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Best Conventional Pollutant Control Technology; Effluent Limitations Guidelines; Final Rule

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 405, 406, 407, 408, 409, 411, 412, 418, 422, 424, 426, and 432

[FRL 2941-9]

Best Conventional Pollutant Control Technology; Effluent Limitations Guidelines

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: This regulation establishes effluent limitations guidelines based on the application of the best conventional pollutant control technology (BCT) for the discharge of conventional pollutants into navigable waters by certain industrial dischargers and also establishes the Agency's general methodology for determining the reasonableness of costs for these, subsequent BCT effluent limitations guidelines, and case by case determinations of BCT effluent limitations in discharge permits under section 402(a)(1) of the Clean Water Act. This action responds to a judicial remand of a final regulation promulgated in August 1979. The effect of this action is to codify BCT effluent limitations guidelines for dischargers in the following industries: Dairy Products Processing, Grain Mills, Fruits and Vegetables Processing, Seafood Processing, Sugar Processing, Cement Manufacturing, Phosphate Manufacturing, Ferroalloy Manufacturing, Glass Manufacturing, and Meat Products.

DATES: This regulation becomes effective August 22, 1986. In accordance with 40 CFR 23 (50 FR 7268), this regulation shall be considered issued for purposes of judicial review at 1:00 p.m. Eastern time on July 23, 1986. Under section 509(b)(2) of the Clean Water Act, judicial review of these regulations and the BCT methodology published today can be made only by filing a petition for review in the United States Court of Appeals within 90 days after the regulation is considered issued for purposes of judicial review. Under section 509(b)(2) of the Clean Water Act, the requirements in this regulation may not be challenged later in civil or criminal proceedings brought by EPA to enforce these requirements. Application of the BCT methodology can be challenged in a subsequent rulemaking and in any case-by-case determinations in permit proceedings.

ADDRESSES: The Record for the final rule is available for public inspection in EPA's Public Information Reference Unit, located in the EPA Library, Room 2404, 401 M Street, SW., Washington, DC. The EPA public information regulation (40 CFR Part 2) provides that a reasonable fee may be charged for copying.

FOR FURTHER INFORMATION CONTACT: Ms. Debra Maness, (202) 382-5385.

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I. Background

A. Definition and Legal Basis

In 1977, Congress amended the Clean Water Act to include section 304(b)(4), which instructs EPA to establish effluent limitations guidelines based on the application of the "best conventional pollutant control technology" (BCT) for existing industrial point sources that discharge conventional pollutants. The BCT effluent limitations guidelines are not additional guidelines, but instead, replace guidelines based on the application of the "best available technology economically achievable" (BAT) for the control of conventional pollutants. BAT effluent limitations guidelines remain in effect for nonconventional and toxic pollutants. Effluent limitations based on BCT may not be less stringent than the limitations based on "best practicable control technology currently available" (BPT). Thus, BPT effluent limitations guidelines are a "floor" below which BCT effluent limitations guidelines cannot be established.

Section 304(b)(4)(B) adds an additional evaluation to the effluent limitations guidelines process for conventional pollutants. In addition to the Clean Water Act requirement that effluent limitations guidelines be economically achievable, the cost associated with the BCT effluent limitations guidelines must also be "reasonable" in relation to the effluent pollutant reductions. The evaluation concerning the reasonableness of BCT also applies to effluent limitations in permits prepared under the National Pollutant Discharge Elimination System according to best professional judgment (BPJ). Thus, throughout this preamble, the use of the term "effluent limitations" means effluent limitations guidelines for industrial categories and effluent limitations established on a case by case basis in permits. The Agency will also prepare permit-writing guidance on the subject of BCT effluent limitations.

In establishing BCT effluent limitations, section 304(b)(4)(B) states that EPA must consider

> . . . the reasonableness of the relationship between the costs of attaining a reduction in effluents and the effluent reduction benefits derived, and the comparison of the cost and level of reduction of such pollutants from the discharge from publicly owned treatment works to the cost and level of reduction of such pollutants from a class or category of industrial sources . . .

The procedure EPA uses to account for these factors is known as the BCT methodology. Stated intuitively, the BCT methodology answers the question of whether it is "cost-reasonable" for industry to control conventional pollutants at a level more stringent than BPT effluent limitations already require. The Act also specifies that in establishing BCT effluent limitations, consideration be given to the age of equipment, production processes, energy requirements, and other appropriate factors.

In developing the BCT methodology, EPA has been guided both by the statutory language of section 304(b)(4)(B) and by Congress' underlying objectives as expressed in the legislative history of the Clean Water Act. Congress was concerned that the controls for conventional pollutants at levels more stringent than BPT were likely to be unreasonably expensive in

apply to the primary industries, although final BCT effluent limitations for the primary industries will be published in future rulemakings. EPA also expects to apply today's BCT methodology in all subsequent rulemakings and permit proceedings and so considers the BCT methodology as described in this **Federal Register** notice final for purposes of judicial review. Application of this methodology can be challenged in subsequent rulemakings and BPJ permit proceedings.

II. Summary of Final Rulemaking

A. Application of BCT Methodology

1. Candidate Technologies

Establishing BCT effluent limitations for an industrial category or subcategory begins by identifying technology options that provide additional conventional pollutant control beyond the level of control provided by the application of BPT effluent limitations. Any such "candidate technologies" are then evaluated to determine if they are technologically feasible and economically achievable. The candidate technology must meet these requirements to be considered as a basis for BCT effluent limitations. EPA then evaluates candidate technologies by applying the BCT cost test, which consists of two parts: the POTW test and the industry cost-effectiveness test.

2. POTW Test

To "pass" the POTW test, the cost per pound of conventional pollutant removed by industrial dischargers in upgrading from BPT to the candidate BCT must be less than the cost per pound of conventional pollutant removed in upgrading POTWs from secondary treatment to advanced secondary treatment. The upgrade cost to industry must be less than the POTW benchmark of $0.25 per pound (in 1976 dollars) for industries whose cost per pound is based on long-term performance data (first tier POTW benchmark), or less than $0.14 per pound for industries whose cost per pound is not based on long-term performance data (second tier POTW benchmark).

While the preferred approach for applying the BCT methodology is to calculate the cost per pound with long-term performance data, these data are not uniformly available for most of the secondary industries. The costs per pound for industries without long-term performance data are derived from the maximum 30-day limitations that were originally based on the application of BAT, prior to the requirement that the Agency establish BCT effluent limitations guidelines. Therefore, for purposes of applying the BCT methodology to the industries with this data constraint, a second tier of benchmarks was calculated using the same type of data as is available for the industries without long-term performance data (i.e., 30-day data).

As discussed in Section I, the conventional pollutants are BOD, TSS, oil and grease, fecal coliform, and pH. The pollutants included in calculating the POTW pollutant removal are BOD and TSS. These pollutants are also used to calculate the pollutant removal for a candidate BCT, but oil and grease may be included when appropriate in the context of the industry and technology being evaluated. Fecal coliform and pH are not included in the calculations because control of these pollutants is not measureable as "pounds removed." An acceptable interval for controlling pH is evaluated with respect to the particular processes of a candidate technology. Generally, the acceptable pH interval for BCT will be the same as that for BPT. Maintaining the acceptable interval is an inherent cost of the BCT technology and must be economically achievable and cost-reasonable.

3. Industry Cost-Effectiveness Test

Candidate technologies must also "pass" the industry cost-effectiveness test. For each industry subcategory, EPA computes a ratio of two incremental costs. The first is the cost per pound removed by the BCT candidate technology relative to BPT; the second is the cost per pound removed by BPT relative to no treatment (i.e., the second cost compares raw wasteload to pollutant load after application of BPT).

The ratio of the first cost divided by the second is a measure of the candidate technology's cost-effectiveness. The ratio is compared to an industry cost benchmark, which again is based on POTW cost and pollutant removal data. The benchmark, like the measure for a candidate technology, is a ratio of two incremental costs: the cost per pound to upgrade a POTW from secondary treatment to advanced secondary treatment is divided by the cost per pound to initially achieve secondary treatment from raw wasteload. If the industry ratio is lower than the benchmark, the candidate technology passes the industry cost test. The benchmark for industries whose ratio is based on long-term performance data is 1.29. The second tier benchmark for industries whose ratio is not based on long-term performance data is 0.68.

In calculating this ratio, EPA will consider any BCT cost per pound less than $0.01 to be the equivalent of *de minimis* or zero costs. There are cases in today's rulemaking where the numerator of the industry cost ratio and therefore the entire ratio are taken to be zero. EPA believes any *de minimis* cost per pound for a candidate BCT technology meets Congressional intent concerning the concept of reasonableness for purposes of the second test.

4. BCT Determination

EPA will evaluate both the POTW test and the industry cost-effectiveness test as measures of reasonableness. The most stringent technology option that "passes" these tests provides the basis for setting BCT effluent limitations. Generally, if all candidate technologies fail any of the tests, or if no candidate technologies more stringent than BPT are identified, then BCT effluent limitations are established at a level equal to BPT effluent limitations.

There may be instances where, because of a lack of comparable industry data, a strict comparison to the benchmarks developed in this rulemaking would undermine Congressional intent on cost-reasonableness. In such instances, EPA will develop appropriate procedures to evaluate cost-reasonableness on an industry-specific basis. Additionally, section 304(b)(4)(B) instructs the Agency to consider "other factors deemed appropriate" when making determinations about BCT. Again, EPA will support such evaluations on an industry-specific basis.

B. Industrial Categories Affected and Summary of Their Results

This final regulation identifies the methodology EPA uses to establish BCT effluent limitations, pursuant to the provisions of section 304(b)(4)(B) of the Clean Water Act. This methodology is used in today's rulemaking to establish BCT effluent limitations for many of the secondary industries. For some of the primary industries, BCT effluent limitations have already been proposed; for others, they have been deferred. While BCT effluent limitations for primary industries will be promulgated in separate rulemaking notices, the methodology used to determine the reasonableness of those limitations will be the same as described in today's final rule.

Due to the extensive regulatory activity (proposal, promulgation, withdrawal, and reproposal) and the time span affecting BCT effluent limitations for the secondary industries, all subcategories for the secondary industries are reviewed here. Table 1 summarizes the results of this review.

The third column of Table 1 describes the status of BCT effluent limitations prior to today's rulemaking. The fourth column indicates whether the existing status is affected by this rulemaking and shows the final outcome. The final column presents the rationale for the final determination.

The results indicate that establishing BCT effluent limitations at a level of control more stringent than BPT effluent limitations is reasonable for seven subcategories. Four subcategories are in the Canned and Preserved Seafood Processing category: Pacific Coast Hand-Shucked Oyster, Atlantic and Gulf Coast Hand-Shucked Oyster, Non-Alaskan Scallop, and Abalone Processing; two are in the Meat Products category: Small Processors and Renderers; and one is in the Phosphate Manufacturing category: Sodium Phosphates. The Agency estimates that the additional treatment associated with the more stringent limitations for these subcategories will result in minimal incremental costs. For the remaining subcategories where BCT effluent limitations are established equal to the BPT effluent limitations, there is no incremental cost beyond BPT.

TABLE 1.—SUMMARY OF BCT METHODOLOGY RESULTS AND BCT EFFLUENT LIMITATIONS GUIDELINES FOR SECONDARY INDUSTRIES

Industry and subpart	CFR part	Prior status of BCT effluent limitations	Outcome of today's rulemaking	Basis of determination [1]
DAIRY PRODUCTS PROCESSING				
A—Receiving stations	405.17	No limitations	Establish BCT = BPT for BOD, TSS, pH	Fail BCT methodology, reason No. 3
B—Fluid products	405.27	do	do	Do.
C—Cultured products	405.37	do	do	Do.
D—Butter	405.47	do	do	Do.
E—Cottage cheese and cultured cream cheese	405.57	do	do	Do.
F—Natural and processed cheese	405.67	do	do	Do.
G—Fluid mix for ice cream and other frozen desserts	405.77	do	do	Do.
H—Ice cream, frozen desserts, novelties and other dairy desserts	405.87	do	do	Do.
I—Condensed milk	405.97	do	do	Do.
J—Dry milk	405.107	do	do	Do.
K—Condensed whey	405.117	BCT = BPT for pH	No change for pH. Establish BCT = BPT for BOD, TSS.	Do.
L—Dry whey	405.127	No limitations	Establish BCT = BPT for BOD, TSS, pH	Do.
GRAIN MILLS				
A—Corn wet milling	406.17	Limitations suspended	No change to prior status	Technology under review
B—Corn dry milling	406.27	No limitations	Establish BCT = BPT for BOD, TSS, pH	Fail BCT methodology, reason No. 3
C—Normal wheat flour milling	406.37	BCT = BPT, zero discharge.	No change to prior status	No candidate technology.
D—Bulgur wheat flour milling	406.47	BCT = BPT for pH	No change for pH. Establish BCT = BPT for BOD, TSS.	Fail BCT methodology, reason No. 3
E—Normal rice milling	406.57	BCT = BPT, zero discharge.	No change to prior status	No candidate technology.
F—Parboiled rice processing	406.67	No limitations	Establish BCT = BPT for BOD, TSS, pH	Fail BCT methodology, reason No. 3
G—Animal feed	406.77	BCT = BPT, zero discharge	No change to prior status	No candidate technology.
H—Hot cereal	406.87	do	do	Do.
I—Ready-to-eat cereal	406.97	No limitations	Establish BCT = BPT for BOD, TSS, pH	Fail BCT methodology, reason No. 3
J—Wheat starch and gluten	406.107	do	do	Do.
CANNED AND PRESERVED FRUITS AND VEGETABLES PROCESSING				
A—Apple juice	407.17	BCT = BPT for pH	No change for pH. Establish BCT = BPT for BOD, TSS.	Do.
B—Apple products	407.27	do	do	Do.
C—Citrus products	407.37	No limitations	Establish BCT = BPT for BOD, TSS, pH	Do.
D—Frozen potato products	407.47	BCT = BPT for pH	No change for pH. Establish BCT = BPT for BOD, TSS.	Do.
E—Dehydrated potato products	407.57	No limitations	Establish BCT = BPT for BOD, TSS, pH	Do.
F—Canned and preserved fruits	407.67	do	do	Do.
G—Canned and preserved vegetables	407.77	do	do	Do.
H—Canned and miscellaneous specialties	407.87	do	do	Do.
CANNED AND PRESERVED SEAFOOD PROCESSING				
A—Farm-raised catfish processing	408.17	do	Establish BCT = BPT for TSS, oil and grease, pH.	Do.
B—Conventional blue crab processing	408.27	do	do	Fail BCT methodology, reason No. 1
C—Mechanized blue crab processing	408.37	do	do	Do.
D—Non-remote Alaskan crab meat processing	408.47	do	do	Do.
E—Remote Alaskan crab meat processing	408.57	do	Establish BCT = BPT	Do.
F—Non-remote Alaskan whole crab and crab section processing	408.67	do	Establish BCT = BPT for TSS, oil and grease, pH	Do.
G—Remote Alaskan whole crab and crab section processing	408.77	do	Establish BCT = BPT	Do.
H—Dungeness and Tanner crab processing in the contiguous States	408.87	do	Establish BCT = BPT for TSS, oil and grease, pH.	Do.
I—Non-remote Alaskan shrimp processing	408.97	do	do	Do.
J—Remote Alaskan shrimp processing	408.107	do	Establish BCT = BPT	Do.
K—Northern shrimp processing in the contiguous States	408.117	do	Establish BCT = BPT for TSS, oil and grease, pH	Do.
L—Southern non-breaded shrimp processing in the contiguous States	408.127	do	do	Do.
M—Breaded shrimp processing in the contiguous States	408.137	do	do	Do.
N—Tuna processing	408.147	do	do	Do.
O—Fish meal processing	408.157	do	Establish BCT = BPT for BOD, TSS, oil and grease, pH.	Fail BCT methodology, reason No. 2
P—Alaskan hand-butchered salmon processing	408.167			
—Non-remote		do	Reserve section	Technology under review
—Remote		do	Establish BCT = BPT	Fail BCT methodology, reason No. 1
Q—Alaskan mechanized salmon processing	408.177			
—Non-remote		do	Establish BCT = BPT for TSS, oil and grease, pH	Do.

