INFORMATION COLLECTION REQUEST

U.S. ENVIRONMENTAL PROTECTION AGENCY

DETAILED INDUSTRY QUESTIONNAIRES: PHASE II
COOLING WATER INTAKE STRUCTURES
&
WATERSHED CASE STUDY SHORT QUESTIONNAIRE

August 18, 1999

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PART A OF THE SUPPORTING STATEMENT

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1. Identification of the Information Collection

1(a) Title of the Information Collection

Detailed Industry Questionnaire: Phase II Cooling Water Intake Structures

1(b) Short Characterization (Abstract)

The U.S. Environmental Protection Agency (EPA or the "Agency") requests approval from the Office of Management and Budget (OMB) to conduct a detailed industry survey of facilities potentially subject to Section 316(b) of the Clean Water Act (CWA), 33 U.S.C. 1326(b). Section 316(b) provides that any standard established pursuant to Sections 301 or 306 of the CWA and applicable to a point source shall require that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available (BTA) for minimizing adverse environmental impact. Such impacts occur as a result of impingement (where fish and other aquatic life are trapped on technologies at the entrance to cooling water intake structures) and entrainment (where aquatic organisms, eggs, and larvae are taken into the cooling system, passed through the heat exchanger, and then pumped back out with the discharge from the facility).

The detailed questionnaire survey effort is the second step of a two-step regulatory information collection effort. The screener questionnaire represented the first step. On December 24, 1998, OMB approved the Industry Screener Questionnaire: Phase I Cooling Water Intake Structures (OMB number 2040-0203). The Office of Wastewater Management (OWM) and Office of Science and Technology (OST) will use the information collected from the detailed questionnaire survey effort to help better understand the design, location, construction, capacity, and operation of cooling water intake structures at facilities throughout the United States and to assess economic impacts from any regulatory effort affecting those

facilities. EPA does ***not*** intend to make judgements via answers to this questionnaire about whether a facility is in compliance with Section 316(b). The survey is simply a tool to help EPA characterize the design, location, construction, and capacity of cooling water intake structures on a national basis. The baseline technical and environmental data will help EPA frame regulatory options and define further research needs regarding the relationship of cooling water intake structures, intake technologies, and environmental impacts. These data will also be used in the selection of case study sites and the performance of case study analyses (see discussion of case studies on the next page). The survey also collects economic data on facility ownership, major activities, markets and finances. The Agency will use this information to assess facility-level and firm-level impacts of complying with the proposed cooling water intake structure regulations. In order to evaluate fully costs associated with a proposed Section 316(b) regulation, EPA will consider the costs associated with performing Section 316(b) demonstrations, additions and modifications to cooling water intake structures and equipment, and operating and monitoring costs associated with the regulation, and, for electricity generators, the replacement power cost associated with unit down-time during the construction period. The economic data will also enable EPA to carry out required economic analyses, including a Regulatory Impact Analysis (RIA), a cost/benefits analyses, and requirements of the Small Business Regulatory Enforcement Fairness Act (SBREFA).

EPA anticipates that the Section 316(b) regulation will cover a large number of industrial categories since Section 316(b) potentially applies to any industrial facility that withdraws water from surface water sources and uses it for contact or noncontact cooling purposes. However, EPA has ultimately narrowed its information research activities to focus on traditional utilities, nonutility power producers, and four other industrial categories for which publicly available data showed large quantities of cooling water use. Traditional utilities and nonutility power producers that use cooling water were further limited to those plants that generate electricity by means of steam as the thermodynamic medium (steam electric) because they are associated with large cooling water needs. Facilities in the traditional steam electric utility category are classified under Standard Industrial Classification (SIC) codes 4911 and 493, while nonutility power producers are classified under the major code that corresponds to the primary purpose of the facility (e.g.,

the primary code may be SIC 49 if the primary purpose of the facility is to generate electricity). The four industrial categories (also referred to as the "other industries" throughout this document) that were identified and found to use large amounts of cooling water are Paper and Allied Products (SIC Major Group 26), Chemical and Allied Products (SIC Major Group 28), Petroleum and Coal Products (SIC Major Group 29), and Primary Metals (SIC Major Group 33). Together, EPA estimates that these six industrial sectors account for more than 99 percent of all cooling water used in the U.S.

The survey effort will incorporate five different questionnaires to collect both firm-level and facility- (or plant-) level technical and financial/economic information. Some questionnaires will collect minimal information while others will collect more detailed information. All questionnaires have been designed with the intent to minimize burden on the respondents to the extent possible.

There are five questionnaires that will be distributed under this effort.

- Detailed Industry Questionnaire: Phase II Cooling Water Intake Structures - Traditional Steam Electric Utilities
- Short Technical Industry Questionnaire: Phase II Cooling Water Intake Structures - Traditional Steam Electric Utilities
- Detailed Industry Questionnaire: Phase II Cooling Water Intake Structures - Steam Electric Nonutility Power Producers
- Detailed Industry Questionnaire: Phase II Cooling Water Intake Structures - Manufacturers
- Watershed Case Study Short Questionnaire

The first four questionnaires listed above comprise the detailed questionnaire survey effort. These questionnaires are designed to minimize respondent burden, where possible. The questionnaires will be organized into three different packages and sent out to the three major industry groups: traditional steam electric utilities, steam electric nonutility power producers, and other industries.

Under the traditional steam electric utility group, each utility will receive a package that contains two different types of questionnaires. Detailed questionnaires requesting plant-level technical and financial/economic information will be directed to a sample of plants (280 plants) that have been chosen based on certain characteristics or stratifying variables. That same package will contain a much shorter and less burdensome questionnaire (the Short Technical Industry Questionnaire) containing only technical questions, to be distributed to the remainder of that utility's plants for response (approximately 654 plants).

Facilities from the steam electric nonutility power producer group (a sample of approximately 190), will receive a survey package that has two parts. The first part is similar to the detailed questionnaire for traditional steam electric utility plants, but requests slightly more information because of the lack of publicly available data. The second part of the questionnaire will request voluntary and supplemental data from the firm who owns the nonutility facility. This will allow the firm to voluntarily supply EPA with information concerning their facilities outside the sample frame for the detailed questionnaires which may be impacted by this rulemaking. The voluntary and supplemental information will enable EPA to more fully estimate firm-level economic impacts.

The survey package sent to manufacturers (approximately 191 facilities) will also be similar to the detailed questionnaire for traditional steam electric utilities in that it will have two parts, facility-level data and voluntary and supplemental data. However, the facility-level part will request slightly different economic information.

EPA will also conduct a separate information collection activity to collect technical and limited economic information from a selection of facilities located on particular watersheds that have been chosen as case study sites. This effort may involve information collection from facilities that have not been chosen to receive either a screener or detailed questionnaire or additional sampling of facilities in case study areas for which EPA has identified a need for more detailed information based on the information from screener or short technical questionnaires. The data from this effort will be used to (1) provide a very detailed and in

depth analysis of the costs and benefits for specific regions of concern; (2) help demonstrate the site-specific nature of environmental impacts of cooling water intake structures and potential benefits of implementing best technology available (BTA); (3) support the development of a tiering framework for the Section 316(b) regulation; (4) evaluate cumulative impact potential; (5) determine the effectiveness of specific technologies; (6) produce models of national benefits; (7) and provide examples of how a permit writer would analyze a plant when issuing a permit.

Approximately 350 facilities and plants will receive a watershed case study questionnaire. This questionnaire is short, requests some technical and financial data, and is essentially the screener questionnaire except that it has been modified to clarify some of the questions. In addition, it is estimated that the Agency will require more detailed technical and financial information from approximately 95 facilities in the watershed case study sites. These facilities will receive a detailed questionnaire.

Facilities and plants that receive the detailed industry questionnaires must complete and return them to EPA within 90 days of receipt. Plants that receive the Short Technical Industry Questionnaire must complete and return it within 30 days of receipt. Facilities that receive a watershed case study questionnaire must complete and return them to EPA within 45 days of receipt.

Toll-free help lines for both technical and economic/financial data will be maintained by the Agency to assist facilities in responding to the questionnaires. Once the responses are returned, Agency contractors will tabulate respondents' answers into a computer database for further analyses.

2. Need for and Use of the Collection

2(a) Need/Authority for the Collection

EPA is developing regulations implementing Section 316(b) of the Clean Water Act, 33 U.S.C. 1326(b) pursuant to a Consent Decree entered on October 10, 1995 in Cronin v. Reilly,[1] a lawsuit brought against the Agency by a coalition of environmental groups headed by the Hudson Riverkeeper. The Consent Decree (see *Attachment 1*) establishes a judicially enforceable seven year schedule for EPA to propose and take final action with respect to a Section 316(b) regulation. OMB reviewed and agreed to the Consent Decree in September 1994. To ensure that any Section 316(b) regulation is based on accurate information, EPA initiated a variety of data-gathering activities. The detailed questionnaire and the watershed case study survey efforts are some of the mechanisms through which EPA is gathering background industry- and facility-level information about cooling water intake structures. EPA will use the information collected through the screener questionnaire to select facilities for receipt of the detailed questionnaires. EPA has the authority to collect this information under Section 308 of the CWA (33 U.S.C. Section 1318).

OMB's regulations implementing the Paperwork Reduction Act provide that an agency submission of a proposed collection of information shall certify that the proposed collection of information "is necessary for the proper performance of the functions of the Agency, including that the information to be collected will have practical utility...." (5 C.F.R. § 1309(a)). According to OMB's draft Paperwork Reduction Act guidance dated February 3, 1997, "[t]he term 'need' means that some programmatic or policy requirement... exists." (Draft Guidance at page 38.) The Draft Guidance continues, "'Need' has been used as the administrative equivalent to stating that the collection of information 'is necessary for the proper performance' of the functions of the agency. 44 U.S.C. 3508." (Draft Guidance at page 38, n. 160.) With respect to the "practical utility" component of "need," the Draft Guidance states, "The term 'practical utility' refers to the usefulness of information (considering its accuracy, adequacy, and reliability) to carry out the agency's functions in a timely manner." (Draft Guidance at page 39.)

EPA believes the collection of the information requested in the detailed questionnaires, the Short Technical Industry Questionnaire, and the Watershed Short Case Study Questionnaire is necessary for the

[1] United States District Court, Southern District of New York, 93 Civ. 0314 (AGS).

proper performance of the functions of the agency. The Consent Decree in Cronin v. Reilly obligates EPA to propose regulations implementing Section 316(b) no later than July 2, 1999 and to take final action with respect to the regulations no later than August 13, 2001. The existing schedule is currently being reviewed.

The information collected through the screener questionnaire, the detailed questionnaires, the Short Technical Industry Questionnaire, and the Watershed Short Case Study Questionnaire, in conjunction with other data (i.e., from case studies, publicly available data, literature sources, and studies from manufacturers), will help EPA characterize various candidate BTA technologies and determine where and under what environmental conditions these technologies are being used. This will help EPA develop regulatory options for evaluation and enable the selection of a regulatory option when the Agency takes final action as required by the Consent Decree.

In its statement disapproving EPA's first ICR for the screener questionnaire survey effort (EPA ICR number 1828.01; OMB No. 2040-0203 for the Industry Screener Questionnaire: Phase I Cooling Water Intake Structures), OMB specifically directed EPA to document more fully that the information to be collected is necessary for the proper performance of the functions of the Agency, including the practical utility of the information being collected. The Disapproval Statement directed that this showing include (1) "evidence that significant adverse environmental impacts are occurring as a result of cooling water intake structures;" (2) "evidence that point sources are not currently using best technology available to minimize such impacts;" and (3) "evidence that a national regulatory approach of the type this information collection is designed to support would be more effective at implementing the statutory requirements than the current approach relying on site-specific information, best professional judgement of NPDES permit writers, and state regulations tailored to meet local conditions and concerns." Each of these areas is addressed below.

1. Evidence that Significant Adverse Environmental Impacts Are Occurring as a Result of Cooling Water Intake Structures.

EPA's May 1977 *Guidance for Evaluating the Adverse Impact of Cooling Water Intake Structures on the Aquatic Environment* describes two ways in which cooling water intake structures can cause adverse environmental impacts. The first is entrainment, which occurs when organisms are drawn through the cooling water intake structure into the cooling system. There, the organisms are subject to mechanical, thermal, and toxic stress. Mortality of entrained organisms is extremely high. The second effect is the impingement of fish and other aquatic organisms on devices installed on the cooling water intake structure to prevent debris from entering the facility's cooling water system. Organisms are trapped against these screening devices by the velocity of the water passing through the cooling water intake structure.

Research of the available literature and Section 316(b) demonstration studies obtained from NPDES permit files has identified numerous documented cases of impacts associated with impingement and entrainment and the subsequent effects of these actions on populations of aquatic organisms. For example, specific losses associated with individual steam electric generating plants include 3 to 4 billion larvae and post larvae per year,[2] 23 tons of fish and shellfish of recreational, commercial or forage value lost each year,[3] and 1 million fish lost during a three-week study period.[4] Several studies estimating the impacts of entrainment on populations of key commercial or recreational fish predicted declines in population size. Studies focusing on entrainment mortality in the Hudson River predicted reductions in the year-class

[2] *Brunswick Nuclear Steam Electric Generating Plant of Carolina Power and Light Company Located near Southport, North Carolina, Historical Summary and Review of Section 316(b) Issues.* EPA Region IV, September 19, 1979

[3] *Findings and Determination under 33 U.S.C. Section 1326, In the Matter of Florida Power Corporation Crystal River Power Plant Units 1, 2, and 3. NPDES Permit No. FL0000159.* EPA Region IV, December 2, 1986

[4] *Impingement Losses at the D.C. Cook Nuclear Power Plant during 1975-1982 with a Discussion of Factors Responsible and Possible Impact on Local Populations,* Thurber, Nancy J. and David J. Jude. Special Report No. 115 of the Great Lakes Research Division. Great Lakes and Marine Waters Center. The University of Michigan. 1985.

strength for 6 species ranging from 4 percent to 79 percent depending on the species.[5] A modeling effort looking at the impact of entrainment mortality on the population of a selected species in the Cape Fear estuarine system predicted a 15 to 35 percent reduction in the population.[6]

The following are among other more recent documented examples of impacts occurring as a result of cooling water intake structures:

A. Brayton Point. PG&E Generating's Brayton Point plant (formerly owned by New England Power Company) is located in Mt. Hope Bay, in the northeastern reach of Narragansett Bay, Rhode Island. In order to increase electric generating capacity, Unit 4 was switched from closed-cycle to once-through cooling in 1985. The modification of Unit 4 resulted in an increase in cooling water intake flow of 45 percent. Studies designed to evaluate whether the cooling water intake structure was affecting fish species abundance trends found that Mt. Hope Bay experienced a progressively steady rate of decline in finfish species of recreational, commercial, and ecological importance.[7] In contrast, species abundance trends were relatively stable in coastal areas and portions of Narragansett Bay that are not influenced by the cooling water intake structure. Further strengthening the evidence that the cooling water intake structure was contributing to the documented declines was the finding that the rate of population decline increased substantially with the full implementation of the once-through cooling mode for Unit 4. The modification of Unit 4 is estimated to have resulted in an 87 percent reduction in finfish abundance based on a time series-intervention model. These impacts were associated with both impingement and entrainment as well as the thermal discharge of cooling water. Entrainment data indicated that 4.9 billion tautog eggs, 0.86 billion

[5] *Estimates of Entrainment Mortality for Striped Bass and Other Fish Species Inhabiting the Hudson River Estuary,* Boreman, John and Phillip Goodyear. American Fisheries Society Monograph 4:152-160, 1988.

[6] *Brunswick Nuclear Steam Electric Generating Plant of Carolina Power and Light Company, Historically Summary and Review of Section 316(b) Issues.* EPA Region IV, 1979.

[7] *Comparison of Trends in the Finfish Assemblages of Mt. Hope Bay and Narragansett Bay in Relation to Operations of the New England Power Brayton Point Station.* Mark Gibson, Rhode Island Division Fish and Wildlife, Marine Fisheries Office, June 1995 and revised August 1996.

windowpane eggs, and 0.89 billion winter flounder larvae were entrained in 1994 alone. Using adult equivalent analyses, the entrainment and impingement of fish eggs and larvae in 1994 translated to a loss of 30,885, 20,146, and 96,507 pounds of adult tautog, windowpane, and winter flounder, respectively.

B. San Onofre Nuclear Generating Station. The San Onofre Nuclear Generating Station (SONGS) is on the coastline of the Southern California Bight, approximately 2.5 miles southeast of San Clemente, California. The marine portions of Units 2 and 3, which are once-through, open-cycle cooling systems, began commercial operation in August of 1993 and 1994, respectively. Since then, many studies have been completed to evaluate the impact of the SONGS facility on the marine environment.[8]

Studies of kelp beds in near shore waters within the vicinity of the SONGS facility determined that the operation of cooling water intake structures resulted in a 60 percent (80 hectare) reduction in the area covered by moderate to high density kelp. Studies indicated that poor survival and lack of development of new kelp plants was the result of increased turbidity due to withdrawal of intake water at SONGS. The loss of kelp was also determined to be detrimental to fish communities associated with the kelp forests. For example, fish living close to the cobble bottom in the impact area experienced a 70 percent decline in abundance. Fish living in the water column in the impact areas had a 17 percent loss in abundance and a 33 percent decline in biomass relative to control populations. The abundance of large invertebrates within kelp beds also declined for many species, particularly snails.

