality. Although this is not currently an identified trend, film manufacturers have incentive to establish this trend, to keep their part of the market share (Matuszko, 2005d).

19.10.4 Wastewater Treatment and Pollution Prevention

EPA estimates that discharges of silver account for 99 percent of the toxic load discharged by the photoprocessing industry. According to the 1997 PDS, silver recovery is almost always practiced to some extent at photoprocessing facilities. The most common methods of silver recovery are metallic replacement and electrolytic recovery.

Many POTWs have stringent silver limits in their NPDES permits or need to reduce metals concentrations in biosolids. POTWs have identified photographic facilities as a whole as a major source of silver. In an attempt to provide photoprocessing facilities and POTWs with a cost-effective alternative to numeric limits and monitoring, in 1997, NACWA (formerly AMSA), the Silver Council, and two industry groups for the Photographic industry developed a “Code of Management Practices for Silver Dischargers” (Silver CMP). The Silver CMP provides recommendations on control technologies and management practices for controlling silver discharges to POTWs, and encourages pollution prevention technologies such as water conservation. The recommended practices are defined by a minimum recovery of silver from silver-rich processing solutions (e.g., 90%, 95%, and 99%). The minimum recovery and recommended practices vary with the size of the photoprocessor, defined by flow volume of silver-rich solution and wash water. Four POTWs documented loadings reductions of 20 to 52 percent over historical baselines after CMP implementation (Matuszko, 2005d).

19.10.5 Pass Through and Interference Potential

As described above, pollutant loading estimates based on most recent information available indicate annual TWPE discharges for the industry are approximately 300,000 (over 99% due to silver). On a per facility basis, accounting for a POTW removal for silver of 88%, this equates to discharges of less than 10 TWPE per facility per year. As to interference potential, EPA did not locate nor did commenters provide any updated data relating to the interference potential from discharges from photoprocessing wastewater.

19.10.6 Findings of EPA’s Review of the Photoprocessing Industry

EPA’s review of current information indicates that there is not a significant concern with pass through and interference at POTWs from this industry’s discharges. EPA concludes that categorical pretreatment standards are not warranted for this industry at this time.

19.11 Printing and Publishing

Printing and publishing establishments are engaged in operations that include five main printing processes: lithographic printing; screen printing; flexographic printing; letterpress printing; and gravure printing.

In October of 1983, EPA published a study of the Printing and Publishing industry, entitled *Summary of Available Data on the Levels and Control of Toxic Pollutant Discharges in the Printing and Publishing Point Source Category* (1983 Data Summary) (U.S. EPA, 1983). At that time, EPA concluded that national pretreatment standards were not warranted due to the small quantity of toxic pollutant discharges associated with this industry (0.0021 to 0.914 pounds per day per facility). This section briefly discusses EPA's findings from the most recent review of the Printing and Publishing industry.

19.11.1 Comments Received

In response to the 2004 Plan, MCES commented that categorical pretreatment standards are not warranted for the Printing and Publishing industry (OW-2003-0074-0670), and NRDC suggested that EPA develop regulations for the industry that focus on preventing pollution by substituting materials, minimizing changeover, and recycling ink (OW-2003-0074-0733)[21]. EPA received comments from the King County Wastewater Treatment Division in response to the 2006 Preliminary Plan stating that categorical pretreatment standards are not necessary for the Printing and Publishing industry (see OW-2004-0032-1042).

19.11.2 Industry Profile

The Printing and Publishing industry includes facilities in SIC codes 2732, 2752, 2754, 2759, 2761, 2771, 2782, 2789, 2791, 2796, and 7334. Brief descriptions of these SIC codes are as follows:

- 2732: Book printing;
- 2752: Commercial printing, lithographic;
- 2754: Commercial printing, gravure;
- 2759: Commercial printing, not elsewhere classified;
- 2761: Manifold business forms;
- 2771: Greeting cards;
- 2782: Blankbooks and looseleaf binders;
- 2789: Bookbinding and related work;
- 2791: Typesetting;
- 2796: Platemaking services; and
- 7334: Photocopying and duplicating services.

According to the U.S. Census Bureau, there were approximately 49,000 printing and publishing facilities in 1997 and 43,000 facilities in 2002. Of these facilities, 202 reported to TRI in 2000. Sixty-two percent of these facilities reported no wastewater discharges, 37 percent

[21] EPA did not identify this industry as a potential new category under section 304(m)(1)(B), as that provision applies only to direct discharging industries subject to effluent guidelines – not to indirect dischargers.

reported only indirect discharges, and one percent reported both direct and indirect discharges. Twenty-one printing and publishing facilities reported to PCS in 2000 (two were classified as major dischargers). The direct dischargers captured in the PCS database represent less than 0.05 percent of the industry. Thus, EPA estimates that the vast majority of printing and publishing facilities are indirect dischargers (Matuszko, 2005e).

19.11.3 Wastewater Characteristics

The EPA's October 1983 Summary of Available Data on the Levels and Control of Toxic Pollutant Discharges in the Printing and Publishing Point Source Category (1983 Data Summary) contains information on wastewater generation. According to the 1983 Data Summary, wastewater flows in the industry generally range from 26 to 50 gallons per day and are often not continuous. The 1983 Data Summary also found that the facilities with the largest flows are direct dischargers and only 3.7 percent of printers discharge more than 5,000 gpd of wastewater (Matuszko, 2005e).

No establishments reported wastewater flow data to TRI in 2000. In the 2000 PCS database, 21 facilities report direct discharges, and their flows range from 241 to 2.5 million gallons per day with a median wastewater flow of 0.02 million gallons per day (MGD) (Matuszko, 2005e).

While PCS data is limited for this industry, these more recent data indicate that wastewater discharge volumes may have decreased from those presented in the 1983 Data Summary. This finding is consistent with case studies documenting water reduction practices (Massachusetts Office of Technical Assistance, Connecticut Department of Environmental Protection, and the Enviroene Web Page) (Matuszko, 2005e).

EPA obtained discharge data for the untreated wastewater (before POTW treatment) from the Printing and Publishing industry from reported releases to PCS and TRI in 2000. Based on these data (1,630 TWPE[22] discharged from the 76 TRI-reporting facilities in 2000), approximately 21 TWPE is discharged per facility per year.

Eight facilities collectively contribute approximately 81 percent of the total industry TWPE in treated wastewater based on 2000 TRI data (accounting for POTW removals)[23]. Ninety-nine percent of the TWPE discharges from these eight facilities are indirect discharges of copper, which EPA estimated at approximately 44 TWPE per facility based on an estimated facility TPWE of 255 (reported ranges of 11 – 499 TWPE) and accounting for POTW removals. EPA contacted five of these facilities (four companies) to determine the source of copper. These facilities explained that the gravure printing process involves copper and chrome

[22] The 2005 memorandum (Matuszko, 2005e) lists the industry TWPE (before POTW treatment) as 1,907, which includes 279.98 TWPE of sodium nitrite discharged from the Citiplate, Inc. facility. In response to comments on the proposed 2006 Plan, EPA revised its methodology for sodium nitrite. See Section 4.2 and DCN 03675. The revised sodium nitrite TWPE from Citiplate, Inc. (before POTW treatment) is 0.486.

[23] The 2005 memorandum (Matuszko, 2005e) lists nine facilities contributing approximately 90 percent of the total industry TWPE. EPA calculated this industry TWPE including sodium nitrite discharges from the Citiplate, Inc. facility based on an older methodology described in footnote 4. In addition, in response to comments, EPA updated the POTW removal rate for sodium nitrite. See Section 4.2 and DCN 03676. The revised sodium nitrite TWPE from Citiplate, Inc. (accounting for POTW removal) is 0.0486.

plating of the printing cylinders. The cylinders are de-chromed and de-coppered after every print job, and then re-plated with chrome and copper for the next image imprinting. Etching, polishing and rinsing of the copper plated cylinders releases copper into the wastewater. Copper is also present in the discarded sludge from blue and green inks (Matuszko, 2005e).

Of the five facilities that EPA contacted, all perform gravure printing in addition to other types of printing. Also, four facilities use analytical data to estimate the range of copper transferred to the POTW. The fifth facility back calculates the amount transferred based on copper in filter cake from pretreatment, and the efficiency of the pretreatment system (Matuszko, 2005e).

19.11.4 Wastewater Treatment and Pollution Prevention

Based on the 1983 Data Summary, most printing and publishing facilities do not perform wastewater treatment on site.

19.11.5 Pass Through and Interference Potential

Seventy six facilities reported discharges to TRI in 2000 from printing and publishing facilities. After accounting for POTW removals, the majority of these facilities discharge approximately 1 TWPE per facility annually. TWPE for the eight facilities described in Section 19.11.3 (including platemaking, gravure printing, lithographic printing, and greeting card printing facilities) approximate 44 TWPE per facility annually. Table 19-9 presents the year 2000 TRI discharge data for treated and untreated wastewater.

Table 19-9. Summary of Wastewater Discharges from the Printing and Publishing Industry

Data Source	Total Annual TWPE[a,b]	Number of Facilities Reporting[a]	Annual TWPE per Facility
TRIReleases2000_v6 (Before POTW removal)	1,630	76	21.4
TRIReleases2000_v6 (After POTW removal)	440	76	5.79

Source: "Printing and Publishing" (Matuszko, 2005e)
[a]Includes direct and indirect dischargers.
[b]Accounts for reduced TWPE from Citiplate, Inc. sodium nitrite discharge as described in footnotes 4 and 5.

Regarding interference potential, EPA did not locate nor did commenters provide any updated data relating to the interference potential from the printing and publishing industry.

19.11.6 Findings of EPA's Review of the Printing and Publishing Industry

EPA's review of current information indicates that there is not a significant concern with pass through and interference at POTWs from this industry's discharges. EPA therefore finds that categorical pretreatment standards are not warranted for this industry at this time.

19.12 <u>Tobacco Products</u>

The Tobacco Products industry is composed of facilities that manufacture the following: cigarettes; cigars; smokeless tobacco (i.e., chewing, plug/twist, and snuff tobacco); loose smoking tobacco (i.e., pipe and roll-your-own cigarette tobacco); and reconstituted (sheet) tobacco; as well as facilities engaged in the stemming and redrying of tobacco.

EPA identified the Tobacco Products industry for review because one public comment on the preliminary 2004 Final Plan suggested that EPA consider developing tobacco products effluent guidelines. In particular, the commenter expressed concern over the quantity of toxics and carcinogens that may be discharged in wastewater associated with the manufacture of cigarettes. At the time of publication of the 2004 Final Plan, EPA was unable to determine, based on readily available information, whether to identify Tobacco Products as a potential new category in the Plan. In particular, EPA lacked information on whether Tobacco Products facilities discharge toxic and nonconventional pollutants in nontrivial amounts, whether the industry is composed of entirely or almost entirely indirect dischargers, and whether indirect dischargers in the industry cause pass through or interference with POTWs. In order to determine whether to identify the tobacco products industrial sector as a potential new point source category, EPA conducted a detailed study of the pollutant discharges for this industrial sector.

During its detailed study of this industry, EPA determined that most tobacco products facilities discharge their wastewater to POTWs. EPA therefore determined that this category is almost entirely composed of indirect dischargers and is therefore not subject to identification as a potential new category for effluent guidelines under CWA section 304(m)(1)(B). EPA therefore proceeded to review this industry in its review of indirect dischargers without categorical pretreatment standards to determine whether to establish such standards under CWA Sections 304(g) and 307(b).

This section briefly discusses EPA's findings on the Tobacco Products industry. For a complete discussion of EPA's review, see *Final Engineering Report: Tobacco Products Processing Detailed Study* (U.S. EPA, 2006).

19.12.1 Comments Received

As described above, EPA received one comment on its Preliminary 2004 Plan that it should consider developing ELGS for the tobacco products industry. On its Preliminary 2006 Plan, EPA received four comments that it should not develop ELGs for the tobacco products industry: one from a POTW association, NACWA; one from the City of Winston-Salem, NC; and two from tobacco companies. R.J. Reynolds (Reynolds American) provided information on its tobacco products processes and study reports on the biodegradability of nicotine (OW-2004-0032-1096). For an evaluation of these study reports, see *Comments on the Four Reports Submitted by R.J. Reynolds Tobacco Company in Response to Request for Data in the Notice of Availability of Preliminary 2006 Effluent Guidelines Program Plan* (Upgren, 2006). Lorillard Tobacco Company provided a Sewage Collection and Water Reclamation Plant Report for 2004 for the City of Greensboro (OW-2004-0032-1105.1). The City of Winston-Salem provided pollutant concentrations and other information on the wastewater that tobacco products facilities discharge to one POTW (OW-2004-0032-1061). NACWA stated that indirect dischargers within the tobacco products industry are efficiently regulated by local pretreatment programs (OW-2004-0032-1093).