TABLE 1.—SUMMARY OF BCT METHODOLOGY RESULTS AND BCT EFFLUENT LIMITATIONS GUIDELINES FOR SECONDARY INDUSTRIES—Continued

Industry and subpart	CFR part	Prior status of BCT effluent limitations	Outcome of today's rulemaking	Basis of determination [1]
—Remote		do	Establish BAT = BPT	Do
R—West coast hand-butchered salmon processing	408.187	do	Establish BCT = BPT for TSS, oil and grease, pH.	Do
S—West coast mechanized salmon processing	408.197	do	do	Do
T—Alaskan bottom fish processing	408.207			
—Non-remote		do	Reserve section	Technology under review
—Remote		do	Establish BCT = BPT	Fail BCT methodology, reason No 1
U—Non-Alaskan conventional bottom fish processing	408.217	do	Establish BCT = BPT for TSS, oil and grease, pH.	Do
V—Non-Alaskan mechanized bottom fish processing	408.227	do	do	Do
W—Hand-shucked clam processing	408.237	do	do	Fail BCT methodology, reason No 2
X—Mechanized clam processing	408.247	do	do	Fail BCT methodology, reason No 1
Y—Pacific coast hand-shucked oyster processing	408.257	do	Establish BCT = BPT for pH and BCT more stringent than BPT for TSS, oil and grease.	Pass BCT methodology
Z—Atlantic and Gulf Coast hand-shucked oyster processing	408.267	do	do	Do
AA—Steamed and canned oyster processing	408.277	do	Establish BCT = BPT for TSS, oil and grease, pH.	Fail BCT methodology, reason No 1
AB—Sardine processing	408.287	do	do	Do
AC—Alaskan scallop processing	408.297			
—Nonremote		do	Reserve section	Technology under review.
—Remote		do	Establish BCT = BPT	Fail BCT methodology, reason No 1
AD—Non-Alaskan scallop processing	408.307	do	Establish BCT = BPT for pH and BCT more stringent that BPT for TSS, oil and grease.	Pass BCT methodology
AE—Alaskan herring fillet processing	408.317			
—Non-remote		do	Establish BCT = BPT for TSS, oil and grease, pH.	Fail BCT methodology, reason No 1
—Remote		do	Establish BCT = BPT	Do
AF—Non-Alaskan herring fillet processing	408.327	do	Establish BCT = BPT for TSS, oil and grease, pH.	Do
AG—Abalone processing	408.337	do	Establish BCT = BPT for pH and BCT more stringent than BPT for TSS, oil and grease.	Pass BCT methodology
SUGAR PROCESSING				
A—Beet sugar processing	409.17	BCT = BPT for pH	No change for pH. Establish BCT = BPT for BOD, TSS, fecal coliform.	Fail BCT methodology reason No 3
B—Crystalline cane sugar refining	409.27	do	No change for pH. Establish BCT = BPT	Do
C—Liquid cane sugar refining	409.37	do	No change for pH. Establish BCT = BPT for BOD, TSS.	Do
D—Louisiana raw cane sugar processing	409.47	No limitations	Establish BCT = BPT for BOD, TSS, pH	Do
E—Florida and Texas raw cane sugar processing	409.57	do	Establish BCT = BPT	No candidate technology
F—Hilo-Hamakua Coast of the Island of Hawaii raw cane sugar processing	409.67	do	Establish BCT = BPT for BOD, TSS, pH	Fail BCT methodology reason No 3
G—Hawaiian raw cane sugar processing subcategory	409.77	do	Establish BCT = BPT	No candidate technology
H—Puerto Rican raw cane sugar processing	409.87	do	Establish BCT = BPT for BOD, TSS, pH	Fail BCT methodology, reason No 3
CEMENT MANUFACTURING				
A—Nonleaching	411.17	BCT = BPT pH, TSS	No change to prior status	No candidate technology
B—Leaching	411.27	BCT = BPT for pH	No change for pH. Establish BCT = BPT for TSS.	Fail BCT methodology reason No 3
C—Materials storage piles runoff	411.37	BCT = BPT for pH, TSS	No change to prior status	No candidate technology
FEEDLOTS				
A—All subcategories except ducks	412.17	BCT = BAT	Reserve section	Technology under review
B—Ducks	No section	No limitations	No change to prior status	Do
FERTILIZER MANUFACTURING				
A—Phosphate	418.17	BCT = BPT for TSS	do	No candidate technology [2]
B—Ammonia	418.27	BCT = BPT for pH	do	Do
C—Urea	No section	No limitations	do	No control of conventional pollutant discharges
D—Ammonium nitrate	do	do	do	Do
E—Nitric acid	do	do	do	Do
F—Ammonium sulfate production	418.67	BCT = BPT	do	No candidate technology
G—Mixed and blended fertilizer production	418.77	do	do	Do
PHOSPHATE MANUFACTURING				
A—Phosphorus production	No section	No limitations	do	No control of conventional pollutant discharges
B—Phosphorus consuming	do	do	do	Do
C—Phosphate	do	do	do	Do
D—Defluorinated phosphate rock	422.47	BCT = BPT for TSS, pH	do	No candidate technology
E—Defluorinated phosphoric acid	422.57	do	do	Do

III. Development of BCT Methodology and Benchmarks

A. POTW Test

As discussed earlier in this preamble, the 1979 BCT promulgation addressed the concept of reasonableness with a single measure that would be applied to BCT determinations in all industries. The Agency determined that a single methodology, or "rule-of-thumb" approach was preferable to a case-by-case approach. The core of the 1979 methodology, as directed by the statute, was a comparison of the cost of removing additional pounds of conventional pollutants by industrial dischargers to the cost of conventional pollutant removals by a POTW.

EPA considered a number of ways that a POTW test could be formulated (see the preamble to the proposed rules at 43 FR 35572, August 23, 1978). By 1977, industry was required to control pollutant discharges at a level achievable by BPT. Analagously, POTWs were required to have met effluent limitations based on secondary treatment by 1977. The Agency believed that a relevant basis of comparison for POTWs would be at an incremental level beyond secondary treatment because BCT effluent limitations guidelines would be at least equal to, and in some cases, more stringent than BPT effluent limitations guidelines. After a careful consideration of alternatives, EPA adopted a test employing a comparison of the cost to upgrade POTWs from secondary treatment to advanced secondary treatment.

Some commenters have argued that the repeal of Section 301(b)(2)(B) of the Clean Water Act changed EPA's statutory authority for relying on cost to upgrade to advanced secondary treatment as a basis for the BCT methodology. Section 301(b)(2)(B) had required that POTWs achieve "best practicable wastewater treatment technology" (BPWTT) by July 1, 1983. We do not believe that the repeal of BPWTT diminishes the rationale for using advanced secondary treatment in the POTW test or in the industry cost test.

In its final regulation on August 29, 1979, EPA stated three major reasons for using advanced secondary treatment in the POTW test (44 FR 50735). The first was that "calculation of the costs per pound of conventional pollutant removal based on the increment from secondary to advanced secondary yields the best approximation of . . . marginal costs." The second was that advanced secondary treatment represents the "knee-of-the-curve" with respect to POTW costs (referring to the point where incremental costs begin to exceed incremental benefits). The last reason was that the level of treatment for a POTW to upgrade from secondary to advanced secondary treatment roughly parallels the industrial increment under consideration. In its review, the Fourth Circuit upheld EPA's choice of advanced secondary treatment as the relevant increment for the POTW benchmark. These reasons remain the basis for our choice of the secondary to advanced secondary increment as the foundation of the POTW test.

B. Industry Cost Test

The methodology promulgated in 1979 included only the POTW test. The methodological changes proposed in 1982 were primarily in response to the 1981 Court decision, which directed EPA to develop a second test to compare the industry cost and effluent reduction benefits resulting from more stringent levels of conventional pollutant control. Neither the Court nor the legislative history of the Clean Water Act provide specific guidance on how to design this second test. In developing the industry cost-effectiveness test (or "industry cost test"), the Agency determined that it should be designed so as to meet three conditions. First, the industry cost test should use an explicit numerical benchmark. By comparing industry costs to a uniform benchmark, EPA reduces bias in evaluating so many different industries. Second, the test should measure both increases in pollution control costs and reductions of conventional pollutants and thus measure the cost-effectiveness (in cost per pound removed) of the potential BCT level of control. Third, the test should be designed so that, from a practical standpoint, the information needed to conduct the test is generally available and promulgation of BCT effluent limitations guidelines would not be further delayed.

The Agency considered several alternative structures for the second test. The 1982 notice of proposed rulemaking discussed five ways to measure industry cost-effectiveness and two ways to establish the benchmark against which the industry values would be compared. The alternatives and the rationale for selecting an alternative are discussed in detail in the preamble to the proposed rule (47 FR 49181). The industry cost and pollutant removal calculations were based on an "increasing cost ratio" that combined two computations of cost per pound removed—one to reflect the control afforded by BPT effluent limitations and the second to reflect the additional control afforded by the candidate BCT technology. While the calculations for the second test have been refined in response to comments, the second test used in today's final regulation is conceptually the same as that proposed in 1982.

One of the refinements corrected an inconsistency in the "starting point" for calculating the cost per pound for secondary treatment and the cost per pound for BPT. In the 1982 proposal, some calculations of effluent reduction were based on raw waste pollutant concentrations; in other cases, primary treatment concentrations were used. Instead of using various levels of treatment for pre-BPT (or pre-secondary) conditions, the Agency established raw wasteload as the starting point both for industrial calculations and for POTW calculations (i.e., the pre-BPT and pre-secondary treatment levels). These changes address the concerns of commenters and maintain consistency between POTW and industry calculations. Additionally, where the cost per pound for a BCT candidate technology is less than $0.01, EPA will consider the numerator of the industry cost ratio and, therefore, the entire ratio to be zero (see Section II.A.3).

C. POTW Cost Data

1. History and Overall Approach to POTW Cost Data

The methodology for both tests relies on the cost for POTWs to control conventional pollutants. The source of POTW cost data was a controversial

issue during several of the previous BCT rulemaking actions. In the 1979 promulgation and in the 1982 reproposal, EPA relied on empirical cost data. However, the 1982 action incorporated two revisions concerning EPA's use of the empirical data base. First, in the 1979 promulgation, the POTW cost comparison figure (the "POTW benchmark") was based on costs and removals for an average-sized POTW, which was 2 million gallons per day (mgd). In 1982, EPA proposed to base the POTW benchmark on cost and removal data for a range of POTW sizes. Costs per pound of pollutant removed were calculated for each of the various sizes, and then the costs were flow-weighted and summed to obtain a single POTW benchmark. The use of data for different POTW flow sizes better depicts the costs of removing conventional pollutants at POTWs because the economies of scale inherent in large POTWs can be included in the calculations. The flow-weighting approach is retained in the final rule.

Second, the 1982 proposal incorporated corrected and updated POTW cost data to calculate the POTW benchmark and the new industry cost benchmark. Incremental annual costs in the 1979 promulgation were estimated from actual POTW cost data collected by the Agency and reported in two cost documents (EPA 430/9–77–013, January 1978 and EPA 430/9–77–015, May 1978). The source of the actual cost data used in the 1982 proposal was the updated version of the cost documents used in 1979 (for the 1982 notice: EPA 430/9–80–003, April 1980 and EPA 430/9–81–004, September 1981). In both rulemakings, the cost documents provided the most up-to-date information regarding the costs of constructing and operating POTWs.

In 1983, more up-to-date cost information was again available, and on June 2, 1983, the Agency issued a notice indicating EPA's intent to use the most current data to promulgate the BCT methodology. EPA then became aware that the new data might not be appropriate for estimating the incremental cost of advanced secondary treatment. In the analysis of construction cost data, it appeared that the editing criteria to define secondary treatment systems and advanced secondary treatment systems might have been inaccurate or inconsistent. POTW costs may also have varied substantially due to site-specific factors that were unrelated to treatment plant performance. The empirical data base was not an actual study of upgrade costs at specific plants, which hindered the Agency's attempt to calculate an incremental cost. In September 1983, the Agency withdrew the new data to further evaluate the costs. The Agency also realized that the cost curves used in the 1982 proposal might be subject to the same problems as the cost curves published and withdrawn in 1983. EPA then concluded that it was necessary to use a different data source to calculate incremental costs for the POTW and industry cost benchmarks.

The alternative approach was to develop model POTWs with specified design assumptions and then present design cost estimates for those models to determine the cost of upgrading POTWs from secondary treatment to advanced secondary treatment.

The model POTWs are municipal wastewater treatment facilities with specifications for size, basic design, general operating conditions, and required effluent levels. These specifications were provided to four engineering consulting firms who then estimated the model POTW costs. The design criteria for secondary treatment required that the POTW achieve effluent limitations of 30 milligrams per liter (mg/l) BOD and 30 mg/l TSS (as maximums for 30-day averages), using technology that was current in 1977. While in some circumstances, a permit authority may allow less stringent effluent limitations for certain POTWs (e.g., 45 mg/l BOD and 45 mg/l TSS for a POTW with a trickling filter), effluent limitations of 30 mg/l BOD and 30 mg/l TSS were used for the model POTWs because, unless adjusted, they are required by the Agency's secondary treatment regulation (40 CFR 133.105).

The design criteria for advanced secondary treatment required that the secondary treatment POTW be modified to achieve more stringent effluent levels. In the 1984 notice, the Agency identified three possible effluent levels for defining advanced secondary treatment: 20 mg/l for BOD and TSS, 15 mg/l, and 10 mg/l. For each level, the Agency specified a treatment technology that could be used to upgrade the secondary POTW to meet the more stringent effluent limitations. Of the three effluent levels, the Agency selected 20 mg/l BOD and 20 mg/l TSS (as maximums for monthly averages) as the most appropriate definition of advanced secondary treatment.

In the 1982 proposal, the increment to advanced secondary treatment was from 30 mg/l to 10 mg/l for both pollutants. The Agency used a definition of 10 mg/l each of BOD and TSS in that proposal because it represented the best performance for advanced secondary treatment. In the 1984 notice, the Agency identified 20 mg/l BOD as a better choice because it was the most common permit requirement for POTWs beyond secondary treatment. Overall, the comments received on the definition of 20 mg/l were favorable, and the Agency is retaining this definition in the final methodology.

The model POTW approach was presented in the 1984 notice of data availability. Many comments supported the change to the design estimates, but the Agency received some detailed criticism of some of the design assumptions. Based on those comments, the final methodology includes some changes that refine and improve the data used for the benchmark calculations. These refinements are discussed below. The Agency is aware of the difficulties with both the empirical data base and the design estimates (see section IX, Comment Nos. 4, 8, and 9). On balance, and given the several changes to the cost data, we have determined that using design estimates is the preferred approach, and have retained this approach in the final rule.

2. Design Specifications for Model Plants

The major change affecting the model POTW costs since the 1984 notice is the specification of polymer addition as the treatment needed to upgrade a secondary POTW to advanced secondary treatment. The original model POTW specifications in the 1984 notice identified the additional treatment only as chemical addition. One of the engineering firms that estimated model POTW costs chose alum for the additive; the others chose polymer. Based on the evaluation of the comments concerning the use of alum, the Agency decided to specify polymer addition as the technology for advanced secondary treatment. While alum is effective at reducing the level of solids, its addition is usually associated with site-specific problems such as a high phosphorus content in the wastewater. The addition of polymer is a better design assumption for model POTWs. This specification change precludes the use of alum, and the engineering firm that had initially used alum revised their design and costs to reflect polymer addition.

The technology basis for secondary treatment for the model POTW is conventional activated sludge. Various sludge disposal methods are used, depending on the size of the model POTW. As mentioned above, polymer addition is the technology to upgrade the secondary POTW to meet effluent limitations of 20 mg/l BOD and 20 mg/l

TSS. Some secondary POTWs with conventional activated sludge processes may achieve better performance than 30 mg/l BOD and 30 mg/l TSS and may intermittently achieve 20 mg/l BOD and 20 mg/l TSS without additional technologies. With the constraint that an existing POTW is being modified, however, consistent and reliable performance at more stringent levels can best be achieved with additional treatment and, therefore, additional cost. Some of the comments on the 1984 notice claim that activated sludge POTWs will routinely meet the Agency's defined level of advanced secondary treatment without additional technology; that is, through better operation of existing facilities. These claims were supported by performance data from certain POTWs.

Considering the characteristics of POTWs as a whole, the Agency believes this claim is an overstatement of a secondary POTW's capability. The polymer addition step, however, would ensure that the defined level of advanced secondary treatment will be met. Polymers have been used to improve the performance of secondary POTWs; the technology is not prohibitively expensive, and it is well documented as effective. Commenters also challenged a series of specific model POTW design and costing assumptions. Many of their comments addressed sizing and capacity assumptions for specific equipment, such as influent pumps or vacuum filters. Agency engineers and each engineering firm evaluated each of these comments, reviewed the design assumptions and costs, and where necessary, corrected or revised the designs and costs.

3. Model POTW Cost Estimates

The procedure for using the engineering cost estimates is basically the same as presented in the 1984 notice. Estimates of the incremental cost to upgrade from secondary treatment to advanced secondary treatment were developed for five sizes of POTWs. Table 2 presents a distribution, by size, of POTWs in the United States. Each of the five model POTW sizes is approximately equal to the average flow in each size category, expressed in million gallons per day (mgd). The five model POTW sizes are 0.052 mgd, 0.38 mgd, 3.3 mgd, 25 mgd, and 140 mgd. The POTW and industry cost benchmarks continue to be based on weighting the cost per pound of conventional pollutants removed, according to the size distribution of POTWs. The weighting factors, shown on the last line of Table 2, are calculated by dividing the total flow for each size category by the total flow for all POTWs.

As in the proposal, the POTW costs used to calculate the benchmarks are the total annual costs of constructing and operating a secondary POTW, and the total annual cost to upgrade the POTW to advanced secondary treatment. Total annual costs include capital charges, interest, and operation and maintenance costs. Capital costs are amortized over 30 years at a 10 percent interest rate. The engineering cost estimates are presented in 1984 dollars and then indexed to 1976 third quarter dollars and to other years' dollars to facilitate comparison of the benchmark to the costs of BCT candidate technologies for industrial subcategories.

The engineering firms that provided model POTW estimates and the model POTW sizes analyzed by the respective firms are the same as those presented in the 1984 notice. The four firms are Camp Dresser and McKee, Inc., E. C. Jordan Co., Sverdrup and Parcel and Associates, Inc., and J. M. Smith and Associates Consulting Engineers. Each firm is nationally recognized for experience in designing municipal wastewater treatment facilities. The first three firms estimated costs for the three largest model POTW sizes: 3.3, 25, and 140 mgd. For these model POTWs, the three firms developed detailed estimates based on preliminary design of POTW components. The fourth firm, using planning level estimates, provided costs for the two smaller POTW sizes: 0.052 and 0.38 mgd. Planning level cost estimates were developed from empirically-based, cost-estimating curves that present costs as a function of size and also with a computer-assisted, cost-estimating program (the EPA-developed CAPDET: Computer Assisted Procedure for the Design and Evaluation of Wastewater Treatment Systems). Planning level estimates usually have a lower degree of accuracy than design estimates. However, this does not significantly affect the benchmarks because the weighting factors for the two smallest POTW sizes are very low (see Table 2).

TABLE 2—POTW SIZE DISTRIBUTION

	Size Range by Flow (mgd) [1]					
	0 to 0.105	0.106 to 1.05	1.06 to 10.5	10.6 to 50.2	50.3 & greater	All POTWs
Number of POTWs	5,021	7,033	2,686	415	96	15,251
Total flow	259	2,675	8,836	9,290	13,354	34,415
Average flow	0.0515	0.3803	3.290	22.39	139.1	2.257
Weighting factor	.0075	.0777	.2567	.2700	.3880	1.0

[1] mgd = millions of gallons per day

Source: The 1980 Needs Survey (FRD-23, EPA 430/9-81-006, February 1981)

Each engineering firm estimated costs for a secondary POTW and for the ungrade of the POTW to advanced secondary treatment. A summary of the cost estimates is shown in Table 3. Each firm reported their estimates on a standard format to facilitate review and comparison. The reporting format presents the costs for 18 cost centers (e.g., primary clarification, aeration, chlorination) and for 16 cost divisions (e.g., electrical, concrete, equipment) within each cost center. A review of the cost estimates highlighted the major areas of difference among the firms, and also identified areas needing further review. After reviewing the final cost estimates submitted by the engineering firms, the Agency concluded that the differences in cost estimates are attributable to differences in engineering philosophies. While the basic design criteria and general operating conditions were the same for all three firms, the specific design criteria were determined by each firm, according to their best judgment, experience, and expertise. Comparisons of individual cost centers show that differences exist in the choice of equipment, size and operating specifications of equipment, structures that house the components, POTW layout, and labor requirements.