Estimates for losses of midwater fish species due to direct entrainment by cooling water intake structures at SONGS is between 16.5 to 45 tons per year. This loss represents a 41 percent mortality rate for fish (primarily northern anchovy, queenfish, and white croaker) entrained by intake water at SONGS. In a normal year, approximately 350,000 juvenile white croaker would be killed through entrainment at SONGS. This number represents 33,000 adult individuals or 3.5 tons of adult fish. Changes in densities of

[8] Review of Southern California Edison, San Onofre Nuclear Generating Station (SONGS) 316(b) Demonstration. Prepared by SAIC, July, 20, 1993.

fish populations within the vicinity of the plant were observed in species of queen fish and white croaker relative to control populations. Within 3 kilometers of SONGS, the density of queenfish and white croaker decreased by 34 to 63 percent in shallow water samples and 50 to 70 percent in deep water samples.

In its Disapproval Statement, OMB stated that EPA should "clearly state its interpretation" of the term "adverse environmental impact." How that term should be defined for purposes of a Section 316(b) regulation is a major issue in this proceeding. Therefore, EPA has conducted outreach, including discussions at a public meeting held on June 29, 1998, to receive input from stakeholders on how this term should be defined. Representatives of New York State declared at the public meeting that New York considers the death of a single organism as a result of a cooling water intake structure to be an "adverse environmental impact" for purposes of Section 316(b). Representatives of environmental groups who attended the public meeting also advocated this approach. On the other hand, industry representatives took the position that no "adverse environmental impacts" are occurring unless the cooling water intake structure affects the health of the aquatic community as a whole. EPA intends to include a definition of "adverse environmental impacts" in the regulatory proposal that it must issue under the Consent Decree. The Agency will base the definition, in part, on the data and other information that it will receive from the administration of the screener and detailed questionnaires. EPA will carefully consider public comment on this issue before taking final action. EPA believes it is premature for the Agency to define "adverse environmental impacts" at this time for purposes of a Section 316(b) regulation.

EPA has considered how to define "adverse environmental impact" in other contexts in the past. For example, the May 1977 *Guidance for Evaluating the Adverse Impact of Cooling Water Intake Structures on the Aquatic Environment* stated, "Adverse aquatic environmental impacts occur wherever there will be entrainment or impingement damage as a result of the operation of a specific cooling water intake structure." (Guidance at page 15) The guidance recognized, however, that some impingement and entrainment is unavoidable. It was made clear that the magnitude of the impact is the critical question to be answered and that this should be addressed on a case-by-case basis, considering the species involved, the magnitude of the

losses, years of intake operation remaining, ability to reduce losses, and other factors. The collection of just such data is an essential goal of EPA's overall information collection efforts.

Existing and historical studies like those described earlier in this section provide only a partial picture of the severity of environmental impacts associated with cooling water intake structures. Most importantly, the methodologies for evaluating adverse environmental impacts used in the 1970s and 1980s, when the majority of Section 316(b) evaluations were performed, were inconsistent and incomplete. For example, some studies only reported gross fish or larvae losses; others reported fish losses in numbers based on species and life stage; finally, others reported percent losses with respect to fish population. Recent advances in environmental assessment techniques now provide better tools to evaluate the significance of impacts associated with the operation of cooling water intake structures. Models calculating predicted impacts to fish populations have improved as additional data are generated on the life histories of key species.

EPA has published guidance resulting from more than 10 years of research on the development and implementation of biocriteria as a tool for assessing the health of aquatic communities. The biocriteria steering committee is working on a stressor identification protocol to evaluate the relative contribution of specific stressors on biological communities. Just this year, EPA published final *Guidelines for Ecological Risk Assessment* developed by a forum of technical experts within and outside of EPA, refined by comments received following public notice of draft guidelines and reviewed by the Science Advisory Board. These guidelines provide a framework for evaluating the adverse ecological effects that may result from individual or multiple stressors and will improve the quality and consistency of site-specific evaluations of the magnitude of adverse environmental impacts associated with cooling water intake structures. EPA believes these tools may improve the reliability and comparability of Section 316(b) evaluations and contribute to the development of a regulatory definition of adverse environmental impact. However, EPA needs to collect data in order to apply these tools in a scientifically sound manner.

2. Evidence That Point Sources Are Not Using Best Technology Available To Minimize Adverse Environmental Impacts.

Minimal data are available to characterize the current utilization of technologies to minimize adverse environmental impacts from cooling water intake structures. EPA evaluated sources of available data in an effort to determine which technologies are being used. For traditional steam electric utilities, data on cooling water intake structure technologies was available from an industry source.[9] Similar information has not been compiled for either the nonutility power producers nor the other industry categories withdrawing cooling water. In collecting, assembling, and reviewing background information on cooling water use, EPA found very little useful information on the steam electric nonutility power producing sector and the four other industries (Chemicals and Allied Products, Primary Metals, Petroleum and Coal Products, and Paper and Allied Products). Most regions and States have focused their Section 316(b) approaches only on traditional steam electric utilities. The NPDES permit files that EPA has reviewed do not contain information on BTA for the other categories of facilities that are known to use cooling water. In discussions with EPA Regional officials, only two regions (Regions IV and V) were identified where other industrial facilities (specifically steel mills) that use cooling water were evaluated for potential impacts; however, modifications to the intake structures at these facilities have not been made.

Until more detailed information is collected, EPA cannot state whether the point source facilities using cooling water are using technologies to minimize adverse environmental impacts. EPA will be collecting this information through the screener and detailed questionnaires.

The remainder of this discussion will focus on the traditional steam electric data that EPA has collected to characterize that industry's cooling water intake structures.

[9] Edison Electric Institute. *Power Statistics Database*. Utility Data Institute, McGraw Hill. 1994.

Traditional steam electric utilities use a wide variety of cooling water intake technologies to maximize cooling system efficiency and minimize environmental impacts. Data on technologies used at these facilities can be found in the *Power Statistics Database*, a database funded by the Edison Electric Institute and maintained by the Utility Data Institute (UDI). The database consists of a compilation of limited information on cooling water intake structures voluntarily reported by traditional steam electric utilities to UDI. Updated yearly until 1994, the database provides information on the technologies employed at individual facilities, but it does not provide information on whether the technology employed was determined to be BTA. Additionally, for numerous facilities reported in the database, the field indicating whether a Section 316(b) determination had been made for a given facility is incomplete. More importantly, the database cannot help EPA evaluate whether the technologies employed at specific cooling water intake structures would be considered BTA at the present time.

Nevertheless, EPA has looked at what technologies have been implemented at traditional steam electric utilities. Based on knowledge gained from extensive literature reviews and dialogue with other Federal, State, industry, academic, consulting, and environmental experts, EPA has made assumptions about what technologies might be considered "best" under certain circumstances. EPA has concluded, however, that it needs additional data to fully evaluate the extent to which BTA is being employed at existing traditional steam electric facilities. The
detailed questionnaires are being designed to collect some of this data from these entities. Based on currently available data, EPA's preliminary evaluation of BTA implementation status for the traditional steam electric industry follows.

The most common technologies reported to be in use by steam electric utilities are trash racks and screens that prevent debris from entering and damaging the facilities' cooling water systems. They also serve to exclude larger fish and aquatic organisms from entering the systems. A few of these screening systems are equipped with fish return mechanisms; however, many of these systems are not operated to ensure the survival of the impinged organisms.

As a result of discussions with NPDES permitting authorities and utility officials, it appears that fine mesh screens are an effective technology for minimizing entrainment. They can, however, increase impingement. As of 1994, data submitted to the *Power Statistics Database* indicate that of the 703 steam electric plants in the database that withdraw cooling water from surface water sources, 14 (2 percent) employed fine mesh screens on at least one cooling water intake structure. These 14 plants represented about one percent of the cooling water withdrawn from surface waters by plants reporting data. These findings might suggest that BTA is not being used and that EPA should evaluate the implementation status of Section 316(b) further.

Low intake velocity has also been frequently mentioned as a design criterion for minimizing impingement at cooling water intake structures. There is some debate regarding whether approach velocities should be at or below a half foot per second (0.5 fps) or 1 fps to be protective.[10] EPA has looked at the data in the *Power Statistics Database* and found that of the 389 plants that reported an intake velocity above zero (zero was both a reported value and a default value for data not reported), 88 (23 percent) reported a velocity at or below 0.5 fps, and 92 (24 percent) reported a velocity at or below 1 fps. These findings might indicate that, in general, BTA is not being used and that EPA should evaluate the implementation status of Section 316(b) further.

Some believe that closed-cycle cooling systems (e.g., systems employing cooling towers) are the best means of protecting organisms from impingement and entrainment because of the significant reduction in the volume of intake water needed. Of the 703 steam facilities in the *Power Statistics Database* reported as withdrawing cooling water from surface waters, 263 (37 percent) reported the use of closed-cycle cooling

[10]The 0.5 feet per second (fps) approach velocity value has been frequently cited by some NPDES permitting authorities and utility officials as an informal standard for minimizing impingement. The following citation is for what appears to be the first Federal document that advocated this value as a "standard": John Boreman (National Power Plant Team), *Impacts of Power Plant Intake Velocities on Fish*, U.S. Fish and Wildlife Service, March 1977. Some industry officials have argued during the course of meetings with EPA that 1 fps would be just as good a "standard" as 0.5 fps.

systems. Most (245) of these plants were reported as being located on fresh water bodies. The other 18 were reported as using brackish or saline water as their source water.

Another effective approach for minimizing adverse environmental impacts associated with cooling water intake structures is to locate the intake structures in areas with low abundance of aquatic life and design the structures so that they do not provide attractive habitat for aquatic communities. However, this approach is of little utility for existing facilities where options for relocating intake structures are infeasible. For example, the *Power Statistics Database* indicates that a number of steam electric power generation facilities are located on estuarine water bodies which are considered to be areas of high productivity and abundance. In addition, estuaries are often nursery areas for many species. The flow to these facilities totaled 15.7 percent of the total once-through cooling water flow being withdrawn by steam electric plants in 1994. BTA for these facilities might include reductions in the total volume of cooling water allowed to be withdrawn (e.g., by use of a closed-cycle cooling system). However, there is not sufficient available information for EPA to conclude that closed-cycle cooling would be BTA for these facilities. EPA intends to collect data through the screener and detailed questionnaires to better assess the use and operation of closed-cycle cooling systems.

Based on the information evaluated, EPA believes there is reason to be concerned that many point sources are not using BTA to minimize adverse environmental impacts. Although some data are available to identify what technologies are being employed on cooling water intake structures at traditional steam electric facilities, knowing the technology employed does not allow a judgment on whether the technology is best available for minimizing adverse environmental impacts at a particular location. EPA believes there may be "suites" of technologies that are appropriate for sites with certain characteristics; however, it is too early in EPA's evaluation process for such a determination to be made. Because each site could potentially employ a different technology that might be considered BTA, information on whether a Section 316(b) determination has already been made and reevaluated within the last NPDES permit term is needed to assess

whether the facility is meeting BTA for purposes of Section 316(b). EPA will use the questionnaires to gather such information.

3. Evidence that a National Regulatory Approach Is Warranted.

NPDES permitting authorities have the requirements of Section 316(b) codified in a diversity of ways. In 1993, EPA evaluated State regulations and statutes, seeking information on each State's regulations/statutes relating to Section 316(b). Of the 40 States with NPDES permitting authority, only three were found to have statutes or regulations specifically addressing cooling water intake structures in any detail. For example, California's Water Code includes provisions addressing the protection of the marine environment from effects caused by cooling water intake structures. The Water Code requires that new or modified coastal power plants or other industrial installations using seawater for cooling, heating, or industrial processing use the best available site, design technology, and mitigation measures feasible to minimize the intake and mortality of all forms of marine life.

Maryland was also found to have requirements relating to cooling water intake structures. Maryland's regulations closely mirror the statutory language of Section 316(b) by requiring that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impacts. Maryland's regulations, however, go beyond this and require that a facility install and operate modifications to mitigate impingement provided that these costs over the five-year period do not exceed five times the estimated annual value of impingement loss as determined by State procedures. Regarding entrainment losses, Maryland's regulations require the discharger to determine the extent of entrainment loss on a "spawning or nursing area of consequence." If entrainment loss results in "significant adverse environmental impact," the discharger must install and operate functional modifications to mitigate the entrainment loss. Facilities withdrawing less than 10 million gallons per day from surface waters are excluded from these requirements if the volume withdrawn is less than 20 percent of the design

stream flow for nontidal waters or the annual average net flow past the discharge point that is available for dilution for tidal waters.

Several NPDES States have included language in their statutes or regulations referencing either Section 316(b) or 40 *CFR* Part 125, Subpart I, the blank section of the Federal NPDES regulations reserved for criteria applicable to cooling water intake structures. For example, New Jersey's NPDES regulations state, "[T]he criteria applicable to cooling water intake structures shall be as set forth in 40 *CFR* Part 125, Subpart I when the USEPA adopts these criteria." Other States merely restate the statutory language. New York's NPDES regulations require that "[t]he location, design, construction and capacity of cooling water intake structures, in connection with point source thermal discharges, shall reflect the best technology available for minimizing adverse environmental impact."

Table A1. below summarizes some of the State authorities EPA identified (with appropriate citations).

Additionally, in discussions with State and EPA regional contacts, EPA has found that there are differences in the manner in which States have implemented their Section 316(b) authority through the years. Some States and Regions review Section 316(b) requirements each time an NPDES permit is reissued. These permitting authorities may reevaluate the potential for impacts and whether operations or other conditions influencing the potential for impacts have changed at the facility. Other permitting authorities were found to have made initial determinations for facilities in the 1970s but not to have revisited the determinations since.

Table A1. Selected NPDES State Statutory/Regulatory Provisions Addressing Impacts from Cooling Water Intake Structures

NPDES State	Citation	Summary of Requirements
Connecticut	RCSA § 22a, 430-4	Provides for coordination with other Federal/State agencies with jurisdiction over fish, wildlife, or public health, which may recommend conditions necessary to avoid substantial impairment of fish, shellfish, or wildlife resources
New Jersey	NJAC § 7:14A-11.6	Criteria applicable to intake structure shall be as set forth in 40 *CFR* Part 125, when EPA adopts these criteria
New York	6 NYCRR § 704.5	The location, design, construction, and capacity of intake structures in connection with point source thermal discharges shall reflect BTA for minimizing environmental impact
Maryland	MRC § 26.08.03	Detailed regulatory provisions addressing BTA determinations
Illinois	35 Ill. Admin. Code 306.201 (1998)	Requirement that new intake structures on waters designated for general use shall be so designed as to minimize harm to fish and other aquatic organisms
Iowa	567 IAC 62.4(455B)	Incorporates 40 CFR part 401, with cooling water intake structure provisions designated "reserved"
California	Cal. Wat. Code § 13142.5(b)	Requirements that new or expanded coastal power plants or other industrial installations using seawater for cooling shall use best available site, design technology, and mitigation measures feasible to minimize intake and mortality of marine life

Based on the above findings, EPA believes that approaches to implementing Section 316(b) vary greatly. It is evident that some authorities have regulations and other program mechanisms in place to ensure continued implementation of Section 316(b) and evaluation of potential impacts from cooling water intake structures, while others do not. Furthermore, Section 316(b) determinations are currently made on a case-by-case basis, based on permit writers' best professional judgment. Through discussions with some State permitting officials (e.g., in California, Georgia, and New Jersey), EPA was asked to establish national standards in order to help ease the case-by-case burden on permit writers and to promote national uniformity with respect to implementation of Section 316(b).

2(b) Practical Utility/Users of the Data

As stated earlier, Section 316(b) provides that any standard established pursuant to Sections 301 or 306 of the CWA and applicable to a point source shall require that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available (BTA) for minimizing adverse environmental impact. As such, EPA will ultimately use the data collected to develop regulatory options for minimizing environmental impacts caused by cooling water intake structures.

EPA will collect information via the detailed questionnaires from traditional steam electric utilities, steam electric nonutility power producers, and other industries. The data will be entered into a database that can be queried to provide aggregated information that the Agency can use in decision making and for development of regulatory options during the rulemaking process. Additionally, the data will be used to (1) substantiate the need for the rule; (2) characterize the potentially regulated community; (3) characterize the location, design, construction, and capacity of existing and future cooling water intake structures; (4) support economic analyses needed to support the rulemaking effort including a Regulatory Impact Analysis (RIA) or cost/benefit analysis, an Unfunded Mandates Reform Act (UMRA) analysis, and a Small Business Regulatory Enforcement Fairness Act (SBREFA) analysis (see *Attachment 2)*; and (5) support rulemaking development for cooling water intake structures. The data will also be used to support any guidance needed in the future to support the proposed and final regulations.