19.12.2 Industry Profile

This Tobacco Products industry is divided into the following four industry groups:

- SIC code 2111 (Cigarettes): establishments primarily engaged in manufacturing cigarettes from tobacco or other materials;
- SIC code 2121 (Cigars): establishments primarily engaged in manufacturing cigars;
- SIC code 2131 (Smokeless and Loose Chewing Tobacco): establishments primarily engaged in manufacturing chewing and smoking tobacco and snuff; and
- SIC code 2141 (Reconstituted Tobacco and Tobacco Stemming and Re-drying): establishments primarily engaged in the stemming and re-drying of tobacco or in manufacturing reconstituted tobacco.

Based on information in the 2002 Economic Census and reported in 2004 to the U.S. Alcohol and Tobacco Tax and Trade Bureau (TTB), EPA estimates there are 149 tobacco products facilities in the United States. The number of tobacco products processing facilities has been in decline as facilities consolidate. Of these facilities, EPA has identified three facilities with active NPDES permits that discharge process wastewater directly to waters of the U.S. and at least 15 facilities that discharge indirectly to POTWs. The remaining dischargers are either indirect dischargers or zero dischargers.

19.12.3 Wastewater Characteristics

In conducting its detailed study, EPA conducted outreach to the most significant dischargers in this category. These companies have provided extensive information on processes, pollutant discharges and existing permits. Based on information collected to date, EPA believes that primary processing at cigarette manufacturers and their related reconstituted tobacco operations are the main source of discharged wastewater pollution in this industrial sector.

EPA conducted site visits at six tobacco product facilities: four cigarette manufacturing facilities and two dedicated reconstituted tobacco facilities. In addition to collecting information on processes and wastewater generation, EPA also collected grab samples of wastewater during these site visits. EPA collected these wastewater samples to: (1) further characterize wastewater generated and/or discharged at these facilities; and (2) evaluate treatment effectiveness, as applicable. For the sites visited, EPA also contacted states and POTWs to obtain existing permits and identify concerns. Finally, EPA reviewed and evaluated comments from the Preliminary 2006 Plan regarding the tobacco products processing industry.

EPA's review of effluent data from indirect discharging tobacco products processing facilities demonstrates that such discharges are generally characterized by low concentrations of toxic and nonconventional pollutants – primarily metals. One exception is nicotine, with discharge concentrations ranging from 7,500 ug/L to 31,000 ug/L. Nicotine and metals discharges account for approximately 93% of the total annual TWPE associated with indirect tobacco products processing discharges. Source water appears to be the biggest contributor to metal discharges at both indirect and direct discharging facilities (U.S. EPA, 2006).

19.12.4 Wastewater Treatment

EPA did not identify any indirect discharging tobacco products processing facilities that operate pretreatment. As a result, EPA also reviewed wastewater discharge data from direct dischargers in this category. Biological treatment with or without nutrient removal is the most commonly employed wastewater treatment technology. Treatability data collected from tobacco products processing facilities demonstrate on site wastewater treatment systems are highly efficient with BOD_5 and nicotine removals in excess of 99 percent. Resulting discharges are characterized by low concentrations of toxic and nonconventional pollutants – primarily metals. However, based on available data, these metal discharges largely result from source water contributions (U.S. EPA, 2006).

19.12.5 Pass Through and Interference Potential

EPA used the traditional pass through evaluation described in Section 19.1 to identify whether there is a significant pass through potential of toxic pollutants and nonconventional pollutants. Specifically, EPA compared toxic pollutant loadings currently discharged to POTWs and surface waters (baseline loadings) to toxic pollutant loadings that would be discharged to POTWs and surface waters upon compliance with pretreatment standards based on biological treatment with nutrient removal (BNR) (potential post-regulatory loadings). EPA considered BNR treatment technology to be the BAT because both of the direct discharge tobacco facilities sampled by EPA used this technology and based on influent and effluent data collected from these two facilities, EPA determined that BNR treatment systems are generally effective at reducing pollutants in tobacco products wastewater. From this evaluation, EPA found the annual incremental toxic pollutant removals per facility would be small, approximately 29 TWPE/facility (U.S. EPA, 2006), which are similar to the incremental removals EPA calculated for the withdrawn Industrial Laundries proposed rulemaking (32 TWPE/facility). See 64 FR 45071 (August 18, 1999). EPA also performed an analysis of the annual costs for facilities to pretreat using the BNR technology prior to discharge to the POTW. EPA found that the costs to pretreat were well in excess of the incremental pollutant reductions (>$10,000/TWPE removed).

EPA also evaluated possible negative effects of discharges from tobacco products processing facilities to POTWs. As explained above, nicotine and metals account for approximately 93% of the total annual TWPE associated with indirect discharges from this category. Based on information obtained in this study, POTWs achieve nicotine removals in excess of 96%. EPA compared the concentrations of metals found in indirect tobacco products processing discharges to those typically found in POTW influent. This comparison demonstrated that metals concentrations discharged by tobacco products processing facilities are lower than those found in typical POTW influent. Based on these findings, EPA believes that tobacco products processing discharges should not have negative impacts on the receiving POTWs (U.S. EPA, 2006).

To verify this finding, EPA contacted POTWs receiving significant tobacco products processing discharges. All POTWs contacted indicated they had experienced little to no problems with such discharges and that they had no problem handling and treating tobacco products processing discharges.

19.12.6 Findings of EPA's Review of the Tobacco Products Industry

EPA has found that national pretreatment standards are not warranted for this category at this time because there is low potential for pass through (as measured by incremental toxic pollutant removal) or interference at POTWs.

EPA also reviewed wastewater discharge data from the three direct dischargers in this category and found that national effluent guidelines for direct dischargers are unwarranted at this time, as discharges from these facilities are best addressed through effluent limits established by permit writers on a case-by-case BPJ basis.

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20.0 REVIEW OF DIRECT DISCHARGERS WITHOUT EFFLUENT LIMITATIONS GUIDELINES TO IDENTIFY POTENTIAL NEW REGULATORY CATEGORIES FOR EFFLUENT GUIDELINES RULEMAKING

CWA Section 304(m)(1)(B) requires EPA to identify in a plan categories of sources discharging non-trivial amounts of toxic and non-conventional pollutants to waters of the U.S. Based on stakeholder comment and its own crosswalk analysis (see Section 4.1.1), EPA found two industries that were potentially subject to identification under section 304(m)(1)(B): the liquefied natural gas (LNG) import terminals industry and the miscellaneous foods and beverages industry. This section presents EPA's review of these two industries to determine whether to identify them as potential new categories in the 2006 Plan. EPA did not find any other industries that meet the potential identification criteria in section 304(m)(1)(B). See the memorandum entitled, "Commenter-Identified Industries Not Meeting 304(m)(1)(B) Criteria," dated December 1, 2006 (Matuszko, 2006b).

Based on its analysis, EPA is not identifying either of these industries as potential new categories in the 2006 Plan because EPA does not believe that ELGs would be an appropriate tool for regulating discharges from either of these industries. In assessing whether ELGs would be appropriate, EPA is required to considers the various factors in section 304(b)(2)(B) in establishing ELGs for an industrial activity – including the availability of treatment technology, economic achievability, non-water-quality environmental impacts, and "such other factors as the Administrator deems appropriate." EPA believes that section 304(m)(1)(B) gives EPA the discretion to identify in the Plan only those new categories for which EPA believes ELGs may be an appropriate tool. See Norton v. Southern Utah Wilderness Alliance, 542 US 55, 70 (2004) (holding that a broad statutory mandate is not sufficient to constrain an Agency's discretion over its internal planning processes). Instead, EPA believes that discharges from these industries can best be addressed through case by case BPJ-based permit limits, rather than through categorical ELGs. BPJ is a particularly appropriate tool where – as here – there is significant site-specific variability in terms of facility design. A BPJ case-by-case approach would enable permit writers to best capture the technical considerations that might influence the identification of the appropriate pollutant control technology and effluent limits.

20.1 <u>Liquefied Natural Gas Import Terminals</u>

This subsection discusses the comments received on liquefied natural gas (LNG) import terminals and presents a brief industry and economic profile.

20.1.1 Comments Received

EPA received two comments in response to the Preliminary 2006 Plan suggesting that EPA identify LNG import terminals as a potential new category in the Final 2006 Plan.

Specifically, these two commenters suggested that EPA consider establishing ELGs for pollutant discharges from LNG import terminals that use open-loop re-gasification systems, specifically offshore facilities in the Gulf of Mexico. These commenters cited potential impacts on the marine environment from discharges that contain anti-biofouling agents and thermal pollution (cold wastewater). These commenters suggested that EPA consider promulgating effluent guidelines for this industrial sector based on closed-loop re-gasification technologies (EPA-HQ-OW-2004-0032-1094 and 1056).

20.1.2 Category/Subcategory Analysis

The LNG import terminal industry is not currently subject to a categorical ELGs. To determine whether this industry is subject to identification under CWA section 304(m)(1)(B), EPA first assessed whether this industry was properly considered a stand-alone category, or whether it should be considered a potential new subcategory of an existing category and reviewed under CWA section 304(b). EPA reviewed the ELGs for the existing 56 industrial point source categories to determine whether the LNG industry could be considered a potential new subcategory of any of these categories. EPA found that some of the minor wastestreams from LNG import terminals (e.g., deck drainage, gray water, and sanitary water) are similar to wastewaters regulated by the Oil and Gas Extraction ELGs (see 40 CFR part 435, Subpart A), and therefore considered whether the LNG industry could be considered a potential new subcategory of this industrial category.

However, EPA found that LNG import terminals perform an entirely different service than facilities in the Oil and Gas Extraction Category, and therefore should not be considered a potential new subcategory. Specifically, while facilities in the Oil and Gas Extraction Category engage in the extraction of raw materials, LNG import terminals process (or "regasify") the raw material after it has been extracted, liquefied, and delivered to the facility. Thus, the service performed by LNG import terminals is analogous to the Petroleum Refining Category (40 CFR Part 419) – also a stand-alone category that processes a raw material (in that case, oil) extracted by oil and gas extraction facilities. Moreover, the wastewaters associated with the open-loop re-gasification industrial processes performed by LNG facilities are significantly different than the wastewaters associated with facilities in the Oil and Gas Extraction Category. Consequently, EPA determined that this industry constitutes a potential stand-alone category within the meaning of CWA section 304(m)(1)(B). EPA therefore proceeded to analyze whether ELGs would be an appropriate tool for addressing discharges from this category, as discussed below.

20.1.3 Industry Profile

After natural gas has been extracted and liquefied (through cooling to about minus 260°F), it is transported by vessels to LNG import terminals for processing (known as "re-gasification.") Figure 20-1 (Chinloy, 2005) depicts the function of LNG import terminals in the overall context of natural gas production – from extraction to distribution to consumers.

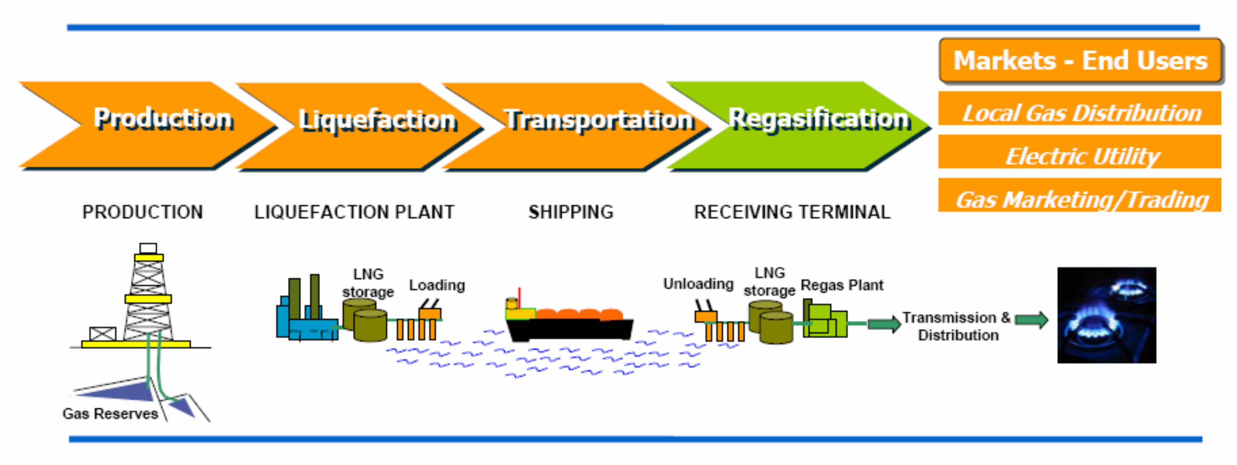

Figure 20-1. General Description of LNG Importation (Chinloy, 2005)

Interest in LNG imports has been rekindled by higher U.S. natural gas prices in recent years, as well as increased competition and technological advances that have lowered costs for liquefaction, shipping, storing, and re-gasification of LNG (U.S. DOE, 2004). However, although LNG imports exceeded historical highs in 2003, even at the current pace they represent only about 2.7 percent of U.S. consumption and 13 percent of imports. In a 2006 report, the U.S Department of Energy (DOE) estimated that total capacity at U.S. LNG facilities will increase from 1.4 trillion cubic feet (tcf) to 4.9 tcf in 2015, when net LNG imports are expected to total 3.1 tcf (imports are thus 58 percent of capacity) (EIA, 2006). DOE then predicts that LNG construction will slow after 2015. Capacity in 2030 is expected to be 5.8 tcf, with imports totaling 4.4 tcf (76 percent of capacity). DOE revised its projections of LNG downward from its 2005 report (which reported that DOE expected LNG exports to be 6.4 tcf in 2025) because it believes that more rapid growth in worldwide demand for natural gas than predicted in 2005 will reduce the availability of LNG supplies, raise worldwide gas prices, and make LNG less economical in U.S. markets. Thus, LNG is expected to meet 16 percent of U.S. natural gas demand in 2030. U.S. demand for natural gas is expected to total 27 tcf at that time. The range of uncertainty for this estimate of LNG imports in 2030 is large. DOE's low and high estimates range from 1.3 tcf (a flat growth scenario) to more than double the reference case estimate (9.6 tcf). Despite DOE's downward adjustment to projected LNG imports, imports are still expected to grow under DOE's reference case assumptions.