TABLE 3.—POTW TOTAL ANNUAL COST ESTIMATES FOR SECONDARY TREATMENT AND THE INCREMENTAL COST FOR ADVANCED SECONDARY TREATMENT

[1984 dollars, in millions]

	Size of Model POTW (mgd)				
	0.052	0.38	3.3	25	140
Total annual costs for secondary treatment:					
JMS	0.07	0.27			
CDM			3.23	11.81	42.36
ECJ			1.99	8.39	29.63
S&P			1.79	8.16	32.99
Incremental cost for advanced secondary treatment:					
JMS	0.0	0.0			
CDM			0.07	0.48	1.86
ECJ			0.11	0.44	1.28
S&P			0.07	0.34	1.53

Key:
JMS: J.M. Smith and Associates Consulting Engineers
CDM: Camp Dresser and McKee, Inc
ECJ: E.C. Jordan Co.
S&P: Sverdrup and Parcel and Associates, Inc

For both secondary and advanced secondary POTWs, the Agency believes that the cost estimates prepared by the engineering firms are representative of the costs to construct and operate a POTW at the specified treatment level. Therefore, all of those estimates were used in the benchmark calculations. For the three largest POTW sizes where there are three estimates, mean costs (arithmetic averages) were calculated for each model POTW size. These average costs, after indexing to 1976 third quarter dollars, are shown in Table 4.

TABLE 4.—TOTAL ANNUAL COSTS FOR MODEL PLANTS

[1976 dollars, in millions]

	Size of POTW (mgd)				
	0.052	0.38	3.3	25	140
Total annual cost for secondary treatment	0.040	0.156	1.351	5.456	20.151
Total annual cost of increment to advanced secondary treatment	0	0	0.047	0.240	0.883

D. POTW Performance Data

1. Use of Long-Term Performance Data

Just as the calculations for both tests rely on the cost for POTWs to control conventional pollutants, the calculations also use the pounds of pollutants removed by various treatment technologies. Prior to the 1884 notice (i.e., in the 1982 proposal), the methodology was sometimes inconsistent in defining performance when comparing different levels of treatment (e.g., raw waste vs. secondary treatment) and when comparing POTW calculations to industry calculations. In some cases, long-term performance data were used; in other cases, maximum 30-day averages were used. For example, an industry's cost per pound, based on long-term data, was compared to a benchmark based on 30-day data. Inconsistent comparisons of this kind biased the test outcomes against industry. This problem was identified in comments on the 1982 proposal, and in the 1984 notice, the Agency responded with its planned corrections: (1) Whenever possible, use long-term performance data to calculate pounds of pollutants removed (where long-term performance is represented by a minimum of 12 months performance); and (2) compare industry costs of removal to POTW costs of removal on a consistent basis.

While the preferred approach for calculating the pounds of pollutants removed is to base the calculations on long-term performance, the Agency lacks sufficient information to estimate long-term performance for the secondary industries for which BCT effluent limitations are established by this rulemaking. Instead, the pollutant removal calculations are based on maximum 30-day effluent limitations. To apply the methodology consistently, the Agency established a second tier of benchmarks, which are correspondingly based on maximum 30-day effluent limitations. Thus, the bias from inconsistent comparisons of treatment effectiveness is eliminated. A summary of the type of performance data used for each tier of calculations is shown in Table 5.

TABLE 5.—THE "TWO-TIER" APPROACH: TYPE OF PERFORMANCE DATA USED TO CALCULATE INCREMENTAL POLLUTANT REMOVALS

	Tier 1—Long-term effluent data available	Tier 2—Long-term effluent data not available
Industry Calculations:		
BPT	Long-term average	Maximum 30-day average
BCT	do	Do
Benchmark Calculations:		
Secondary Treatment	do	Do
Advanced Secondary Treatment	do	Do

While secondary treatment and advanced secondary treatment are generally defined by permit requirements (maximum 30-day limitations), the calculations for pounds of pollutant removed are based on long-term performance. EPA used actual long-term performance data for POTWs achieving the specified permit requirements (30 mg/l for secondary treatment and 20 mg/l for advanced secondary treatment) to derive long-term concentrations. The accuracy of long-term performance data is not greatly affected by site-specific factors and, thus it is appropriate for the Agency to use actual POTW performance data. The 1984 notice set forth the Agency's plans to derive long-term average pollutant concentrations that could be used in the BCT methodology by applying a set of editing criteria to a POTW performance data base to identify a group of POTWs representative of secondary and advanced secondary treatment.

The Agency received substantial comment on the POTW performance data that were used in the 1984 notice. Some comments were particularly critical of the editing criteria used to identify secondary and advanced secondary POTWs in EPA's POTW performance data base. Comments on the 1984 notice generally supported the use of long-term average concentrations, but concern focused on the effluent concentrations that were used. Commenters claimed the long-term concentrations were not representative of secondary and advanced secondary POTWs.

The final methodology continues to use annual average concentrations and continues to derive them from actual performance data. The source of the performance data is a data base covering a range of POTW sizes and treatment technologies. The focus of the data collection effort (which was reported in EPA 430/9-81-004, September 1981) was POTW operation and maintenance costs, but the data base also contains performance data (such as influent and effluent pollutant concentrations), flow data, permit information, and the type of treatment at each facility. For purposes of the BCT methodology, secondary and advanced secondary POTWs are identified by editing the data base for well-operated POTWs that are characteristic of the specified treatment level in terms of permit requirements, performance, and treatment processes.

2. Editing Criteria for Long-Term Performance Data

a. *List of Editing Criteria.* The general objective of the performance data editing criteria is to identify POTWs characteristic of secondary and advanced secondary treatment. The current editing criteria are as follows. POTWs are excluded from the data base if any of the following criteria are met: (1) Less than 12 months of BOD and TSS effluent data are available. (2) Permit limit for the POTW is different than 30 mg/l BOD for a secondary POTW and 20 mg/l for an advanced secondary POTW. (3) BOD and TSS permit limits are exceeded more than once in a 12 month period. One exceedance is allowed for both BOD and TSS if occurring in the same month. (4) The POTW has unit processes not characteristic of either secondary treatment or advanced secondary treatment. The processes considered appropriate for secondary and advanced secondary POTWs are listed below. (5) All BOD and TSS concentrations are 20 mg/l or below for secondary treatment or 10 mg/l or below for advanced secondary treatment.

The first editing criterion remains unchanged from the 1984 notice and

simply defines EPA's minimum information requirements for POTWs in the data base. The second criterion reflects the definitions of secondary and advanced secondary treatment in terms of permit limitations. The three most significant changes from the 1984 notice concern the final three editing criteria.

b. *Criterion 3: Violation of BOD and TSS Permit Limits.* The original editing criteria (for the 1984 notice) to define secondary POTWs specified a permit limitation for BOD of 30 mg/l. The criteria also required that the POTW be in compliance with its permit; that is, the actual monthly average effluent levels for both BOD and TSS has to be 30 mg/l or lower. One violation was allowed, meaning that one monthly average effluent value for either BOD of TSS could exceed 30 mg/l. Some commenters claimed that allowing only one violation of the monthly average limit was inappropriate because the effluent TSS concentration is correlated to the effluent BOD concentration. As a result of this relationship, commenters claimed that the Agency had incorrectly eliminated POTWs from the analysis. To resolve this, EPA evaluated the relationship between BOD and TSS and concluded that, under certain conditions, allowing two violations is a more appropriate editing rule for defining a well-operated secondary POTW. Therefore, the final editing criteria allow one violation each of the BOD and TSS permit requirements if those violations occur in the same month. Violations in the same month only were permitted to allow for the relationship between BOD and TSS; this change is consistent with the objective of the editing criteria—to identify well-operated POTWs.

c. *Criterion 4: Uncharacteristic Unit Processes.* Another comment concerning the editing criteria was that under-performers (i.e., POTWs not in compliance with their permit requirements) were systematically excluded from the analysis while over-performers (i.e., POTWs operating such that BOD and TSS effluent concentrations were much lower than the permit requirements) were included. Commenters argued that including the over-performers lowers the overall average BOD and TSS effluent concentrations, resulting in an incorrect assessment of the performance of POTWs as a whole. The Agency evaluated these comments by analyzing the following factors that affect why POTWs might perform better than required by their permit: (1) Hydraulic loading, (2) unit processes, and (3) influent pollutant characteristics.

When a POTW is hydraulically underloaded (i.e., the daily volume of wastewater treated is less than the daily volume the POTW was designed to treat), performance may be better than the design performance. The issue of underloaded POTWs was raised repeatedly in the comments because many of the POTWs in the performance data base were underloaded. This issue was initially considered when the original editing criteria were established. The Agency evaluated the POTW data to determine if a relationship existed between the actual flow as a percent of design flow and effluent BOD and TSS concentrations. No statistically signficant relationships were found.

Another reason why POTWs could perform better than required by their permits is that the unit processes at the POTW are not typical of secondary treatment. For example, a POTW may have a filter, which is more typical of advanced wastewater treatment than of secondary treatment, and still have secondary treatment permit limits (i.e., 30-day effluent BOD and TSS concentrations of 30 mg/l). In the initial editing criteria for calculating long-term averages, no consideration was given to the type of unit processes in a POTW. In response to comments, the Agency changed the editing rules so that unit processes would be considered in selecting POTWs whose effluent data would be used to calculate the long-term averages. Biological processes considered appropriate for secondary POTWs included trickling filter, rotating biological contactor, and activated sludge. These processes were selected because, when used with other processes such as settling units, they can achieve 30 mg/l BOD and 30 mg/l TSS and because, as reported in the 1978 EPA Needs Survey, they are the most prevalant biological treatment processes at POTWs. Unit processes considered appropriate for advanced secondary POTWs are those processes found in secondary POTWs plus chemical addition to the wastewater.

A third reason why POTW performance may vary concerns influent pollutant characteristics. If pollutant concentrations are high, the biological unit process may not become acclimated to the wastewater, and thus, not perform well. If the pollutant concentrations are low, there may not be enough organic material in the wastewater for the biological unit to operate properly. In either case, pollutant removals may be low. The Agency evaluated the impact of influent pollutant characterization on POTW performance by determining if a statistical correlation exists between the influent and effluent pollutant concentrations. No significant correlation was found, suggesting that POTWs perform equally well within a broad range of influent wastewater pollutant concentrations.

Thus, based on the results of the Agency's review, the editing criteria were changed to reflect differences in unit processes. No changes were made based on either the POTW hydraulic loading or influent pollutant characteristics for the reasons discussed above.

d. Criterion 5: Actual Performance Consistently Beyond Defined Treatment Levels. Another criticism of the editing criteria presented in the 1984 notice was that actual performance of the POTW's was not considered, and as a consequence, the performance results were flawed. In the current editing criteria, the fifth criterion accounts for actual performance. The fifth criterion eliminates POTWs from the analysis if they consistently perform at levels better than would be characteristic of secondary or advanced secondary treatment. Two parameters were used to account for performance: (1) Effluent BOD and TSS concentrations and (2) the frequency of those effluent concentrations.

The fifth editing criterion for secondary treatment eliminates data for a POTW when all of a POTW's effluent BOD and TSS concentrations are 20 mg/l or below. The Agency selected 20 mg/l as the "cut-off" for secondary treatment because advanced secondary treatment is defined by maximum 30-day concentrations of 20 mg/l. Therefore, POTWs consistently meeting the requirements for advanced secondary treatment are excluded from the calculation of long-term averages for secondary treatment. For advanced secondary treatment, the fifth editing criterion eliminates a POTW from the data base when all of a POTW's effluent BOD and TSS concentrations are 10 mg/l or below. The 10 mg/l concentration is the effluent level at which the Agency believes the additional treatment needed to meet that concentration would be characterized as advanced wastewater treatment. The 20 mg/l "cut-off" for secondary treatment and the 10 mg/l "cut-off" for advanced secondary treatment were suggested by several commenters on the 1984 notice. The Agency agreed with the commenters and, therefore, adopted the fifth editing criterion.

The Agency believes that the final editing criteria yield a group of POTWs

characteristics of the specified treatment levels. POTWs whose permit limits, compliance records, treatment processes, and actual performance allowed them to remain in the performance data based were then used to calculate long-term average performance. Long-term BOD and TSS averages for each treatment level were calculated by averaging the monthly average BOD and TSS effluent concentrations for those POTWs identified as being representative of each treatment level.

3. Summary of POTW Performance Data

A summary of the performance data analysis is presented in Table 6. For secondary POTWs, the long-term average concentrations are 16.14 mg/l BOD and 15.84 mg/l TSS, based on data from 52 POTWs. For advanced secondary treatment, the long-term average concentrations are 10.24 mg/l BOD and 10.35 mg/l TSS, based on data from 22 POTWS. The change in average effluent concentrations from secondary to advanced secondary treatment is greater than the change presented in the September 1984 notice due to the revisions to the editing criteria. The Agency believes the effluent concentrations used in today's final regulation are characteristic of the specified treatment levels and are appropriate values to use to calculate the BCT benchmarks.

The number of pounds of pollutants removed at each treatment level is calculated by multiplying the change in concentration times the POTW flow (and multiplying by the appropriate conversion factors).

Using the concentrations for secondary and advanced secondary treatment shown in Table 6, the total change in effluent BOD and TSS concentration between secondary treatment and advanced secondary treatment is 11.39 mg/l. The number of pounds of pollutants removed for each of the flow sizes is shown in Table 7.

TABLE 6.—LONG-TERM AVERAGE EFFLUENT POTW CONCENTRATIONS

Treatment level	Number of POTWs in data base	Maximum 30-day average (mg/l)		Long-term average concentration (mg/l)	
		BOD	TSS	BOD	TSS
Raw waste				210	210
Secondary treatment	52	30.0	30.0	16.14	15.84
Advanced secondary treatment	22	20.0	20.0	10.24	10.35

TABLE 7.—INCREMENTAL POLLUTANT REMOVAL: SECONDARY TREATMENT TO ADVANCED SECONDARY TREATMENT

Flow (mgd)	Pollutants removed per year (million pounds of BOD and TSS)
0.052	0.002
0.38	0.013
3.3	0.114
25	0.867
140	4.857

E. Benchmark Calculations

1. The POTW Benchmark, First Tier

The first tier POTW benchmark is used for industry comparisons when long-term performance data are available—the preferred approach. The POTW benchmark is the incremental cost per pound to remove conventional pollutants beyond secondary treatment to advanced secondary treatment. The incremental cost is based on costs for five sizes of model POTWs, as described above, in Section C.3. The number of pounds of pollutant removed is based on the difference in long-term average pollutant concentrations between secondary and advanced secondary treatment, as described in Section D.

The next step in the calculations is to determine the incremental cost of removal. For each POTW flow, we divide the incremental annual cost (Table 4) by the incremental pollutant removal (Table 7) and weight the results by the factors shown in Table 2. These calculations are summarized in Table 8. The result is a benchmark of $0.25 per pound (1976 dollars). The benchmark is indexed for other time periods in Table 9.

TABLE 8.—SUMMARY OF POTW BENCHMARK CALCULATIONS: SECONDARY TREATMENT TO ADVANCED SECONDARY TREATMENT, FIRST TIER

[1976 dollars]

POTW flow (mgd)	Incremental annual cost (dollars millions)	Incremental annual removal (million pounds)	Dollar per pound	Weighting factor	Weighted dollar per pound
0.052	0	0.002	0	0.0075	0
0.38	0	0.013	0	0.0777	0
3.3	0.047	0.114	0.41	0.2567	0.11
25	0.240	0.867	0.28	0.2700	0.07
140	0.883	4.857	0.18	0.3880	0.07
Total					0.25

TABLE 9.—POTW BENCHMARKS (FIRST TIER) FOR VARIOUS TIME PERIODS

[Dollar per pound]

Year	Quarter			
	1st	2nd	3rd	4th
1976	0.24	0.25	0.25	0.26
1978	0.28	0.29	0.29	0.30
1980	0.35	0.36	0.36	0.37
1982	0.42	0.42	0.43	0.43
1983	0.43	0.43	0.44	0.44
1984	0.44	0.45	0.45	0.46
1985	0.47	0.47	0.47	

2. The Industry Cost Benchmark, First Tier

The industry cost benchmark compares the POTW cost per pound of removing conventional pollutants between scondary treatment and advanced secondary treatment to the cost per pound removed between raw wasteload and secondary treatment. This section outlines the calculations for the industry cost test.

For each POTW flow category, we calculate the following ratio: incremental cost per pound for upgrading the POTW from secondary to advanced secondary treatment divided by the cost per pound to achieve secondary treatment from raw wasteload. The first value in the ratio is the same incremental cost per pound calculated for the first test (the POTW benchmark). The second value in the ratio is the cost per pound to achieve secondary treatment from raw wasteload. The costs to achieve secondary treatment, originally shown in Table 4, are repeated in Table 10. The incremental pollutant removals for raw wasteload to secondary treatment are calculated by multiplying the POTW flow by change in pollutant concentrations. The raw waste influent concentrations for the model POTWs are assumed to be 210 mg/l BOD and 210 mg/l TSS. These influent concentrations are annual averages based on the Agency's evaluation of POTW data from the "1980 Needs Survey" and from "Fate of Priority Pollutants in Publicly Owned Treatment Works" (EPA 440/1-82-303, September 1982). Thus, the change in concentration from raw waste to secondary treatment is from 210 to 16.14 mg/l for BOD and from 210 to 15.84 mg/l for TSS. The total change in concentration for both pollutants is 388.02 mg/l. This change in concentration is multiplied by flow to calculate the number of pounds removed by secondary treatment. These results are shown in the third column of Table 10. The dollar per pound values for each size category are then calculated by dividing the incremental cost by the

incremental removal. The results are shown in the final column of Table 10.