Case study data will be used to (1) provide a very detailed and in depth analysis of the costs and benefits for specific regions of concern; (2) help demonstrate the site-specific nature of environmental impacts of CWIS and potential benefits of implementing BTA; (3) support the development of a tiering framework for the Section 316(b) regulation; (4) evaluate cumulative impact potential; (5) determine the effectiveness of specific technologies; (6) produce models of national benefits; (7) and provide examples of how a permit writer would analyze a plant when issuing a permit.

The voluntary information collected from the nonutility and manufacturing sectors will allow companies to voluntarily supply EPA with information concerning their facilities outside the sample frame

which may be impacted by this rulemaking. This information will be important in the company (firm) level economic analysis and will allow EPA to consider the overall economic impacts of Section 316(b) regulation on affected companies.

The data will be used by the Agency and their contractors.

3. Nonduplication, Consultations, and Other Collection Criteria

3(a) Nonduplication

EPA reviewed existing data sources to identify currently available information on entities subject to Section 316(b) regulation and to ensure that the data requested in the Section 316(b) surveys are not otherwise accessible. Data sources reviewed included data collected by offices within EPA; data, reports, and analyses published by other federal agencies; reports and analyses published by industry; and publicly available financial information compiled by government and private organizations.

EPA's research into existing data sources has produced the best results for economic data on the traditional steam electric utilities. As a regulated industry, utilities are currently subject to substantial annual reporting requirements by various government entities. EPA has located and retrieved relevant data submitted by these entities and has omitted questions intended to collect similar information from the economic part of the utility industry survey. As a result of this nonduplication effort, EPA has been able to reduce the number of questions asked in the economic portion of the utility industry survey by more than 80 percent, substantially reducing both respondent and Agency burden.

Table A2. Number of Questions by Utility Respondent Group and Question Status in Detailed Questionnaires

	Traditional Steam Electric Utility Respondent Group					
	Privately Owned Utilities		Publicly Owned Utilities		Rural Electric Cooperatives	
Questions Asked in Detailed Questionnaires	23	15.8%	23	16.1%	23	16.4%
Questions Available from Public Sources	123	84.2%	120	83.9%	117	83.6%
Total Number of Questions	146		143		140	

As with utilities, the Energy Information Administration (EIA) conducts annual surveys of electricity generation by steam electric nonutility power producers. However, these data are considered confidential business information, and EIA was not able to share these data with EPA. In addition, none of the other data sources reviewed by EPA provided complete and up to date information coverage of steam electric nonutility power producers subject to Section 316(b) regulation.

The following subsections summarize the sources of data and information that EPA reviewed in trying to identify existing sources of data to reduce duplication of effort and minimize burden on survey respondents. Data available through these sources as well as limitations are discussed for each data source. The first part of this section presents a summary of general data sources reviewed; the second section presents data sources specific to certain Section 316(b) industry groups.

General Data Sources

EPA Effluent Guideline Data Sources. EPA project managers reviewed existing effluent guidelines development documents for information on cooling water intake structures. The review showed that the development documents contained very little information on cooling water, and no information on the characteristics of cooling water intake structures. Most of the development documents only broadly characterized the total volume of intake water for a particular subcategory of the industry. Furthermore,

there was little or no documentation on the different uses of the intake water (e.g., process water, cooling water, etc.) or the volumes or flows that could be attributed to each use. In cases where the development document did distinguish between process water and cooling water, the document typically only gave the percentage of water used for noncontact cooling water versus the percentage for contact cooling water. Consequently, little information about cooling water intake structure characteristics or cooling water use is available in past effluent guideline development documents.

EPA project managers also reviewed the draft questionnaire that EAD developed as part of their recent efforts to revise the Iron and steel industry effluent guidelines. This effort included little or no information on the different uses of intake water or the volumes or flows that could be attributed to each use. As a consequence, the project managers found no duplication of technical information requested between the two survey tools. Furthermore, the economic portion of the iron and steel industry survey effort did not ask for cooling water specific financial and economic data, the facility's economic dependence on cooling water, or information on steam electric electricity generation. The project managers also reviewed the 1996 *Preliminary Data Summary for the Petroleum Refining Categories*. The report was found to contain minimal information on cooling water use; it only reconfirmed that cooling water is used in the petroleum refining industry.

U.S. EPA Office of Water Data Sources. The EPA's Office of Water maintains two databases that track and evaluate discharges to waters of the U.S.: the Permit Compliance System (PCS) database and Industrial Facilities Database (IFD). EPA project managers examined the data element dictionary for the PCS database and determined that PCS data do not include financial and economic data or other key data items requested in the survey such as cooling water use and characteristics, or operational data on cooling water intake structure operations. The IFD database was found to contain a few data elements that would allow cooling water intake to be quantified. However, the quality of the data is questionable due to sporadic updating and because there are no stringent quality assurance measures in place to verify the accuracy.

U.S. Bureau of the Census Data Sources. The Bureau of the Census, a division of the U.S. Department of Commerce (DOC), conducts a census every five years of the nation's industrial and business activities. The *1982 Census of Manufactures* is the 31st and last census to collect data on cooling water use among the different industrial sectors. A more recent *1992 Census of Manufactures* is the last census published to date, however, it did not collect data on cooling water use. The *1982 Census of Manufactures* collected data from all manufacturing sites concerning employment, inventories, capital expenditures, value added by manufacture, economic concentration ratios in manufacturing, fuel and electric energy consumption, and water use in manufacturing. It was determined that the census data are largely confidential and are therefore not available to EPA on a site-specific basis. In addition, the data on cooling water use are aggregated only at the two-digit SIC major group level, and are not comprehensively available at the more discerning three and four-digit levels to protect the private entities which the SIC codes represent. While the available cooling water use data were beneficial in assisting EPA to determine the broad categorical industries which use large amounts of cooling water, the census data are not detailed or comprehensive enough to support rulemaking analysis requirements. In addition, EPA questions the current relevance of the data to support rulemaking analysis since the data are nearly 16 years old.

U.S. Geological Survey Sources. The USGS published a document in 1998 called the *Estimated Use of Water in the United States in 1995* (Solley et al. 1998). The report compiled data collected by USGS district offices in conjunction with State Agencies from data collected and stored in the Water Use Files of the database system WATSTORE. This data quantified and described water withdrawals in the U.S. The data provided useful information on industrial water use relative to other types of water uses; however, limitations are inherent in the data. For example, the data did not distinguish between water withdrawn for process use versus cooling water use. In addition, the data are aggregated at the watershed level. No data are available for individual facilities.

Small Business Administration Data Sources. The Small Business Administration (SBA) maintains definitions of small businesses in specific industries and maintains a database that has proven useful to some

prior regulatory development efforts. However, the SBA does not maintain information on unit operation and cooling water intake or use, or other detailed technical or financial data required for the Section 316(b) rulemaking analysis.

Federal Reserve Bank Data Sources. The Federal Reserve Bank compiles monetary aggregates and measures of business activity, capacity utilitization, and inflation. These data have been used as a secondary source of information for general economic rulemaking analysis under the Section 316(b) regulatory development effort , but do not include site-specific and firm-specific data required for Section 316(b) regulation development.

The Dun & Bradstreet Database. The Dun & Bradstreet database provides economic information on domestic businesses at the site level. The data include the Standard Industrial Classification (SIC) code, a description of business, the company name, the site location, a telephone number, the number of employees, some sales information, site area (square footage), the names of corporate executives, and some financial data. These data are available for approximately ten million individual sites in the United States with at least one employee. However, the Dun & Bradstreet database does not provide information about unit operations, cooling water intake structures, water use, and other technical data required for Section 316(b) rulemaking analysis. The database also does not include the required level of detailed economic information EPA needs to support regulatory development. In addition, EPA has learned from other rulemaking efforts, such as the Metal Products and Machinery effluent guidelines, that there are significant numbers of errors in the Dun & Bradstreet data. EPA will use the Dun & Bradstreet database to the greatest degree possible, but the limited scope of the data and the frequency of errors demonstrate that these data are not adequate for Section 316(b) rulemaking.

Value Line Data Sources. Value Line is a securities-related research firm that compiles indicators of financial performance at the level of industries as well as industry projections and profiles. These data may

be used for Section 316(b) rulemaking analysis as a secondary source of information, but they do not include the site-specific and firm-specific data required for rulemaking analysis.

Robert Morris Associates Data Sources. Robert Morris Associates is a private banking organization that compiles a report of financial indicators for firms applying for loans from banks. This database includes both public and private firms. It presents industry averages and distributions around averages. Combined with survey data, EPA has used the Robert Morris Associates database in its economic analysis. However, these data are for too general to be used as the sole basis for Section 316(b) rulemaking.

U.S. Securities and Exchange Commission Data Sources. The Securities and Exchange Commission (SEC) is an independent, nonpartisan, quasi-judicial regulatory agency with responsibility for administering the federal securities law. The purpose of this law is to protect investors in securities markets and to ensure that investors have access to disclosure of all material information concerning publicly traded securities. Information filed with the SEC, such as standard financial statements, is made available through the Electronic Data Gathering, Analysis, and Retrieval system (EDGAR). Reports available through the SEC do not contain detailed site-specific information, but they have firm-specific data that may be useful in the Section 316(b) economic analysis. EPA will use these data as a secondary source of firm specific data. However, the restriction to publicly traded companies, the lack of facility-specific financial, engineering, and environmental data, and the lack of unit level data limit the use of this data source for Section 316(b) regulatory development effort.

Data Sources Specific to Certain Section 316(b) Industry Groups - Traditional Steam Electric Utilities

Federal Energy Regulatory Commission Data Sources. The Federal Energy Regulatory Commission (FERC) is an independent agency that oversees America's natural gas industry, electric utilities, nonfederal hydroelectric projects, and oil pipeline transportation system. FERC requires that utilities, companies, or individuals subject to its regulations periodically file data or information relating to such matters as financial

operations, energy production or supply, and compliance with applicable regulations. Following are brief descriptions of the relevant FERC data collection forms associated with Traditional Steam Electric Utilities:

- *FERC Form 1*, the *Annual Report for Major Electric Utilities, Licensees and Others***,** collects extensive accounting, financial, and operating data from major privately-owned electric utilities.[11] Utility-level information (e.g. number of employees, detailed revenue and expense information, balance sheet information, and electricity generation information) and plant-level information (e.g. production expenses, balance sheet information, and electricity generation information) will be used extensively in the economic analysis of Section 316(b) regulations. While FERC makes data from the Form 1 available to the public, these data are not directly accessible in a cost-effective manner. As described in the following sections, EPA will therefore use FERC Form 1 data as compiled and distributed by other entities.

- *FERC Form 1-F*, the *Annual Report of Nonmajor Public Utilities and Licensees*, collects accounting, financial, and operating data from nonmajor privately-owned electric utilities.[12] The FERC Form 1-F collects utility- and plant-level data similar to the FERC Form 1 albeit less detailed.

Energy Information Administration Data Sources. The Energy Information Administration (EIA) is an independent statistical and analytical agency within the U.S. Department of Energy (DOE). In support of its analytic activities, the EIA administers a series of data collection efforts including extensive surveys of electric utilities' financial operations, and their production and disposition of electricity. EPA carefully reviewed the different data collection forms used by the EIA and identified several forms that collect data needed for the economic analyses of the effects of Section 316(b) regulation on the traditional steam electric

[11] Note that this data collection form only applies to *privately-owned utilities*. Corresponding data collection forms for publicly-owned utilities and rural electric cooperatives are discussed in other parts of this nonduplication section. A privately-owned electric utility is considered "major" if its sales and transmission services, in each of the three previous calendar years, exceeded one of the following: 1) One million megawatt hours of total annual sales; 2) 100 megawatt hours of annual sales for resale; 3) 500 megawatt hours of annual power exchanges delivered; or 4) 500 megawatt hours of annual wheeling for others.

[12] A privately-owned electric utility is considered "nonmajor" if it had total annual sales of 10,000 megawatt hours or more in the previous calendar year but is not classified as "major" under the FERC Form 1 definition.

utility industry. Following are brief descriptions of the relevant EIA data collection forms associated with Traditional Steam Electric Utilities:

- *Form EIA-412*, the *Annual Report of Public Electric Utilities*, collects accounting, financial, and operating data from publicly-owned electric utilities.[13] The information collected in Form EIA-412 is similar to, but less detailed than data collected from major privately-owned electric utilities in FERC Form 1. EPA use of Form EIA-412 data will include both utility-level information (e.g. number of employees, detailed revenue and expense information, balance sheet information, and electricity generation information) and plant-level information (e.g. production expenses, balance sheet information, and electricity generation information).

- *Form EIA-767*, the *Steam-Electric Plant Operation and Design Report*, collects data on air and water quality from steam-electric power plants with generating capacity of 100 megawatts or greater. A subset of these data are provided for steam-electric power plants with generating capacity between 10 and 100 megawatts. EPA use of Form EIA-767 data will include unit-level information on net electricity generation, hours in operation, and the quantity of fuel burned.

- *Form EIA-860*, the *Annual Electric Generator Report*, collects data on the status of electric generating plants and associated equipment in operation and those scheduled to be in operation within the next 10 years of filing the report. Each utility that operates or plans to operate a power plant in the United States is required to file Form EIA-860. EIA uses the data to maintain and update its electric power plant database frame. EPA use of Form EIA-860 data will include unit-level information on operating status, nameplate capacity, and ownership percentage.

- *Form EIA-861*, the *Annual Electric Utility Report*, collects data on generation, wholesale purchases, and sales and revenue by class of consumer and State. Respondents include each electric utility that is engaged in the generation, transmission, distribution, or sale of electric energy primarily for use by the public. Data used from Form EIA-861 will include sales and revenue by consumer class, the utility's NERC region, and address information. In addition, EPA will use data on utility ownership to classify each utility as either a privately-owned utility, a publicly-owned utility, or a rural electric cooperative and to determine which of the three versions of the utility survey the respondent will receive.

[13] Note that this data collection form only applies to *publicly-owned utilities*. Corresponding data collection forms for privately-owned utilities and rural electric cooperatives are discussed in other parts of this nonduplication section.

In addition to data from the EIA data collection forms outlined above, EPA will use EIA's database of FERC Form 1 data. EIA compiles and publishes a database containing the majority of utility-level financial and operating data submitted on the FERC Form 1. While these data are directly available from FERC, the EIA database is published in an electronic format that is more convenient to use than the FERC data. Because EIA conducts basic quality assurance activities, EPA expects that the EIA data is more reliable than the FERC data (see also the discussion on Opri Data Sources below for an alternative database of plant-level FERC and EIA data).

Rural Utility Service Data Sources. The Rural Utility Service (RUS) is a Federal agency that provides rural infrastructure assistance in electricity, water and telecommunications. As a Federal credit agency in the U.S. Department of Agriculture, RUS provides a leadership role in financial lending and technical guidance for the rural utilities industries. Rural utilities that borrow from RUS are subject to annual reporting requirements administered by RUS. Following are brief descriptions of the relevant RUS data collection forms associated with Traditional Steam Electric Utilities:

- *RUS Form 12*, the *Electric Operating Report*, collects accounting, financial, and operating data from rural electric cooperatives[14]. The information collected in RUS Form 12 is similar to data collected from major privately-owned electric utilities in FERC Form 1. EPA use of RUS Form 12 data will include utility-level information (e.g. number of employees, detailed revenue and expense information, balance sheet information, and electricity generation information), plant-level information (e.g. production expenses, balance sheet information, and electricity generation information), as well as unit-level information (e.g. fuel consumption, operating hours, and electricity generation).

U.S. Nuclear Regulatory Commission Data Sources. The U.S. Nuclear Regulatory Commission (NRC) is an independent agency established to ensure the adequate protection of the public health and

[14] Note that this data collection form only applies to *rural electric cooperatives*. Corresponding data collection forms for privately-owned and publicly-owned utilities are discussed in other parts of this nonduplication section.

safety, the common defense and security, and the environment in the use of nuclear materials in the United States. In carrying out its responsibilities of regulating commercial nuclear power reactors, the NRC compiles and publishes data and reports regarding the nuclear sector of the electric power industry. However, these data and reports are based on information collected by other agencies and do not overlap with information requested in the detailed questionnaires.

Utility Data Institute Data Sources. The Utility Data Institute (UDI) is a directory and database publishing division of the McGraw Hill Companies. UDI's product line includes annual operating and financial performance data for electric power plants and electric power companies. Following are brief descriptions of the relevant UDI databases associated with traditional steam electric utilities:

- The *EEI Power Statistics Database*, compiled by UDI, contains data for every conventional, utility-owned steam electric plant in the United States and its Territories. While the database contains unit and plant-specific information needed for the analysis of Section 316(b) regulations, compilation of the database was discontinued in 1994 limiting its usefulness to the Section 316(b) rulemaking analysis.