EPA identified two major factors that affect the pollutant discharges and potential pollutant control technology options for this industrial sector:

- Type of re-gasification technology used (i.e., open-loop or closed-loop); and
- Location of the facility (i.e., onshore or offshore) is the cost to liquefy the gas.

20.1.3.1 Type of Re-gasification Technology Employed

During the re-gasification process, the LNG is warmed from minus 260°F to 40°F and increases three fold in volume. Re-gasification of LNG is an endothermic process and requires a heat source. The LNG is pumped through a heating system, where it absorbs heat and vaporizes, or regasifies, into natural gas. EPA considered the two main types of re-gasification technologies (open-loop vs. closed-loop) because the type of re-gasification technology directly influences the amount and toxicity of the potential pollutant discharges. The CWA gives the Agency authority to consider process changes to evaluate technology-based controls of industrial wastewater pollutants (see "process changes" at CWA 304(b)).

LNG import terminals that use open-loop re-gasification extract heat energy from surface water withdrawals in a once-through warming process. There are a number of open-loop re-gasification technologies that include open rack vaporizers (ORV) and shell and tube vaporizers that withdraw and discharge large quantities of surface waters (e.g., 100 to 200 MGD) for the endothermic process. Antibiofouling chemicals (e.g., sodium hypochlorite, total residual chlorine (TRC), or copper) are typically added to efficiently transfer heat between the surface water withdrawals and the LNG. The industrial wastewater discharge typically contains both conventional and nonconventional pollutants, including total suspended solids (TSS) (including biological matter), antibiofouling chemicals, and thermal pollution (cold wastewater). Thermal pollution (cold wastewater) is a "pollutant," as discussed in recent EPA guidance: "[t]he CWA defines 'effluent limitation' to mean 'any restriction on rates, quantities, or concentrations of chemical, physical, biological, or other constituents which are discharged.' The thermal energy of a discharge (i.e., as measured in British Thermal Units (BTUs)) is a physical constituent of the discharge, and, as such, may appropriately be addressed by an effluent limitation" (U.S. EPA, 2006a). EPA's estimate of pollutant discharges from open-loop re-gasification technologies as part of the 2004 Plan can be found in Table 4 of a memorandum entitled, "Overview of Liquefied Natural Gas (LNG) Import Terminals for CWA Section 304(m) Effluent Guidelines Planning", dated August 19, 2004 (Johnston, 2004).

LNG import terminals that use closed-loop re-gasification do not use surface water in a once-through (open-loop) warming process. Some examples of the method of closed-loop re-gasification heat source generation are using:

- Combustion of 1.0 to 1.5 percent of the imported LNG cargo;
- Air heat exchange with or without an intermediary fluid flow loop; and
- Waste heat from nearby industrial facilities.

These closed-loop re-gasification technologies do not use surface water and discharge only a very small fraction of the wastewater and pollutants, in amount and toxicity of discharged pollutants, compared to open-loop re-gasification pollutant discharges. For example, see the estimate of pollutant discharges from the Cabrillo Port LNG import terminal NPDES permit application (U.S. EPA, 2006b).

20.1.3.2 Onshore Versus Offshore

The location of the LNG import terminal (i.e., onshore vs. offshore) influences the range of available technology options for pollutant removals. Offshore LNG import terminals may have significant space limitations that could significantly increase the costs and economic impacts and affect the technical feasibility of implementing the technology options that may be available for onshore facilities. Moreover, one technology option for onshore facilities, employing waste heat from nearby industrial facilities, is not available for offshore facilities. Consequently, EPA separately evaluated the potential pollutant discharges and potential technology options for the onshore and offshore subsectors of this industry. The CWA gives the Agency authority to consider geographic factors to evaluate technology-based controls of industrial wastewater pollutants (see “such other factors as the Administrator deems appropriate” at CWA 304(b)).

All existing, approved, and proposed onshore LNG import terminals are using or plan to use closed-loop re-gasification. There is one existing offshore LNG import terminal, which is licensed to operate in the open-loop mode, but can operate its shell and tube heat exchanger vaporizers in the open-loop (6 days to offload at 0.5 Bcfd) or closed-loop mode (7.5 days to offload at 0.4 Bcfd) (USCG, 2003). Most of the approved or proposed offshore LNG facilities are proposing to use closed-loop re-gasification.

20.1.3.3 Number of Facilities

EPA identified the existing, approved, and proposed LNG import terminals.

Existing LNG Import Terminals

There are six existing LNG import terminals operating in the U.S. Table 20-1 and Figure 20-2 present more detailed information about each of the facilities.

- **Onshore:** Five onshore LNG import terminals are currently operating in the U.S. These onshore terminals use a variety of closed-loop re-gasification technologies. EPA did not identify any significant pollutant discharges associated with the re-gasification processes at these facilities as compared to facilities with open-loop re-gasification.

- **Offshore:** One offshore terminal began operating in 2005. This offshore terminal both transports and re-gasifies the LNG onboard. This terminal is licensed for operation in the Gulf of Mexico in the open-loop mode and has the operational flexibility to operate its shell and tube heat exchanger vaporizers in the open-loop (6 days to offload at 0.5 Bcfd) or closed-loop mode (7.5 days to offload at 0.4 Bcfd). EPA’s estimate of pollutant discharges from this facility can be found in Table 4 of a memorandum entitled, “Overview of Liquefied Natural Gas (LNG) Import Terminals for CWA Section 304(m) Effluent Guidelines Planning”, dated August 19, 2004 (Johnston, 2004).

Table 20-1. Existing Land-Based and Offshore LNG Import Terminals

Location	2004 LNG Imports (Bcf)	2006 LNG Sendout Capacity (Bcfd)	LNG Storage Capacity (Bcf)	Re-gasification System	Operator
Lake Charles, LA (Onshore)	163.7[a]	2.1	6.3	Closed-Loop: SCV	Southern Union
Cove Point, MD (Onshore)	209.3	1.0	5.0	Closed-Loop: SCV	Dominion
Everett, MA (Onshore)	173.8	1.035	3.5	Closed-Loop: SCV	Distrigas (SUEZ)
Elba Island, GA (Onshore)	105.2	1.2[e]	4.0[e]	Closed-Loop: SCV	El Paso/ Southern LNG
Gulf of Mexico Energy Bridge (Offshore)	6[b]	0.5	0	Open-Loop: Shell & Tube Heat Exchanger[c]	Excelerate Energy
Guayanilla Bay, Puerto Rico (Onshore)	24[d]	0.1	NA	Closed-Loop: Shell & Tube Heat Exchanger	EcoElectrica, LP

Sources: *U.S. Natural Gas Importers by Point of Entry: Liquefied Natural Gas Volumes* (EIA, 2006b); Figure 20-3; *U.S. LNG Markets and Uses: June 2004 Update* (EIA, 2004); Application for Deepwater Port Liscence (El Paso Energy Bridge GOM LLC, 2002); E-mail communication between Andy Flower and Karrie-Jo Shell, U.S. EPA Region 4 (Flower, 2006a); Spreedsheed attachment to E-mail communication between Andy Flower and Karrie-Jo Shell, U.S. EPA Region 4 (Flower, 2006b); Final Environmental Assessment of the El Paso Energy Bridge Gulf of Mexico LLC Deepwater Port Liscence Application (USCG, 2003).

[a]Sendout capacity for Lake Charles includes a 0.6 Bcfd expansion approved by FERC (FERC, 2006a). This expansion is expected online mid-2006 (Panhandle Energy, 2006).

[b]Available for 2005 only as this facility delivered its first LNG load of nearly 3 Bcf on April 6, 2005 (Excelerate Energy, LLC, 2005). Estimated on the basis of two deliveries and the capacity of the ships used by Excelerate Energy (roughly 3 Bcf) (Pan EurAsian Enterprises, Inc., 2006; Excelerate Energy, LLC, 2005).

[c]This terminal is licensed for operation in the Gulf of Mexico in the open-loop mode and has the operational flexibility to operate its shell and tube heat exchanger vaporizers in the open-loop (6 days to offload at 0.5 Bcfd) or closed-loop mode (7.5 days to offload at 0.4 Bcfd) (USCG, 2003).

[d]Available for 2002 only (EIA, 2003).

[e]The Elba Island facility has applied for FERC authorization to expand sendout and storage capacity (FERC, 2006b).

NA – Not available; Information was not available at time of Final 2006 Plan.

SCV – Submerged combustion vaporizer.

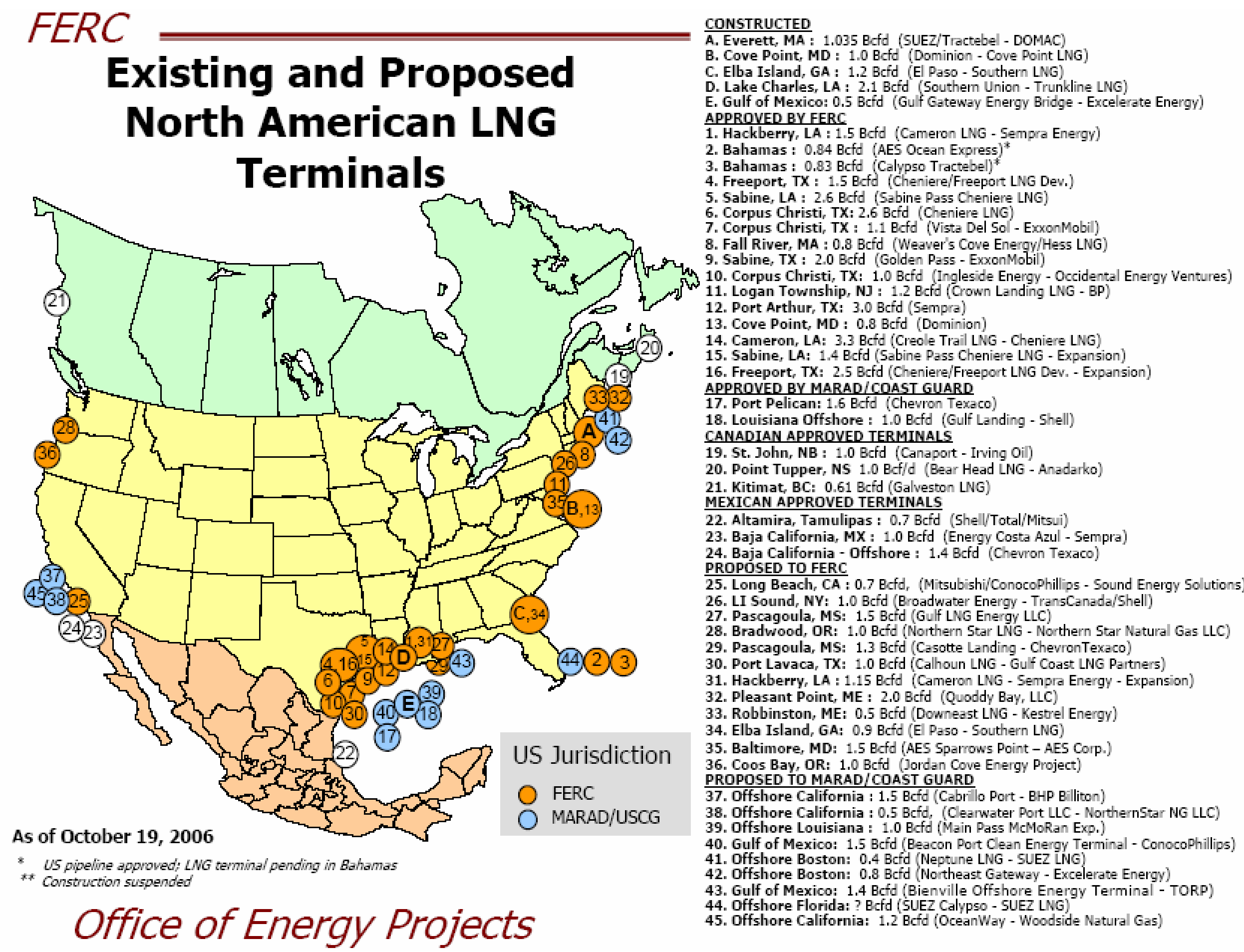

Figure 20-2. Existing and Proposed North American LNG Terminals (FERC, http://www.ferc.gov/industries/lng.asp)

Approved LNG Import Terimals

There are 17 approved LNG import terminals in the U.S. Table 20-2 and Figure 20-2 present more detailed information about each of these facilities.