TABLE 10.—INCREMENTAL ANNUAL COST PER POUND OF POLLUTANTS REMOVED: RAW WASTE TO SECONDARY TREATMENT (FIRST TIER)

[1976 dollars]

POTW flow (mgd)	Incremental annual cost (million dollars)	Incremental annual removal (million pounds)	Dollar per pound removed
0.052	0.040	0.061	0.66
0.38	0.156	0.449	0.35
3.3	1.351	3.900	0.35
25	5.456	29.545	0.18
140	20.151	165.451	0.12

The remaining industry cost benchmark calculations are summarized in Table 11. For each POTW flow, the cost per pound for the increment of secondary treatment to advanced secondary treatment is divided by the cost per pound for the increment of raw waste to secondary treatment. Those cost ratios are multiplied by the weighting factors for each size category, and the weighted ratios are summed to obtain the industry cost benchmark. The result of these calculations is a benchmark of 1.29.

TABLE 11.—SUMMARY OF INDUSTRY COST BENCHMARK CALCULATIONS (FIRST TIER)

POTW flow (mgd)	Incremental cost per pound (1976 dollars)		Cost ratio*	Weighting factor	Weighted ratio
	Raw waste to secondary treatment	Secondary treatment to advanced secondary			
0.052	0.66	0	0	0.0075	0
0.38	0.35	0	0	0.0777	0
3.3	0.35	0.41	1.20	0.2567	0.31
25	0.18	0.28	1.50	0.2700	0.40
140	0.12	0.18	1.49	0.3880	0.58
Total					1.29

* Interim result shown in this column may appear incorrect due to rounding

3. Summary of Second Tier Benchmarks

a. Second Tier POTW Benchmark. Calculations for the second tier POTW benchmark are basically the same as the calculations for the first tier; the only differences are the pollutant concentrations used to calculate the pounds of pollutants removed. For the second tier, we use maximum 30-day average concentrations instead of long-term average concentrations. The calculations for the second tier POTW benchmark are summarized in Table 12. The incremental pollutant removals are again calculated by multiplying the change in concentration by the POTW flow. For the second tier benchmark, the change in concentration is from 30 mg/l to 20 mg/l for both BOD and TSS. The resulting number of pounds of pollutants removed are shown in the third column of Table 12. For each POTW flow, the cost is then divided by the pollutant removal; the resulting dollar per pound is multiplied by the weighting factor; and the weighted costs are summed. The result of these calculations is a second tier POTW benchmark of $0.14 per pound (1976 dollars).

TABLE 12.—SUMMARY OF SECOND TIER POTW BENCHMARK CALCULATIONS

[1976 dollars]

POTW flow (mgd)	Incremental annual cost (million dollars)	Incremental annual removal (million pounds)	Dollar per pound	Weighting factor	Weighted dollar per pound
0.052	0	0.003	0	0.0075	0
0.38	0	0.023	0	0.0777	0
3.3	0.047	0.201	0.24	0.2567	0.06
25	0.240	1.523	0.16	0.2700	0.04
140	0.883	8.528	0.10	0.3880	0.04
Total					0.14

b. Second Tier Industry Cost Benchmark. Calculations for the second tier industry benchmark are the same as the calculations for the first tier, with the exception of pollutant concentrations. The cost ratio remains as follows: the cost per pound to upgrade the POTW from secondary treatment to advanced secondary treatment is divided by the cost per pound to achieve secondary treatment from raw wasteload. The first value in the ratio has already been explained. For the second value in the ratio, the change in concentration for both BOD and TSS is from 210 mg/l to 30 mg/l. Thus, the total change in concentration is 360 mg/l, which is multiplied by flow to calculate the number of pounds removed by secondary treatment. The cost per pound for achieving secondary treatment from raw waste is shown in Table 13. The remaining benchmark calculations are summarized in Table 14. The cost ratios in the fourth column of Table 14 are multiplied by the weighting factors for each size category to obtain flow-weighted ratios. The sum of the flow-weighted ratios is the second tier industry cost benchmark of 0.68.

TABLE 13.—INCREMENTAL ANNUAL COST PER POUND OF REMOVAL FOR RAW WASTE TO SECONDARY TREATMENT (SECOND TIER)

[1976 dollars]

POTW flow (mgd)	Incremental annual cost (dollars millions)	Incremental annual removal (million pounds)	Dollar per pound removed*
0.052	0.040	0.057	0.71
0.38	0.156	0.417	0.38
3.3	1.351	3.618	0.37
25	5.456	27.411	0.20
140	20.151	153.504	0.13

* Result shown in this column may appear incorrect due to rounding

TABLE 14.—SUMMARY OF INDUSTRY COST BENCHMARK (SECOND TIER)

POTW flow (mgd)	Incremental cost per pound (1976 dollars)		Cost ratio*	Weighting factor	Weighted ratio
	Raw waste to secondary treatment	Secondary treatment to advanced secondary			
0.052	0.71	0	0	0.0075	0
0.38	0.38	0	0	0.0777	0
3.3	0.37	0.24	0.63	0.2567	0.16
25	0.20	0.16	0.79	0.2700	0.21
140	0.13	0.10	0.79	0.3880	0.31
Total					0.68

* Interim result shown in this column may appear incorrect due to rounding

IV. Status of Proposed BCT Effluent Limitations Guidelines for Primary Industries

A. Introduction

The final methodology for determining cost reasonableness, as described in this preamble, generally applies to all industries. The rulemaking actions to promulgate or propose BCT effluent limitations for primary industries will appear in separate notices. The expected conclusions for two industries that have received special attention in previous BCT notices, Pharmaceutical Manufacturing and Pulp and Paper, are discussed below. For four other primary industries, the status of BCT effluent limitations is also presented because they were included in the 1982 proposal. Again, effluent limitations for these industries are not included in today's regulation, though today's rulemaking on the BCT methodology provides part of the basis for their subsequent promulgation.

B. Primary Industry Discussions

1. Pharmaceutical Manufacturing

EPA proposed BCT effluent limitations guidelines for the Pharmaceutical Manufacturing industry on November 26, 1982 (47 FR 53584). In a

Notice of Availability on March 9, 1984, EPA provided new cost information that would be used to develop BCT effluent limitations (49 FR 8967). In response to comments concerning that notice, the Agency revised the cost data and calculations used to conduct the BCT cost test. The revised cost data appear in the record for this rulemaking. While those revisions are preliminary and have not yet been published, based on the current data and analysis and the BCT methodology promulgated today, none of the BCT candidate technologies for the four subcategories would pass the cost test, and all four subcategories would have BCT effluent limitations equal to BPT effluent limitations. The Agency plans to promulgate final BCT limitations in a subsequent **Federal Register** notice.

2. Pulp, Paper, and Paperboard

BCT effluent limitations for the Pulp, Paper, and Paperboard industry were included in the 1982 BCT proposal (47 FR 49176). At that time, EPA proposed BCT effluent limitations more stringent than BPT effluent limitations for three subcategories (of a total of 25 subcategories). In 1984, when the Agency published possible changes to the methodology, the number of subcategories passing the BCT cost test increased to ten (49 FR 37046, September 20, 1984). Cost and effluent reduction data for the industry were still preliminary at that time, and the Agency indicated that revisions in those data were expected. These revisions are now nearly complete, and while not yet published, the Agency does not anticipate further changes regarding the impact of the BCT methodology. The revised data are included in the record for today's regulation. Based on the current analyses and the BCT methodology published today, the Agency expects that none of the BCT candidate technologies for any subcategory will pass the cost test, and that BCT effluent limitations for all subcategories will be established in a subsequent **Federal Register** notice as equal to BPT effluent limitations.

3. Timber Products

BCT effluent limitations were established for two of the 16 subcategories in January 1981 (46 FR 8285); they were subsequently withdrawn in February 1982 (47 FR 6835). In October 1982, EPA proposed BCT effluent limitations for 13 subcategories (47 FR 49176). The Agency is still evaluating the proposed limitations and plans to promulgate final limitations in a subsequent **Federal Register** notice.

4. Inorganic Chemicals

In the October 1982 BCT proposal (47 FR 49176), EPA proposed BCT effluent limitations for two subcategories, Hydrofluoric Acid and Chlor-Alkali (Diaphragm Cell). The Agency is still evaluating the proposed limitations and will promulgate final limitations in a subsequent **Federal Register** notice.

5. Metal Finishing

Effluent limitations based on BCT were included in the October 1982 BCT proposal (47 FR 49176). When most of the other effluent limitations guidelines were established for this category in July 1983 (e.g., those based on BPT and BAT, 48 FR 32485), EPA took no further action with respect to regulations based on BCT. The Agency is still evaluating the proposed BCT limitations and plans to promulgate final limitations in a subsequent **Federal Register** notice.

6. Ore Mining and Dressing

In the October 1982 BCT proposal, EPA proposed BCT effluent limitations for seven subcategories (47 FR 49176). When EPA issued the final regulation for this category in December 1982, all sections pertaining to BCT were reserved. The Agency is still evaluating the proposed limitations and plans to promulgate final limitations in a subsequent **Federal Register** notice.

In a subsequent action that only addressed the Gold Placer Mining Subcategory, EPA proposed BCT effluent limitations more stringent than BPT effluent limitations (50 FR 47982, November 20, 1985). As explained in the preamble to that proposed rule, the incremental cost per pound of removing conventional pollutants for the BCT candidate technology is minimal; the value is estimated to be less than one cent. The Agency believes this cost is sufficiently low that the candidate technology is cost-reasonable, and the BCT effluent limitations were proposed accordingly. The Agency will review all public comments and address the application of the BCT methodology to this subcategory when we promulgate the Gold Placer Mining regulations.

V. BCT Effluent Limitations Guidelines for Secondary Industries

A. Introduction

One major purpose of this rulemaking is to establish BCT effluent limitations for many of the secondary industries. EPA reviewed the status of BCT effluent limitations in each subcategory in the following industries: Dairy Products, Grain Mills, Canned and Preserved Fruits and Vegetables, Canned and Preserved Seafoods, Sugar Processing, Cement Manufacturing, Feedlots, Fertilizer Manufacturing, Phosphate Manufacturing, Ferroalloy Manufacturing, Glass Manufacturing, Asbestos Manufacturing, Meat Products, and Mineral Mining and Processing. A summary of the results is shown in Table 1. The background data and calculations are reported in the record for this rulemaking.

The BCT cost test calculations for these industries were frequently based on cost and effluent data collected at the time of the original proposal and promulgation of BAT effluent limitations for each industry. If more current information regarding technology options and their economic achievability became available after promulgation of a final rule, EPA used that information to determine whether the technology satisfied all of the statutory requirements. Thus, the Agency is generally adopting previous findings concerning availability and effectiveness of treatment technologies.

In addition to the BCT cost test, section 304(b)(4)(B) of the Clean Water Act requires EPA to consider other factors such as the age of equipment, production process, and energy requirements when establishing BCT effluent limitations. Based on the rulemaking record for these industries and on this proceeding, EPA has determined that the final BCT effluent limitations following this preamble are technically feasible and otherwise satisfy section 304(b)(4)(B).

Today's regulation covers 135 subcategories (including subdivisions of subcategories); seven pass the BCT cost test and EPA is promulgating BCT limitations more stringent than BPT in these cases. For 88 of the remaining subcategories, BCT limitations are established equal to BPT limitations either because the candidate BCT technology fails the BCT cost test (48 subcategories) or because the Agency has not identified a technology that will achieve greater removals of conventional pollutants than achieved by BPT and also satisfy the requirements with respect to technical and economic feasibility (40 subcategories). For the remaining 40 subcategories, no action is taken with respect to BCT effluent limitations for one of two reasons. First, after reviewing existing limitations under the final BCT methodology, the Agency found that the existing limitations required no change, or second, the Agency has not completed a review of the candidate BCT technologies. A discussion of BCT regulations for each secondary industry follows.

B. Rationale for Establishing BCT Effluent Limitations and Changes Since Proposal

1. Dairy Products Processing (40 CFR Part 405)

The technology basis for the former BAT limitations was tertiary treatment by multimedia filtration. These BAT limitations addressed conventional pollutants only, and in 1979, were replaced by BCT limitations. Prior to the reproposal of BCT limitations in 1982, the Agency reviewed additional information regarding the filtration technology and determined that to ensure effective, year-round performance, it may be necessary to employ coagulation-sedimentation prior to filtration. This may be required because the suspended solids in biologically-treated dairy products processing wastewaters are difficult to treat, in that the excess solids can cause filter blinding and substantial operational difficulty. When the costs of coagulation-sedimentation are taken into account, none of the subcategories pass the BCT cost test. Additionally, EPA has not identified any other technology that results in further reduction of conventional pollutant discharges. Therefore, EPA is establishing BCT limitations equal to BPT limitations for all 12 subcategories in this industry. The final action for these subcategories is the same as the action proposed in 1982.

2. Grain Mills (40 CFR Part 406)

There are ten subcategories in this industry. For four subcategories (Normal Wheat Flour Milling, Normal Rice Milling, Animal Feed, and Hot Cereal), the BPT regulation requires zero discharge of process wastewater. BCT limitations for these four subcategories, established in 1979, already require zero discharge and remain substantively unchanged by this rulemaking because BCT limitations cannot be less stringent than BPT, and further levels of control do not exist beyond zero discharge. An editorial revision is made for these subcategories by incorporating the BPT requirement into BCT limitations by reference.

For the Corn Wet Milling Subcategory, BCT limitations were suspended in July 1980 (45 FR 45582) pending an evaluation of BPT costs. The Agency has not completed this evaluation, and the BCT limitations for this subcategory remain suspended.

The candidate BCT technology for the remaining five subcategories (Corn Dry Milling, Bulgur Wheat Flour Milling, Parboiled Rice Processing, Ready-to-Eat Cereal, and Wheat Starch and Gluten) was filtration, which was the basis for the original BAT limitations. The Agency applied the BCT cost test to this technology for these five subcategories, and it failed, indicating that filtration is not cost-reasonable in these cases. No other candidate technology has been identified and, therefore, BCT limitations are promulgated equal to BPT. The final action for these five subcategories is the same as was proposed in 1982.

3. Canned and Preserved Fruits and Vegetables Processing (40 CFR Part 407)

The candidate BCT technology for the eight subcategories in this industry was filtration. This technology fails the BCT cost test, and no other suitable technology for the removal of conventional pollutants has been identified. Therefore, BCT limitations are established equal to BPT. The final action for this industry is the same as was proposed in 1982.

4. Canned and Preserved Seafood Processing (40 CFR Part 408)

There are 33 subcategories in this industry, and five are further subdivided by geographic location for purposes of this review. The candidate BCT technology for 12 subcategories and sections of two additional subcategories was dissolved air flotation, which was the technology basis for the former BAT limitations. This technology has not been widely applied at full scale, except for the Tuna Subcategory. Space requirements for installation of this technology present problems for many of the plants. EPA has determined, therefore, that dissolved air flotation is not feasible for the following subcategories: Non-Remote Alaskan Crab Meat Processing, Non-Remote Alaskan Whole Crab and Crab Section Processing, Dungeness and Tanner Crab Processing in the Contiguous States, Non-Remote Alaskan Shrimp Processing, Northern Shrimp Processing in the Contiguous States, Southern Non-Breaded Shrimp Processing in the Contiguous States, Breaded Shrimp Processing in the Contiguous States, Alaskan Mechanized Salmon Processing (Non-Remote), West Coast Hand-Butchered Salmon Processing, West Coast Mechanized Salmon Processing, Non-Alaskan Mechanized Bottom Fish Processing, Sardine Processing, Alaskan Herring Fillet Processing (Non-Remote), and Non-Alaskan Herring Fillet Processing. The Agency has not identified any other BCT candidate technology and is therefore establishing BCT effluent limitations equal to BPT effluent limitations for these subcategories.

The basis of BAT limitations in the Tuna Subcategory was optimized dissolved air flotation with chemically-assisted coagulation. The optimized operation adds operational complexity, maintenance requirements, and disposal costs for additional sludge volume. The Agency concludes that these operational difficulties are such that optimized dissolved air flotation is not technically feasible for the Tuna Subcategory. This technology was the only BCT candidate technology identified for the Tuna Subcategory. For these reasons, BCT effluent limitations are established equal to BPT effluent limitations.

In five other subcategories, the candidate BCT technology was aerated lagoons, which was the technology basis for the former BAT limitations. Based on information evaluated after BAT limitations had been issued, EPA determined that the technology is not feasible for Conventional Blue Crab Processing, Mechanized Blue Crab Processing, Non-Alaskan Conventional Bottom Fish Processing, Mechanized Clam Processing, and Steamed and Canned Oyster Processing. EPA determined that aerated lagoons are not a feasible technology for these subcategories because lagoons require a substantial amount of land, which is not uniformly available. Further, the seasonal and often sporadic processing operations of these plants do not provide the consistent source of wastewater needed for proper functioning of biological treatment systems such as aerated lagoons. EPA has not identified any other feasible technology providing further control of conventional pollutants than BPT. Therefore, EPA is establishing BCT limitations equal to BPT for these five subcategories.

The candidate technology for BCT for three other subcategories (characterized as remote Alaskan subcategories) and for the remote section of five additional subcategories was screening of the wastes and subsequent disposal of these wastes. EPA discovered technical problems with this technology, making it unsuitable as the basis for BCT limitations. The technology relies on solid waste disposal, which can be accomplished in non-remote areas by use of reduction facilities, but in remote areas, these facilities are not economically viable. Land disposal or barging are the most viable solid waste disposal techniques available to remote seafood processors, but these techniques are often not feasible or work only during a portion of the year because of weather. Therefore, EPA is establishing BCT limitations equal to

BPT for the following remote seafood subcategories and sections of subcategories: Remote Alaskan Crab Meat Processing, Remote Alaskan Whole Crab and Crab Section Processing, Remote Alaskan Shrimp Processing, and the remote section of Alaskan Hand-Butchered Salmon Processing, Alaskan Mechanized Salmon Processing, Alaskan Bottom Fish Processing, Alaskan Scallop Processing, and Alaskan Herring Fillet Processing.