Opri Data Sources. Opri is a private firm located in Boulder, Colorado, that has compiled extensive databases related to the traditional steam electric utility industry. Opri's "Electric Generating Plant Database" includes plant-level data for privately-owned utilities, publicly-owned utilities, and cooperatives for 1988-1997. While these data are available from the government agencies responsible for administering the data collection forms (FERC, EIA, and RUS), these agencies do not make the information available in an easily accessible electronic format. As a consequence, EPA has purchased plant-level data from Opri to support its economic analyses.

Data Sources Specific to Certain Section 316(b) Industry Groups - Steam Electric Nonutility Power Producers

Energy Information Administration Data Sources. Form EIA-867, the *Annual Nonutility Power Producer Report*, collects data on electricity generation, installed capacity, and energy consumption from nonutility power producers who own or plan on installing electric generation equipment with a total capacity of one megawatt or more. The form does not collect any economic or financial data needed for the economic analysis of Section 316(b) regulations. Unlike the other EIA databases outlined above, EPA will not be able to utilize electricity related data from the Form EIA-867 because EIA informed EPA project managers that the majority of the company-level information in the Form EIA-867 database is confidential. EIA would give EPA name and address information but without linkages to the technical data. EIA would also provide EPA with statistical data presented in an aggregate form. However, to properly analyze the data, EPA must have the raw data. EPA asked EIA officials about the possibility of an Inter-Agency Agreement to allow the release of specific confidential data to EPA. Unfortunately, EIA officials felt obligated to withhold the data since EPA would be using the data for regulatory purposes. Since EIA will not share their confidential data with EPA, the Agency has no other recourse but to collect duplicative data. To minimize respondent burden, EPA included references to all economic data that are reported on Form EIA-867 so that respondents may simply copy the information from the form to the detailed questionnaires.

Utility Data Institute Data Sources. The *UDI Directory of U.S. Cogeneration, Small Power, and Industrial Power Plants* contains data for more than 4,300 nonutility power producer plants. The database, however, is not exclusive to facilities that have steam electric generators. The database also contains nonutility power producers with turbines that do not use cooling water such as gas turbines, geothermal units, wind and solar installations, and a variety of other plant types. The primary focus of the UDI nonutility database is on facilities that provide at least some electricity for sale to utilities. Data elements include capital cost data (if available), location by NERC region, state, county, and town, and listings of various organizations involved in operation, use, funding, and/or design of these plants. Data elements for each plant listing include the megawatt, plant type, fuel use, status (operational, stand-by, under construction, etc.), and major installed equipment by unit. However, no economic or financial data needed for the Section 316(b) rulemaking economic analysis is included in the database.

The UDI nonutility database contains some of the information EPA requires, but EPA is not wholly confident in the reliability of the data sources. Data are compiled from annual reports to shareholders (utilities and other companies), business press, FERC filings, private surveys, Public Utility Commissions, State and regional compendia, trade press, utility reports, vendor and supplier experience and installation lists. Unlike the Form EIA-867 database, there is no overall quality control or quality assurance of the data, and thus the UDI database cannot be used for regulatory purposes. The UDI database has been used by EPA for the Section 316(b) rulemaking effort to compare the names and addresses of steam electric plants with those in the Form EIA-867 database to ensure comprehensive coverage of nonutility power producers.

Edison Electric Institute Data Sources. EEI conducts an annual survey and presents statistics on nonutility power producers in a document entitled, *Capacity and Generation of Non-Utility Sources of Energy*. The report contains national data on capacity and generation by sources for the year. Data include type of producer, qualifying status, prime mover, primary energy source, and major industry group; number and size of projects; and other economic data. Some data collected with the survey duplicate data requested in the screener and detailed questionnaires. However, the data are considered confidential and EEI will only disseminate data in an aggregated form. In order for the data to be useful for this Section 316(b) rulemaking effort, EPA must have the raw data on a facility-specific basis.

3(b) Public Notice Required Prior to ICR Submission to OMB

In compliance with the Paperwork Reduction Act (44 U.S.C. 3501 *et seq*.), EPA published a notice in the *Federal Register* on January 26, 1998 (63 *FR* 3738) announcing that the draft Detailed Industry Questionnaire: Phase II Cooling Water Intake Structures was available for public comment. A copy of the *Federal Register* notice is located in *Attachment 3*.

EPA received nine requests for the detailed questionnaires. The Agency attributed this small number of requests to the detailed questionnaires being available on OWM's Internet homepage.

EPA received 361 separate comments on the detailed questionnaires from twenty-one different commenters. Over 200 of these comments came from Utility Water Act Group (UWAG) which EEI endorsed. EPA met with EEI and UWAG, at UWAG's request, to discuss their extensive comments on the questionnaires. The root of their concern stemmed from the belief that the questionnaire was too burdensome and uncertainty of what EPA would do with all the information collected. Other comments, at large, ranged from simple issues such as respondents needing additional time to complete the detailed questionnaire, to more complicated issues such as ones challenging EPA's need to know facility economic and financial information.

As a result of the insights gained from the public comment and pretest activities, EPA simplified and shortened the detailed questionnaires. In general, EPA tailored the data collection effort to support the development of the Agency's draft pre-decisional regulatory framework, to support required Agency economic analysis (e.g., Regulatory Economic Impact analysis and Small Business Regulatory Enforcement Fairness Act analysis, Unfunded Mandates Reform Act analysis), and to support case study selection for the Agency's cost benefit analysis. In many instances EPA revised questions in order to reduce the burden. For example, EPA reduced the number of years of intake flow data required from 5 to 3 years. Industry commenters and those that pre-tested the detailed questionnaire considered this question by far to be the most burdensome. A copy of the previous version (January 1998) of the *EPA Detailed Industry Questionnaire: Phase II Cooling Water Intake Structure* has been provided in *Attachment 4*. A detailed listing of the comments made and EPA's responses is located in *Attachment 5*.

3(c) Consultations

The following paragraphs describe the specific outreach activities that EPA Staff performed during the Section 316(b) detailed questionnaire development period. These activities were intended to provide EPA with feedback on issues such as questionnaire format, terminology, and technical quality. All of the organizations with which EPA conducted outreach activities thought the process to be productive and beneficial to all parties involved.

EPA conducted a program of outreach to industry groups, environmental groups, and other government entities to get early feedback on the Section 316(b) survey effort. As part of the outreach effort in connection with the development of the detailed questionnaires, EPA distributed the draft detailed questionnaires in January 1997 to industry associations and environmental groups. EPA then met with these groups individually to discuss their issues. EPA believes that this early review and comment opportunity significantly improved the quality of the draft detailed questionnaires noticed in the *Federal Register* for public comment. Most of the organizations acknowledged EPA for incorporating many of their early suggestions into the draft detailed questionnaire. Table A3 provides a listing of the industry associations and professional organization representatives that participated in the EPA early outreach program:

Table A3. Industry Organization Representatives

Organization	Point of Contact	Phone Number
American Forest and Paper Association	Jerry Schwartz	(202) 463-2581
American Iron and Steel Institute	Bruce Steiner	(202) 452-7112
American Petroleum Institute	Jacki Sincore	(202) 682-8326
Chemical Manufacturers Association	Toni Wagner	(703) 741-5248
Utility Water Act Group	Kristy Bulleit	(202) 955-1547
Edison Electric Institute	Richard Bosak	(202) 508-5641
Electric Power Research Institute	Kent Zammit	(415) 855-2097

Later in the detailed questionnaire development process, EPA determined it appropriate to include the additional organizations reflected in Table A4 in the Agency's outreach efforts.

Table A4. Additional Industry Organizations

Organization	Point of Contact	Phone number

Aluminum Association	Lisa Williams	(202) 862-5129
Electric Power Supply Association	Eugene Peters	(202) 789-7200
American Public Power Association	William Wemhoff	(202) 467-2943
National Rural Electric Cooperative Association	Dick Sternberg	(703) 907-5824

In addition to the outreach activities with industry trade associations and related professional groups, EPA met with the environmental organization representatives listed in Table A5 in January of 1997 to discuss the information collection effort to date.

Table A5. Environmental Organization Representatives

Organization	Point of Contact	Phone Number
Hudson Riverkeepers	John Cronin/Theresa Hanczor	(914) 424-4149
New York/New Jersey Baykeeper	Andrew Willner	(908) 291-0176
Widener University School of Law (Delaware Baykeepers)	Jim May	(302) 477-2060
US Fish and Wildlife Service	David Sutherland	(410) 573-4535

EPA contacted the National Resource Defense Council (NRDC), but they chose not to participate at this juncture in the process. The NRDC, however, did advertise the above January meeting on their environmental outreach network. The environmental groups were on the whole pleased with the Agency's information collection effort .

EPA also made presentations on the Section 316(b) rulemaking effort at eleven professional and industry association meetings. EPA presenters encouraged the attendees at these meetings to provide any comments that they felt might improve the detailed questionnaires.

EPA held two public meetings in the Summer of 1998 to discuss issues related to the Section 316(b) rulemaking effort. Comments from these meetings helped EPA to evaluate and revise draft regulatory framework options. This in turned helped the Agency to simplify and shorten the detailed questionnaires by tailoring survey questions to support the draft regulatory framework.

On June 29, 1998, EPA held a day-long public meeting in Arlington, Virginia to discuss a draft regulatory framework for screening facilities based on their potential adverse environmental impacts from impingement and entrainment. Over 111 individuals representing industry, environmental groups (including the lead plaintiff in this lawsuit and NRDC), academia, other Federal agencies, the public, and the States of New York and Pennsylvania were in attendance. EPA received a great deal of useful input on the draft framework at the meeting, both supporting and adverse. In addition, EPA accepted written submissions on issues discussed at the meeting through July 20, 1998.

On September 10 and 11, 1998 EPA held another day and a half-long public meeting in Alexandria, Virginia, to continue its public outreach on issues related to the Section 316(b) rulemaking effort. The focus of this meeting was on technology, cost, and mitigation issues. Over 100 individuals representing industry, environmental groups (including the lead plaintiff in this lawsuit and NRDC), academia, other Federal agencies, the public, and the States of New York and Pennsylvania attended the meeting. EPA accepted written submissions through October 30, 1998, on issues discussed at the meeting.

In addition, the Agency developed a web page to provide equal access to the latest status and information on the Section 316(b) project to all interested parties. For example, the web page contains all the quarterly status reports, screener questionnaire ICR package, draft screener and detailed questionnaires, the draft regulatory framework, and public meeting summaries and transcripts. The Section 316(b) web site may be viewed at http://www.epa.gov/owm/316b.htm.

Lastly, EPA conducted a pretest of the detailed questionnaire for steam electric utilities. Six facilities participated in the pre-test. Two investor owned (privately owned) utilities volunteered through the Utility Water Act Group to complete the detailed questionnaire utility-level information and to have one of their plants complete the plant-level information. EPA randomly selected two municipal utilities and two rural cooperative utilities to complete the draft detailed questionnaire. After selection, the Agency coordinated with the respective industry associations to ensure that the utilities which were randomly selected would have advanced notice that they would be receiving the detailed questionnaire as part of the Agency's pretest activities. The purpose of the pretest was for EPA to learn about how efficiently recipients could provide the required information and to allow the recipients to provide suggested changes to improve the detailed questionnaires. In particular, EPA requested comment on the following topics.

- Whether the proposed detailed questionnaires were necessary for the proper performance of the functions of the Agency, including whether the information would have practical utility;
- The accuracy of the Agency's estimate of the burden of the proposed detailed questionnaires, including the validity of the methodology and assumptions used;
- The detailed questionnaires' quality, utility, and clarity; and
- Minimization of the burden of the detailed questionnaires on those who would be required to respond, including the use of appropriate automated electronic, mechanical, or other technology collection techniques or other forms of information technology collection techniques or other forms of information technology, e.g., permitting electronic submission of responses.

In addition, EPA requested that the recipients provide feedback on the amount of time required to complete the detailed questionnaires. EPA received constructive suggestions from the pretest respondents. The Agency incorporated many of these comments into the final drafts of the detailed questionnaires. EPA incorporated all the pretest respondents' comments into the response to comment document in *Attachment 5*.

3(d) Effects of Less Frequent Collection

The cooling water intake structure detailed questionnaire survey effort is a one-time data collection activity. Therefore, this section is not applicable to this effort.

3(e) General Guidelines

The proposed data collection activity will be conducted in accordance with the Paperwork Reduction Act guidelines at 5 CFR 1320.5(d)(2).

3(f) Confidentiality

In accordance with 40 CFR Part 2, Subpart B, Section 2.203, the questionnaires inform respondents of their right to claim information as confidential. The survey provides instructions on the procedures for making Confidential Business Information (CBI) claims. The respondents are also informed of the terms and rules governing protection of CBI obtained under the CWA.

EPA and its contractors will follow EAD's existing CBI plan to protect data labeled as CBI. These plans include the following procedures:

- Ensure secure handling of completed detailed questionnaires that precludes access by unauthorized personnel.
- Store the completed questionnaires and databases in secured areas of EPA and the authorized contractors' offices, with access restricted to authorized EPA and contractor personnel only.
- Restrict any publication or dissemination of confidential study results or findings to aggregate statistics and coded listings. Individual respondents will not be identified in summary reports and the contractors will not release respondents' names to unauthorized individuals.

Each contractor that collects, processes, or stores CBI is responsible for ensuring the confidentiality of those data. The contractor shall safeguard the information as described in Section 2.211(d) of Subpart B

and is obligated to use or disclose the information only as permitted by the contract under which the information is furnished.

3(g) Sensitive Questions

No sensitive questions pertaining to private or personal information, such as sexual behavior or religious beliefs, will be asked in the detailed questionnaires. Therefore, this section is not applicable.

4. The Respondents and the Information Requested

4(a) Respondents/SIC

EPA administered a screener questionnaire as the first phase of a two-phase data collection process. The screener questionnaire was sent to facilities identified in the sample frame to be steam electric nonutility power producers, both industrial self-generators and nonindustrial generators, and manufacturers that fell under the four other industrial categories: paper and allied products, chemical and allied products, petroleum and coal products, and primary metals. SIC Codes associated with the respondent categories of facilities that were surveyed are provided in Table A6. These categories of facilities were chosen based on their large use of cooling water (see Section 2(a)). A more detailed accounting of SIC codes covered by the nonutility industry is provided in *Attachment 6*.

Table A6. Industry Categories and SIC Codes

Respondent Industry Categories	SIC Codes
Traditional Steam Electric Utilities	SIC codes 4911 and 493
Steam Electric Nonutility Power Producers	
Industrial Self-Generators	See *Attachment 6*
Nonindustrial	SIC Major Group 49
Other Industries	
Paper and Allied Products	SIC codes 2611,2621, and 2631
Chemicals and Allied Products	SIC codes 28 except 2895, 2893, 2851, and 2879
Petroleum & Coal Products	SIC codes 2911
Primary Metals	SIC codes 3312, 3315, 3316, 3317, 3353, 3363, 3365, and 3366

Based on the screener questionnaire responses, EPA identified those facilities (in the nonutility power producer and other industry categories) that will receive the more comprehensive detailed questionnaires during this second phase of the information collection activity. EPA's approach in determining the detailed questionnaires sample frames involved the identification of population strata, the calculation of sample sizes based on desired levels of precision, and the random selection of sites given the sample size calculations within each strata. Each stratum was determined based upon responses to the screener questionnaire such that sites within a strata are determined to be more homogeneous than heterogeneous. Homogeneity is desired in order to minimize variance and support accurate population characterization.

4(b) Information Requested

1. <u>Data items, including recordkeeping requirements.</u>

The detailed questionnaire survey and watershed case study efforts will not require any recordkeeping.

There are five questionnaires that will be distributed. They include:

- Detailed Industry Questionnaire: Phase II Cooling Water Intake Structures - Traditional Steam Electric Utilities
- Short Technical Industry Questionnaire: Phase II Cooling Water Intake Structures - Traditional Steam Electric Utilities
- Detailed Industry Questionnaire: Phase II Cooling Water Intake Structures - Steam Electric Nonutility Power Producers
- Detailed Industry Questionnaire: Phase II Cooling Water Intake Structures - Manufacturers
- Watershed Case Study Short Questionnaire

Copies of the five questionnaires are located in *Attachment 7*.

Each of the three versions of the detailed questionnaires will have similar components. The similar components are summarized below. The category-specific (i.e., traditional steam electric utility, steam electric nonutility power producer, and manufacturer) components summary will follow.

General Components for All Detailed Questionnaires

Certification Statement. Each questionnaire, once signed by a responsible corporate official or his or her authorized representative, confirms the authenticity and accuracy of questionnaire responses.