- **Onshore:** In addition to the five existing onshore facilities, sixteen onshore terminals or expansions of existing terminals have been approved for operation by FERC. These land-based terminals propose to use closed-loop re-gasification technologies. EPA did not identify any significant pollutant discharges associated with the re-gasification processes at these facilities as compared to facilities with open-loop re-gasification.

- **Offshore:** In addition to the one existing offshore facility, only one offshore terminal is currently licensed for operation.[1] However, the operator has yet to start construction on the terminal (Gulf Landing). The Gulf Landing LNG import terminal is proposing to use an open loop re-gasification technology (open rack vaporizers). EPA's estimate of pollutant discharges from this facility can be found in Table 4 of a memorandum entitled, "Overview of Liquefied Natural Gas (LNG) Import Terminals for CWA Section 304(m) Effluent Guidelines Planning", dated August 19, 2004 (Johnston, 2004).

Proposed LNG Import Terminals

There are 23 proposed LNG import terminals in the U.S. Table 20-3, Table 20-4, and Figure 20-2 present more detailed information about each of these facilities.

- **Onshore:** As of November 9, 2006, 13 onshore are awaiting FERC approval of their license application to operate. These land-based terminals propose to use closed-loop re-gasification technologies. EPA did not identify any significant pollutant discharges associated with the re-gasification processes at these facilities as compared to facilities with open-loop re-gasification.

- **Offshore:** As of November 9, 2006, 10 offshore terminals are awaiting regulatory approval of their license application to operate (U.S. Coast Guard in Federal waters and FERC in State waters).[2] EPA has learned that only one operator is proposing to use open-loop re-gasification technology (Bienville Offshore Energy Terminal). The remaining nine terminals are proposing to use closed-loop re-gasification technologies.

Planned LNG Import Terminals

There are eight planned LNG import terminals in the U.S. Figure 20-3 presents the potential facilities. As of November 9, 2006, five onshore and three offshort terminals are planned, but have not yet applied for a license to operate. Details on these terminals are not available at the time of the Final 2006 Plan.

[1] EPA notes that one operator has indefinitely suspended activities to construct an offshore terminal that received approval for its Deepwater Port Act license (Port Pelican). See 70 FR 57885 (4 October 2005).
[2] EPA also notes that three applicants have withdrawn their Deepwater Port Act license application for their offshore terminals (Brinkmann, P.E., 2005; Cornelius, 2006a; Cornelius, 2006b).

Table 20-2. Approved U.S. Land-Based LNG Import Terminals

No.	Project Name/ Operator/ FERC Docket No.	Location	Storage Capacity	Sendout Capacity	Vaporizer Design	LNG Ship Frequency
1	Freeport LNG Project Cheniere/Freeport CP03-75-000 (Phase I) CP05-361-000 (Phase II) Phase I: $400 million facility cost	Freeport, TX	Phase I: 320,000 cubic meters (m^3) (2 tanks each with 160,000 m^3) Phase II: 480,000 cubic meters (m^3) (3 tanks each with 160,000 m^3)	Phase I: 1.5 Bcf/d Phase II: 4.0 Bcf/d	Closed-Loop: Air heat exchanger (heating tower) Supplemental gas-fired heater for cold weather	Phase I: 200 ships/year Phase II: 400 ships/year
2	Sabine Pass LNG and Pipeline Project Cheniere CP04-38-000 CP04-47-000 $600 million facility cost	Cameron Parish, LA (across from Sabine Pass)	480,000 m^3 (3 tanks each with 160,000 m^3)	2.6 Bcf/d	Closed-Loop: Gas-fired heater	300 ships/year
3	Cheniere Corpus Christi LNG Terminal and Pipeline Project Cheniere CP04-37-000 CP04-44-000 $450 million facility cost	Corpus Christi, TX	480,000 m^3 (3 tanks each with 160,000 m^3)	2.6 Bcf/d	Closed-Loop: Gas-fired heater	300 ships/ year
4	Golden Pass LNG Terminal and Pipeline Project ExxonMobil PF04-1-000 $600 million facility cost	Sabine, TX	Phase I: 480,000 m^3 (3 160,000 m^3 tanks) Phase II: 800,000 m^3 (5 160,000 m^3 tanks)	Phase I: 1 Bcf/d Phase II: 2 Bcf/d	Closed-Loop: Gas-fired heater	Phase I: 1 ship/4 days (91 ships/ year) Phase II: 1 ship/2 days (183 ships/ year)
5	Vista del Sol LNG Terminal Project ExxonMobil PF04-3-000 PF04-9-000 $600 million facility cost	Corpus Christi, TX	480,000 m^3 (3 tanks each with 160,000 m^3)	Phase I: 1 Bcf/d	Closed-Loop: Gas-fired heater	1 ship/4 days (91 ships/year)
6	Ingleside Energy Center LNG Project Occidental PF04-9-000	Corpus Christi, TX	320,000 m^3 (2 tanks each with 160,000 m^3)	1 Bcf/d	Closed-Loop: Water heat exchanger (waste water from the chemical plant)	1 ship/3 days

Table 20-2 (Continued)

No.	Project Name/ Operator/ FERC Docket No.	Location	Storage Capacity	Sendout Capacity	Vaporizer Design	LNG Ship Frequency
7	Cameron LNG, LLC Sempra Energy CP02-374-000 CP02-376-000 CP02-377-000 CP02-378-000 $700 million facility cost	Hackberry, LA	480,000 m^3 (3 tanks each with 160,000 m^3)	1.5 Bcf/d	Closed-Loop	210 ships/year
8	Weaver's Cove LNG CP04-36-000 $250 million facility cost	Fall River, MA	200,000 m^3 (1 tank)	0.4 Bcf/d	Closed-Loop: Gas-fired heater	50-70 ships/ year
9	Creole Trail LNG Cheniere LNG PF05-8	Cameron, LA	640,000 m^3	3.3 Bcf/d	Closed-Loop: Gas-fired heater	300-400 ships/year
10	Port Arthur LNG Receiving Terminal Project Sempra Docket No. PF04-11-000	Port Arthur, TX	480,000 m^3 (3 tanks each with 160,000 m^3)	1.5 Bcf/d	Closed-Loop: Gas-fired heater	150 ships/year
11	BP Crown Landing LNG PF04-2-000 PF04-5-000 $500 million facility cost	Logan Township, NJ	450,000 m^3	1.2 Bcf/d	Closed-Loop: Gas-fired heater	100 ships/year

Source: Dockets for each project available at http://elibrary.ferc.gov/industries/lng/indus-act/terminals/exist-prop-lng.asp; EIA's Current View on LNG Imports into the United States (Martin, 2004).
Note: Not listed in this table are expansions at existing or other approved terminals, and two terminals to be sited in the Bahamas.

Table 20-3. Proposed U.S. Land-Based LNG Import Terminals

No.	Project Name/ Operator/ FERC Docket No.	Location	Storage Capacity	Sendout Capacity	Vaporizer Design	LNG Ship Frequency
1	Sound Energy Solutions Mitsubishi/ConocoPhillips PF03-06 and PF04-58 (see FR Vol. 69, No. 27, p. 6277-6278)	Long Beach, CA	320,000 m^3	1.0 Bcf/d	Closed Loop: Shell and tube gas-fired vaporizers	120 ships/year
2	Gulf Energy Gulf Energy LNG LLC PF05-05 (see FR Vol. 70, No. 46, p. 11960-11961)	Pascagoula, MS	320,000 m^3	1.0 Bcf/d	Not specified	115 ships/year
3	Northern Star LNG Northern Star Natural Gas, LLC PF05-10 (see FR Vol. 70, No. 181, p. 55123-55125)	Bradwood, OR	320,000 m^3	1.0 Bcf/d	Closed-Loop: Ambient air vaporizers	125 ships/year
4	Casotte Landing Chevron PF05-09 (see FR Vol. 70, No. 70, p. 19433-19435)	Pascagoula, MS	480,000 m^3	1.3 Bcf/d	Closed-Loop: Refinery cooling water	166 ships/year
5	Calhoun LNG Gulf Coast LNG Partners CP05-91 (see FR Vol. 70, No. 148, p. 44616-44618)	Port Lavaca, TX	320,000 m^3	1.0 Bcf/d	Not specified	120 ships/year
6	Pleasant Point Quoddy Bay, LLC PF06-11 (see FR Vol. 71, No. 54, p. 14200-14203)	Pleasant Point, ME	480,000 m^3	0.5 Bcf/d	Closed-Loop: Gas-fired heater	90 ships/year
7	Downeast LNG Kestrel Energy PF06-13 (see FR Vol. 71, No. 54, p.14196-14198)	Robbinston, ME	160,000 m^3	0.5 Bcf/d	Closed-Loop: Gas-fired heater	50 ships/year

Source: Dockets for Port Arthur, BP Crown Landing, and Creole Trail are available at http://elibrary.ferc.gov/industries/lng/indus-act/terminals/exist-prop-lng.asp; Notice of Intent from Federal Register Notices as presented in the table and 71 FR 30128-30129, May 25, 2006 for Casotte Landing; EIA's Current View on LNG Imports into the United States (Martin, 2004).
Note: Not included here are the most recently proposed LNG terminals in Sparrows Point, Baltimore, MD, and Coos Bay, OR (see Figure 20-3) and expansions at existing or approved facilities. Also does not include a terminal to be located in Long Island Sound, which considered an offshore terminal and is presented in Table 20-4.

Table 20-4. Licensed and Proposed U.S. Offshore LNG Import Terminals

No.	Company (Facility Name)	Offshore Location	Proposed Re-gasification System	USCG Deepwater Port Licensing Information (Docket No.)[a]
1	Shell (Gulf Landing) (DPA License Issued)	West Cameron Block 213 - GOM 38 miles south of LA	Open-Loop: ORV	Yes (16860)
2	BHP Billiton (Cabrillo Port) (Proposed)	Offshore Oxnard, CA 14 miles from CA	Closed-Loop: SCV	Yes (16877)
3	Freeport Energy (Main Pass Energy Hub) (Proposed)	Main Pass Block 299 - GOM 16 miles from LA	Closed-Loop: SCV	Yes (17696)
4	Crystal Energy (Clearwater Port) (Proposed)	Offshore Ventura County, CA 12.6 miles from CA	Closed-Loop: SCV	Yes (TBD)
5	Excelerate Energy (Northeast Gateway) (Proposed)	Offshore MA 13 miles south-southeast of Gloucester, MA	Closed-Loop: Shell and Tube	Yes (22219)
6	SUEZ (Neptune LNG) (Proposed)	Offshore MA 22 miles northeast of Boston, MA	Closed-Loop: Shell and Tube	Yes (22611)
7	TransCanada/Shell (Broadwater Energy) (Proposed)	Long Island Sound, NY 9 miles from NY and 11 miles from CT	Closed-Loop: Shell and Tube	No (FERC lead, see Docket Numbers PF05-04 and CP06-54)
8	SUEZ (Calypso Energy) (Proposed)	Offshore FL 10 miles east of Port Everglades, FL	Closed-Loop: Shell and Tube	Yes (TBD)
9	TORP Technology AS (Bienville Offshore Energy Terminal) (Proposed)	Main Pass Block 258 - GOM 63 miles south of Dauphin Island, AL	Open-Loop: Hi-Load Shell and Tube	Yes (24644)
10	Woodside Natural Gas (OceanWay Secure Energy)	Offshore Los Angeles, CA 28.3 miles from CA	Closed-Loop: Air Heat Exchange	Yes (TBD)
11	Atlantic Sea Island Group LLC (Safe Harbor Energy)	Offshore NY/NJ 13.5 miles south of Long Beach, NY and 19 miles east of Sandy Hook, NJ.	Closed-Loop: Air Heat Exchange	Yes (TBD)