The Agency is currently considering a petition from a portion of the Alaskan seafood industry requesting that EPA redesignate certain Alaskan cities from being considered "non-remote" and instead apply the effluent limitations guidelines and standards applicable to remote cities. If this petition were granted, the BPT effluent limitations guidelines for the affected locations would be based on grinding rather than screening technology. On May 18, 1980, EPA temporarily suspended the applicability of the BPT effluent limitations guidelines for non-remote facilities located in Anchorage, Cordova, Juneau, Ketchikan, and Petersburg pending review of the industry's petition (45 FR 32675). This notice explained that during the suspension period, facilities in these cities had agreed to comply with the regulations for the remote Alaskan processors. On January 9, 1981, EPA proposed its response to the petition and, at the same time, extended the suspension of the regulations for the affected cities until EPA makes a final decision on the petition (46 FR 2544). EPA has not yet taken final action on the petition; hence, BPT effluent limitations for the five cities listed above remain suspended.

In today's rulemaking, EPA is establishing some BCT limitations equal to BPT limitations for the cities in question. Therefore, this rulemaking imposes no additional burden on any facility. If, as a result of the pending petition, there is a change in the designation of a city from "non-remote" to "remote," that change will mean a change in the BPT and BCT effluent limitations that will apply. Since the BCT effluent limitations in this rulemaking establish limitations by cross referencing the BPT effluent limitations, where the BPT effluent limitations are suspended, the BCT effluent limitations will also be considered suspended until the BPT effluent limitations are repromulgated. EPA is promulgating the BCT effluent limitations guidelines in their present form for the affected subcategories to establish the framework to apply BCT effluent limitations in the future.

For the non-remote section of three Alaskan subcategories, EPA has not completed an economic impact analysis and is therefore reserving BCT effluent limitations for Alaskan Hand-Butchered Salmon Processing (non-remote), Alaskan Bottom Fish Processing (non-remote), and Alaskan Scallop Processing (non-remote).

After issuing the former BAT regulations for two other subcategories (Fish Meal and Hand-Shucked Clam Processing), EPA determined that the candidate technology, screening of wastes and process changes, would have resulted in substantial economic impact. For the Fish Meal Processing Subcategory, 12 of the 54 direct discharging plants would probably close as a result of the former BAT regulations. Most of these plants are small facilities. For the Hand-Shucked Clam Processing Subcategory, nine of the 15 direct dischargers would probably close rather than comply with the BCT regulations. These nine plants consist of all of the six small plants and all three of the canned clam plants in the subcategory. Based on these projected impacts, EPA concludes that the technology is not economically achievable. No other technology was identified as a candidate for BCT. For these reasons, EPA establishes BCT limitations equal to BPT in these subcategories.

The BCT cost test was applied to BCT candidate technologies for the remaining five subcategories. The candidate technology for Farm-Raised Catfish Processing includes screening, grease removal, and aerated lagoons. This technology fails the POTW test, and because no other candidate technology has been identified, BCT limitations are established equal to BPT.

The candidate technology for the remaining four subcategories relies on simple in-plant controls, which have only minimal costs and pass the POTW test. Since the incremental cost between BPT and BCT is considered to be zero, the second test ratio is also considered to be zero, and the technology passes the second test. Thus, EPA has determined that in-plant controls are technically feasible, economically achievable, and pass both parts of the BCT cost test for Pacific Coast Hand-Shucked Oyster Processing, Atlantic and Gulf Coast Hand-Shucked Oyster Processing, Non-Alaskan Scallop Processing, and Abalone Processing. The Agency proposed BCT limitations based on in-plant controls for these four subcategories and specifically requested comments on the proposed decision. The Agency did not receive any adverse comments in response to that request, and no new information has been evaluated. Therefore, BCT limitations for these four subcategories are established based on in-plant controls. The final BCT limitations for this industry are the same as the BCT regulations that were proposed in 1982.

5. Sugar Processing (40 CFR Part 409)

There are eight subcategories in this industry. For two subcategories, BPT regulations require zero discharge of process wastewater. No technology more stringent than zero discharge exists and BCT cannot be established at a level less stringent than BPT. Therefore, EPA considers BCT requirements of zero discharge to be reasonable and is establishing BCT limitations equal to BPT for the Florida and Texas Raw Cane Sugar Processing Subcategory and the Hawaiian Raw Cane Sugar Processing Subcategory.

For the remaining six subcategories, EPA is also establishing BCT limitations equal to BPT because the candidate BCT technology fails the BCT cost test and no other candidate technology more stringent than BPT has been identified. These subcategories are Crystalline Cane Sugar Refining, Liquid Cane Sugar Refining, Louisiana Raw Cane Sugar Processing, Puerto Rican Raw Cane Sugar Processing, Hilo-Hamakua Coast of the Island of Hawaii Raw Cane Sugar Processing, and Beet Sugar Processing. For the first two of these six subcategories, the candidate technology is recirculation of barometric condenser cooling water and discharge of blowdown to an upgraded biological system. For the next two subcategories, the candidate technology is recycle of barometric condenser cooling water and cane wash water with the blowdown going to biological treatment. For the Hilo-Hamakua Coast subcategory, the candidate technology is recirculation of barometric condenser cooling water and biological treatment of both cane wash water and the blowdown from the recirculation system. For Beet Sugar Processing, the candidate technology is zero discharge of barometric condenser cooling water. Final BCT effluent limitations for all eight subcategories are the same as were proposed in 1982.

6. Cement Manufacturing (40 CFR Part 411)

Two of the three subcategories (Nonleaching and Materials Storage Piles Runoff) have BCT limitations equal to BPT. The Agency has not identified any other candidate technology that

provides additional control of conventional pollutants and, therefore, BCT effluent limitations in those two subcategories remain unchanged by this rulemaking. The BCT candidate technology for the remaining subcategory, Leaching, is treatment and reuse. This technology fails the BCT cost test, no other candidate technology has been identified, and BCT limitations are established equal to BPT. This action is the same as the 1982 proposed action for the Leaching Subcategory.

7. Feedlots (40 CFR Part 412)

The Feedlots category consists of two subcategories. For the first (All Subcategories Except Ducks), BCT limitations are primarily based on zero discharge of process wastewater pollutants. The 1982 proposed action for this subcategory would have removed the section for BCT effluent limitations because the existing BCT limitations are more stringent than BPT limitations due to the rainfall event specified for discharge of pollutants from the overflow. The Agency has not evaluated the cost of the more stringent overflow restriction according to the BCT methodology. Therefore, the existing section is removed and reserved. The existing BAT limitations, however, remain unchanged; they also require zero discharge of process waste pollutants with the more restrictive condition for discharge from overflow.

For the second subcategory (Ducks), conventional pollutant discharges from man-made or natural (e.g., marshes) swimwater areas are difficult to quantify. These discharges are also difficult to adapt to traditional end-of-pipe treatment technologies. The technology basis for BAT (and the candidate BCT technology) was dry lots, but the effluent reduction benefits between existing discharges and dry lots cannot readily be quantified. Therefore, the BCT cost test cannot be performed. EPA did not propose, and is not now establishing BCT effluent limitations guidelines for duck feedlots.

8. Fertilizer (40 CFR Part 418)

The Agency has not established effluent limitations guidelines to control conventional pollutant discharges for three of the seven subcategories in this category: Urea, Ammonium Nitrate, and Nitric Acid. The existing BPT and BAT requirements for those subcategories do not address conventional pollutants. Therefore, no action is taken with respect to BCT for these three subcategories; there are no BCT effluent limitations guidelines. For two other subcategories (Ammonium Sulfate Production and Mixed and Blend Fertilizer Production), BCT limitations based on zero discharge of process wastewater pollutants have already been promulgated. In both of these subcategories, the BPT regulations are also based on zero discharge and, therefore, no evaluation by the BCT cost test is necessary.

For the Phosphate Subcategory, BCT limitations based on zero discharge have already been promulgated but with discharge allowances for specified rainfall events. No more stringent candidate technology for control of conventional pollutants has been identified; the existing BCT limitations for the Phosphate Fertilizer Subcategory remain unchanged. On July 25, 1984, the Agency proposed to amend the applicability section for Phosphate Fertilizer to exclude four plants in Louisiana from BAT and BCT effluent limitations (49 FR 29977). Final action on this amendment is pending and is not affected by today's rulemaking.

For the Ammonia Subcategory, BCT limitations have already been promulgated equal to BPT. The Agency has not identified any other candidate technologies that would result in additional control of conventional pollutants. Therefore, no change is being made to the BCT effluent limitations for this subcategory. The BAT limitations for the Ammonia Subcategory are being revised to remove the limitation for pH, which is a conventional pollutant and cannot be included in the BAT limitations. Instead, it is included in the BCT limitations.

This rulemaking also includes minor editorial corrections for the Phosphate and Ammonia Subcategories to correct the titles in the table of contents.

9. Phosphate Manufacturing (40 CFR Part 422)

The Phosphate category covers six subcategories. Three subcategories (Phosphorus Production, Phosphorus Consuming, and Phosphate) do not have any regulations in effect; they consist of applicability sections only. EPA is not establishing BCT limitations for these subcategories at this time. Two other subcategories (Defluorinated Phosphate Rock and Defluorinated Phosphoric Acid) already have BCT limitations equal to BPT; no further analysis is required because both regulations are based on zero discharge with effluent limitations for specified rainfall events. The existing BCT requirements for these subcategories remain unchanged by this final action. For the remaining subcategory, Sodium Phosphates, the candidate technology is increased recirculation of process wastewater, which passes the BCT cost test. The incremental costs are estimated to be minimal in that any costs attributed to reducing the flow to the treatment system are offset by the smaller amount of lime needed. Therefore, BCT limitations at the BAT level of control are reasonable and are so established. This level of control is the same as was proposed in 1982.

10. Ferroalloy Manufacturing (40 CFR Part 424)

One of the seven subcategories (Other Calcium Carbide Furnaces) has BCT limitations equal to BPT already in effect; both BCT and BPT require zero discharge of process wastewater pollutants. No other technology provides additional control and therefore, the existing BCT limitations remain unchanged. Candidate technologies for the remaining six subcategories rely on partial recycle and physical-chemical treatment of blowdown (plus filtration for the Calcium Carbide Furnace Subcategory), which fails the cost test. No other candidate technologies have been identified and, therefore, BCT limitations are established equal to BPT for these subcategories.

This final action encompasses one change from the BCT limitations proposed in 1982. When the candidate technology for the Slag Processing Subcategory was evaluated with the 1982 proposed benchmarks, it passed the cost test, and BCT limitations were proposed at a level more stringent than BPT limitations. The benchmarks in this final action are lower than the benchmarks proposed in 1982, and while the candidate technology for the Slag Processing Subcategory still passes the POTW test, it fails the industry cost test. Therefore, BCT limitations are established at a less stringent level of control than was proposed (i.e., equal to BPT instead of equal to BAT).

11. Glass Manufacturing (40 CFR Part 426)

Two of the 13 subcategories (Sheet Glass and Rolled Glass) have BCT and BPT requirements based on zero discharge already in effect; those subcategories remain unchanged by this final action. Candidate technologies for eight other subcategories are as follows. For the Plate Glass Subcategory, the candidate technology is effluent recycle and sand filtration. For Float Glass, Automotive Glass Tempering, and Automotive Glass Laminating, the candidate technology is diatomaceous earth filtration. For the Glass Container Subcategory, the technology is recirculation of cullet quench water, dissolved air flotation, and

diatomaceous earth filtration of the blowdown. The candidate technology for Glass Tubing is the same as for Glass Container without dissolved air flotation. For the Television Picture Tube Envelope Subcategory, the candidate technology is sand filtration. For the Incandescent Lamp Envelope Subcategory, the technology is sand filtration for frosting wastewaters and diatomaceous earth filtration of the cullet quench water. These technologies fail the BCT cost test, and no other candidate technology has been identified. For these reasons, BCT limitations were proposed and are now established equal to BPT for those eight subcategories.

For the Insulation Fiberglass Subcategory, BPT requirements are based on zero discharge with specific limitations on the discharge of conventional pollutants from wet air pollution control devices. The candidate BCT technology is zero discharge from all sources, including air pollution control devices. The Agency lacks sufficient data to quantitatively evaluate the candidate BCT technology with the BCT cost test. However, based on estimates of the incremental cost of additional flow restrictions (which are crucial to the candidate technology), the Agency believes the candidate technology is not cost reasonable and is establishing BCT limitations equal to BPT.

In the Hand Pressed and Blown Glass Subcategory, there are no BPT effluent limitations for any pollutants. The Agency is considering proposing BPT regulations that would result in a nationally applicable base level of treatment being required for this subcategory. Effluent limitations based on BCT will be evaluated at the same time. Therefore, BCT limitations for the Hand Pressed and Blown Glass Subcategory are being removed and reserved. This rulemaking also includes revisions to the BAT limitations for the Hand Pressed and Blown Glass Subcategory and the Incandescent Lamp Envelope Subcategory. The corrections remove conventional pollutant limitations from the BAT sections in those subcategories.

The remaining subcategory, Machine Pressed and Blown Glass Manufacturing, has been reserved. No regulations are currently in effect, and no action is taken with regard to BCT limitations.

12. Asbestos Manufacturing (40 CFR Part 427)

One of the 11 subcategories, Solvent Recovery, has BCT limitations equal to BPT already in effect. No other technology for removing conventional pollutants has been identified, and the existing BCT limitations for this subcategory are not affected by this rulemaking. For the remaining ten subcategories, no action is being taken with respect to BCT limitations. BCT limitations have not been proposed for any of these ten subcategories, and therefore, none are established at this time.

13. Meat Products (40 CFR Part 432)

The original BAT limitations for eight of the ten subcategories in this category were based on nitrification. Those BAT limitations were subsequently withdrawn, pending a review of the feasibility of that technology. The Agency concluded that biological nitrification was not a suitable technology basis for BCT. One significant factor is that nitrification effects removal of ammonia nitrogen from these wastewaters, but affords only small removals of conventional pollutants beyond BPT levels. Further, a key part of the former BAT limitations was reduction in water use in meat processing operations, which may not be achievable in many plants. Finally, preliminary results of the technology review indicated that consistent, year-round removal of conventional pollutants beyond BPT is technically achievable only with extraordinary operational care. For these reasons, EPA has rejected nitrification as the basis for BCT. No other technologies have been identified, and BCT limitations are therefore established equal to BPT for the eight subcategories.

For the remaining two subcategories, Small Processors and Renderers, the candidate technology is in-plant controls (the former BAT). This technology passes the BCT cost test, and BCT limitations are established at the BAT level of control. For both subcategories, the incremental costs associated with the former BAT limitations are minimal. The Agency concluded that these costs were reasonable and proposed, and now promulgates, BCT limitations accordingly. The Agency did not receive any comments objecting to the proposed level of control.

14. Mineral Mining and Processing (40 CFR Part 436)

This category contains 38 subcategories; 17 have no regulations in effect; the remainder have BPT regulations only. While some of the BPT regulations are based on zero discharge of process wastewater pollutants, the Agency has not yet proposed any BCT limitations for this category. This final rulemaking does not contain regulations for any of the subparts of this category.

VI. Anti-Backsliding

In order to implement the Clean Water Act goal of continued further progress toward eliminating pollutant discharges, EPA established an "anti-backsliding" policy reflected in the NPDES regulations at 40 CFR 122.44(1). *See U.S. Steel v. Train* 556 F.2d 822, 842 (7th Cir., 1977). Generally, this provision prohibited the reissuance of an NPDES permit with limitations, standards, and conditions less stringent than those in the previous permit. However, the NPDES regulations contained an exception to this anti-backsliding policy at 40 CFR 122.44(1)(2)(iii) for subsequently promulgated effluent limitations guidelines based on BCT. In September 1984, the Agency revised several other parts of the NPDES rules. In that revision, EPA recognized that the BCT exception is inconsistent with the general intent of the anti-backsliding policy (49 FR 37998 and 38021, September 26, 1984). The Agency agreed with a commenter's statement that BCT effluent limitations must in all cases be at least as stringent as BPT effluent limitations, whether those BPT limitations are included in a guideline or are in a permit based on best professional judgment (BPJ). Therefore, the preamble to the 1984 NPDES rule noted that EPA would assess the need to correct the anti-backsliding policy in conjunction with issuance of a final BCT methodology.

There may be cases where BPJ permits are more stringent than BCT effluent limitations. Thus, EPA intends to propose amendments to 40 CFR 122.44(1) to correct the anti-backsliding regulations and remove the exception concerning BCT effluent limitations.

VII. Availability of Fundamentally Different Factors Variances

Upon promulgation of this regulation, the appropriate effluent limitations must be applied in all Federal and State NPDES permits thereafter issued to direct dischargers. For BCT limitations, the only exception to the binding limitation is EPA's "fundamentally different factors" (FDF) variance. The FDF variance recognizes factors concerning a particular discharger that are fundamentally different from the factors considered in this rulemaking. However, the economic ability of the individual operator to meet the compliance cost for BCT is not a consideration for granting a variance. *See National Crushed Stone Association v. EPA* 449 U.S. 64 (1980) (Evaluating

FDF variances from BPT). *See also* the NPDES regulations at 40 CFR Part 125, Subparts A and D (45 FR 14166 et seq., April 1, 1983) for the text and explanation of the FDF variance.

This rulemaking references the availability of the FDF variance in each section where the Agency is establishing BCT effluent limitations guidelines. Some prior BCT regulations that are not changed by today's rulemaking did not specifically cross reference the FDF variance provision. Under the terms of the FDF regulations, the FDF variance is available for all BCT effluent limitations regardless of whether or not the text of a BCT regulation specifically indicates the availability of FDF variances.