General Information and Instructions. Each package has a section with general instructions that discuss such topics as the purpose of the questionnaires, EPA's authority for conducting the survey, who

must complete the questionnaire, where help can be obtained on questions, Certification Statement requirements, when and how questionnaires can be returned to EPA, and how responses can be claimed as containing confidential business information (CBI). Specific instructions for completing certain sections of the questionnaire are provided at the beginning of the section to which they pertain.

Glossary. Definitions of terms used in the questionnaire are contained in the Glossary that accompanies the document. Definitions of key terms are also provided in the questionnaire at the point at which the terms are first used. These definitions are intended for use ***only*** in combination with this questionnaire. These definitions are ***not*** regulatory definitions at this point in time.

Components and Data Items for Traditional Steam Electric Utilities Detailed Questionnaire

Part 1. This Part requests general plant information, such as plant name, location, operating status, Standard Industrial Classification (SIC) codes, and National Pollutant Discharge Elimination System (NPDES) permit status. In addition, this part screens plants from the survey that may not use cooling water for contact or noncontact cooling purposes **or** are not directly withdrawing cooling water from surface water and, thus, are not subject to Section 316(b).

Part 2. This Part requests plant-level technical data.

- *Section A* requests profile information on the plant's cooling water systems, cooling water intake structures, cooling water discharge outfalls, and the plant's water balance diagram. Section A first requests basic design and operational data for each of the plant's cooling water systems that are presently operating, temporarily offline, or planned or under construction. General profile data are then requested for the plant's intake structures that directly withdraw cooling water from surface water. The type of data requested for the cooling water structures includes the following: plant-designated names and numbers, latitudes and longitudes, total design intake flows, proportion of total flows used for cooling, and activities for which cooling water was used in 1998. Section A requests some very basic data on cooling water discharge outfalls, such as plant-designated names or numbers and latitudes and longitudes at the point of each discharge outfall. The information from this

section will be related to other data requested throughout the questionnaire to give EPA an understanding of the plant's general design and use of cooling water. Finally, a water balance diagram is requested to provide EPA with an understanding of how cooling water use and discharge practices relate to the plant's general water use practices. The diagrams will be used to analyze other data requested throughout the survey.

- *Section B* requests information on the type of surface water sources being used by plants to provide cooling water. The configuration of the plant's intake structures is requested, such as whether intake canals/channels are used, whether the intake structure incorporates a bay or cove, and whether the intake structure is at the shoreline or offshore. Depth of the water source at the withdrawal point is requested in addition to the average distance of the intake structure below the water surface. The section concludes by requesting information on whether the plant's intake structures are within 300 meters of sensitive aquatic ecological areas, if such information is known. The data from this section of the questionnaire will enable EPA to characterize the distribution of plants that have cooling water intake structures and the types of water bodies from which cooling water is being withdrawn.

- *Section C* requests basic design and operating data about the technologies being used at cooling water intake structures. The questions are limited to those intake structures that directly withdraw cooling water from surface water. Information is also solicited on the design pass-through velocity at each intake structure. Actual monthly cooling water intake flows are also requested for each intake structure for the years 1996 to 1998. In addition, plants are asked to provide some basic data if they have ever reduced cooling water intake flow rates to minimize *impingement* and/or *entrainment* and if they have employed dilution pump technologies to reduce the temperature of their discharge. For plants employing an ice control system at any of their cooling water intake structures, some basic information regarding the type of system(s) in place is requested. Some basic information on technologies that were previously used to minimize impingement and/or entrainment at an intake structure but were ineffective is requested. Finally, some very basic data on cooling water towers are requested for those plants that employ such devices.

- *Section D* requests information on the types of plant studies that may have conducted relative to Section 316(b). Basic data are requested for any Section 316(b) demonstration studies that may have been completed (i.e., studies to show that the location, design, construction, and capacity of a cooling water intake structure reflect BTA for minimizing adverse environmental impact). Information is also requested on any discrete biological or technology-related plant studies that have been conducted on impingement and entrainment. Through this section of the questionnaire, EPA is attempting to identify research that plants have already undertaken on Section 316(b)- related topics and the availability of study data.

- *Section E* requests basic information for cooling water intake structures planned or under construction. Basic design data are requested for these intake structures. This information will help EPA gain an understanding of the numbers of new intake structures expected to go on line in the future and their basic design and operating characteristics.

Part 3. This Part of the survey asks for economic and financial information about each plant and its steam-electric generating units. This part requests identifying and contact information, information on economic activities other than generation of electricity, and revenues and costs associated with the economic activities. This part also asks for three years of data on a plant-level financial balance sheet and operational information about the generating units. The Agency will use this information to assess the potential impacts of compliance with cooling water intake structure guidelines (under the authority of Section 316(b) of the Clean Water Act) on the economic viability of all affected plants and their steam-electric generating units.

Components and Data Items for Steam Electric Nonutility Power Producers and Manufacturers Detailed Questionnaires

Facility-Level Information. The technical information requested is essentially the same as for the traditional steam electric utilities. Ecomonic and financial data requested differs from and is more detailed than the questionnaire for the traditional steam electric utilities. However, the data items are very similar between the questionnaires for steam electric nonutility power producers and manufacturers. Section A of Part 3, Economic and Financial Data, requests general facility information including information on the facility's fiscal year and years of financial data available. Section B requests identifying information on the facility's owners and previous owners. The nonutility questionnaire asks for information on the immediate owner of the facility, while the manufacturer questionnaire asks whether the facility was owned by another entity and if it was a domestic entity. Both questionnaires request income statement information (total revenues, costs, and after-tax income), full time employees, and total electricity sales for the domestic parent firm. Section C requests facility revenues and costs. The questionnaire for manufacturers allows the facility to report estimated dat a in lieu of actual data. The questionnaires request 3 years of facility income

statement information. Section D requests facility balance sheet information. The manufacturer questionnaire has a Section E requesting facility liquidation values while the nonutility power producer questionnaire does not. Both questionnaires request miscellaneous facility information such as total facility employment and the rate of interest on the line of credit or short term debt. The nonutility power producer questionnaire requests information on economic activities other than electricity generation including revenues and costs. The manufacturer questionnaire requests information on the most significant sources of competition for domestic and international markets and percentage of non-electric revenue associated with the use of cooling water directly withdrawn from surface water. Both questionnaires have final sections on electricity generation and use information.

Voluntary and Supplemental Information. Technical information requested in this document is essentially the same information requested in the screener questionnaire. The information requested includes facility identification and contact information, general scoping data, and design and operational data for cooling water intake structures and cooling water systems. The economic data requested is a little more detailed than the screener questionnaire and asks for total revenues, costs and after-tax income. The information requested is the same for both the nonutility power producers and the manufacturers. This is voluntary information EPA is requesting because the firm owning a surveyed facility may own more than one U.S. facility that would incur costs under new cooling water intake structure guidelines. As a consequence, a regulation under the authority of Section 316(b) of the Clean Water Act might affect this firm more than a firm that has only one facility that operates cooling water intake structures. This questionnaire collects data about other U.S. facilities operating cooling water intake structures owned by a firm in order to measure the combined economic impact of proposed Section 316(b) guidelines on this firm.

Data Items for the Short Technical Industry Questionnaire

This questionnaire requests minimal technical information from plants that were not required to fill out the detailed questionnaire. The questionnaire requests the following information: general plant

information such as name, address, location and SIC codes; general scoping data such as NPDES permit status, whether cooling water is used, and whether it is withdrawn from surface water; and plant design and operational data for cooling water intake structures and systems. This short technical questionnaire is essentially the screener questionnaire without the financial and economic questions.

Data Items for Watershed Case Study Short Questionnaires

The Watershed Case Study Short Questionnaire is essentially the screener questionnaire with additional clarification and a velocity question. Like the screener questionnaire, the Watershed Case Study Short Questionnaire consists of the Certification and General Information and Instructions, five sections requesting technical and financial data, and a Glossary.

Justifications for the detailed questionnaires, the Short Technical Industry Questionnaire and the Short Case Study Technical Questionnaire are located in *Attachment 8*.

2. Respondent Activities.

Respondents must complete and return the detailed questionnaire and certification statements to EPA within 90 calendar days after receiving the materials. The Short Technical Industry Questionnaire is required to be returned within 30 days after receiving the materials. The Watershed Case Study Short Questionnaire must be returned within 45 days. For the facility's convenience, EPA will enclose self-addressed envelopes in which to return their materials. For quantitative data, EPA requests actual data to the extent that they are available, but will accept good faith estimates when actual data are not available. In addition, in many questions, the respondent is able to respond that data is unavailable. This procedure alleviates the requirement for a facility to spend time and money for sampling if actual data do not exist. The Agency is requesting information that a typical facility maintains. Based on the pretest results, EPA expects respondents to have to engage in the following activities to complete and return to EPA the detailed

questionnaires, the Short Technical Industry Questionnaire or the Short Case Study Technical Questionnaire:

- Review instructions
- Search data sources
- Type or write in the information requested
- Review the information provided (management)
- Mail the completed detailed questionnaires to EPA

5. The Information Collected - Agency Activities, Collection, Methodology and Information Management

5(a) Agency Activities

OWM and EAD project managers have planned for and allocated resources for the efficient and effective management of information collected related to cooling water intake structures. EPA conducted, or will conduct, the following activities in developing, administering, and analyzing the detailed questionnaires:

- Review other related Agency and government questionnaires.
- Develop cooling water intake structure detailed questionnaires.
- Meet with stakeholders providing comments on the draft detailed questionnaires.
- Notice availability of detailed questionnaires for public comment in the Federal Register.
- Pretest the detailed questionnaire at six facilities.
- Revise the detailed questionnaires based on pretest respondent and public comments.
- Develop the response to comment document.
- Develop the sample frame consisting of three industry groups.
- Develop the mailing list database and mailing labels.

- Develop a tracking system for detailed questionnaires mailing and receipt activities.
- Print the detailed questionnaires.
- Mail the detailed questionnaires to industry, municipal, and government facilities.
- Develop and maintain detailed questionnaires help lines for respondents.
- Maintain the questionnaire response tracking system.
- Receive and review (code) the returned questionnaires and follow-up to collect missing or incomplete information.
- Correct/clarify discrepancies
- Enter and verify data.
- Perform technical analyses and statistical summaries.
- Conduct CBI functions.

EPA used the screener questionnaire to determine which facilities are potentially within scope of Section 316(b). EPA used the data received from facilities that are within scope to develop and stratify the sample frame for the subsequent detailed questionnaires and to develop the initial framework for the cooling water intake structure regulation.

5(b) Collection Methodology and Information Management

EPA's selection of industries for survey sampling was based on (1) the aggregate quantity of cooling water used by an industry, (2) the number of facilities using large quantities of water, and (3) the identification of industry groups for which effluent guidelines have been promulgated under CWA Section 306. (EPA used information from effluent guidelines Rulemaking to eliminate categories of industry for purposes of this survey, which use little or no cooling water or which are predominantly indirect dischargers). Within SIC Major Group 49, a small, identifiable set of facilities (electric utility and nonutility power producers) account for about 93% of industrial cooling water intake. EPA believes that the approach used to narrow the survey sample size enables the identification of all significant categories of facilities to be surveyed for potential coverage by the Section 316(b) regulation, and provides a reasonable

and adequate basis for assessing adverse environmental impacts of cooling water intake structures and best technologies available (BTA) for minimizing such impacts.

The targeted universe *(initial sample frame)* for the cooling water intake structure questionnaires is a population of steam electric utility and nonutility power producers (some in primary code SIC Major Group 49 and some in other major manufacturing groups) *and* a sample of industrial facilities in SIC Major Groups 26, 28, 29, and 33 (based on the outcome of the screener questionnaire). To minimize the burden on the respondents, EPA is allowing the respondents to complete the detailed questionnaires in legible handwriting or typewritten form. The questionnaires will be sent via a carrier that requires a signature to acknowledge receipt (i.e., registered mail). By sending the questionnaires using this procedure, EPA ensures that the designated facility receives the package and that an initial facility point-of-contact is identified.

Each questionnaire mailed to a facility will have a unique identification number. The facility identification numbers, in conjunction with an electronic tracking system, will be used to track the mailing date of the questionnaires, the date of any required follow-up letters or telephone call to respondents, and the date EPA receives the completed survey. The identification number will also serve as an identification code for data entry in the survey database. EPA will make follow-up telephone calls to survey respondents on an as-needed basis.

Upon receipt of the completed questionnaires, EPA and EPA contractors will review the questionnaires and perform data entry of the responses. The coded questionnaire responses will then be entered into a database. All confidential business information will be treated according to CBI procedures established for EAD and its contractors (includes OWM contractors).

A toll-free help line will be staffed during normal business hours during the response period to answer questions respondents may have on the questionnaires. The help line will be staffed with trained contractor personnel who will provide respondents with assistance in completing the questionnaires. The help line provides an immediate response to any inquiries which ultimately reduces the burden to the

respondents. The help line will reduce misinterpretations of the detailed questionnaires and thus decrease the burden that EPA would create if the Agency had to call site personnel to clarify incorrect or inaccurate questionnaire answers.

The Agency considered creating electronic versions of the survey questionnaires. However, after careful analysis, EPA decided that electronic questionnaires would not be efficient for the following reasons:

- EPA could not be sure that the software at the respondent facilities would be comparable with the EPA software used to develop the questionnaires. Substantiating this view, one of the pretest facilities stated that the diversity of information systems makes it impractical to require electronic submission in a specified format.

- EPA developed the questionnaire using as many check box and closed-ended questions as possible and made it easy to split sections among different facility departments.

- EPA determined that the expense of developing an electronic questionnaire (especially if both an electronic and hard copy version needed to be developed) was not cost effective because this is a one-time survey effort. Since this survey will not be reused, neither the respondents nor the EPA would derive any significant benefits from an electronic version of the questionnaire.

EPA confirmed through the pretest responses that the hard-copy questionnaire is a simple, direct means to collect data. None of the pretest respondents requested an electronic questionnaire and one respondent specifically requested that EPA not require that facilities respond only by electronic means. The feedback from pretest respondents indicates that the detailed questionnaires on the whole were well organized and easy to read and understand.

5(c) Small Entity Flexibility.

The majority of the businesses that EPA is targeting to receive the detailed questionnaires are not defined as small. Based on EPA's research, the only industrial category with a significant number of small

businesses is the steam electric nonutility power producers. The major reason EPA decided to administer a screener questionnaire followed by the detailed questionnaire was to ultimately reduce the burden on facilities who are out-of-scope. EPA hypothesized that small entities have a greater probability to be out-of-scope than large facilities. Given this hypothesis, EPA designed the screener questionnaire to allow facilities who are out-of-scope to exit the survey before having to invest time researching data. For those facilities that are in-scope, EPA requests a minimum of data to broadly characterize each industrial category and to develop a valid sample frame for the administration of the detailed questionnaires. EPA designed the screener questionnaire to obtain basic cooling water use and operational data and associated economic data in order to reduce the number of facilities required to complete the detailed questionnaires. The detailed questionnaires contains on the average 88 questions. The screener questionnaire contained only 22 questions of which most are closed-ended questions. The burden of the detailed questionnaires is estimated at 156 hours each, whereas the highest detailed questionnaire pretest burden was reported at 430 hours.

In addition to the overall reductions in the burden on survey recipients associated with the use of a screener questionnaire prior to administering a detailed questionnaire, EPA has taken the following steps to minimize the time and effort necessary for respondents to completed the detailed questionnaires:

- EPA has ensured that the instructions and questions are clear. This principle was validated during the pretest. All respondents reported that the instructions and questions were easy to read and understand. There were, however, one or two questions that caused some confusion. As a result, EPA worked with the pretest facilities to rewrite these questions. Common industry terms are used throughout the survey to make it more understandable to the respondents. Questions use yes-or-no or multiple choice formats wherever possible. Furthermore, the detailed questionnaires uses skip patterns to direct respondents to only those questions relevant to that facility.

- EPA has met with and discussed the draft detailed questionnaires with most of the effected industry trade association representatives with the objective to minimize the burden.

- As previously discussed, a help line will be operational during the survey period to answer respondents' technical questions.

5(d) Collection Schedule

The schedule for the detailed questionnaire distribution, response receipt, and data collection activities is as follows. Table A7 provides a list of the anticipated activities, durations, and the starting time frame in number of calender days after OMB completes their review of this package.

Table A7. Detailed Questionnaires Action Duration, and Starting Time frame

Action	Duration (Days)	Starting Time frame in Approximate Number of Calendar Days After OMB Approval
Detailed Questionnaires Printed and Mailed	28	28
Receive Detailed Questionnaires Responses	90	118
Detailed Questionnaires Survey Follow-up	180	298
Data Entry of Detailed Questionnaires Responses	120	418

6. Estimating Respondent Burden and Cost of Collection

The following section presents the rationale and results of EPA's estimation of burden and costs for the detailed questionnaire survey and watershed case study efforts.