[a]Indicates whether the company has applied for a deepwater port license.
The USCG docket for each Deepwater Port license application can be accessed using the docket number and the following website: http://www.uscg.mil/hq/g-m/mso/mso5.htm. This table was compiled using documents available on the USCG docket, with the following exceptions: (1) information about Clearwater Port is from presentations and press releases, most of which are available at http://www.crystalenergyllc.com; (2) Broadwater Energy is from http://www.broadwaterenergy.com/; (3) Calypso Energy is from http://www.suez.com/upload/up1527.pdf and Calypso LNG LLC, Deepwater Port License Application (Public), Volume I, Calypso LNG Project, Page 3, February 2006; (4) the vaporizer technology for Woodside OceanWay Secure Energy came from http://www.oceanwaysecureenergy.com/marinelife.html. Additionally, the Port Pelican, Pearl Crossing, Compass Port, and Beacon Port LNG import terminals are not included in this table. Port Pelican's licensee suspended construction activities (Poten & Partners, 2004) (70 FR 57885; 4 October 2005). Pearl Crossing, Compass Port, and Beacon Port all withdrew their Deepwater Port Act license applications (70 FR 73059, 8 December 2005; Brinkmann, 2005; Cornelius, 2006b). The Atlantic Sea Island Group proposes to construct a man-made island about 13.5 miles offshore southern side of LI, New York, in approximately 60 feet of water in the Atlantic Ocean. The facility-proposed design will include four 180,000 m^3 storage tanks with a send-out capacity of 2 Bcf/d and a proposed in-service date of 2010 (source: http://www.safeharborenergy.com/, Final Environmental Impact Statement for the Crown Landing LNG Project and Logan Lateral Project, FERC Docket Nos. CP04-411-000 and CP04-416-000, TABLE 3.2.2-2, elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=11013835, and MARAD website: http://www.marad.dot.gov/DWP/LNG/port_news/news_detail.asp?ID=25&from=home).
Note: This table does not include the Tidelands Oil & Gas Esperanza Energy or Excelerate's Pacific or Southeast Gateway offshore LNG import terminals as these facilities have not applied for a Deepwater Port operation license. The Esperanza Energy is focusing its evaluation on several potential sites up to 12 miles offshore of the greater Long Beach area and use of the open-loop (Hi-Load Shell and Tube) re-gasification technology (California Energy Commission, 2006). Excelerate's Pacific and Southeast Gateway LNG import terminals will use a similar design as Excelerate Energy's other LNG import terminals and these two terminals are planned for development off of the coasts of Northern California and Florida, respectively (California Energy Commission, 2006; http://www.excelerateenergy.com/activities.php).
TBD – To be determined.
ORV – Open-rack vaporizers.
SCV – Submerged combustion vaporization.

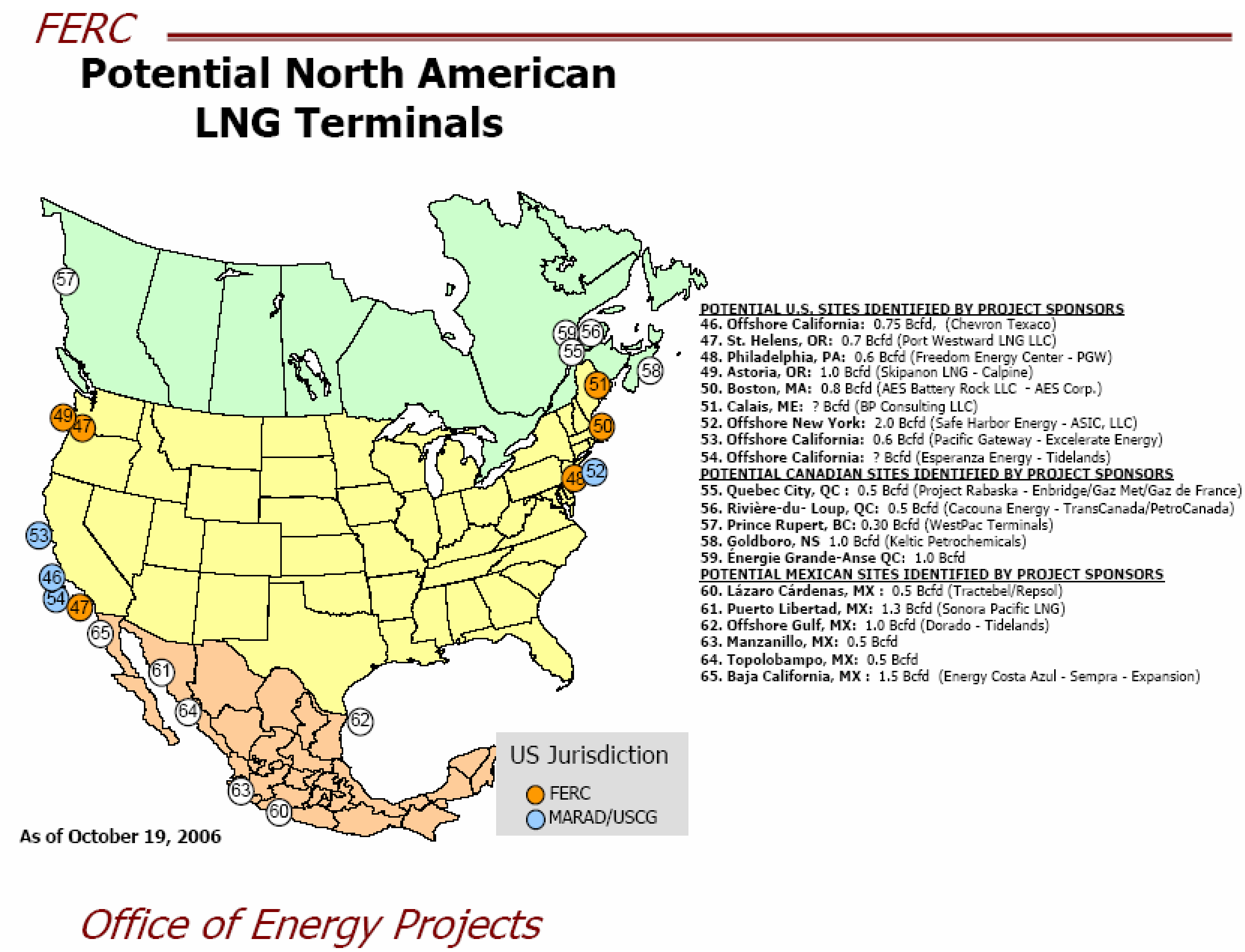

Figure 20-3. Potential North American LNG Terminals
(FERC, http://www.ferc.gov/industries/lng.asp)

Table 20-5. Existing, Approved, Proposed and Planned U.S. LNG Import Terminals (2006)

Status	Total Throughput (Bcfd)	Annual Throughput (tcf/yr)	Percentage of Total
Existing	5.84	2.13	9.80%
Approved (FERC)	25.30	9.23	42.5%
Approved (CG)	1.60	0.58	2.70%
Proposed (FERC)	13.55	4.95	22.8%
Proposed (CG)	10.30	3.21	14.8%
Planned (FERC/CG)	4.45	1.62	7.5%
Total	**61.04**	**22.27**	**100%**

Source: Existing LNG Terminals (FERC, 2006a); Existing LNG Terminals (FERC, 2006c).
Note: Table includes only planned facilities as of as of November 9, 2006 where a throughput estimate is available. The Port Pelican, Pearl Crossing, Compass Port, and Beacon Port LNG import terminals are not included in this table. Port Pelican's licensee has indefinitely suspended construction activities (Poten & Partners, 2004) (70 FR 57885; 4 October 2005). Pearl Crossing, Compass Port, and Beacon Port withdrew their Deepwater Port Act license applications (see 70 FR 73059, 8 December 2005; Brinkmann, 2005; Cornelius, 2006a, Cornelius, 2006b).

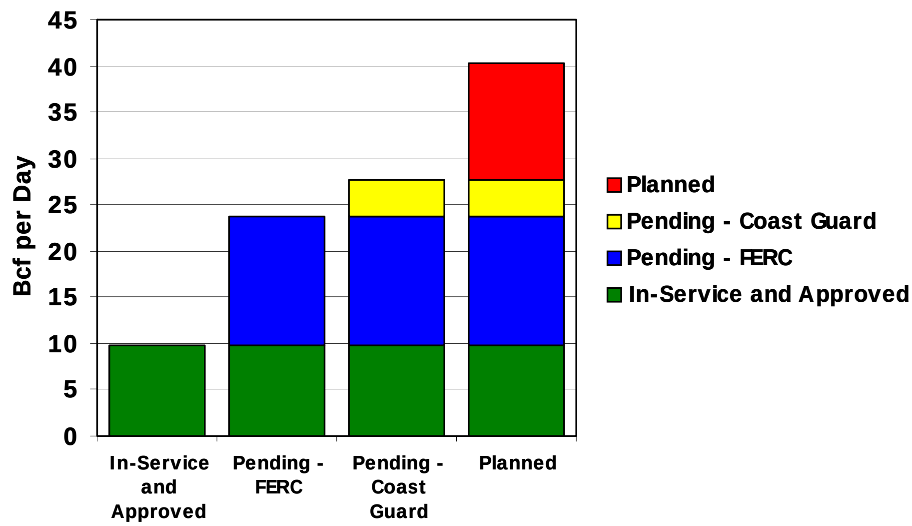

Figure 20-4. Existing and Proposed North American LNG Terminals (FERC, 2004)

20.1.4 Economic Profile

United States and foreign companies are competing to build LNG import terminals in many regions of North America because of the perceived opportunity in the growing LNG industry (Kelly, 2004). According to industry analysts, the cost of LNG at the point of U.S. delivery is approximately $3/MMBtu (Greenspan, 2005). Below is a rough breakdown of this cost (Economides, 2005):

- $1/MMBtu is the cost of the feedstock gas at the exporting location;
- $1/MMBtu is the cost to liquefy the gas;
- $0.30/MMBtu is the cost to regasify the LNG (open-loop) or $0.375/MMBtu (closed-loop);[3] and
- $1/MMBtu is the cost to transport the LNG.[4]

[3] EPA estimated the incremental cost of using closed-loop regasification instead of open-loop (i.e., $0.375 - $0.300 = $0.075 MMBtu), based on information from the Gulf Landing facility. EPA assumed a $5.00/MMBtu price of gas in 2009 (when Gulf Landing comes on-line) through 2029, and assumed the higher end of the incremental gas usage found in the literature (increment of 1.5 percent of the LNG cargo). EPA then estimated that the additional energy cost to Gulf Landing for the closed-loop regasification system ($27.4 million in 2009) is the major cost differential between open-loop and closed-loop regasification. In 2010, therefore, the operating cost differential between open-loop and closed-loop regasification for this facility might be roughly $0.075/MMBtu processed (= $27.4 million/365 million MMBtu).

[4] This is a conservative estimate for the transportation of LNG to the United States, as the longer the distance of the LNG supply to the United States, the higher the shipping costs. Approximately, 0.25 percent of the LNG is consumed in transit due to the “boil-off” process, which is necessary for maintaining LNG temperature.

The long-range U.S. wellhead price of gas expected through 2030 ranges roughly from $4.00-$6.00/MMBtu in 2004 dollars (EIA, 2006a).

Financing Models for LNG Import Terminals

An important factor in evaluating the potential economic impact of various pollutant control technologies (e.g., using closed-loop re-gasification in lieu of open-loop re-gasification) is to identify whether the LNG import terminal operates at a profit (profit center) or at cost (or loss) in support of a larger, profit-making line (cost center). Profit centers are analyzed at the facility level; since changes in cash flow can be properly interpreted (a change from positive to negative cash flow due to a rule is usually counted as a regulatory closure). Cost centers (or captive facilities, for which some or all revenues are accounted for higher up in the corporate structure) cannot be analyzed at the facility level; impact must be measured at a higher level in the corporate hierarchy. At the higher level, a rule-induced change from positive cash flow to negative cash flow or change in profitability considered significant denotes a regulatory closure or other impact. This economic analysis reviewed the four basic financing models by which LNG terminals might operate (Chinloy, 2005):

- Tolling: A fixed fee is charged and the supply of LNG is set through contracts. The fixed fee typically covers the capital and operating costs, while allowing for reasonable returns on investment. Land-based facilities such as the Lake Charles LNG import terminal include as part of their fee a percentage of gas to operate their closed loop re-gasification system. Tolling is the preferred approach for most U.S. LNG terminals (Chinloy, 2005). This type of facility is a stand-alone operation (i.e., profit center).

- Integrated: Contracts or integrated investments establish a chain of LNG supply. Integrated investments have recently been used by integrated majors, e.g., Shell's Gulf Landing, LNG import terminal. This model may entail linkages from production, through liquefaction, transportation, re-gasification, and distribution. The integrated investments approach is becoming more prevalent in the United States. This type of facility is likely to be a cost center.

- Rate-based: The terminal is owned by a regulated utility (e.g., gas distribution or electric). This type of facility is likely to be a cost center.