VIII. Regulatory Analysis Requirements

A. Regulatory Flexibility Analysis

Pub. L. 96-354 requires EPA to prepare a Regulatory Flexibility Analysis for regulations that have a significant impact on a substantial number of small entities. This analysis may be prepared in conjunction with or as part of other Agency analysis. In support of previous rulemakings for the industries covered by today's regulation, EPA conducted analyses to evaluate the impacts on small entities. No potential for significant impact was projected. An exception to this conclusion is for the seafoods industry, where an economic analysis projected significant economic impact for certain small plants (See Section IV). EPA is setting BCT effluent limitations equal to BPT effluent limitations for these plants; therefore, there is no incremental effect associated with this regulation for these small plants.

No new significant impacts on small businesses are expected as a result of today's final regulation. Therefore, a formal Regulatory Flexibility Analysis is not required. The previous analyses and small business definitions are included in the record.

B. Regulatory Impact Analysis

Executive Order 12291 requires EPA and other agencies to perform regulatory impact analyses of major regulations. Major rules impose an annual cost to the economy of $100 million or more or meet certain other economic impact criteria specified in the Order. The expected cost of today's regulation on industry is significantly less than $100 million per year, and none of the other criteria are met. This action, therefore, is not a major regulation as defined by E.O. 12291 and no Regulatory Impact Analysis is required. For future BCT rulemakings, the Agency will again consider whether the final BCT effluent limitations represent a major regulation in light of the cost and impact to the specific industry.

IX. Response to Major Comments

EPA received public comments on the October 1982 proposal from 44 industrial concerns (firms and trade associations) and one state environmental protection agency. All comments were carefully considered and appropriate changes adopted whenever data and information supported those changes. Five methodological changes to the proposal were highlighted in the 1984 notice of data availability. The Agency received comments from 17 parties concerning the BCT methodology in response to the September 1984 notice. Five issues from those comments are addressed below. All of the comments on the 1982 proposal and the 1984 notice and our detailed responses are included in two documents: "BCT Comments and Responses—Proposed Methodology and Limitations" and "Response to Comments, BCT Notice of Data Availability." Both documents are included in the record for this rulemaking. The remainder of this section presents the most significant comments received on the 1982 proposal and 1984 notice and our responses.

A. Major Comments from the 1982 Proposed Rule

1. Use of Advanced Secondary Treatment

Comment: Commenters questioned the use of the incremental costs of secondary to advanced secondary treatment as the basis for developing the POTW benchmark. Specific comments regarding the use of advanced secondary treatment focused on statutory authority and Congress' intentions with respect to the methodology.

Response: The criticisms of using advanced secondary treatment were initially raised prior to the 1982 proposal. In fact, many of these criticisms were raised when EPA published the 1979 BCT methodology and were specifically rejected by the U.S. Court of Appeals for the Fourth Circuit in *American Paper Institute* v. *EPA* 60 F.2d 954 (4th Cir. 1981). While the Clean Water Act does not mention advanced secondary treatment in reference to BCT, the Court of Appeals accepted its use in this context.

The final BCT methodology continues to rely on the same comparison as was proposed; that is, an industry's cost to control conventional pollutants beyond BPT is compared to a POTW cost for control beyond secondary treatment. The cost basis for industry is the increment between BPT and BCT; the cost basis for POTWs is the increment between secondary treatment and advanced secondary treatment. While the 1981 court decision affirmed EPA's choice of analyzing costs beyond the secondary treatment level, some commenters observed that the repeal of section 301(b)(2)(B) of the Clean Water Act affected EPA's statutory authority for relying on the cost of advanced secondary treatment in the BCT methodology since it was section 301(b)(2)(B) that had required POTW's to achieve treatment beyond secondary. The Agency believes, however, that the increment of secondary treatment to advanced secondary treatment is both correct and consistent with the statute. As stated in the August 29, 1979 final regulation (44 FR 50735) and in Section III.A above, there remain three reasons for EPA's choice of the secondary to advanced secondary increment. First, this increment yields an approximation of marginal costs at secondary treatment. Second, advanced secondary treatment is the "knee-of-the-curve" with respect to POTW costs. Finally, the level of treatment for a POTW to upgrade from secondary to advanced secondary treatment roughly parallels the industrial increment under consideration.

In order to compare the benchmark to an industry's cost of removing additional pounds of conventional pollutants, the benchmark and industry cost must be evaluated consistently. The final BCT methodology achieves this analytical consistency with the parallel between secondary treatment for POTWs and the BPT level of control for industrial dischargers. The treatment technology is often similar, the level of pollutant reduction is often similar, and the level of regulatory control is similar in that both secondary treatment and BPT represent a minimum level of control. The BCT methodology then poses a question of whether to control conventional pollutants beyond this minimum level; i.e., "beyond BPT." Therefore, the comparison to the POTW cost should also reflect control beyond the minimum level; i.e., "beyond secondary."

2. Weighting of POTW Flows

Comment: Some commenters criticized the flow-weighting scheme used in the proposal and suggested alternative approaches. Other commenters stated that those criticisms were unfounded and supported the Agency's use of a flow-weighted average cost per pound and also

supported the Agency's proposed weighting scheme.

Response: The Agency evaluated alternative approaches to a weighting scheme and concluded that none were appropriate. For example, weighting by total incremental costs for each scale of POTWs would weight the high cost plants more heavily simply because they have high costs, rather than because they remove large amounts of pollutants. Another alternative, weighting by total incremental pounds, produced similar results to the approach the Agency proposed. A third suggestion, weighting both flow and the number of POTW, heavily weights the smaller POTWs and biases the incremental costs upwards. This result is also not representative of the expenditures made on POTWs.

The Agency's overall response is that the proposed flow-weighting scheme is appropriate in terms of representing various sizes of POTWs, is more reliable than using cost data for a single point, and correctly corresponds to the approach used to estimate industry costs. Therefore, use of the proposed flow-weighting scheme is maintained in the final methodology.

3. Establishing a Benchmark for the Second Test

Comment: Several commenters responded to the Agency's solicitation regarding an appropriate measure for the industry cost test benchmark. Some of these comments supported the concept of elasticity of unity (using a benchmark of 1.0) as a more appropriate measure than the increasing cost ratio.

Response: The Agency disagrees with comments that the elasticity of unity should be applied because it has no significant bearing on determining cost-effectiveness, which is the objective of the second test. Further, from a practical point of view, as mentioned in the comments, EPA does not have enough data to use the elasticity of unity approach. For almost all of the secondary industries, the Agency has cost and pollutant removal data for only one BCT candidate technology (generally the original BAT technology). As a consequence, it is not possible to identify the point where elasticity is one. The basis for the second test benchmark in the final methodology remains the increasing cost ratio. Most of the comments received on this issue were not opposed to the Agency's approach.

4. POTW Cost Data

Comment: Some comments received in response to the 1982 proposal plus comments received in response to a subsequent notice concerning POTW cost data (48 FR 24742, June 2, 1983) criticized EPA's use of actual POTW costs in deriving POTW cost curves. Commenters believed that site-specific factors dwarfed the cost differentials associated with improving POTW effluent performance from secondary to advanced secondary treatment. Substantial concerns were expressed with regard to the validity of the POTW cost data.

Response: For the 1982 proposal, the Agency based its estimates of POTW costs on actual plants' experiences regarding the costs of constructing and operating POTWs. In 1983, more up-to-date information of a similar nature was available, and the Agency issued a notice indicating its intentions to use the new data as the basis for calculating the benchmarks.

Following that notice, the Agency became aware that the new data might not be appropriate for use in the BCT methodology. The Agency's analysis of the new data was prompted, in part, by comments from the industry. The costs of secondary and advanced secondary treatment, as derived from the new data, varied substantially due to site-specific factors. The resulting incremental costs were determined to be unsuitable for use in the BCT methodology. The Agency also realized that the data used in the 1982 proposal might be subject to similar problems. Consequently, the new data were withdrawn, and after further evaluation, the Agency concluded it was necessary to use a different data source for POTW costs. The selected approach was to develop model POTW costs. The Agency presented the model POTW costs in detail in the September 1984 notice. Comments concerning that notice are presented below (under Heading B.)

5. Choice of Effluent Level to Define Advanced Secondary Treatment

Comment: One commenter stated that the selection of 10 mg/l as the achievable concentration for both BOD and TSS (the level proposed in 1982) was not representative of POTW performance at advanced secondary treatment. The same commenter also noted that the operational definition of advanced secondary treatment has been described in EPA documents as ranging from 10 mg/l to 25 mg/l for both BOD and TSS, rather than as a single, legally defined value, such as 30 mg/l is for secondary treatment. An industry organization submitted a rebuttal comment, asserting that there was no need for EPA to change the definition of advanced secondary treatment.

Response: EPA re-examined the data and is now defining advanced secondary treatment as a maximum 30-day average concentration of 20 mg/l BOD and 20 mg/l TSS. EPA indicated its intent to use this definition in the 1984 notice and received supportive comments. EPA believes this level represents typical permit limitations for advanced secondary facilities and has applied this definition to several aspects of the methodology. First, EPA applied this definition to the design specifications for estimating POTW costs. Second, when estimating the long-term performance for advanced secondary POTWs, EPA included a permit limitation of 20 mg/l BOD in the editing criteria.

The Agency recognizes there is no single, generally-accepted definition for advanced secondary treatment as there is for secondary treatment. EPA's analysis of actual permit data showed that 20 mg/l BOD is the most common permit requirement for POTWs beyond secondary treatment. The Agency believes that concentrations of 20 mg/l BOD and TSS represent the best definition of advanced secondary treatment for purposes of the BCT methodology.

When the Agency changed its approach for estimating POTW costs, these comments concerning the definition of advanced secondary treatment became less relevant. For the proposal in 1982, a change in definition alone would affect the calculation of incremental pollutant removals and the resulting benchmarks. For the final methodology, where the model POTWs reflect specific treatment systems for specific performance levels, the calculation of pollutant removals is affected by both definition and cost. Therefore, the computational "side-effects" of changing the definition are very different than would have been true when this comment was originally made.

6. Use of Pre-BPT and Pre-Secondary Treatment Levels

Comment: Various industry commenters complained that EPA's inconsistent definition of pre-BPT treatment levels would result in inconsistent BCT calculations. They noted that these inconsistencies would lead to misleading conclusions regarding the cost per pound of pollutant removed for BPT and would bias the industry cost test against certain industries.

In selecting the previous pre-BPT levels for industrial categories and subcategories, EPA attempted to choose treatment levels existing at the time BPT effluent limitations guidelines were developed. Commenters criticized the subjectivity involved in selecting this treatment level. They also pointed out that this "treatment-in-place" level

could not be developed for all industry categories, forcing EPA to assume no treatment for some industries. By using both "treatment-in-place" and "no treatment," EPA introduced inconsistencies and biases that were based either on whether an industry had substantially complied with BPT effluent limitations guidelines before their promulgation or on the availability of data to conduct the calculations. Commenters asserted that these factors should not be a consideration in determining the stringency of BCT effluent limitations guidelines. Commenters suggested two ways to improve the computation. First, some commenters suggested that EPA collect new data to employ the "treatment-in-place" method for all industry categories. Second, other commenters suggested that EPA base all pre-BPT calculations on raw waste (i.e., no treatment).

Response: EPA agrees with the criticisms and is therefore establishing the pre-BPT treatment level for all industry categories as raw waste. EPA also recognizes that the primary treatment level for POTWs that was used in the proposal cannot be considered equivalent to raw waste for industry. Therefore, EPA is using raw waste as the pre-secondary treatment level for POTW cost and pollutant reduction calculations. These changes were presented in the 1984 notice and are maintained in the final BCT methodology. EPA concludes that a consistent application of raw waste as the "starting point" for both industry and POTW calculations addresses the commenters' concerns.

7. Use of Long-Term Average Effluent Concentrations

Comment: The Agency received several comments opposing the use of 30-day maximum effluent limitations in pollutant removal calculations. Commenters claimed that the use of 30-day limitations biases the test against industries whose "variability factors" are larger than those for POTWs. A "variability factor" is the ratio of the 30-day maximum effluent limitation to a long-term effluent concentration. The use of 30-day maximum limitations was said to bias the test against the industry by overstating the number of incremental pounds of pollutants removed by BCT.

For industry calculations, the commenters also noted that EPA based removals on 30-day limitations for the BPT and BCT levels, while using long-term averages for pre-BPT levels (both treatment in-place and raw wasteload). Commenters asserted that this biased the dollar per pound calculations for both the BPT and BCT incremental treatment levels. The calculation overstates the actual pounds removed in going from BPT to BCT, and understates the actual pounds removed in going from pre-BPT to BPT.

Commenters suggested several ways to correct these biases. The suggestions focused on the long-term data.

Response: EPA recognizes the merits of these comments and has changed the industry and benchmark calculations as follows. For industry calculations, EPA is using annual average effluent levels (which are considered long-term) for raw waste, BPT, and BCT. For POTW calculations, EPA uses annual average effluent levels for raw waste, secondary treatment, and advanced secondary treatment. In summary, the long-term average effluent concentrations are applied at all treatment levels for both industry and POTW calculations. This approach was presented in the 1984 notice, was supported by commenters (see Comment No. 11, below), and is maintained in the final BCT methodology.

An exception to using long-term average concentrations occurs for many of the secondary industries, where, due to data constraints, EPA can only conduct the industry calculations at BPT and BCT levels using the 30-day maximum limitations. To reduce the possible bias that would exist if these secondary industry calculations were compared to BCT benchmarks based on long-term averages, EPA established a second tier of benchmarks that correspond to the industry calculations. These second tier benchmarks are based on 30-day limitations for secondary and advanced secondary treatment. This solution was presented in the 1984 notice and did not receive opposition. The two-tier approach is maintained in the final methodology.

To summarize, using long-term average concentrations is the preferred approach. The benchmarks in this final rulemaking are derived from long-term effluent data. Industry calculations will also be based on long-term effluent data. When the preferred approach is not feasible due to limitations on long-term data (as is true for many of the secondary industries), a second tier of benchmarks will be applied so that the BCT cost test is conducted on a consistent basis.

B. Major Comments From the 1984 Notice of Data Availability

8. Variation Among the Model Plant Cost Estimates

Comment: Commenters questioned the reliability and accuracy of the POTW cost estimates due to the variation in results. Costs from the three engineering firms were to be based on the same basic design criteria, but the commenters found the variation in results to be inexplicable. The comments also argued that the Agency's estimates of the incremental cost to reach advanced secondary treatment were much too high.

Response: The Agency provided limited design specifications on size, general operating conditions, required effluent levels, and basic treatment processes to three engineering design firms with experience in POTW development. Specific design criteria were determined by each firm to take maximum advantage of their experience and expertise. EPA did not want to prejudice the end result by providing overly detailed directions to the design firms.

One reason for the large variation among the incremental total annual costs was one firm's design assumption regarding the use of alum in the chemical addition step for advanced secondary treatment. While the addition of alum does reduce the level of solids in the final effluent, alum addition greatly increases the sludge handling requirements with a corresponding increase in cost. Alum is generally used to remove phosphorus. The Agency concluded that addition of alum is not the most appropriate choice for the model POTWs to be used in the BCT methodology. The more common chemical additive is polymer, which was chosen by the two other design firms. The general design criteria were adjusted by specifying that chemical addition be the addition of a polymer.

Other corrections and minor revisions were also made as a result of comments on specific engineering assumptions. The variation among incremental total annual costs in the current estimates is much smaller than the variation in costs in the September 1984 notice. For example, in the 1984 notice, the incremental total annual costs for the 25 mgd model POTW ranged from $0.40 million to $1.53 million. The current estimates used in today's regulation range from $0.34 million to $0.48 million. In addition, the average incremental costs (which are the values used in the benchmark calculations) are

significantly lower than the average incremental costs in the 1984 notice.

9. Use of Planning Level Estimates in Benchmark Calculations

Comment: Some commenters encouraged inclusion of "planning level" estimates for the large model POTWs. Their arguments claimed the planning level estimates are no less accurate than the design estimates.

Response: In addition to the design estimates provided by three firms, EPA directed a fourth engineering firm to develop planning level estimates. Two sources of information were used for the planning level estimates: available planning level cost curves and the CAPDET cost estimating computer program.

Planning level estimates are typically used by engineers during preliminary analyses of a wide range of alternatives. Their greatest application is as a screening tool, whereby alternatives having obviously high costs are eliminated from further analysis. The accuracy of planning level estimates is typically within 30 percent of the final cost of a project, while for design estimates, accuracy is in the range of 10 to 15 percent. The Agency obtained detailed design cost estimates for the large POTW sizes because the incremental cost implication for upgrading large facilities is of much greater significance than for upgrading small facilities due to the flow-weighting factors assigned in the benchmark calculations. The planning level estimates were prepared for all five sizes of model POTWs, but they were used only for the two smallest sizes. The calculations for the three larger sizes continue to be based solely on the design estimates.

10. Presentation of Data in Engineering Reports

Comment: Some commenters claimed that the level of detail provided in the engineering reports was inadequate. The reports were further criticized for their lack of design drawings. The commenters claimed the presentation of data precluded adequate review by the public, and they urged further disclosure of background information and a reopening of the comment period.

Response: The reports from the design firms all followed a similar format for presentation of information. Treatment systems and costs were described for each POTW; the amount of detail provided was substantial for structures and equipment. Similarly, the assumptions and costs for operating and maintenance were presented in detail. In response to the lack of drawings, the Agency notes that it is standard engineering practice to develop detailed design drawings to fit particular sites. The hypothetical nature of the model POTWs makes preparation of drawings (other than general sketches of equipment arrangement or to prepare construction quantity estimates) inappropriate.

EPA firmly believes that the information needed to analyze the contractors' work was available. We do not believe that additional information was necessary to review or evaluate the cost estimates; reopening the 105-day comment period was not necessary.

11. Appropriateness of Long-Term Average Concentrations

Comment: Commenters believe the Agency incorrectly calculated long-term average effluent concentrations for POTW treatment levels. Specifically, their criticism focused on the choice of POTWs included in the performance analysis. Commenters asserted that problems with the editing criteria resulted in an incorrect assessment of incremental pollutant removals.