6(a) Estimating Respondent Burden and Costs

The detailed questionnaires, the Short Technical Industry Questionnaire, and the Watershed Short Case Study Questionnaire will require recipient facilities to devote time (i.e., as measured by staff man-hours) and resources (i.e., copies of documents and response mailings) to produce acceptable responses to the EPA questionnaires. EPA expects that engineers, engineering supervisors, accountants, and financial personnel, along with clerical staff, will devote time toward gathering and preparing the final responses. The costs to the respondents' facilities associated with these time commitments can be estimated by multiplying the time spent in each labor category by an appropriately loaded hourly salary rate. Because labor rates vary so widely among the personnel involved in completing the detailed questionnaires, EPA generally uses an average loaded hourly rate which is representative of the average salary for the respondent industry(ies). The

basis for the labor rate that will be used for purposes of this cost estimate is an average hourly rate for white-collar workers in the goods-producing manufacturing industries ($21.43 per hour).[15] These average hourly rates are published by the Bureau of Labor Statistics each year. Assuming a fringe rate of 50 percent and a 67 percent overhead and profit rate, the hourly rate for a private sector employee would be $53.68 [(21.43*(1.5))*1.67].

To develop burden cost estimates, EPA estimates the number of hours that will be required to complete all of the questions in the questionnaires (including reviewing instructions, researching data sources, typing or writing the information requested, reviewing responses, and returning survey) and then multiplied these results by $53.68 per hour to generate a cost estimate. EPA has based the estimates for burden associated with the detailed questionnaires on pretest responses and comments from industry and trade organizations. The results from pretest surveys showed that it took an average of 211 hours to complete the survey. However, due to the comments on the pretest (particularly on the amount of flow data requested), EPA has reduced the amount of data originally requested therefore lowering the burden estimate to 156 hours each. Estimates on the burden required to complete the Short Technical Industry Questionnaire, and the Watershed Case Study Short Questionnaire are each 10 hours as they are both similar to the screener questionnaire.

Operation and maintenance costs are estimated based on the one-time costs each respondent will incur in responding to the questionnaires. These costs are assumed to include the cost of copying and mailing each questionnaire. Using a rate of $.05 per impression, the average cost per respondent for copying the detailed questionnaires is $9.75 [$.05 * 195 impressions]. The average cost per respondent for copying the Short Technical Industry Questionnaire, and the Watershed Case Study Short Questionnaire is $2.00 [$.05 * 40 impressions]. Mailing costs are estimated at approximately $4.00 for each detailed questionnaires and $2.00 each for the other questionnaires.

[15] U.S. Department of Labor, Bureau of Labor Statistics. *Employer Costs for Employee Compensation - March 1998.* Release: Thursday, July 9, 1998.

Table A8 presents an estimate of the total respondent burden and costs expected for completing the detailed questionnaires, the Short Technical Industry Questionnaire, and the Watershed Short Case Study. As shown in Table A8, EPA estimates that a total national respondent burden of 128,763 hours and a cost of $6,924,183 (current dollars) will be required to complete the questionnaires. The average respondent costs for each detailed questionnaire is expected to be approximately $8,387 [$8,374 + $13.75]. The average respondent costs for each of the other questionnaires is $540 [$537+$3.00].

Table A8. Estimating Respondent Costs to Complete Questionnaires

Questionnaire	Total Number of Respondents	Average Burden Per Respondent (in hours)	Total Burden (in hours)	Average Labor Costs[a] Per Respondent (in dollars)	Total Labor Costs[a] (in dollars)	Average O&M Costs Per Respondent (in dollars)	Total O&M Costs (in dollars)	Total Costs (in dollars)
Detailed	756	156	117936	$8,374	$6,330,804	$13.75	10395	**$6,341,199**
Short Tech. Industry/ Supplemental and Voluntary	730	10	7300	$537	$391,864	$3.00	2190	**$394,054**
Watershed Case Study Short	350	10	3500	$537	$187,880	$3.00	1050	**$188,930**
Total	**1,836**		**128,736**	**$9,448**	**$6,910,548**		**$13,635**	**$6,924,183**

[a] Costs assume an average aggregate labor rate of $53.68 per hour.

6(b) Estimating Agency Burden and Costs

Table A9 provides an estimate of the federal labor costs associated with the development and implementation of the detailed questionnaire and the watershed case study survey efforts. In developing these costs, EPA assumed that the activities associated with the detailed questionnaires, the Short Technical Industry Questionnaire, and the Watershed Case Study Short Questionnaire would require the efforts of two Agency employees with an average salary equivalent to a GS 14 step 2 at a rate of approximately $33.95 per hour. The average hourly rate is based on hourly rates found in the Office of Personnel Management 1999 General Schedule. To get the total costs for Agency personnel, the average hourly rate was increased by 60 percent to account for overhead costs.

Assuming that one man-year equals 2,080 hours, EPA estimates that four Agency employee will spend approximately one (1) man-year (or 2,080 hours) developing, administering, and reviewing the questionnaires. The Agency employee estimated total labor costs are expected to be $112,986. The hourly burden and costs for Agency personnel to develop and administer the detailed questionnaires is based on hours and costs expended to date and on previous experience in administering similar surveys for the purposes of developing effluent limitations guidelines and standards.

Table A9. Estimated Federal Employee Costs

Approximate Average GS-Level	Average Labor Rate (in dollars)	Loaded Rate (in dollars)	Labor hours	Total Costs (in dollars)
GS 14 step 2	$33.95	$54.32	2,080	$112,986

In addition to the Agency employees, contractor personnel at various professional and technical levels are also expected to spend time developing and reviewing the questionnaires, mailing surveys, performing data-entry tasks, and analyzing the responses. The contractor burden hours are estimated at a composite rate of approximately $62 per hour. The hourly burden attributed to contractors is expected to be approximately 19,578 hours. Total combined hourly burden with both contractor and EPA staff totals are approximately 21,658 hours. Table A10 identifies tasks performed by both EPA personnel and contractors and the associated hours expected to be required for each task.

Table A11 presents all costs expected to be incurred by the Agency in administering the detailed questionnaire and the watershed case study survey efforts. Total costs associated with contractor support are expected to be $1,201,152. Mailing, printing, and copying costs are estimated to be $34,580. As with the costs for the Agency employees, costs associated with contractor hours and costs to develop and administer the detailed questionnaires, the Short Technical Industry Questionnaire, and the Watershed Case Study Short Questionnaire are based on hours and costs expended to date and on previous experience in administering similar surveys for the purposes of developing effluent limitations guidelines and standards.

Summing all of the costs, the total burden to the government will be $1,348,718. This estimate includes the tasks detailed in Table A10 above, including performing preliminary technical and economic analyses. However, it does not include costs for developing regulatory options or documentation.

Table A10. Estimated Agency Burden (Including Both EPA and Contractor Staff Hours)

Agency and Contractor Tasks	Estimated Burden Hours
Research and Develop Sample Frames/Mailing Lists; Design and Develop Detailed Questionnaire; Prepare Public Notice; Conduct Pretest; and Review and Respond to All Comments.	10,552
Develop and Maintain Tracking System and CBI Procedures.	774
Mail Detailed Surveys and Perform Follow-up Activities Related to Mailing and Receipt of Detailed Questionnaire using US Mail and Post Card Alert.	150
Perform Data Entry of Detailed Questionnaires.	810
Set-up and Operate Help lines; Review Responses on Detailed Questionnaires; and Perform Follow-up Activities Associated with Discrepancies in Responses.	8,912
Preliminary Engineering and Statistical Analyses.	460
TOTAL	21,658

Table A11. Breakdown of Costs to Government in Administering Survey

Cost Category	Total Cost to Agency (in dollars)
EPA Personnel	$112,986
Contractor Support	$1,201,152
Mailing, Printing, Copying	$34,580
Total	**$1,348,718**

6(c) Bottom Line Burden Hours and Costs

By combining the burden hours and costs to the respondents and the burden hour and costs to the government, EPA estimates that the total burden hours will be 150,394 and the total cost of administering the detailed questionnaires, the Short Technical Industry Questionnaire, and the Watershed Case Study Short Questionnaire will be $8,272,901.

Table A12. Total Estimated Bottom Line Burden and Cost Summary

	Total Burden (in hours)	Total Costs (in dollars)
Respondents	128,736	$6,924,183
Agency/Contractor	21,658	$1,348,718
Total Costs	**150,394**	**$8,272,901**

6(d) Reasons For Change In Burden

The detailed questionnaires, the Short Technical Industry Questionnaire, and the Watershed Case Study Short Questionnaire are all part of a one-time data collection activity. Therefore, this section is not applicable to this effort.

6(e) Burden Statement

The public reporting and record keeping burden for the collection of information using the detailed questionnaires is estimated to average 156 hours per response (i.e., a total of 117,936 hours of burden divided among anticipated 756 respondents). The public reporting and record keeping burden for the collection of information using the Short Technical Industry Questionnaire, the Watershed Case Study Short Questionnaire, and the Voluntary and Supplemental Information Questionnaire is estimated to average 10 hours per response (i.e., a total of 10,800 hours of burden divided among anticipated 1080 respondents).

Burden means the total time, effort, or financial resources expended by persons to generate, maintain, or disclose or provide information to or for a Federal agency. This includes the time needed to review instructions; develop, acquire, install, and utilize technology and systems for the purposes of collecting, validating, and verifying information, processing and maintaining information, and disclosing and providing information; adjust the existing ways to comply with any previously applicable instructions and requirements; train personnel to be able to respond to a collection of information; search data sources; complete and review the collection of information; and transmit or otherwise disclose information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. The OMB control number for EPA's regulations are listed in 40 CFR Part 9 and 48 CFR Chapter 15.

Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, OP Regulatory Information Division, U.S. Environmental Protection Agency (2137), 401 M St., S.W., Washington, D.C. 20460; and to the Office of Information and Regulatory Affairs, Office of Management and Budget, 725 17th Street, NW, Washington, DC 20503, Attention: Desk Officer for EPA. Include the ICR number and OMB control number in any correspondence.

PART B OF THE SUPPORTING STATEMENT

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1. Survey Objectives, Key Variables, and Other Preliminaries

1(a) Survey Objectives

The detailed and watershed case study questionnaire survey effort will provide information essential to establishing a need for and developing, as necessary, proposed regulations under Section 316(b). Questionnaire data is essential for characterizing the nationwide and industry-specific status of cooling water intake location, design, construction, and capacity, for assessing the financial status of plants and firms potentially affected by a Section 316(b) proposed regulation, and for identifying existing Section 316(b) studies addressing potential for adverse environmental impacts.

1(b) Key Variables

For a discussion of key variables, please refer to Part A, Section 4(b) of this ICR.

1(c) Statistical Approach

The objectives of the detailed questionnaire information collection effort can be achieved by a sample survey at considerably lower cost and burden (to EPA and respondents) than would be required for a census. A statistically designed sample survey is necessary to achieve the objectives, in particular, to ensure that the resulting inferences and analyses are as statistically unbiased and as precise as is practicable. The design can be characterized as a two-phase design (with screener and detailed questionnaire phases), using stratification in both phases. This design will be applied to two of the three major industrial categories, which can also be regarded as primary strata: (1) steam electric nonutility power producers, and (2) those other industries (manufacturers) that were identified as using relatively large amounts of cooling water. On the third category of facilities, the traditional steam electric utility industry, the Agency has publicly available data that can be used as the primary data and will allow them to stratify the sample without the use of a screener questionnaire.

The watershed case study information collection effort is based on a census of facilities on selected watersheds. The watersheds were not selected using a statistical design and thus extrapolation to a national level will not be justified using statistical principles.

Science Applications International Corporation (SAIC) will conduct the surveys under two separate contracts. SAIC, at 11251 Roger Bacon Drive, Reston, VA 20190, will provide technical support for sample frame development and validation; data entry; design and quality assurance (QA) review of survey response database; and statistical analysis and reporting of questionnaire responses. This support will be provided under EPA Contract No 68-C4-0046 (expiring September 1999), which is monitored by the Economics and Statistics Branch, Engineering Analysis Division of EPA's Office of Science and Technology (OST). SAIC, at 1710 Goodridge Drive, McLean, VA 22102, will provide technical support for questionnaire design, collation, and mail-out; set-up and operation of a help line; follow-up and QA of responses; development and maintenance of survey tracking systems; and analysis of survey data. This support will be provided under EPA Contract No. 68-C4-0034 (expiring August 1999), which is monitored by the Permits Division of EPA's Office of Wastewater Management (OWM).

Development of economic and financial related questions; operation of a help line; and economic and financial analyses of detailed questionnaire data will be provided by Abt Associates Inc., located at 55 Wheeler Street, Cambridge MA 02138-1168. This support will be provided under EPA Contract No. 68-C4-0060 (expiring September 1999), which is monitored by the Economics and Statistics Branch, Engineering Analysis Division of EPA's Office of Science and Technology.

EPA will take suitable precautions to ensure continuity of service from one contract to the next in 1999 and 2000. These precautions will include the timely delivery of the following products in electronic format to EPA: databases, quality control (QC) reports and editing notes, and related database programs (e.g., SAS) and flow charts. Arrangements will also be made for continuity and transfer of questionnaire and help line tracking information, phone logs, coding sheets, and completed questionnaires.

1(d) Feasibility

The detailed questionnaire and the watershed case study questionnaire survey efforts will be conducted under the authority of Section 308 of the Clean Water Act (33 U.S.C. 1318). Questionnaires will be mailed to industrial manufacturers, and nonutility and utility power producer facilities that are well-represented by trade organizations and are kept informed by trade publications. Such target populations have, in the past, provided very high response rates and high completion rates.

The detailed questionnaire for traditional steam electric utilities has been pre-tested, and responses have been considered as described in Part A, Section 3(c) of this ICR. This was the only survey to be pretested because the detailed questionnaires are all similar. The commenters indicated that the questionnaires are well-organized and easy to read and understand. Since the Short Technical Industry and the Watershed Short Case Study Questionnaires are similar to the screener questionnaire, EPA believes the pre-test of the screener applies to these questionnaires. A toll-free telephone help line will be provided by contractors while the questionnaires are in the field. Respondents are provided information regarding these help lines in the General Information and Instructions sections of the questionnaire.

Funding and scheduling for this project have been compared to previous and ongoing EPA effluent guideline projects. They have been judged to be sufficient given project objectives.

The collection schedule (*see Section 5(d) in Part A of this ICR*) accounts for the events and response times leading up to final analysis of survey data. This project will involve the design of analyses, computer programs, and report formats in advance of data entry of questionnaire responses. This approach will ensure that key results are reported promptly once data entry and data quality checks are finished. Completion of these tasks will require planning and coordination among the contractors for statistical, technical, and financial analyses. It will also require that the survey database be designed (and a mock-up of the database be completed) well before data entry begins so that analytical programs can be tested.

2. Survey Design

Three populations of facilities are identified in Section 2(a) below as potentially subject to CWA Section 316(b): traditional steam electric utilities (934 plants belonging to 319 utilities), steam electric nonutility power producers (1158 facilities), and four industrial categories grouped as “other industries ” (4457 facilities). A screener survey (see Section 2(b) below) reduced the *estimated* population size in the latter two populations to 363 nonutility power producer facilities and 616 other industry facilities, although only 281 nonutility facilities and 191 other industry facilities have been *identified* as respondents. EPA intends to *sample* 190 nonutility facilities and 191 other industry facilities, to achieve precision targets set out in Section 2(c) below (Note: this is the sample size for detailed questionnaires for these categories). In the traditional steam electric utility population, EPA intends to *sample* about 280 of the 934 *plants* using a plant-level detailed questionnaire containing both technical and financial questions, and to characterize the remaining plants (654) using the Short Technical Industry Questionnaire containing only plant-level technical questions. The sample of traditional steam electric utility plants receiving a detailed questionnaire will provide a basis for predicting cost impacts of these options in aggregate, and for modeling plant-specific costs in relation to responses to the key variables common to the detailed questionnaires and Short technical Industry Questionnaires. Thus, the Short Technical Industry Questionnaire will allow prediction of costs at the remainder of the 934 plants. Plant-specific costs are needed as input to a modeling system; these costs will be needed for all plants required in the model—those owned by utilities and those in the nonutility power producer stratum called "nonindustrial nonutilities." Samples will be stratified using a number of variables related to costs of regulatory options. For nonutility power producers and other industries, the stratification variables were obtained as responses to the screener questionnaire. For traditional steam electric utilities, they were assembled from publicly available databases.

A group of up to 350 nonutility power producers and other industry facilities that are located within specific identified watersheds will receive a copy of a Watershed Case Study Questionnaire. It is expected that up to 95 of those facilities and/or utility plants will be chosen to receive a detailed questionnaire. Information requested for these facilities will be combined with information collected for other facilities on

these watersheds, either from the detailed questionnaires or the screener questionnaire, and used to estimate cumulative impacts caused by any proposed regulations. As discussed previously, these case studies will be used for the cost and benefits analysis, to test regulatory options, and to evaluate cumulative impacts.