- Merchant: The terminal operates primarily without contracts in place. It is subject to substantial volume and price risk (Chinloy, 2005). This model is unlikely to be able to arrange financing (Chinloy, 2005). This type of facility is a stand-alone operation (i.e., profit center).

This economic impact analysis considered the two most prevalent and applicable factors to determine which business model—tolling or integrated— is more applicable for various LNG import terminals operated by large, integrated oil and gas firms:

- The tolling model in which a company acts as a service provider with tolling arrangements provides much lower returns on investment than those from the integrated model (Deutsche Bank, 2005).

- An integrated model allows operators to take advantage of significant price differentials (arbitrage) between foreign gas prices or the cost of producing gas in foreign locations and the price of gas in the United States (or elsewhere in the LNG importing regions of the world). These differentials, even with the cost of liquefaction, transport, and re-gasification, are significant and can provide enormous profits.

For example, the operating earnings for an integrated model on each MMBtu are estimated to total $1.70 ($5.00 price of gas in the United States minus the $3.30 anticipated cost of delivering gas via LNG importation, assuming that open-loop re-gasification technology is used). This is a 34.0 percent operating margin. With closed-loop re-gasification technology, an additional 1.5 percent of gas throughput is used, costing $0.075 ($5.00*0.015 = $0.075); thus, the earnings per MMBtu are slightly smaller ($1.625 = $1.70 - $0.075), representing a 32.6 percent margin. It appears that, to the extent possible, most LNG import terminals owned by integrated majors would process their own LNG and that stand-alone profitability would unlikely be the main objective of the terminals' operation.

Number of New Facilities Expected

EPA considered whether the potential growth of this industrial sector might add significantly to the estimate of facilities requiring NPDES permits with effluent limits for open-loop re-gasification wastewaters. EPA examined whether the present trend of LNG import terminal proposals will continue or expand (see Figures 20-2 and 20-3). EPA concluded that, for several reasons, the significant growth in LNG import terminal proposals would most likely not continue at the pace shown in recent years. The major factors limiting the importation of LNG to the U.S. consumer include not the lack of LNG re-gasification terminals in the United States, but the following economic and supply-side related issues:

- Most industry analysts note that over-capacity is a major issue for this industrial sector (Deutsche Bank, 2005; A.G. Edwards, 2005; Credit Suisse First Boston, 2005; Citigroup Smith Barney, 2004; EIA, 2006a; EIA, 2006b; ERG, 2006; Chinloy, 2005). In 2005, the existing terminals operated only at 40 percent capacity (GPO, 2005) and capacity utilization is expected to remain roughly in the 50 percent to 70 percent range (Deutsche Bank, 2005; see Figure 20-5) over the next decade or longer, even while demand for LNG grows and several new LNG terminals are constructed.

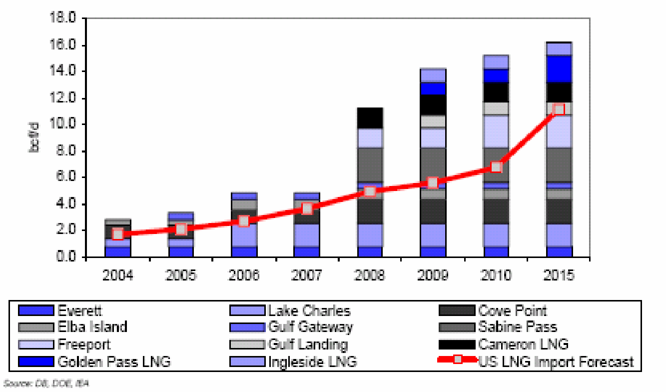

Figure 20-5. Excess Regas Capacity in the U.S.—Here to Stay (U.S. DOE, EIA, as cited in Deutsche Bank, 2005)

- LNG supplies are tight, due to the significantly greater cost of constructing liquefaction infrastructure and political instability in many potential LNG exporting regions (Deutsche Bank, 2005). For example, a shortage of feedstock gas has recently led to a number of global liquefaction projects operating at less than full capacity due to, among other things, declining reserves and political unrest in LNG-producing countries (LNGLawblog, 2006e). This constraint in liquefaction capacity, not re-gasification terminal capacity, will remain a major constraint for North American LNG imports (North American National Gas Group, 2005).

- Demand for natural gas worldwide is growing (EIA, 2006b), particularly in Europe and the Far East, which are also expanding their LNG re-gasification infrastructure (GSI, 2005). EIA indicates that more rapid growth in worldwide demand for natural gas than that predicted in 2005 will reduce the availability of LNG supplies, raise worldwide gas prices, and make LNG less economical in U.S. markets (EIA, 2006b).

- Many other LNG-importing countries have fewer alternatives to LNG for their gas needs and are willing to pay a much higher price than U.S. consumers for that LNG. Price differences between the U.S. and other foreign markets competing for limited LNG supplies are often measured in dollars.[5] It is this price differential that will determine where LNG suppliers send their cargos.[6] LNG owners are diverting cargos from the United States to other more profitable markets. According to FERC, LNG import terminals in the U.S. are "operating at less than 40 percent

[5] For example, the Cove Point LNG terminal in Maryland competed in the global market with a netback of $6.53/MMBtu for LNG supplier (Trinidad), while Lake Charles yielded only $5.51/MMBtu, compared to Spain's $9.02/MMBtu netback (LNGlawblog.com, 2006e).

[6] See the assessment of James W. Duncan, Director of Structured Products for ConocoPhillips Gas & Power, "LNG is a growing and dynamic market, but there are going to be new players in the marketplace, which is going to prohibit and inhibit the amount of LNG that is available to come here. What will drive that market will be price. Molecules flow to dollars. It's not a mystery. I think it has been mentioned that Spain paid the equivalent of $14/MMBtu last summer...and the molecule [not] surprisingly went there and did not come here. Those price dynamics are coming to fruition" (Rigzone, 2006).

capacity" (Rosenberg, 2006). When asked why, Mr. Kelliher, the FERC chairman, replied, "It's because we have to compete with foreign demand. LNG comes to this country either by long-term contract or in spot shipments. We've been losing out on a lot of spot shipments to Europe. If prices are higher elsewhere, that's where the spot shipments are going to go . . . The world has twice the capacity to import LNG as it has to make LNG. That gives developers of the liquefaction facilities more choices when it comes to what markets they prefer to use" (Rosenberg, 2006). For example, in November 2005, an LNG transport ship traveling from Nigeria and bound for a U.S. LNG import terminal idled in the Gulf of Mexico for a week - during which prices soared in Europe - before sailing back across the Atlantic Ocean to Spain to unload its cargo (Gold, 2006). More recently, LNG cargos destined for Lake Charles, LA, and Cove Point, MD, were diverted to Mexico and Spain, respectively (LNGlawblog.com, 2006f).

- Last year saw very low imports (GPO, 2006). Platts and industry analysts attribute the low U.S. imports to intense Asian and European competition for LNG coupled with mild winter weather in the United States (LNGlawblog.com, 2006a). Figure 20-6 shows the impacts of U.S. alternatives on LNG imports. Future growth of LNG imports is projected to level out after 2015 as unconventional sources of gas, such as CBM (ENR, 2006) and Alaska gas become more available (EIA, 2006a; EIA, 2006b). Furthermore, several LNG import terminals are planned for Mexico and Canada (Smith, 2005). Gas from these terminals would reach California and New England. Mexico expects to be a net exporter of natural gas to the United States by 2010, or even earlier, as oversupply appears to be developing there (LNGlawblog, 2006b, 2006c).

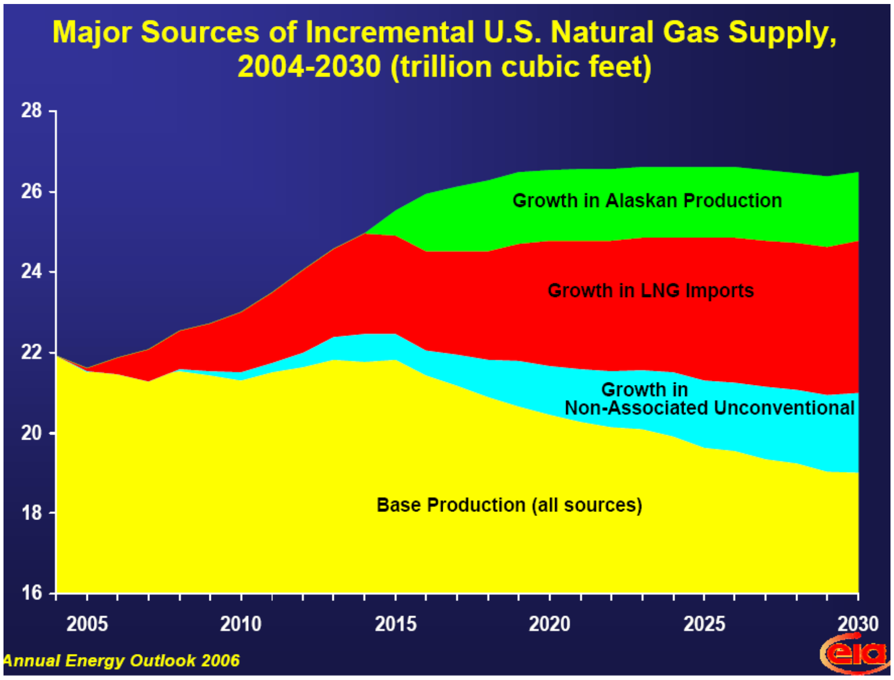

Figure 20-6. Growth in LNG Imports Given Growth in Alaskan and Unconventional Gas Production (EIA, 2006b)

Given these economic and supply-side related issues, DOE and others predict that U.S. demand for LNG will constrain imports and that very few of the approved, proposed, or planned terminals will be built over the next 10 years or longer (EIA, 2006a; EIA, 2006b; Deutsche Bank, 2005; A.G. Edwards, 2005; Credit Suisse First Boston, 2005; Citigroup Smith Barney, 2004; Chinloy, 2005; Greenspan, 2005). DOE projects two land-based facilities under construction, two expansions at existing land-based facilities, and four other facilities that will be built. These terminals are expected to serve the Gulf Coast, Southern California, Florida, and New England (EIA, 2006a). Of these four, two might not be U.S.-based (Southern California and New England might be served by terminals currently in advanced planning stages in Mexico and Canada—see Figure 20-3; also see Chinloy, 2005).

In summarizing the current U.S. LNG import terminal market, Chinloy sees expansions at existing facilities, the two terminals under construction, and a third terminal in advanced stages in Mexico (which is planned, in part, to serve Southern California) as leaving a 1.9 Bcfd "gap" in the predicted 28.1 tcf per year of U.S. natural gas demand in 2015 (which is about 80 Bcfd) (Chinloy, 2005). The "gap" is only 2 percent of projected demand for natural gas in 2015. Chinloy sees a need for at most only six additional LNG import terminals in the next 10 years. Given that several approved or proposed terminals would each be larger than this 1.9 Bcfd gap, the next decade may see very few additional terminals being constructed (see Table 5).

Finally, analysts predict a shakeout in LNG terminal plans in the next few years, as those terminals closest to completion send signals to the market that the LNG supply gap has been filled (Van Praet, 2004; NGI, 2006). EPA has already seen four offshore projects, for example, that either had construction activities suspended (Port Pelican) (Poten & Partners, 2004; 70 FR 57885, October 4, 2005), or the applicant has withdrawn the terminal from proposal (Pearl Crossing and Compass Port).

20.1.5 Summary of EPA's Review of the LNG Industry

Based on its review of the LNG import terminal industry, EPA is not identifying this industry for ELGs rulemaking at this time. First, out of existing LNG import terminals, all but one use closed-loop re-gasification. Discharges from closed-loop re-gasification likely present a low hazard to human health and the environment. Second, out of all of the approved, proposed, or planned LNG import terminals, few are likely to be built due to economic and supply-side issues. Moreover, even fewer are projected to use open-loop re-gasification. As noted above, no potential new onshore facilities and only three possible new offshore LNG import terminals have proposed to use "open-loop" re-gasification. Because the hazard associated with this industry is attributable to only a few facilities (one existing facility and possibly two new facilities), EPA believes that discharges from this industry can best be addressed through case by case BPJ-based permit limits, rather than through a categorical ELGs. BPJ is a particularly appropriate tool where – as here – there is significant site-specific variability in terms of facility design. A BPJ case-by-case approach would enable permit writers to best capture the technical considerations that might influence the identification of the appropriate pollutant control technology and effluent limits.