Response: It is important to note that commenters generally supported the use of long-term averages instead of maximum 30-day limitations, which had previously been used in the methodology. Also, they generally supported the Agency's use of the POTW performance data base. Their objections focused on the specific values that were identified as the long-term average concentrations. EPA recognized that some of the commenters' concerns warranted additional analyses, which have since been conducted and are discussed in Section III.D.

The editing criteria specify a permit limitation and the conditions for complying with the limitation. The Agency revised the editing rule on violations to allow both pollutants to exceed the permit requirement if that situation occurs in the same month; this revision accounts for the relationship between the pollutants. Editing criteria were also added to better define the treatment systems for secondary and advanced secondary treatment POTWs. Further, the criteria now exclude POTWs that were performing at levels much better than would be characteristic of secondary and advanced secondary treatment. The revised editing criteria, which respond to the commenters' concerns, were used to calculate the long-term averages for the final benchmarks.

12. Reproposing BCT Methodology and Effluent Limitations Guidelines

Comment: Several commenters submitted procedural objections to the notice of data availability. They claimed that the changes in the September 1984 notice were significant enough departures from the October 1982 proposal to warrant reproposal of the methodology and effluent limitations guidelines.

Response: The changes presented in the September 1984 notice were all in response to, and were logical outgrowths of, comments submitted on the October 1982 proposal. As an example, one commenter had strongly criticized the empirical cost data that were being considered; this comment influenced the Agency's decision to develop model POTW costs.

The comments concerning reproposal emphasized the need for meaningful comment. EPA believes this need has adequately been met. When the September 1984 notice was published, the Agency notified all parties who submitted comment on the earlier proposal, making a special effort to give them opportunity to comment on the new information. This opportunity was further facilitated by a 45-day extension to the comment period. Also, the major commenters from October 1982 all submitted further comments in September 1984. Therefore, EPA believes that all interested parties had ample opportunity to submit meaningful comments and that reproposal is not necessary.

X. Availability of Technical Information

The costs and pollutant removal data that were used to support the industry calculations for the secondary industries were taken from the development documents and economic analyses that were published in the development of BAT effluent limitations guidelines. These documents are available for review as part of the record for this rulemaking (in EPA's library) and at all EPA regional libraries.

POTW cost data used to calculate the final benchmarks are documented in reports from each of the engineering firms that provided model POTW cost estimates. Those costs, the benchmark calculations, and results are presented in an additional report, "BCT Benchmarks: Methodology, Analysis and Results." All of these documents are available for review as part of the record in EPA's library.

XI. OMB Review

This regulation was submitted to the Office of Management and Budget for

significantly lower than the average incremental costs in the 1984 notice.

9. Use of Planning Level Estimates in Benchmark Calculations

Comment: Some commenters encouraged inclusion of "planning level" estimates for the large model POTWs. Their arguments claimed the planning level estimates are no less accurate than the design estimates.

Response: In addition to the design estimates provided by three firms, EPA directed a fourth engineering firm to develop planning level estimates. Two sources of information were used for the planning level estimates: available planning level cost curves and the CAPDET cost estimating computer program.

Planning level estimates are typically used by engineers during preliminary analyses of a wide range of alternatives. Their greatest application is as a screening tool, whereby alternatives having obviously high costs are eliminated from further analysis. The accuracy of planning level estimates is typically within 30 percent of the final cost of a project, while for design estimates, accuracy is in the range of 10 to 15 percent. The Agency obtained detailed design cost estimates for the large POTW sizes because the incremental cost implication for upgrading large facilities is of much greater significance than for upgrading small facilities due to the flow-weighting factors assigned in the benchmark calculations. The planning level estimates were prepared for all five sizes of model POTWs, but they were used only for the two smallest sizes. The calculations for the three larger sizes continue to be based solely on the design estimates.

10. Presentation of Data in Engineering Reports

Comment: Some commenters claimed that the level of detail provided in the engineering reports was inadequate. The reports were further criticized for their lack of design drawings. The commenters claimed the presentation of data precluded adequate review by the public, and they urged further disclosure of background information and a reopening of the comment period.

Response: The reports from the design firms all followed a similar format for presentation of information. Treatment systems and costs were described for each POTW; the amount of detail provided was substantial for structures and equipment. Similarly, the assumptions and costs for operating and maintenance were presented in detail. In response to the lack of drawings, the Agency notes that it is standard engineering practice to develop detailed design drawings to fit particular sites. The hypothetical nature of the model POTWs makes preparation of drawings (other than general sketches of equipment arrangement or to prepare construction quantity estimates) inappropriate.

EPA firmly believes that the information needed to analyze the contractors' work was available. We do not believe that additional information was necessary to review or evaluate the cost estimates; reopening the 105-day comment period was not necessary.

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Response: It is important to note that commenters generally supported the use of long-term averages instead of maximum 30-day limitations, which had previously been used in the methodology. Also, they generally supported the Agency's use of the POTW performance data base. Their objections focused on the specific values that were identified as the long-term average concentrations. EPA recognized that some of the commenters' concerns warranted additional analyses, which have since been conducted and are discussed in Section III.D.

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The comments concerning reproposal emphasized the need for meaningful comment. EPA believes this need has adequately been met. When the September 1984 notice was published, the Agency notified all parties who submitted comment on the earlier proposal, making a special effort to give them opportunity to comment on the new information. This opportunity was further facilitated by a 45-day extension to the comment period. Also, the major commenters from October 1982 all submitted further comments in September 1984. Therefore, EPA believes that all interested parties had ample opportunity to submit meaningful comments and that reproposal is not necessary.

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POTW cost data used to calculate the final benchmarks are documented in reports from each of the engineering firms that provided model POTW cost estimates. Those costs, the benchmark calculations, and results are presented in an additional report, "BCT Benchmarks: Methodology, Analysis and Results." All of these documents are available for review as part of the record in EPA's library.

XI. OMB Review

This regulation was submitted to the Office of Management and Budget for

review as required by Executive Order 12291. This rule does not contain any information collection requirements subject to the Paperwork Reduction Act of 1980 (44 U.S.C. 3501 et seq.). Comments from OMB to EPA and EPA's responses are available for public inspection as part of the record for this rulemaking.

List of Subjects

40 CFR Part 405

Dairy products, Water pollution control, Waste treatment and disposal.

40 CFR Part 406

Grains, Water pollution control, Waste treatment and disposal.

40 CFR Part 407

Fruits, Vegetables, Water pollution control, Waste treatment and disposal.

40 CFR Part 408

Seafood, Water pollution control, Waste treatment and disposal.

40 CFR Part 409

Sugar, Water pollution control, Waste treatment and disposal.

40 CFR Part 411

Cement industry, Water pollution control, Waste treatment and disposal.

40 CFR Part 412

Feedlots, Livestock, Water pollution control, Waste treatment and disposal.

40 CFR Part 418

Fertilizers, Water pollution control, Waste treatment and disposal.

40 CFR Part 422

Phosphate, Water pollution control, Waste treatment and disposal.

40 CFR Part 424

Iron, Metals, Water pollution control, Waste treatment and disposal.

40 CFR Part 426

Glass and glass products, Water pollution control, Waste treatment and disposal.

40 CFR Part 432

Meat and meat products, Water pollution control, Waste treatment and disposal.

Dated: May 19, 1986.

Lee M. Thomas,

Administrator.

For the reasons set out in the preamble, 40 CFR Parts 405, 406, 407, 408, 409, 411, 412, 418, 422, 424, 426, and 432 are amended as follows:

1. The title of Part 405 is revised to read as follows:

PART 405—DAIRY PRODUCTS PROCESSING POINT SOURCE CATEGORY.

2. The authority citation for Part 405 is revised to read as follows:

Authority: Secs. 301, 304 (b) and (c), 306 (b) and (c) and 307(c) of the Federal Water Pollution Control Act, as amended (the Act); 33 U.S.C. 1251, 1311, 1314 (b) and (c), 1316 (b) and (c), and 1317(c); 86 Stat. 816, et seq., Pub. L. 92-500; 91 Stat. 1567, Pub. L. 95-217.

§§ 405.17, 405.27, 405.37, 405.47, 405.57, 405.67, 405.77, 405.87, 405.97, 405.107, 405.127 [Added]

§ 405.117 [Revised]

3. Sections 405.17, 405.27, 405.37, 405.47, 405.57, 405.67, 405.77, 405.87, 405.97, 405.107, and 405.127 are added, and § 405.117 is revised. The text of each section is identical except for the section number in the heading and the section number referenced at the end of the section. The text of the sections is set out only once. Within the text are two blank spaces, one designated (a) and one designated (b). In the table preceding the text, column (a) indicates the section number to be added to the section heading for the respective subparts of Part 405. Column (b) indicates the section number to be added to the text of the section indicated in column (a).

Subpart	(a) Section number to be added to section heading	(b) Section number to be added to text of the section in (a)
Subpart A—Receiving stations subcategory	405.17	405.12
Subpart B—Fluid products subcategory	405.27	405.22
Subpart C—Cultured products subcategory	405.37	405.32
Subpart D—Butter subcategory	405.47	405.42
Subpart E—Cottage cheese and cultured cream cheese subcategory	405.57	405.52
Subpart F—Natural and processed cheese subcategory	405.67	405.62
Subpart G—Fluid mix for ice cream and other frozen deserts subcategory	405.77	405.72
Subpart H—Ice cream, frozen desserts, novelties and other dairy desserts subcategory	405.87	405.82
Subpart I—Condensed milk subcategory	405.97	405.92
Subpart J—Dry milk subcategory	405.107	405.102
Subpart K—Condensed whey subcategory	405.117	405.112
Subpart L—Dry whey subcategory	405.127	405.122

§ (a) Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT).

Except as provided in §§ 125.30 through 125.32, any existing point source subject to this subpart shall achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT): The limitations shall be the same as those specified for conventional pollutants (which are defined in § 401.16) in § *(b)* of this subpart for the best practicable control technology currently available (BPT).

PART 406—GRAIN MILLS POINT SOURCE CATEGORY

1. The authority citation for Part 406 is revised to read as follows:

Authority: Secs. 301, 304 (b) and (c), 306 (b) and (c), 307(c) of the Federal Water Pollution Control Act, as amended; 33 U.S.C. 1251, 1311, 1314 (b) and (c), 1316 (b) and (c), 1317(c); 86 Stat. 816 et seq., Pub. L. 92-500; 91 Stat. 1567, Pub. L. 95-217.

§§ 406.27, 406.67, 406.97, 406.107 [Added]

§§ 406.37, 406.47, 406.57, 406.77, 406.87 [Revised]

2. Sections 406.27, 406.67, 406.97, and 406.107 are added, and §§406.37, 406.47, 406.57, 406.77, and 406.87 are revised. The text of each section is identical except for the section number in the heading and the section number referenced at the end of the section. The text of the sections is set out only once. Within the text are two blank spaces, one designated (a) and one designated (b). In the table preceding the text, column (a) indicates the section number to be added to the section heading for the respective subparts of Part 406. Column (b) indicates the section number to be added to the text of the section indicated in column (a).

Subpart	(a) Section number to be added to section heading	(b) Section number to be added to text of the section in (a)
Subpart B—Corn dry milling subcategory	406.27	406.22
Subpart C—Normal wheat flour milling subcategory	406.37	406.32
Supart D—Bulgur wheat flour milling subcategory	406.47	406.42
Subpart E—Normal rice milling subcategory	406.57	406.52
Subpart F—Parboiled rice processing subcategory	406.67	406.62
Subpart G—Animal feed subcategory	406.77	406.72
Subpart H—Hot cereal subcategory	406.87	406.82
Subpart I—Ready-to-eat cereal subcategory	406.97	406.92
Subpart J—Wheat starch and gluten	406.107	406.102

§ (a) Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT).

Except as provided in §§ 125.30 through 125.32, any existing point source subject to this subpart shall achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT): The limitations shall be the same as those specified for conventional pollutants (which are defined in § 401.16) in § (*b*) of this subpart for the best practicable control technology currently available (BPT).

PART 407—CANNED AND PRESERVED FRUITS AND VEGETABLES PROCESSING POINT SOURCE CATEGORY

1. The authority citation for Part 407 is revised to read as follows:

Authority: Secs. 301, 304 (b) and (c), 306 (b) and (c), 307(c) of the Federal Water Pollution Control Act, as amended: 33 U.S.C. 1251, 1311, 1314 (b) and (c), 1316 (b) and (c), 1317(c); 86 Stat. 816 et seq., Pub. L. 92-500; 91 Stat. 1567, Pub. L. 95-217.

§§ 407.17, 407.27, 407.47 [Revised]

§§ 407.37, 407.57, 407.67, 407.77, 407.87 [Added]

2. Sections 407.17, 407.27, and 407.47 are revised, and §§ 407.37, 407.57, 407.67, 407.77, and 407.87 are added. The text of each section is identical except for the section number in the heading and the section number referenced at the end of the section. The text of the sections is set out only once. Within the text are two blank spaces, one designated (a) and one designated (b). In the table preceding the text, column (a) indicates the section number to be added to the section heading for the respective subparts of Part 407. Column (b) indicates the section number to be added to the text of the section indicated in column (a).

Subpart	(a) Section number to be added to section heading	(b) Section number to be added to text of the section in (a)
Subpart A—Apple juice subcategory	407.17	407.12
Subpart B—Apple products subcategory	407.27	407.22
Subpart C—Citrus products subcategory	407.37	407.32
Subpart D—Frozen potato products subcategory	407.47	407.42
Subpart E—Dehydrated potato products subcategory	407.57	407.52
Subpart F—Canned and preserved fruits subcategory	407.67	407.62
Subpart G—Canned and preserved vegetable subcategory	407.77	407.72
Subpart H—Canned and miscellaneous specialties subcategory	407.87	407.82

§ (a) Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT).

Except as provided in §§ 125.30 through 125.32, any existing point source subject to this subpart shall achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT): The limitations shall be the same as those specified for conventional pollutants (which are defined in § 401.16) in § (b) of this subpart for the best practicable control technology currently available (BPT).

PART 408—CANNED AND PRESERVED SEAFOOD PROCESSING POINT SOURCE CATEGORY

1. The authority citation for Part 408 is revised to read as follows:

Authority: Secs. 301, 304 (b) and (c), 306 (b) and (c), 307(c), of the Federal Water Pollution Control Act, as amended: 33 U.S.C. 1251, 1311, 1314 (b) and (c), 1316 (b) and (c), 1317(c); 86 Stat. 816 et seq., Pub. L. 92-500; 91 Stat. 1567, Pub. L. 95-217.

§§ 408.17, 408.27, 408.37, 408.47, 408.57, 408.67, 408.77, 408.87, 408.97, 408.107, 408.117, 408.127, 408.137, 408.147, 408.157, 408.177, 408.187, 408.197, 408.217, 408.227, 408.237, 408.247, 408.277, 408.287, 408.317, 408.327 [Added]

2. Sections 408.17, 408.27, 408.37, 408.47, 408.57, 408.67, 408.77, 408.87, 408.97, 408.107, 408.117, 408.127, 408.137, 408.147, 408.157, 408.177, 408.187, 408.197, 408.217, 408.227, 408.237, 408.247, 408.277, 408.287, 408.317, and 408.327 are added. The text of each section is identical except for the section number in the heading and the section number referenced at the end of the section. The text of the sections is set out only once. Within the text are two blank spaces, one designated (a) and one designated (b). In the table preceding the text, column (a) indicates the section number to be added to the section heading for the respective subparts of Part 408. Column (b) indicates the section number to be added to the text of the section indicated in column (a).

Subpart	(a) Section number to be added to section heading	(b) Section number to be added to text of the section in (a)
Subpart A—Farm-raised catfish processing subcategory	408.17	408.12
Subpart B—Conventional blue crab processing subcategory	408.27	408.22
Subpart C—Mechanized blue crab processing subcategory	408.37	408.32
Subpart D—Non-remote Alaskan crab meat processing subcategory	408.47	408.42
Subpart E—Remote Alaskan crab meat processing subcategory	408.57	408.52
Subpart F—Non-remote Alaskan whole crab and crab section	408.67	408.62
Subpart G—Remote Alaskan whole crab and crab section processing subcategory	408.77	408.72
Subpart H—Dungeness and Tanner crab processing in the contiguous states subcategory	408.87	408.82
Subpart I—Non-remote Alaskan shrimp processing subcategory	408.97	408.92
Subpart J—Remote Alaskan shrimp processing subcategory	408.107	408.102
Subpart K—Northern shrimp processing in the contiguous states subcategory	408.117	408.112
Subpart L—Southern non-breaded shrimp processing in the contiguous states subcategory	408.127	408.122
Subpart M—Breaded shrimp processing in the contiguous states subcategory	408.137	408.132
Subpart N—Tuna processing subcategory	408.147	408.142
Subpart O—Fish meal processing subcategory	408.157	408.152
Subpart Q—Alaskan mechanized salmon processing subcategory	408.177	408.172
Subpart R—West coast hand-butchered salmon processing subcategory	408.187	408.182
Subpart S—West coast mechanized salmon processing subcategory	408.197	408.192
Subpart U—Non-Alaskan conventional bottom fish processing subcategory	408.217	408.212
Subpart V—Non-Alaskan mechanized bottom fish processing subcategory	408.227	408.222
Subpart W—Hand-shucked clam processing subcategory	408.237	408.232
Subpart X—Mechanized clam processing subcategory	408.247	408.242
Subpart AA—Steamed and canned oyster processing subcategory	408.277	408.272
Subpart AB—Sardine processing subcategory	408.287	408.282
Subpart AE—Alaskan herring fillet processing subcategory	408.317	408.312
Subpart AF—Non-Alaskan herring fillet processing subcategory	408.327	408.322

§ (a) Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT).

Except as provided in §§ 125.30 through 125.32, any existing point source subject to this subpart shall achieve the following effluent limitations representing the degree of effluent reduction attainable by the application

of the best conventional pollutant control technology (BCT): The limitations shall be the same as those specified for conventional pollutants (which are defined in § 401.16 in § *(b)* of this subpart for the best practicable control technology currently available (BPT).

3. Section 408.167 is added to Subpart P to read as follows:

§ 408.167 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology.

(a) [Reserved].