2(a) Target Population and Coverage

Section 316(b) of the Clean Water Act (CWA) provides that any standard established pursuant to Sections 301 or 306 of the CWA and applicable to a point source require that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact. Given this language, industries covered by effluent guidelines (CWA Sections 301 and 306) contain, as a subpopulation, the industries and facilities to be covered by a Section 316(b) rule. This subpopulation contains a large number of industrial categories and facilities, not all of which are point sources under the CWA or use substantial amounts of cooling water.

As stated previously, EPA has identified three major industrial categories for this survey effort. The three categories include: (1) traditional steam electric utilities, (2) steam electric nonutility power producers, and (3) other industries. Through past Section 316(b) regulatory efforts and EPA's effluent guidelines program, the Agency knows that steam electric generators are the largest industrial users of cooling water. The condensers that support the steam turbines in these facilities require substantial amounts of cooling water. EPA has used databases from the Energy Information Administration (EIA) to identify these facilities. As shown in Table B1, EPA estimates that traditional steam electric utilities (SIC Codes 4911 and 493) and steam electric nonutility power producers (SIC Major Group 49) account for approximately 92.5 percent of the total cooling water intake in the United States. Given the high demand for cooling water by the facilities in these two categories on a per facility and aggregate basis, these categories are the most important target audiences for EPA's Section 316(b) survey effort.

Beyond steam electric generators, EPA has looked at other industrial facilities that use cooling water for purposes besides electricity generation (e.g., to cool equipment, for quenching, etc.). EPA has used

information from the *1982 Census of Manufactures* to identify other major industrial categories showing some cooling water use. As illustrated in Table B1, four major industrial categories, together with steam electric utilities and nonutility power producers account for approximately 99 percent of the total cooling water intake in the United States. These four major industrial categories include the following: (1) Paper and Allied Products (SIC Major Group 26), (2) Chemicals and Allied Products (SIC Major Group 28), (3) Petroleum and Coal Products (SIC Major Group 29), and (4) Primary Metals Industries (SIC Major Group 33).

For the major industrial categories shown to use cooling water by the *1982 Census of Manufactures*, EPA also used information from its effluent guideline rules and development documents to identify the subcategories subject to rules requiring NPDES permits and to eliminate industrial groups that use little cooling water or that are predominately indirect dischargers. The resultant selection of industries for this questionnaire is shown in Tables B2 and B3.

Initial estimates of potential numbers of facilities (Table B1), based on Dun & Bradstreet's database, were greatly reduced by using more accurate, industry-specific data sources (Table B2) to develop the sample frames and mailing lists. In addition, responses to the screener questionnaire (see below) have further reduced the estimated number of in-scope facilities (Tables B2 and B4).

As discussed under Section 3(a) of Part A of this ICR, nonutility power producers include industrial self-generators and nonindustrial generators. It is important to note that facilities considered industrial self-generators may be included under the frame containing facilities in the four major industrial categories being targeted by EPA. EPA has cross-referenced its nonutility power producer frame with the other industry frame to remove duplicates from the other industry frame. However, It is possible for a *firm* (as opposed to a *facility*) to belong to both frames if it has one facility that generates electricity using a steam-cycle unit and another facility that uses cooling water for purposes other than electricity

generation. Given these circumstances, the sample unit for the nonutility power producer and the other industry frames will be the facility.

EPA mailed a screener questionnaire to all identified nonutility power producers and to a sample of other industries. EPA did not mail a screener questionnaire to facilities in the traditional steam electric utility category because the number and in-scope status of these facilities is known from public sources.

Table B1. Potential Number of Steam Electric Power Producers and Facilities in Other Industrial Categories Ranked by Cooling Water Intake Flow Rate

(SIC Code) and Industrial Category[1]	Number of Facilities in Frame and In-scope [2]	Cooling Water Intake Flow[3]		
		Billion Gal./Yr.	Percent of Total	Cumulative Percent
(49) Steam Electric Utility Power Producers	934	70,000	91	91
(49) Steam Electric Nonutility Power Producers	1,158	1,172	1.5	92.5
(28) Chemicals and Allied Products	22,579	2,797	5.53	96.1
(33) Primary Metals Industries	10,999	1,312	1.68	97.8
(29) Petroleum & Coal Products	3,509	590	0.76	98.5
(26) Paper & Allied Products	9,881	534	0.68	99.2
(XX) Additional 14 Categories[4]	365,000	607	0.80	100

[1] The table is based on reported primary SIC codes.
[2] Numbers of facilities are from Dun & Bradstreet's database except numbers for traditional steam electric utilities, which are from the Form EIA-767 database, and steam electric nonutility power producers, which are from the Form EIA-867 database.
[3] Data on cooling water use are from the *1982 Census of Manufactures*, excepting traditional steam electric utilities, which are from the Form EIA-767 database, and the steam electric nonutility power producers, which are from the Form EIA-867 database.
[4] 14 additional major industrial categories (major SIC codes) with effluent guidelines.

Table B2. Targeted Industrial Categories and Intended Allocation of Questionnaires

Category and (SIC Code)	No. Of In-Scope Facilities in Sample Frame [a]	Screener Questionnaires	Short Technical Questionnaire	Detailed Questionnaire
Steam Electric Utility Power Producers (4911 and 493) [b]	934	0	654	280
Steam Electric Nonutility Power Producers (49)	363	1,050	0	190
Other Industries (26, 28, 29, 33)	616	1,550	0	191
Totals	**1,913**	**2,600**	**654**	**661**

[a] Number responding to screener questionnaire and in-scope (see Table B4 for estimated number in-scope which is larger owing to non-response). Count for Steam Electric Utility Plant comes from aggregation of the Form EIA-767, Form EIA-860, and Form EIA-861 databases.

The screener questionnaire survey was used to estimate the numbers of "in-scope" facilities (those potentially subject to proposed regulations under Section 316(b)). Facilities that responded to the screener questionnaire constitute the sample frame for the detailed questionnaire (Table B4).

The estimated population size (Table B4) exceeds the number of respondents in all categories for two reasons: (1) a substantial number of facilities did not respond, and for these, EPA estimates that the fraction of in-scope facilities equals the in-scope fraction for respondents; (2) follow-up calls established that some facilities misinterpreted the screener questionnaire "scoping" questions, so the inscope fractions were adjusted accordingly. To neglect such adjustments at this stage of the survey could lead to an underestimate of the affected population size and the costs of a proposed regulation.

Precision targets were set in the ICR for the screener questionnaire and these are reiterated below in Section 2(c). These still apply approximately, if the uncertainty regarding population sizes (Table B4) is ignored. The estimated number of in-scope facilities is 363 among steam electric nonutility power producers and 616 among other industries (these numbers will increase slightly when follow-up is completed).

Planned sample sizes for the number of detailed questionnaires being sent to other industry are based upon precision targets, with an expectation (based on experience with the screener questionnaire) that 20% of plants will not respond in time for EPA to use the data. This leads to a recommendation to census the other industry category. Planned sample sizes for the number of detailed questionnaires being sent to traditional steam electric utility plants are based upon the precision targets of section 2(c).

Table B3. Disposition of Detailed Questionnaires for Traditional Steam Electric Utilities, Steam Electric Nonutility Power Producers, and Other Industries

Stratum	Number of Facilities in Sample Frame	No. Screener Questionnaires Mailed	Number of Facilities Responding	Estimated Number of In-Scope Facilities	Number of Facilities Responding and In-Scope	Intended Sample Size for Detailed Questionnaire
Population: Traditional Steam Electric Utilities						
Traditional Steam Electric Utilities	934	0	NA	934	NA	**280**
Population: Steam Electric Nonutility Power Producers						
Steam Electric Nonutility Power Producers	1,158	1,050	793	363	281	**190**
Population: Other Industries						
Chemicals & Allied Products (SIC 28)	2,349	650	498	264	56	56
Primary Metals Industries (SIC 33)	1,417	515	430	127	38	38
Paper & Allied Products (SIC 26)	538	232	186	190	66	66
Petroleum & Coal Products (SIC 29)	153	153	136	35	31	31
Total Facilities in Other Industries	4,457	1,550	1250	616	191	**191**
Total Facilities Across Populations	5,615	2,600	2043	979	472	**661**

"Number Responding and In-Scope" (including in-scope facilities identified through follow-up calls and mailed reminders) will constitute the sample frame for the Detailed Questionnaire.

In-Scope Responses as Percent of Estimated Frame Size range from 21% to 88% for strata and 48% to 77% for the two populations.

2(b) Sampling Design

The detailed questionnaire survey effort sampling design will be a stratified random probability sample. The overall design is that of a two-phase (double) sample, the screener questionnaire being the first phase, and the detailed questionnaire the second phase. Screener questionnaire responses will be used to provide (1) estimates of stratum population sizes (number of facilities), and estimates of within-population variances for some key characteristics, (2) information used to refine choices of strata, and (3) a frame for the detailed questionnaire with facility addresses and strata identified. In preparation for the detailed questionnaire survey, screener questionnaires were mailed to a sample of 2,600 of the 5,615 identified facilities. The disposition of those screeners was described above.

Answers to questions on the screener questionnaire identified differences among facilities in terms of their size, their water sources, and intake flow rates. Such information will be used to stratify the sample of facilities to receive the detailed questionnaires. Stratification is described under Sections 3 and 4, below.

1. Survey Design for Utility and Nonutility Steam Electric Power Producers

An important consideration for survey design is EPA's need to predict compliance costs for all utility and nonutility plants that are part of the electric grid, in order to support the Section 316(b) economic analysis. The reason for this requirement is two-fold:

- *The economic viability of a generating unit is determined by its operating costs relative to that of all other units with which it directly competes.* In the electricity market, the decision of whether and how much a unit is utilized depends on its operating costs relative to that of other units with which it directly competes (i.e., all units within the same NERC region). Therefore, to assess economic impacts from Section 316(b) regulation, compliance costs for all plants affected by the regulation are needed.

- *Compliance costs for all plants are needed to make full use of existing electricity market models.* Industry representatives have repeatedly stressed, both in comments on the draft detailed questionnaires and in industry meetings, the complexity of the electricity market and

the need for an economic analysis that accounts for transmission constraints, hourly dispatch decisions, and industry deregulation. The only way that EPA can take these factors into account is by use of an electricity market model. These models make dispatch and retirement decisions based on a comparison of the efficiencies of all competing units. Therefore, the model needs information, including compliance costs for each generating unit within each plant.

EPA will use the following survey approach to obtain compliance cost estimates for all units and plants that are part of the electric grid:

Traditional Steam Electric Utility Category

- *A sample at the plant (or facility) level (Detailed Industry Questionnaire for Steam Electric Utilities).* Responses to the detailed questionnaires will be used to derive an accurate estimate of compliance costs for the sample of plants. A financial/economic questionnaire will provide the information necessary to assess economic impacts at the plant-level.

- *A census of plants not receiving the detailed questionnaire (Short Technical Questionnaire).* The remaining 654 plants will be characterized using a short, screener-type technical questionnaire that requests information about a handful of key variables expected to predict costs. Using the detailed questionnaire survey, above, these key variables will be related to the cost estimates derived from the detailed questionnaire using statistical models. The statistical models will then be used to predict costs for plants receiving the short technical questionnaire. In this way, costs can be estimated accurately even for those plants that do not receive a detailed questionnaire. This plan provides for the calculation of compliance costs at all plants while reducing the burden on the respondent population. This part of the survey is very similar to the screener questionnaire used in Phase I of the Section 316(b) survey effort, except that no financial/economic information is requested in the Short Technical Industry Questionnaire.

Steam Electric Nonutility Power Producer Category

- *A sample at the facility level (Detailed Questionnaire for Steam Electric Nonutility Power Producers).* The technical portion of the detailed questionnaire will be used to derive an accurate estimate of compliance costs for the sample of facilities. The financial/economic portion of the detailed questionnaire will provide the information necessary to assess economic impacts at the firm level and the facility level. A census of all those facilities in the Nonutility Power Producer category that responded and are inscope will be conducted with the detailed questionnaire. The need for a census is based on the small number of screener questionnaire respondents that were in scope for this industry category

2. Survey Design for Other Industries

The survey design for the other industries will include a sample at the facility level (Detailed Industry Questionnaire for Manufacturers). The technical portion of the detailed questionnaire will be used to derive an accurate estimate of compliance costs for the sample of facilities. The financial/economic portion of the questionnaire will provide the information necessary to assess economic impacts at the firm level and the facility level.

3. Sampling Frames

For both the traditional steam electric utility and steam electric nonutility power producer categories, databases produced by EIA were used as the primary sources for EPA's sample frames. EPA also considered databases produced by the Utility Data Institute (UDI) and the Edison Electric Institute (EEI). The EIA databases were selected because they are based on verifiable information from official contacts; reporting is mandatory; information is more complete and current; and they provide a direct link to extensive financial data (Federal Energy Regulatory Commission (FERC) forms) maintained by the Department of Energy (DOE). Extensive comparisons were made between EIA, UDI, and EEI databases to assess possible differences in the populations covered. EIA databases appear to cover the same populations of traditional steam electric utilities and steam electric nonutility power producers (within the facility megawatt capacity limits of the EIA databases).

Traditional Steam Electric Utility Category

The primary source of information for the traditional steam electric utility category was EIA Form-767 data. Facilities were selected based on their operating status codes (i.e., facilities were eliminated if they were reported as being permanently offline). EPA also evaluated and compared data from EIA Form-860 and EIA Form-861 and found that the same utilities and facilities were represented (as expected) for the selection criteria of interest (i.e., steam electric facilities). EIA's Form-767 database includes basic data for facilities having generating nameplate capacities between 10 and 100 megawatts and contained more detailed information for facilities with higher generating nameplate capacities. To include facilities with smaller nameplate capacities (i.e., less than 10 megawatts) and to include facilities with combined-cycle generating units, the frame was augmented with data from EIA's Form-860 database. The frame was then cross-referenced with EIA's Form-861 database to ensure complete coverage and to obtain address information for the facility owner.

Steam Electric Nonutility Power Producer Category

The primary source of information used to develop the frame for this category was EIA's Form-867 database, which included facilities having a nameplate capacity of at least 1 megawatt. When requesting the Form-867 database from EIA, EPA asked that the database be subsetted to include only those facilities with generating units having a steam prime mover. (The prime mover field is confidential on a facility basis in the EIA-867 database.) The frame was then augmented with facilities having a nameplate capacity of less than 1 megawatt and meeting other selection criteria (e.g., having a steam prime mover) from UDI's database, *"U.S. Cogeneration, Small Power Producer, and Industrial Power Plants*."

Other Industry Category

As noted above, other industrial categories (other than SIC Major Group 49) were selected for consideration for EPA's Section 316(b) survey effort by evaluating cooling water use data in the *1982 Census of Manufactures* and other effluent guideline development materials.

SIC Major Group 26: Paper and Allied Products. The sample frame was based upon a 1996 mailing list developed under EPA's recent (1997) Pulp and Paper effluent guideline. The list included 565 mills. The frame was augmented by more current facility information obtained from the American Forest Products Association and from a review of *Lockwood-Post's Directory of the Pulp, Paper, and Allied Trades.*

SIC Major Group 28: Chemicals and Allied Products. The sample frame was based upon PCS and TRI. Facilities were selected by using the reported primary SIC code and a reported National Pollutant Discharge Elimination System (NPDES) permit number. The count of facilities compared favorably to the number of facilities reported in the *SRI Directory of Chemical Producers* (1,274 companies and 3,613 facilities). Based on EPA's 1997 Study of Inorganic Chemical producers and EPA's 1987 Organic Chemical Manufacturing and Plastics and Synthetic Fibers (OCPSF) effluent guideline development documents, between 30 and 50 percent of the facilities reported by SRI (i.e., 1,100 to 1,800 facilities) are expected to be direct dischargers having NPDES permits. EPA, therefore, believed that PCS and TRI, in combination, could provide a list of all major and many of the minor dischargers within this category. This approach did not, however, provide an exact count of the population. A sample survey (screener questionnaire) of the 3,613 facilities in the SRI directory, using a feasible or reasonable sample size, would not provide an estimate of population size much more precise than presently available to EPA. A simple query to all 3,613 could be made by telephone or postcard to establish eligibility, which would likely improve the estimate of population size albeit with additional cost and burden. EPA, however, decided that this effort would not be worthwhile. The PCS and TRI lists were compared and duplicates taken out. The combined lists were then used as the basis for EPA's sample frame for this industry group.

SIC Major Group 29: Petroleum and Coal Products. The sample frame was based upon the *1997 Worldwide Refining and Gas Producing Directory* published by Pennwell Publishing Company. The frame was compared to and augmented with nonduplicated entries in the list of refineries published in the December 1996 issue of the *Oil and Gas Journal*.

SIC Major Group 33: Primary Metals Industries. The sample frame was based upon (a) a frame developed in 1997 for EPA's current effluent guidelines project for the Iron and Steel industry, (b) a directory provided by the Aluminum Association, and (c) PCS and TRI records for aluminum and copper producers selected on the basis of primary SIC codes and NPDES permits. The two lists for aluminum and copper producers (items b and c above) were compared and duplicates were taken out. The combined list was used as the sample frame for the primary metals industry.

4. Sample Sizes and Their Allocation

Required sample sizes are based upon precision targets discussed below (Section 2(c), Precision and Sample Size Requirements) and the need to understand costs, benefits, and financial impacts comprehensively in the industry categories (as described above). These considerations require sampling about 661 plants and facilities (see Table B2) using the three different detailed questionnaires and the Short Technical Industry Questionnaire survey instruments. Approximately 350 facilities will be surveyed using the Watershed Case Study Short Questionnaire with approximately 95 facilities expected to receive one of the detailed questionnaires (see Section 2(b) in this ICR).

Allocation of questionnaires among industrial categories (primary strata) and the secondary strata identified below (business size, waterbody type, and cooling water intake) will be made in proportion to (a) number of plants (population size) in each stratum and (b) an estimate of variability within each stratum. (see Cochran, WG, 1977, Sampling Techniques (3rd ed.), Ch 5.5, "Optimum Allocation"). This allocation may be modified to insure a minimum sample within certain subcategories.

Within-stratum population sizes can be estimated using responses to the screener questionnaire's "scoping" questions. Within-stratum standard deviations can be estimated using variances of surrogate variables that are related to many of the important calculated quantities for the survey, including costs and benefits. These variables are: annual cooling water intake flow, annual electricity generation using cooling water obtained from surface waters, and design cooling water intake.

5. Stratification Variables

Stratification serves two essential purposes. It increases precision (reducing one source of uncertainty) for estimates of costs, benefits, and other quantities. It also enables one to more accurately match cost and benefit calculations, and regulatory options to the circumstances that influence these calculations. In addition, it will allow an analysis of the suitability of each option (e.g., facility age, equipment, and finances; intake and cooling technologies in place; the environmental source of cooling water; the location and capacity of the cooling water intake structures).

Strata for the detailed questionnaire survey sample will consist of three industrial categories referred to here as the primary strata. Additional strata will be determined from responses to the screener questionnaire and will include differences among facilities in terms of their size, their intake water sources, and intake flow rates. These are referred to here as the secondary strata. Stratification for the detailed questionnaire survey effort will combine these, nesting the secondary within the primary strata.

The term "stratification" is being used in two senses for the detailed questionnaire survey effort. First, for sampling design, survey strata will be used to increase precision and to discriminate classes of facilities expected to differ in costs and benefits. Only survey strata are addressed particularly here. Secondly, for financial and technical analyses, even more "strata" (classes) of facilities will be examined to determine if regulatory distinctions can be made amongst these classes, to discriminate classes of facilities differing in costs and benefits. Some questions in the screener and detailed questionnaires are intended to provide candidate variables for the classification of facilities and, more generally, to provide candidate

predictor variates (for use in categorical and regression analysis) that may help EPA determine more precisely and accurately the costs and benefits of a proposed regulation in specific situations as well as in the aggregate.

Strata will be based on (1) Small Business Administration business size cut-off values, (2) cooling water intake flow rates, (3) source of cooling water, (4) type of cooling water system, (5) cooling water intake configuration, (6) cooling water intake technology employed, and (7) North American Electric Reliability Council (NERC) region. Each stratification variable will be grouped into two or more classes using expert judgement and technical information. The choice of classes is not critical to the benefits of stratification, and experts recommend more rather than fewer strata and classes. The value or level of each of these stratification variables is expected to affect costs, benefits, assessments of potential adverse impacts and best technology options, and appropriate regulatory options.

6. Sampling Methods

The sample for the detailed questionnaire survey effort will be a randomized probability sample with stratification and allocation as described above. The sample unit for the survey is the plant or facility. Firms are not used as a basis for sampling for several reasons: (1) The conditions subjecting a plant or facility to regulation under Section 316(b) are intrinsic to the plant or facility and its site ; (2) the attributes which affect potential for adverse impacts, best available technology, and costs of regulatory options are all intrinsic to a plant and its site; (3) available information for sample frames identify plants, but not always owner firms (owner firms are identified for steam electric utility plants but not for steam electric nonutility power producers or other industries); and (4) plants are enduring structures with fixed locations while owner firms may easily have changed since the frame was developed.

In drawing a sample, EPA will also use systematic sampling within strata and subcategories. Systematic sampling will result in more uniformly proportional coverage of NERC Regions, and States. To draw a systematic sample, facilities within each stratum will be grouped by industrial subcategory, NERC

Regions within subcategories, and States within NERC Regions (and by owner or utility, if applicable). At each grouping level, the sequence of groups (e.g., Regions within each industrial subcategory) will be randomized within the next higher level of grouping. Then every k-th plant in the list will be sampled. Systematic sampling is not strictly random, and much has been written about its limitations and benefits (Cochran, WG, 1977, Sampling Techniques, 3rd ed., Wiley; Kish, L, 1965, Survey Sampling, Wiley). However, it is very widely used in large surveys. In a sample that does not consist of spatially or temporally ordered units, there are no important objections to systematic sampling in a survey similar to that proposed here.

7. Multi-Stage Sampling

There is no plan to use multi-stage (cluster) sampling for this survey effort.

2(c) Precision and Sample Size Requirements

1. Precision Targets and Sample Size Requirements

The sample sizes set out in Table B2 will allow EPA to meet the two precision targets described below and to meet precision requirements for SBREFA analysis described in the last paragraph of this section.

The precision targets used here are:

- For costs and benefits analysis:

  - To estimate a population proportion to within ± 0.05 (95 percent confidence interval)
  - To estimate a population mean or total with a coefficient of variation (CV) of 0.05

The second target applies to a continuous measurement (e.g., revenue, cost, flow), and implies a 95% confidence interval of plus or minus 10 percent of the estimated value. The CV for some important quantities is known to be large. For steam electric utilities' plants, some key variables (nameplate capacity, design cooling water intake flow, and annual electricity generation) appear to have lognormal or similar distributions and have CVs of 1-2 (based on the EEI Power Statistics database for 1994).

- For SBREFA analysis:

  - To estimate 20 % of firms to within ± 5% with 95% confidence
  - To estimate 100 firms to within ± 10 with 95% confidence

The sample sizes required to meet these precision targets are shown in Tables B5 and B6. These tables apply to any population subject to simple random sampling (somewhat better precision may be achieved by the stratified sampling plan that EPA will employ). These tables are interpreted and applied to the Section 316(b) populations in the text below; the resulting sample sizes chosen by EPA are shown in Table B7.

EPA applied these goals separately to each of the three major industrial categories (traditional steam electric utilities, nonutility power producers, and other industries), anticipating the need to determine values specific to each category. These industrial categories are expected to differ in many characteristics affecting costs, benefits, and the small business impacts of regulatory options.

We first estimated the number of facilities (or plants) that should be sampled to adequately characterize populations. The estimated number of in-scope plants was 934 among the traditional steam electric utilities, 363 among steam electric nonutility power producers and 616 among other industries (see Tables B2 and B4); the numbers of identified facilities (or plants) are 934, 281, and 191, respectively. Interpolation in Table B5 indicated that sample sizes of 272, 187, and 237, respectively, will support the precision target of 50% ± 5%. Table B6 similarly indicates that sample sizes of 280-590, 190-296, and 243-445, respectively, will support the two precision targets for the CV of a population mean.

The population size of "in-scope" traditional steam electric utility plants is expected to be less than the 934 plants in the sample frame. It is known that some facilities withdraw all their cooling water from sources other than surface water sources (e.g., municipalities, other industrial sources, and or groundwater wells, etc.). However, public sources of information on the source of cooling water intake were inadequate as described in Section 3 of this ICR.

The precision targets are intended to address precision for a mean or total for the entire population within each of the three major industrial categories. Estimates for subcategories will necessarily be less precise. Precision of our survey for national totals could be better than calculated here because we will use stratified, systematic sampling. However, the precision targets address only sampling error. Reported or measured quantities are also be subject to non-sampling errors (imprecision and inaccuracy).

Selecting the number of detailed questionnaires to send to each stratum (i.e., sample allocation) was discussed above under 2(b)(V), "Sampling Methods," and under 2(b)(III), "Sample Sizes and Their Allocation." Allocation will be designed to maximize precision, given the total number of questionnaires allowed.

EPA also considered precision targets and sample sizes for the number of owner firms, based on Agency SBREFA guidance. A SBREFA analysis considers the number and percent of small firms experiencing a specified regulatory cost burden (1%, 3%, and 5% of revenues). Significant levels in this context are 100 firms and 20 % of firms. The column in Table B5 under P = 0.20 shows the sample sizes required to estimate 20 % of firms within ± 5 %. We also considered the error in estimating the number of firms affected when the true number is 100. To achieve a 95% confidence interval of ± 10 firms, when the total population sampled (large & small businesses) is 200, 500, 1000, or 2000, a sample size of about 132, 377, 776, and 1570 (respectively) would be required. The number of traditional steam electric utilities (firms) having in-scope plants is 319. Firms that have in-scope facilities may be 363 or less among steam electric nonutility power producers and 616 or less among other industries (see Table B4). Interpolation in Table B5 indicates that sample sizes of 195, 147, and 176, respectively, are needed to meet the "20% of

firms" target, and sample sizes of 232, 265, and 472, respectively, will meet the "± 10 firms" target. Revenues will be available for all firms (from the screener questionnaires and public sources), and costs can be estimated for all, as described above.

The sample sizes required to achieve various precision targets for the Section 316(b) populations, discussed above, are collected in Table B7. Some precision targets will not be achieved by the chosen sample sizes because the identified numbers of respondents to the screener questionnaire was smaller than the recommended sample size. Also, in it is not likely that the precision target will be achieved if the CV of observations is 2; however, 2 is an unusually high value for population CV.

Table B4. Sample Size Required in Simple Random Sampling for Population Proportion to Have a 95 Percent Confidence Interval (CI) with Margin of Error Equal to 0.05

Sample size (approximate) required to estimate P to within ± 0.05				
	Population Proportion P			
Population Size N	0.05	0.10	0.20	0.50
200	53	82	110	132
500	64	108	165	217
1000	68	122	197	278
2000	70	129	219	322

The sample sizes for estimating the number of firms are not shown in this Table. They follow from the sample sizes above for proportions, because the standard deviation for the estimated number of firms equals that for the corresponding proportion multiplied by "N." A subpopulation of 100 is less easily estimated with precision when it is a smaller fraction of the population. This is reflected in Table B5, which shows implicitly that a subpopulation that is a small fraction of a population is estimated with a large relative error.

Table B5. Sample Size Required in Simple Random Sampling, for the Population Mean or Total to Have a Coefficient of Variation Equal to 0.05

Sample size (approximate) required to estimate population mean or total with CV of 0.05			
	Population Coefficient of Variation (CV)		
Population Size N	0.5	1.0	2.0
200	67	133	178
500	82	222	381
1000	91	286	615
2000	95	333	889

Table B6. Sample Sizes Required for Various Precision Targets, and Sample Size Chosen

Population	Plants in Population estimated (identified)	Sample of Plants for 50% ± 5% target	Sample of Plants for CV = 0.05 target	Sample of Firms for CI of ± 10 target	Sample of Firms for 20% ± 5% target	Sample Size Chosen
Utility	934 (934)	272	280-590	232	195	280
Nonutility	363 (281)	187	190-296	265	147	190
Other Industries	616 (191)	237	243-445	472	176	191

2. Nonsampling Errors

Costing and financial calculations entail unknown (or unquantified) errors — bias and imprecision. If these errors were quantified, they could be considered in the sample size calculations. It is important to note that such errors have not been (apparently, could not be) quantified in past effluent guideline development efforts. Thus, *only* sampling error has been estimated and reported in the record for past guidelines. This continues to apply to the present Section 316(b) effort.

Nonresponse is relatively low for questionnaires sent under the authority of Section 308 of the Clean Water Act. EPA will employ several measures to reduce nonresponses. The cover letter and instructions for the questionnaires will explain the legal authority, responsibility to respond, reasons for the survey, and penalty for nonresponse. Delivery or nondelivery of the questionnaires will be tracked using certified mail. A help line will be operated while the questionnaires are in the field so that technical, financial and administrative questions regarding the survey can be addressed. Recipients not responding by the questionnaire deadline date may be telephoned to encourage response, to answer questions, and to determine the reasons for the nonresponse.

Inaccurate or incomplete responses can occur due to misunderstandings or the misinterpretation of questions and the unintentional skipping of questions by respondents. Errors can occur when responses are

coded, edited and entered into the database. The design and implementation of the detailed questionnaires will employ a number of quality assurance techniques to reduce the frequency of such errors. These techniques include the following:

- Review of questions for ambiguity and clarity
- Use of an easily-followed sequence of questions and stopping points
- Avoidance of questions requiring an open-ended response
- Provision of a limited number of carefully considered responses to each question
- Provision of clear definitions of units of measurement and of technical terms
- Provision of clear instructions with references to the definitions
- Provision of a "help line" with a toll-free number to assist respondents
- Review of questions by engineers, scientists, and economists who will telephone respondents to obtain missing information and resolve problems and inconsistencies
- Use of double-entry keypunch verification on all questionnaires
- Conduct of computerized comparison of selected responses to detect inconsistencies and illogical responses
- Conduct of computerized analyses to screen for out-of-range and inconsistent numerical values
- Conduct of computerized analyses to detect missing numerical data and missing units

2(d) Questionnaire Design

The questionnaires have been designed to group requests for related technical data into matrices. The purpose of the matrices is to help respondents see the relationship of some of the information being requested that might otherwise be overlooked if it were requested in a linear format. Generally, the matrices

request respondents to categorize aspects of the design or operation of their facility by checking applicable pre-coded responses. EPA has conducted substantial background research prior to the development of these questionnaires that suggests that the precoded responses are appropriate. Moreover, results of the pretest described earlier and below support these categorizations. Finally, where actual numeric data are requested (e.g., intake flow rates), responses are requested on a fill-in-the-blank basis. Where possible, close-ended questions have been used, to reduce the burden to the respondents and to aid in eliminating misinterpretation of the responses. Where appropriate, EPA allows elaboration of a facility's unique circumstances under the "Other" response option.

To further aid respondents in completing the questionnaires, key terms have been highlighted in the questions, and definitions have been provided at the point of first reference. Finally, a glossaries are also provided with the questionnaires.

3. Pretests and Pilot Tests

Pretests of the questionnaire were conducted by six facilities. *Please refer to Part A, Section 3(c) of this ICR for information on this topic*.

4. Collection Methods and Follow-up

4(a) Collection Methods

Please refer to Section 5(b), Part A of this ICR for information on this topic.

4(b) Survey Response and Follow-Up

Please refer to Section 5(b), Part A of this ICR for information on this topic.

5. Analyzing and Reporting Survey Results

5(a) Data Preparation

EPA will prepare the Section 316(b) survey data in a manner consistent with other survey efforts at the agency (e.g., past effluent guidelines surveys). Upon receipt of the completed questionnaires, they will be reviewed for coding consistency, missing data, and obvious inconsistencies in reported data by engineering and economic staff. Any inconsistencies will be resolved through call backs and any changes made will be documented. Contractor resources will be used for this effort as well as for data entry. Once the data is entered into a database, numerous manual and electronic QA activities are performed and the results provided to engineering and economic staff for further resolution and documentation.

5(b) Analysis

Analyses of the questionnaires will have the objectives of (a) producing narrative and quantitative characterizations of industry groups, water body types, and cooling water intake structures and technologies, (b) characterizing plant-specific and site-specific factors that distinguish potential for adverse environmental impact, (c) characterizing plant-specific and site-specific factors that distinguish technology options and costs for reducing adverse environmental impact, (d) estimating costs of regulatory options and impacts; (e) estimating benefits of regulatory options. *Please refer to Section 4(b) of Part A of this ICR for additional information on this topic.*

5(c) Reporting Results

All responses containing or consisting of CBI will be so identified in the survey database. Regulations governing confidentiality of business information appear at 40 CFR Part 2 Subpart B, and these are adhered to strictly by EPA and its contractors. Safeguards and procedures for CBI are described in written plans maintained by EPA and its contractors.

Information not classified as CBI could potentially be shared with any interested parties. Such information is subject to Freedom of Information Act (FOIA) requests. Results of EPA's analyses become publicly available most often in three ways: (1) within proposed and final rules published in the *Federal Register*, (2) within development and supporting documents otherwise published in support of rulemaking, and (3) within materials placed in the rulemaking docket. The first two classes of documents are being made available by EPA on the Internet with increasing frequency; and this mode of reporting is a possibility for the results of the questionnaires described in this ICR.