Therefore, EPA is exercising its discretion to not identify LNG in the 2006 Plan because it does not believe categorical ELGs would be an appropriate tool to regulate discharges from this category. The Supreme Court in Norton v. Southern Utah Wilderness Alliance explicitly recognized the importance of Agency discretion over its internal planning processes, finding that the statutory mandate at issue was not sufficiently specific to require the Agency to include certain provisions in its plan. In this case, the CWA requires all NPDES permits to contain technology-based effluent limitations – but also specifically allows those limitations to be developed using best professional judgment under CWA section 402(a)(1), rather than pursuant to ELGs. See CWA section 304(b)(2)(B). Significantly, section 301(b)(3)(B) was enacted contemporaneously with section 304(m) and its planning process, suggesting that Congress contemplated the use of both tools, with the choice of tools in any given 304(m) plan left to the Administrator's discretion. Like the statutory mandate in Norton, the CWA requirement that EPA develop an effluent guidelines plan – when coupled with the direction to establish technology-based limitations either through ELGs or site-specific BAT decision-making – cannot be read to constrain the Agency's discretion over what it includes in its plan.

20.2 <u>Miscellaneous Foods and Beverages Industry</u>

During its 2005 annual review, EPA identified 26 SIC codes related to the manufacture of a variety of food and beverage products that were not covered by any existing ELGs. EPA found that industries in these 26 SIC codes were properly considered a potential new stand-alone category based on the similarity of products produced as well as the similarity of their operations and wastewater characteristics. EPA's finding is supported by the fact that EPA had previously considered many of these industries to be part of a stand-alone category – the Miscellaneous Foods and Beverages Point Source Category – when it began ELGs rulemaking for this industry in the 1970s.

EPA's analysis of this industry for its 1970's rulemaking is detailed in its "Draft Development Document for Effluent Limitations Guidelines and New Source Performance Standards for the Miscellaneous Foods and Beverages Point Source Category" (U.S. EPA, 1975a). At that time, EPA determined it was appropriate to subcategorize the industry into five segments: vegetable oil processing and refining; beverages; bakery and confectionary products; pet foods; and miscellaneous and specialty products. EPA concluded that the major parameters of significance discharged from this industry were conventional parameters (BOD_5, TSS, oil and grease, and pH) and that such discharges did not contain toxic pollutants (U.S. EPA, 1975a; U.S. EPA, 1975b). While EPA recommended establishing effluent guidelines limitations for conventional parameters from direct dischargers in certain subcategories, it did not recommend pretreatment standards for indirect dischargers because it concluded that none of the constituents in miscellaneous foods and beverage wastewaters would interfere with or pass through a POTW (U.S. EPA, 1975a). EPA did not continue its efforts to establish ELGs for this category because it changed the focus of its ELGs program to toxics shortly after completion of its analysis of this industry.

For purposes of assessing whether to identify the miscellaneous foods and beverages industry as a potential new category in the 2006 Plan, EPA again reviewed the discharges from this industry to determine whether ELGs would be an appropriate tool for addressing the hazard associated with this industry, as discussed below.

20.2.1 Summary of Comments Received

In response to the Preliminary 2004 Plan, the Natural Resources Defense Council (NRDC) commented that EPA should identify the following industries in the Plan as new categories for effluent guidelines rulemaking: SIC code 2075: Soybean Oil Mills, SIC code 2082: Malt Beverages, and SIC code 2085: Distilled and Blended Liquors (EPA-HQ-OW-2003-0074-0733).

20.2.2 Industry Profile

In reviewing data for the industries identified by NRDC, EPA identified additional industries related to food processing that are not covered by existing ELGs. In total, EPA found 26 SIC codes that could properly be considered part of a potential new Miscellaneous Foods and Beverages Category. Table 20-6 lists the counts of facilities in the 26 SIC codes from data in the U.S. Census (2002), TRI (2002 and 2003), and PCS (2002). The U.S. Census shows 127,000 establishments in the miscellaneous foods and beverages industry in 2002; however, less than 1 percent reported to TRI (0.286 percent) and PCS (0.097 percent).

Table 20-6. Number of Facilities in Miscellaneous Foods and Beverages SIC Codes

SIC Code	2002 Census Data	2002 PCS[b]	2002 TRI[c]	2003 TRI[c]
2032: Canned Specialties	1,804	7	11	14
2034: Dehydrated Fruits, Vegetables, Soups	2,196	2	9	9
2038: Frozen Specialties, NEC	415	4	26	25
2051: Bread & Other Bakery Products	3,305[a]	3	7	9
2052: Cookies & Crackers		3	17	14
2053: Frozen Bakery Products	259	1	7	6
2064: Candy & Other Confection Products	1,602	1	5	6
2066: Chocolate & Cocoa Products	1,234	3	4	5
2067: Chewing Gum	518	2	1	1
2068: Salted & Roasted Nuts & Seeds	163	1	0	0
2074: Cottonseed Oil Mills	341[a]	2	15	14
2075: Soybean Oil Mills		15	60	57
2076: Vegetable Oil Mills, Except Corn		2	8	10
2079: Shortening, Table Oils, Margarine		3	22	17
2082: Malt Beverages	682	10	22	23
2083: Malt	27	1	2	2
2084: Wines, Brandy & Brandy Spirit	1,271[a]	3	15	13
2085: Distilled, Rectified, & Blended Liquors		28	6	6
2086: Bottled & Canned Soft Drinks & Carbonated Water	764	7	31	23
2087: Flavor Extract & Flavor Syrups, NEC	2,425	7	16	15
2095: Roasted Coffee	281	1	2	2
2097: Manufactured Ice	492	2	10	6
2098: Macaroni, Spaghetti, Vermicelli, Noodles	193	3	1	1
2099: Food Preparations, NEC	4,602	9	65	51
5144: Poultry & Poultry Products	39,425	1	1	1
5182: Wine & Distilled Alcoholic Beverages	64,637	2	0	0
Total	**127,000**	**123 (13 majors)**	**363**	**330**

Source: *2005 Annual Screening-Level Analysis: Supporting the Annual Review of Existing Effluent Limitations Guidelines and Standards and Identification of New Point Source Categories for Effluent Limitations Guidelines and Standards* (U.S. EPA, 2005); U.S. Economic Census (U.S. Census, 2002).

[a]Due to the poor bridging between NAICS and SIC codes, the number of facilities for certain SIC codes could not be determined for the 2002 Census.

[b]Major and minor dischargers.

[c]Releases to any media.

EPA obtained data on the number of facilities reporting direct and indirect discharges from the miscellaneous foods and beverages industry from *TRIReleases2002_v4.* Table 20-7 presents the number of facilities in the TRI database, by discharge type. Less than 1 percent of the facilities in the miscellaneous foods and beverages industry report to TRI. Of these, approximately 58 percent report no water discharge, 37 report discharges to POTWs, and 5 percent report discharges to surface water. As shown in Table 20-6 above, 123 facilities report direct discharges to PCS.

Table 20-7. Miscellaneous Foods and Beverages Facilities by Type of Discharge Reported in TRI 2002

SIC Code	Reported Only Direct Discharges	Reported Only Indirect Discharges	Reported Both Direct and Indirect Discharges	Reported No Water Discharges
Miscellaneous Foods and Beverages	14	130	10	209

Source: *TRIReleases2002_v4*.

20.2.3 Wastewater Characteristics

Table 20-8 summarizes the pollutant loads data for the miscellaneous foods and beverages industry from *TRIReleases2003_v02*, *TRIReleases2002_v04,* and *PCSLoads2002_v04*.

Table 20-8. Summary of Data for the Miscellaneous Foods and Beverages Industry

Data Source	Number of Facilities Reporting Discharges Greater than Zero	Annual Pounds	Annual TWPE	Annual TWPE/Facility
TRI 2003[a]	158	5,560,000	5,440	34.5
TRI 2002[a]	154	5,390,000	6,860	44.6
PCS 2002[b]	13	16,200,000	337,000	168,000

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

Table 20-9 lists the pollutant loads data in *PCSLoads2002_v4, TRIReleases2002_v04,* and *TRIReleases2003_v02* by SIC code. The facility-specific TWPEs are generally low (e.g. using TRI 2000 data, the average TWPE/facility for each SIC code is approximately 17). EPA's literature review and its earlier consideration of this industry support these data. Although the available quantitative data are limited, based on available literature and its previous study, EPA would expect a low level of toxics in the wastewaters from the miscellaneous foods and beverages industry. The pollutants expected in greatest quantities include BOD, TSS, and oil and grease. Possible other wastewater pollutants from this industry may include organics, nutrients, suspended solids, dissolved solids (including chlorides), solvents, detergents, and pesticides originating from the processing of the foods and beverages and the cleaning of process equipment (U.S. EPA, 1975; EBRD, 2006; UNEP, 2004; Triangular Wave, 2006).

Table 20-10 lists the pollutants of concern identified for the miscellaneous foods and beverages industry based on reported discharges to PCS and TRI. The top industry pollutant as reported in PCS in 2002 is sulfide. One facility within SIC code 2085 contributes 100 percent of the industry sulfide TWPE. The top two industry pollutants as reported to TRI in 2002 and 2003 are nitrate compounds and chlorine. The majority of the TWPE for these pollutants results from facilities within SIC codes 2075 and 2082. Due to the higher TWPE contributions from SIC code 2075, 2082, and 2085 (see Table 20-4 for total TWPE contributions from these SIC codes), and relatively low TWPE of the other SIC codes, the remainder of this section focuses on these three SIC codes.

20.2.4 SIC Code 2075: Soybean Oil Mills

Establishments included in SIC code 2075 are primarily engaged in manufacturing the following soybean products:

- Lecithin, soybean;
- Soybean flour and grits;
- Soybean oil, cake, and meal;
- Soybean oil, deodorized;
- Soybean protein concentrates; and
- Soybean protein isolates.

Establishments in this SIC code also process purchased soybean oil into products other than edible cooking oils. Establishments primarily engaged in refining soybean oil into edible cooking oils are classified under SIC code 2079: Shortening, Table Oils, Margarine (Bicknell, 2004).

At soybean oil mills raw soybeans are processed into soybean products. Soybeans are dehulled, cooked and flaked, then crushed and subjected to direct solvent extraction to produce two types of products, soybean oil and soybean meal and cakes. Solvent is removed from the meal by steam (vapor) stripping followed by toasting. Solvent is recovered from the oil by evaporation followed by steam stripping (Bicknell, 2004).

Table 20-9. TRI and PCS Data Listing for Miscellaneous Foods and Beverages SIC Codes

SIC Code	PCS 2002				TRI 2002				TRI 2003			
	Facility Count[b]	Total Pounds	TWPE	TWPE/ Facility	Facility Count	Total Pounds	TWPE	TWPE/ Facility	Facility Count	Total Pounds	TWPE	TWPE/ Facility
2032					7	51,900	40.3	5.75	10	74,500	57	5.72
2034					2	149	1.88	0.939	1	72.9	1.55	1.55
2038					13	49,100	51.6	3.97	12	45,800	49.6	4.13
2051					1	0.000174	0.00741	0.00741	3	4,220	4.69	1.56
2052					1	220	0.24	0.244	1	220	0.244	0.244
2053					3	7,810	8.70	2.90	4	4,830	4.02	1.01
2064				0	4	42,300	31.6	7.89	5	68,400	53.8	10.8
2066					2	2,130	2.06	1.03	2	1,950	1.88	0.942
2067	1	180,000	0[a]									
2074					5	3.66	0.129	0.026	4	2.70	0.0951	0.0238
2075	**1**	**1,220,000**	**0[a]**	**0**	**42**	**1,710,000**	**2,927**	**69.7**	**40**	**2,060,000**	**1,750**	**43.7**
2076	1	12	0[a]	0	5	0.752	0.0265	0.00530	7	5,170	4.26	0.609
2079					9	22,200	537	59.6	8	13,200	269	33.7
2082	**3**	**1,630,000**	**9,540**	**3,150**	**17**	**3,129,000**	**2,356**	**139**	**20**	**2,620,000**	**1,980**	**98.9**
2083					1	1,000	1.11	1.11	1	1,150	1.28	1.28
2084					2	40,900	45.4	22.7	2	290,000	322	161
2085	**7**	**159,000,000**	**327,000**	**46,800**	**2**	**3,870**	**58.7**	**29.4**	**2**	**5,330**	**69.1**	**34.5**
2086					6	37,800	38.6	6.43	4	43,100	47.8	12.0
2087					5	25,800	18.6	3.71	7	69,000	73.5	10.5
2095					2	31,800	432	216	2	37,900	484	242
2097					1	2,140	2.37	2.37				
2099					23	236,000	308	13.4	22	209,000	272	12.4
5144					1	16.0	0.0119	0.0119	1	15.9	0.0119	0.0119

Source: *PCSLoads2002_v4*; *TRIReleases2002_v4*; *TRIReleases2003_v2*.
[a]There is no TWPE associated with the pollutants in PCS for the SIC code.
[b]Major dischargers only.
Blanks indicate that the databases contain no data for the SIC code. **Bold indicates SIC codes contributing the majority of the total industry TWPE**.

Table 20-10. Pollutants of Concern for the Miscellaneous Foods and Beverages Industry

Pollutant	2002 PCS			2002 TRI			2003 TRI		
	Number of Facilities Reporting Pollutant[a]	Total Pounds Released	TWPE	Number of Facilities Reporting Pollutant	Total Pounds Released	TWPE	Number of Facilities Reporting Pollutant	Total Pounds Released	TWPE
Sulfide	1	112, 074	313, 970	Pollutants are not in the top five TRI 2002 reported pollutants.			Pollutants are not in the top five TRI 2003 reported pollutants.		
Chlorine	2	17, 722	9,023	4	3,780	1,925	3	423	215
Copper	2	9,373	5,950	Pollutants are not in the top five TRI 2002 reported pollutants.			Pollutants are not in the top five TRI 2003 reported pollutants.		
Manganese	2	21,553	1,518						
TKN	2	551,783	1,258						
Nitrate Compounds	Pollutants are not in the top five PCS 2002 reported pollutants.			29	4,959,303	3,703	32	4,840,031	3,614
Propylene Oxide				2	19,850	421	2	22,109	469
Ammonia				51	337,301	374	58	611,879	679
Nickel and Nickel Compounds				10	1,994	217	Pollutants are not in the top five TRI 2003 reported pollutants.		
N-Hexane				Pollutants are not in the top five TRI 2002 reported pollutants.			48	3,898	137
Industry Total	**13**	**161,581,216**	**336,924**	**154**	**5,391,632**	**6,862**	**158**	**5,560,811**	**5,444**

Source: *PCSLoads2002_v4*; *TRIReleases2002_v4*; *TRIReleases2003_v2*.
[a]Discharges include only majors.

Conventional wastewater pollutants from this industry include BOD, suspended solids, and fats, oils, and greases. Soybean oil mills employ conventional biological wastewater treatment preceded by oil/water separation of high oil concentration wastewaters (Bicknell, 2004).

Table 20-11 lists the pollutants of concern based on data from *TRIReleases2003_v2* and *TRIReleases2002_v4* for SIC code 2075. For this SIC code, the total TWPE from data in *PCSLoads2002_v4* is zero, and EPA has PCS data for only one major discharger. As a result, EPA excluded PCS data from Table 20-6.

Table 20-11. Pollutants of Concern for the Miscellaneous Foods and Beverages Industry, SIC Code 2075: Soybean Oil Mills

Pollutants with Greatest TWPE	TRI 2003		TRI 2002	
	Annual TWPE	Percent of SIC Code Total Annual TWPE	Annual TWPE	Percent of SIC Code Total Annual TWPE
Chlorine	NR	NA	1,553[a]	53.0%
Nitrate Compounds	1,514[b]	86.6%	1,250	42.7%
N-Hexane	137	7.8%	22	0.8%
Nickel and Nickel Compounds	57.4	3.3%	65.6	2.2%
Ammonia	30.0	1.7%	29.4	1.0%
Sodium Nitrite (as N)	10.2	0.6%	7.1	0.2%
SIC Code Total Annual TWPE	**1749.1**	**NA**	**2927.4**	**NA**

Source: *TRIReleases2002_v4*; *TRIReleases2003_v2*.
[a]TWPE result from one facility: Bunge Milling, Inc., Danville, IL, TRI Facility ID: 61832-LHFFG-321EA.
[b]99.8% of TWPE results from one facility: Solae L.L.C., Pryor, Oklahoma, TRI Facility ID: 74362-PRTNT-HUNTS
NA – Not applicable.
NR – Not reported.

Based on data from *TRIReleases2002_v4,* all of the chlorine TWPE for SIC code 2075 is from one facility, Bunge Milling, Inc., Danville, IL, TRI Facility ID: 61832-LHFFG-321EA. This facility did not report any TRI chemical releases to water in 2003.

Nitrate compounds are the greatest contributor to the TWPE for this SIC code. Based on data from *TRIReleases2003_v2*, 99.8 percent of the nitrate compounds TWPE results from one facility, Solae L.L.C., Pryor, Oklahoma, TRI Facility ID: 74362-PRTNT-HUNTS.

20.2.5 SIC Code 2082: Malt Beverages

Establishments included in SIC code 2082 are primarily engaged in manufacturing the following malt beverages:

- Ale;
- Beer (alcoholic beverage);
- Brewers' grain;
- Liquors, malt;
- Malt extract, liquors, and syrups;
- Near beer (nonalcoholic beverage);
- Porter (alcoholic beverage); and
- Stout (alcoholic beverage).

The malt beverage industry uses the following basic unit processes: grinding of rice, corn, and malt (soaked and germinated grain); brewing (cooking); filtration; fermenting; aging; vessel clean-up; and packaging (Bicknell, 2004).

Conventional wastewater pollutants from this industry include BOD, and suspended solids. Malt beverages processing plants employ conventional biological wastewater treatment. Spent grain (mash) is typically recovered for use as animal feed (Bicknell, 2004).

Table 20-12 lists the pollutants of concern based on data from *TRIReleases2003_v2*, *TRIReleases2002_v4*, and *PCSLoads2002_v4* for SIC code 2082.

Based on data from *PCSLoads2002_v4*, all of the chlorine TWPE is discharged from one facility, the Miller Brewing Company, Eden, NC, NPDES ID: NC0029980. Likely, the facility adds chlorine as a disinfectant for water treatment.

Nitrate compounds contribute over 97 percent of the TPWE for SIC code 2982. Based on data from *TRIReleases2002_v4*, 94.2 percent of the nitrate compounds TWPE results from one facility: Anheuser-Busch, Inc., Baldwinsville, NY, TRI Facility ID: 13027-NHSRB-2885B.

Table 20-12. Pollutants of Concern for the Miscellaneous Foods and Beverages Industry, SIC Code 2082: Malt Beverages

Pollutants with Greatest TWPE	Data Source Used for Identification	TRI 2003		2002 Data	
		Annual TWPE	Percent of SIC Code Total Annual TWPE	Annual TWPE	Percent of SIC Code Total Annual TWPE
Nitrate Compounds	TRI	1,928.0[a]	97.4%	2,301.6[a]	97.7%
Ammonia	TRI	44.6	2.3%	49.6	2.1%
Sodium Nitrite	TRI	6.0	0.3%	5.3	0.2%
SIC Code Total Annual TWPE	**TRI**	**1978.6**	**NA**	**2356.6**	**NA**
Chlorine	PCS	NA	NA	8.995.2[b]	94.3
Nitrite/Nitrate (as N)	PCS	NA	NA	291.4	3.1
Copper	PCS	NA	NA	85.0	0.9
Nitrogen, Ammonia	PCS	NA	NA	84.8	0.9
Zinc	PCS	NA	NA	54.2	0.6
Fluoride	PCS	NA	NA	14.8	0.2
Cyanide	PCS	NA	NA	7.4	0.1
SIC Code Total Annual TWPE	**PCS**	**NA**	**NA**	**9537.5**	**NA**

Source: *PCSLoads2002_v4*; *TRIReleases2002_v4*; *TRIReleases2003_v2*.
[a]94.2% of TWPE result from one facility: Anheuser-Busch, Inc., Baldwinsville, NY, TRI Facility ID: 13027-NHSRB-2885B.
[b]TWPE result from one facility: Miller Brewing Company, Eden, NC, NPDES ID: NC0029980
NA – Not available.

20.2.6 SIC Code 2085: Distilled, Rectified, and Blended Liquors

Establishments included in SIC code 2085 are primarily engaged in the following processes: manufacturing alcoholic liquors by distillation; and manufacturing cordials and alcoholic cocktails by blending processes or mixing liquors and other ingredients (Bicknell, 2004).

The distilled and blended liquors industry uses the following basic unit processes: milling of grain and malt (soaked and germinated grain); cooking; cooling; filtration; fermenting; distillation; aging; vessel clean-up; and packaging. Cordials and liqueurs are manufactured by blending liquors with other ingredients, such as fruit syrups (Bicknell, 2004).

Conventional wastewater pollutants from this industry include BOD and suspended solids. Molasses distillery wastes include nitrogen and phosphates. Distilled and blended liquor facilities typically employ conventional biological wastewater treatment (Bicknell, 2004).

Table 20-13 lists the pollutants of concern based on data from *PCSLoads2002_v4* for SIC code 2085. For this SIC code, the total TWPE from data in *TRIReleases2002_v4* and *TRIReleases2003_v2* is less than 70. As a result, EPA excluded TRI data from Table 20-13.

Table 20-13. Pollutants of Concern for the Miscellaneous Foods and Beverages Industry, SIC Code 2085: Distilled, Rectified, and Blended Liquors

Pollutants with Greatest TWPE	PCS 2002	
	Annual TWPE	Percent of SIC Code Total Annual TWPE
Sulfide	313,970.1[a]	95.9%
Copper	5,864.9	1.8%
Manganese	1,517.4	0.5%
Nitrogen, Kjeldahl Total (As N)	1,255.9	0.4%
Phenol & Phenolics	1,012.0	0.3%
Silver	803.4	0.2%
Cadmium	680.6	0.2%
Zinc	464.3	0.1%
Fluoride	428.8	0.1%
Thallium	389.3	0.1%
Lead	355.2	0.1%
Arsenic	210.7	0.1%
Selenium	207.3	0.1%
SIC Code Total Annual TWPE	**327,357**	**NA**

Source: *PCSLoads2002_v04*.
[a]TWPE results from one facility: Bacardi Corporation, Puerto Rico, NPDES ID: PR0000591
NA – Not available.

Based on data from *PCSLoads2002_v4*, over 95 percent of the total SIC code total annual TWPE is from sulfide discharges from one facility, the Bacardi Corporation, Puerto Rico, NPDES ID: PR0000591. EPA reviewed the permit limits and monthly reporting data of the Bacardi facility and contacted both the facility and the EPA Region 2 office regarding Bacardi's discharges.

The Region 2 office identified that the Bacardi facility discharges sulfide, BOD, oil and grease, and other pollutants at levels exceeding permit limits. It currently operates an anaerobic system for treatment of its wastewaters prior to discharge. The Bacardi facility is under a compliance schedule to meet the sulfide limit of 2 ug/L, which is a water quality-based limit. This compliance schedule will expire soon. The Bacardi facility has requested that the Puerto Rico Environmental Quality Board consider a change in the sulfide limit that takes into account mixing zone implications (Matuszko, 2006a). Based on a previous Caribbean Rum Study and recent NPDES permits for similar facilities, the Bacardi facility is the only known rum producer that discharges directly to waters of the U.S. and employs an anaerobic treatment system. Because sulfide is produced during anaerobic treatment, EPA concludes that its sulfide discharges are unique and not representative of other facilities in this sector.

20.2.7 Summary of Review of Miscellaneous Foods and Beverages Industry

EPA previously considered establishing ELGs for the miscellaneous foods and beverages industry in the 1970s. EPA did not establish ELGs for this industry at that time because of the relatively low amounts of toxics in wastewater discharges associated with this industry and its conclusion that constituents in miscellaneous foods and beverage wastewaters would not interfere with or pass through a POTW.

Based on its review of current available data and literature, EPA again found that discharges from miscellaneous foods and beverages are primarily comprised of conventional pollutants (BOD_5 , TSS, and Oil and Grease) and contain few toxics. Therefore, the overall hazard associated with this industry (as measured in TWPE) is low.

The bulk of the hazard (measured as TWPE) reported to TRI and PCS from wastewater discharges associated with this industry are from five facilities discharging nitrate compounds, chlorine, and sulfide.

- Two facilities (Solae L.L.C. in SIC code 2075, Anheuseur-Busch in SIC code 2082) account for almost all of the TWPE associated with nitrate compounds reported to TRI.
- Two facilities (Bunge Milling, Inc. in SIC code 2075, Miller Brewing Co. in SIC code 2082) account for almost all of the TWPE associated with chlorine reported to TRI in 2002 – with the Bunge Milling facility reporting no water discharges to the 2003 TRI.
- One facility (Bacardi Corp. in SIC code 2085) accounts for nearly all the sulfide TWPE in *PCSLoads2002_v04*. EPA concluded these sulfide discharges are unique to the wastewater treatment system at Bacardi and not representative of other facilities in this sector.

Because of the low overall hazard associated with discharges from this industry, Miscellaneous Foods and Beverages does not constitute a priority for effluent guidelines rulemaking at this time. Moreover, because of the small number of facilities accounting for the toxics, EPA believes that site-specific effluent limits established by permit writers on a BPJ basis are an appropriate tool to address discharges from this industry at this time. For the reasons discussed in Section 20.1.5 of this TSD, EPA believes that Section 304(m)(1)(B) gives EPA the discretion to identify in the Plan only those new categories for which EPA believes an effluent guideline may be an appropriate tool. See Norton v. Southern Utah Wilderness Alliance, 542 US 55, 70 (2004) (holding that a broad statutory mandate is not sufficient to constrain an Agency's discretion over its internal planning processes).

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