(b) Except as provided in §§ 125.30 through 125.32, any hand-butchered salmon processing facility located in population or processing centers including but not limited to Anchorage, Cordova, Juneau, Ketchikan, Kodiak, and Petersburg shall achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT): The limitations shall be the same as those specified for conventional pollutants (which are defined in § 401.16) in § 408.162(b)(2) of this subpart for the best practicable control technology currently available (BPT).

4. Section 408.207 is added to Subpart T to read as follows:

§ 408.207 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology.

(a) [Reserved].

(b) Except as provided in §§ 125.30 through 125.32, any Alaskan bottom fish processing facility located in population or processing centers including but not limited to Anchorage, Cordova, Juneau, Ketchikan, Kodiak, and Petersburg shall achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT): The limitations shall be the same as those specified for conventional pollutants (which are defined in § 401.16) in § 408.202(b)(2) of this subpart for the best practicable control technology currently available (BPT).

5. Section 408.257 is added to Subpart Y to read as follows:

§ 408.257 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology.

Except as provided in §§ 125.30 through 125.32, the following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a point source subject to the provisions of this subpart after application of the best conventional pollutant control technology:

Effluent characteristic	Effluent limitations	
	Maximum for any 1 day	Average of daily values for thirty consecutive days shall not exceed—
	Metric units (kilograms per 1,000 kg of product)	
TSS	45	36
Oil and grease	2.2	1.7
pH	(1)	(1)
	English units (pounds per 1,000 lb of product)	
TSS	45	36
Oil and grease	2.2	1.7
pH	(1)	(1)

[1] Within the range 6.0 to 9.0.

6. Section 408.267 is added to Subpart Z to read as follows:

§ 408.267 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology.

Except as provided in §§ 125.30 through 125.32, the following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a point source subject to the provisions of this subpart after application of the best conventional pollutant control technology:

Effluent characteristic	Effluent limitations	
	Maximum for any 1 day	Average of daily values for thirty consecutive days shall not exceed—
	Metric units (kilograms per 1,000 kg of product)	
TSS	23	16
Oil and grease	1.1	0.77
pH	(1)	(1)
	English units (pounds per 1,000 lb of product)	
TSS	23	16
Oil and grease	1.1	0.77
pH	(1)	(1)

[1] Within the range 6.0 to 9.0.

7. Section 408.297 is added to Subpart AC to read as follows:

§ 408.297 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology.

(a) [Reserved].

(b) Except as provided in §§ 125.30 through 125.32, any Alaskan scallop processing facility located in population or processing centers including but not limited to Anchorage, Cordova, Juneau, Ketchikan, Kodiak, and Petersburg shall achieve the following effluent limitations representing the degreee of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT): The limitations shall be the same as those specified for conventional pollutants (which are defined in § 401.16) in § 408.292(b)(2) of this subpart for the best practicable control technology currently available (BPT).

8. Section 408.307 is added to Subpart AD to read as follows:

§ 408.307 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology.

Except as provided in §§ 125.30 through 125.32, the following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a point source subject to the provisions of this subpart after application of the best conventional pollutant control technology:

Effluent characteristic	Effluent limitations	
	Maximum for any 1 day	Average of daily values for thirty consecutive days shall not exceed—
	Metric units (kg/kg of product)	
TSS	5.7	1.4
Oil and grease	7.3	0.23
pH	(1)	(1)
	English units (pounds per 1,000 lb of product)	
TSS	5.7	1.4
Oil and grease	7.3	0.23
pH	(1)	(1)

[1] Within the range 6.0 to 9.0.

9. Section 408.337 is added to Subpart AG to read as follows:

§ 408.337 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology.

Except as provided in §§ 125.30 through 125.32, the following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a point source subject to the provisions of this subpart after application of the best conventional pollutant control technology:

Effluent characteristic	Effluent limitations	
	Maximum for any 1 day	Average of daily values for thirty consecutive days shall not exceed-
	Metric units (kg/kkg of seafood)	
TSS	26	14
Oil and grease	21	1.3
pH	(1)	(1)
	English units (pounds per 1,000 lb of seafood)	
TSS	26	14
Oil and grease	2.1	1.3
pH	(1)	(1)

[1] Within the range 6.0 to 9.0.

PART 409—SUGAR PROCESSING POINT SOURCE CATEGORY

1. The authority citation for Part 409 is revised to read as follows:

Authority: Secs. 301, 304 (b) and (c), 306 (b) and (c), 307 (c) and (d), and 316(b) of the Federal Water Pollution Control Act, as amended; 33 U.S.C. 1251, 1311, 1314 (b) and (c), 1316 (b) and (c), 1317(c), and 1326(c); 86 Stat. 816 et seq., Pub. L. 92–500; 91 Stat. 1567, Pub. L. 95–217.

§§ 409.17, 409.27, 409.37 [Revised]

§§ 409.47, 409.57, 409.67, 409.77, 409.87 [Added]

2. Sections 409.17, 409.27, and 409.37 are revised, and §§ 409.47, 409.57, 409.67, 409.77, and 409.87 are added. The text of each section is identical except for the section number in the heading and the section number referenced at the end of the section. The text of the sections is set out only once. Within the text are two blank spaces, one designated (a) and one designated (b). In the table preceding the text, column (a) indicates the section number to be added to the section heading for the respective subparts of Part 409, Column (b) indicates the section number to be added to the text of the section indicated in column (a).

Subpart	(a) Section number to be added to section heading	(b) Section number to be added to text of the section in (a)
Subpart A—Beet sugar processing subcategory	409.17	409.12
Subpart B—Crystalline cane sugar refining subcategory	409.27	409.22
Subpart C—Liquid cane sugar refining subcategory	409.37	409.32
Subpart D—Lousiana raw cane sugar processing subcategory	409.47	409.42
Subpart E—Florida and Texas raw cane sugar processing subcategory	409.57	409.52
Subpart F—Hilo-Hamakua Coast of the island of Hawaii raw cane sugar processing subcategory	409.67	409.62
Subpart G—Hawaiian raw cane sugar processing subcategory	409.77	409.72
Subpart H—Puerto Rican raw cane sugar processing subcategory	409.87	409.82

§ (a) Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT).

Except as provided in §§ 125.30 through 125.32, any existing point source subject to this subpart shall achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT): The limitations shall be the same as those specified for conventional pollutants (which are defined in § 401.16) in § *(b)* of this subpart for the best practicable control technology currently available (BPT).

PART 411—CEMENT MANUFACTURING POINT SOURCE CATEGORY

1. The authority citation for Part 411 is revised to read as follows:

Authority: Secs. 301, 304 (b) and (c), 306 (b) and (c), and 307(c) of the Federal Water Pollution Control Act, as amended; 33 U.S.C. 1251, 1311, 1314 (b) and (c), 1316 (b) and (c), and 1317(c); 86 Stat. 816 et seq., Pub. L. 92–500; 91 Stat. 1567, Pub. L. 95–217.

2. Section 411.27 is revised to read as follows:

§ 411.27 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the conventional pollutant control technology (BCT).

Except as provided in §§ 125.30 through 125.32, any existing point source subject to this subpart shall achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT): The limitations shall be the same as those specified for conventional pollutants (which are defined in § 401.16) in § 411.22 of this subpart for the best practicable control techology currently available (BPT).

PART 412—FEEDLOTS POINT SOURCE CATEGORY

1. The authority citation for Part 412 is revised to read as follows:

Auhority: Secs. 301, 304 (b) and (c), 306 (b) and (c), and 307(c) of the Federal Water Pollution Control Act, as amended; 33 U.S.C. 1251, 1311, 1314 (b) and (c), 1316 (b) and (c), and 1317(c); 86 Stat. 816 et seq., Pub. L. 92–500; 91 Stat. 1567, Pub. L. 95–217.

§ 412.17 [Removed and Reserved]

2. Section 412.17 is removed and reserved.

PART 418—FERTILIZER MANUFACTURING POINT SOURCE CATEGORY

1. The authority citation for Part 418 is revised to read as follows:

Authority: Secs. 301, 304 (b) and (c), 306 (b) and (c), 307(c) of the Federal Water Pollution Control Act, as amended; 33 U.S.C. 1251, 1311, 1314 (b) and (c), 1316 (b) and (c), and 1317(c); 86 Stat. 816 et seq., Pub. L. 92–500; 91 Stat. 1567, Pub. L. 95–217.

2. The heading of § 418.17 is revised to read as follows. (The entry for § 418.17 is also revised in the table of contents for Part 418.)

§ 418.17 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology.

* * * * *

3. In the table of contents for Part 418, the entry for § 418.27 is revised to read as follows:

Sec.

* * * * *

418.27 Effuent limitations quidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology.

* * * * *

4. Section 418.23 is revised to read as follows:

§ 418.23 Effluent limitations quidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.

Except as provided in §§ 125.30 through 125.32, the following limitations establish the quantity or quality of pollutants or pollutant properties, which may be discharged by a point source

subject to the provisions of this subpart after application of the best available technology economically achievable.

Effluent characteristic	Effluent limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days shall not exceed—
	Metric units (kilograms per 1,000 kg of product)	
Ammonia (as N)	0.05	0.025
	English units (pounds per 1,000 lb of product)	
Ammonia (as N)	0.05	0.025

PART—422 PHOSPHATE MANUFACTURING POINT SOURCE CATEGORY

1. The authority citation for Part 422 is revised to read as follows:

Authority: Secs. 301, 304 (b) and (c), 306 (b) and (c), and 307(c) of the Federal Water Pollution Control Act, as amended: 33 U.S.C. 1251, 1311, 1314 (b) and (c), 1316 (b) and (c), 1317(c); 86 Stat. 816 et seq., Pub. L. 92-500; 91 Stat. 1567, Pub. L. 95-217.

§ 422.66 [Revised]

2. Section 422.66 is reserved.

3. Section 422.67 is added to read as follows:

§ 422.67 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology.

Except as provided in §§ 125.30 through 125.32, the following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a point source subject to the provisions of this subpart after application of the best conventional pollutant control technology:

[Metric units (kg/kkg of product) English units (lb/1,000 lb of product)]

Effluent characteristic	Effluent limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days shall not exceed—
TSS	0.35	0.18
pH	(1)	(1)

(1) Within the range 6.0 to 9.5.

PART 424—FERROALLOY MANUFACTURING POINT SOURCE CATEGORY

1. The authority citation for Part 424 is revised to read as follows:

Authority: Secs. 301, 304(b) and (c), 306(b) and (c), 307(c) of the Federal Water Pollution Control Act, as amended; 33 U.S.C. 1251, 1311, 1314(b) and (c), 1316 (b) and (c), 1317(c); 86 Stat. 816 et seq., Pub. L. 92-500; 91 Stat. 1567, Pub. L. 95-217.

§§ 424.17, 424.27, 424.37 [Added]

§§ 424.47, 424.67, 424.77 [Revised]

2. Sections 424.17, 424.27, and 424.37 are added, and §§ 424.47, 424.67, and 424.77 are revised. The text of each section is identical except for the section number in the heading and the section number referenced at the end of the section. The text of the sections is set out only once. Within the text are two blank spaces, one designated (a) and one designated (b). In the table preceding the text, column (a) indicates the section number to be added to the section heading for the respective subparts of Part 424. Column (b) indicates the section number to be added to the text of the section indicated in column (a).

Subpart	(a) Section number to be added to section heading	(b) Section number to be added to text of the section in (a)
Subpart A—Open electric furnaces with wet air pollution control devices subcategory	424.17	424.12
Subpart B—Covered electric furnances and other smelting operations with wet air pollution control devices subcategory	424.27	424.22
Subpart C—Slag processing subcategory	424.37	424.32
Subpart D—Covered calcium carbide furnaces with wet air pollution control devices subcategory	424.47	424.42
Subpart F—Electrolytic manganese products subcategory	424.67	424.62
Subpart G—Electrolytic chromium subcategory	424.77	424.72

§ (a) Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology.

Except as provided in §§ 125.30 through 125.32, any existing point source subject to this subpart shall achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT): The limitations shall be the same as those specified for conventional pollutants (which are defined in § 401.16) in § *(b)* of this subpart for the best practicable control technology currently available (BPT).

PART 426—GLASS MANUFACTURING POINT SOURCE CATEGORY

1. The authority citation for Part 426 is revised to read as follows:

Authority: Secs. 301, 304 (b) and (c), 306 (b) and (c), 307(c), and 316(b) of the Federal Water Pollution Control Act, as amended; 33 U.S.C. 1251, 1311, 1314, 1316 (b) and (c), 1317(b); 86 Stat. 816 et seq., Pub. L. 92-500; 91 Stat. 1567, Pub. L. 95-217.

§§ 426.17 and 426.47 [Added]

§§ 426.57, 426.67, 426.77, 426.87, 426.107, 426.117, 426.127, 426.137 [Revised]

2. Sections 426.17 and 426.47 are added, and §§ 426.57, 426.67, 426.77, 426.87, 426.107, 426.117, 426.127, and 426.137 are revised. The text of each section is identical except for the section number in the heading and the section number referenced at the end of the section. The text of the sections is set out only once. Within the text are two blank spaces, one designated (a) and one designated (b). In the table preceding the text, column (a) indicates the section number to be added to the section heading for the respective subparts of Part 426. Column (b) indicates the section number to be added to the text of the section indicated in column (a).

Subpart	(a) Section number to be added to section heading	(b) Section number to be added to text of the section in (a)
Subpart A—Insulation fiberglass subcategory	426.17	426.12
Subpart D—Plate glass manufacturing subcategory	426.47	426.42
Subpart E—Float glass manufacturing subcategory	426.57	426.52
Subpart F—Automotive glass tempering subcategory	426.67	426.62
Subpart G—Automotive glass laminating subcategory		
Support H—Glass container manufacturing subcategory	426.87	426.82
Subpart J—Glass tubing (Danner) manufacturing subcategory	426.107	426.102
Subpart K—Television picture tube envelope manufacturing subcategory	426.117	426.112
Subpart L—Incandescent lamp envelope manufacturing subcategory	426.127	426.122

§ (a) Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT).

Except as provided in §§ 125.30 through 125.32, any existing point source

subject to this subpart shall achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT): The limitations shall be the same as those specified for conventional pollutants (which are defined in § 401.16) in § (*b*) of this subpart for the best practicable control technology currently available (BPT).

3. Section 426.123 is revised to read as follows:

§ 426.123 Effluent limitations guidelines representing the degree of effluent reduction available by the application of the best available technology economically achievable.

Except as provided in §§ 125.30 through 125.32, the following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a point source subject to the provisions of this subpart after application of the best available technology economically achievable:

(a) [Reserved]

(b) Any manufacturing plant which frosts incandescent lamp envelopes shall meet the following limitations with regard to the finishing operations.

Effluent characteristic	Effluent limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days shall not exceed—
	Metric units (g/kkg of product frosted)	
Fluoride	104.0	52.0
Ammonia	240.0	120.0
	English units (lb/1,000 lb of product frosted)	
Fluoride	0.104	0.052
Ammonia	0.24	0.12

§ 426.133 [Amended]

4. In § 426.133, paragraph (c) is removed and reserved.

§ 426.137 [Removed and Reserved]

5. Section 426.137 is removed and reserved.

PART 432—MEAT PRODUCTS POINT SOURCE CATEGORY

1. The authority citation for Part 432 is revised to read as follows:

Authority: Secs. 301, 304 (b) and (c), 306 (b) and (c), and 307(c) of the Federal Water Pollution Control Act, as amended; 33 U.S.C. 1251, 1311, 1314 (b) and (c), 1316 (b) and (c), 1317(c); 86 Stat. 816 et seq., Pub. L. 92-500; 91 Stat. 1567, Pub. L. 95-217.

§§ 432.17, 432.27, 432.37, 432.47, 432.67, 432.77, 432.87, 432.97 [Revised]

2. Sections 432.17, 432.27, 432.37, 432.47, 432.67, 432.77, 432.87, and 432.97 are revised. The text of each section is identical except for the section number in the heading and the section number referenced at the end of the section. The text of the sections is set out only once. Within the text are two blank spaces, one designated (a) and one designated (b). In the table preceding the text, column (a) indicates the section number to be added to the section heading for the respective subparts of Part 432. Column (b) indicates the section number to be added to the text of the section indicated in column (a).

Subpart	(a) Section number to be added to section heading	(b) Section number to be added to text of the section in (a)
Subpart A—Simple slaughterhouse subcategory	432.17	432.12
Subpart B—Complex slaughterhouse subcategory	432.27	432.22
Subpart C—Low-processing packinghouse subcategory	432.37	432.32
Subpart D—High-processing packinghouse subcategory	432.47	432.42
Subpart F—Meat cutter subcategory	432.67	432.62
Subpart G—Sausage and luncheon meats processor subcategory	432.77	432.72
Subpart H—Ham processor subcategory	432.87	432.82
Subpart I—Canned meat processor subcategory	432.97	432.92

§ (a) Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT).

Except as provided in §§ 125.30 through 125.32, any existing point source subject to this subpart shall achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT): The limitations shall be the same as those specified for conventional pollutants (which are defined in § 401.16) in § *b* of this subpart for the best practicable control technology currently available (BPT).

3. Section 432.57 is added to Subpart E to read as follows:

§ 432.57 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology.

Except as provided in §§ 125.30 through 125.32, the following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a point source subject to the provisions of this subpart after application of the best conventional pollutant control technology:

Effluent characteristic	Effluent limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days shall not exceed—
	Metric units (kg/kkg of finished product)	
BOD5	1.0	0.5
TSS	1.2	0.6
Oil and grease	0.5	0.25
pH	(1)	(1)
Fecal coliforms	(2)	(2)
	English units (lb/1,000 lb of finished product)	
BOD5	1.0	0.5
TSS	1.2	0.6
Oil and grease	0.5	0.25
pH	(1)	(1)
Fecal coliforms	(2)	(2)

[1] Within the range 6.0 to 9.0.
[2] No limitation.

4. Section 432.107 is added to Subpart J to read as follows:

§ 432.107 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollution control technology.

(a) Except as provided in §§ 125.30 through 125.32, and subject to the provisions of paragraph (b) of this section, the following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a point source subject to the provisions of this subpart after application of the best conventional pollutant control technology: