FOR PUBLICATION

UNITED STATES COURT OF APPEALS
FOR THE NINTH CIRCUIT

FOOD & WATER WATCH; SNAKE RIVER WATERKEEPER, INC.,
Petitioners,

v.

U.S. ENVIRONMENTAL PROTECTION AGENCY,
Respondent.

No. 20-71554

OPINION

On Petition for Review of an Order of the
Environmental Protection Agency

Argued and Submitted May 6, 2021
Portland, Oregon

Filed September 16, 2021

Before: William A. Fletcher and Michelle T. Friedland, Circuit Judges, and Frederic Block,* District Judge.

Opinion by Judge W. Fletcher

* The Honorable Frederic Block, United States District Judge for the Eastern District of New York, sitting by designation.

SUMMARY[**]

Clean Water Act

The panel granted a petition for review brought by petitioner environmental organizations challenging a National Pollutant Discharge Elimination System ("NPDES") Permit issued by the Environmental Protection Agency ("EPA") for Concentrated Animal Feeding Operations ("CAFOs") in Idaho.

The Clean Water Act prohibits the discharge of any pollutant by any person from any point source into the navigable waters of the United States except when the discharge is authorized by a permit issued under the NPDES. CAFOs house, feed, and raise thousands of animals in confined locations, and they generate animal manure, which can pose substantial risks to the environment and public health. Manure is typically stored in lagoons, and animal waste that leaks from lagoons can reach groundwater that can, in turn, reach navigable waters. The EPA has regulated CAFOS since the mid-1970s. The EPA regulates both production areas and land-application areas of CAFOs. Production areas include animal confinement areas, manure storage areas including lagoons, raw materials storage areas, and waste containment areas. Land-application areas are fields where manure, litter, and process wastewater are applied as fertilizer.

[**] This summary constitutes no part of the opinion of the court. It has been prepared by court staff for the convenience of the reader.

The panel held that the petitioners' challenge was timely. The parties agreed that petitioners challenged the Idaho Permit within 120 days of the issuance. The panel rejected the EPA's contention that the Permit largely relied on a 2003 Rule and that the petition was therefore untimely.

The panel agreed with petitioners' contention that the Permit lacked sufficient monitoring provisions to ensure compliance with the Permit's "zero discharge" requirements for both production and land-application areas, and therefore, it was arbitrary, capricious, and an abuse of discretion, and not in accordance with the law. The statutory and regulatory framework gives discretion to the EPA in crafting appropriate monitoring requirements for each NPDES permit, but the EPA's discretion is not unlimited.

Concerning production areas, the panel held the Permit had sufficient monitoring requirements for above-ground discharges from production areas. The CAFOs were required to perform daily inspections, and these mandated inspections were, in effect, monitoring requirements. The panel deferred to the EPA's expertise, and held that these provisions were sufficient to ensure compliance with the Permit's zero-discharge effluent limitations from production areas.

The panel held that the Permit had no monitoring provisions for underground discharges from production areas. Without a requirement that CAFOs monitor waste containment structures for underground discharges, there was no way to ensure that production areas comply with the Permit's zero-discharge requirement.

Concerning land-application areas, the panel held that the Idaho Permit flatly prohibited discharges from land-application areas during dry weather. The Permit, however, had no monitoring provisions for dry weather discharges from land-application areas, even though the record before the EPA showed that such discharges can occur during irrigation of fertilized CAFO fields. Without a requirement to monitor runoff from irrigated CAFO fields, there was no way to ensure that a CAFO is complying with the Permit's dry weather no-discharge requirement for land-application areas.

The panel therefore granted the petition and vacated the permit.

COUNSEL

Tyler Lobdell (argued), Staff Attorney, Food & Water Watch, Boise, Idaho; Allison M. LaPlante and Danielle Replogle, Earthrise Law Center, Lewis & Clark Law School, Portland, Oregon; for Petitioners.

Benjamin J. Grillot (argued), Attorney; Eric Grant, Deputy Assistant Attorney General; Jonathan D. Brightbill, Principal Deputy Assistant Attorney General; Environment and Natural Resources Division, United States Department of Justice, Washington, D.C.; Simma Kupchan and CourtneyWeber, Office of General Counsel and Office of Regional Counsel, United States Environmental Protection Agency, Washington, D.C.; for Respondent.

OPINION

W. FLETCHER, Circuit Judge:

The Clean Water Act ("CWA") prohibits the "discharge of any pollutant" by "any person" from any "point source" into the navigable waters of the United States except when the discharge is authorized by a permit issued under the National Pollutant Discharge Elimination System ("NPDES"). 33 U.S.C. §§ 1311(a), 1342. In May 2020, the EPA issued a General NPDES Permit for Concentrated Animal Feeding Operations ("CAFOs") in Idaho (the "Idaho Permit" or "Permit"). Final Reissuance of NPDES General Permit for CAFOs in Idaho, 85 Fed. Reg. 28,624 (May 13, 2020). Two environmental organizations, Food & Water Watch and Snake River Waterkeeper ("Petitioners"), challenge the Permit, contending that its issuance was arbitrary, capricious, and in violation of law because it lacks sufficient monitoring provisions to ensure compliance with its discharge limitations. We agree and grant the petition.

I. Background

Concentrated animal feeding operations house, feed, and raise thousands of animals in confined locations. NPDES Permit Regulation and Effluent Limitation Guidelines and Standards for CAFOs, 68 Fed. Reg. 7,176, 7,179 (Feb. 12, 2003) (codified at 40 C.F.R. Parts 9, 122, 123, and 412) [hereinafter "the 2003 Rule"]. Nationwide, CAFOs generate more than 500 million tons of animal manure annually, which "when improperly managed, can pose substantial risks to the environment and public health." *Id.* In 2008, the EPA estimated that approximately 75 percent of CAFOs discharge pollution into waterways. *See* Revised NPDES Permit

Regulation and Effluent Limitations Guidelines for CAFOs in Response to the *Waterkeeper* Decision, 73 Fed. Reg. 70,418, 70,469 (Nov. 20, 2008) (codified at 40 C.F.R. Parts 9, 122, and 412) [hereinafter "the 2008 Rule"]; *see also* 2003 Rule at 7,181.

CAFOs manage manure by collecting, storing, and treating it, and applying it to fields as fertilizer. Thomas R. Head, *Local Regulation of Animal Feeding Operations: Concerns, Limits, and Options for Southeastern States*, 6 Env't Law. 503, 515–16 (2000). Manure is typically stored in large open-air tanks or anaerobic lagoons. *Id.* at 515. Lagoons pose two serious hazards. First, "even the most well-managed lagoons usually fill to capacity within just two or three years." *Id.* Unless excess liquid is removed, a lagoon will overflow. *Id.* Second, the potential "always exists that lagoons will fail or rupture and pollute surface waters or allow waste to seep into groundwater." *Id.* "[E]ven assuming the lagoons were constructed pursuant to [Natural Resource Conservation Service] standards, these standards specifically allow for permeability and, thus, the lagoons are designed to leak." *Cmty. Ass'n for Restoration of the Env't, Inc. v. Cow Palace, LLC*, 80 F. Supp. 3d 1180, 1223 (E.D. Wash. 2015). Depending on the character of the soil surrounding the lagoon, animal waste leaked from lagoons can reach groundwater that can, in turn, reach navigable waters. CAFOs typically use animal waste as fertilizer for their fields. While application of animal waste can be safe, improper application, rainfall, or irrigation can result in discharges that reach navigable waters.

Because of the significant environmental threats CAFOs pose, the EPA has regulated them since the mid-1970s. *See*

41 Fed. Reg. 11,458 (Mar. 18, 1976); 39 Fed. Reg. 5,704 (Feb. 14, 1974).

A. Statutory Background

The objective of the CWA is to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." 33 U.S.C. § 1251(a). To achieve this objective, the CWA prohibits a point source from discharging pollutants into the "navigable waters of the United States" without an NPDES permit. *Id.* § 1311(a). The CWA defines "discharge of a pollutant" to mean "any addition of any pollutant to navigable waters from any point source." *Id.* § 1362(12). A "point source" is "any discernible, confined and discrete conveyance . . . from which pollutants are or may be discharged." *Id.* § 1362(14).

An NPDES permit limits the amounts and kinds of pollutants that may be discharged from a point source. *See id.* § 1311(a) (making it unlawful for a point source to discharge a pollutant without first obtaining a permit and complying with its terms). Every NPDES permit must set forth "effluent limitations," that is, certain "restriction[s] . . . on [the] quantities, rates, and concentrations of chemical, physical, biological, and other constituents which are discharged from point sources into navigable waters." *Id.* §§ 1311, 1342, 1362(11); *see also S. Fla. Water Mgmt. Dist. v. Miccosukee Tribe of Indians*, 541 U.S. 95, 102 (2004) ("Generally speaking, the NPDES requires dischargers to obtain permits that place limits on the type and quantity of pollutants that can be released into the Nation's waters."). Specific effluent limitations in individual NPDES permits are based on general "effluent limitation guidelines" ("ELGs") promulgated by the EPA. *See EPA v. Cal. ex. rel. State*

Water Res. Control Bd., 426 U.S. 200, 205 (1976) ("An NPDES permit serves to transform generally applicable effluent limitations and other standards including those based on water quality into the obligations . . . of the individual discharger.").

Section 1362(14) of the CWA lists a CAFO as a point source. *Id.* ("The term 'point source' means any discernible, confined and discrete conveyance, including but not limited to any . . . *concentrated animal feeding operation* . . . from which pollutants are or may be discharged.") (emphasis added). Section 1362(14) provides that the term point source "does not include agricultural stormwater discharges and return flows from irrigated agriculture." *Id.*

Because CAFOs are themselves point sources, the EPA has interpreted the stormwater and irrigation discharge exceptions as not applying when such discharges are from a CAFO. For example, the Idaho Permit prohibits dry weather discharges from a CAFO's land application area. Discharges from irrigation return flows are included in the prohibition on dry-weather discharges. *See* Idaho Permit at 10 ("*No Dry Weather Discharge*. There shall be no dry weather discharge of manure, litter, or process wastewater to a water of the United States from a CAFO as a result of the application of manure, litter or process wastewater . . . . *This prohibition includes* discharges . . . through tile drains, ditches or other conveyances, and *irrigation return*." (emphasis added)). Further, while the EPA has partially incorporated the stormwater discharge exception into a CAFO regulation, it has done so as a matter of regulatory discretion rather than statutory compulsion. *See* 40 C.F.R. § 122.23(e) (waiving the requirement for an NPDES permit for stormwater discharges from CAFO fields *if* the CAFO has land applied manure, litter, or process wastewater in accordance with site-specific nutrient management practices). *But see Waterkeeper Alliance, Inc. v. U.S. E.P.A*, 399 F.3d 486, 507 (2d Cir. 2005); *Concerned Area Residents for the Env't v. Southview Farm*, 34 F.3d 114, 121 (2d Cir. 1994).

B. CAFO Regulations

The EPA regulates both production areas and land-application areas of CAFOs. Production areas include animal confinement areas (where animals are confined for feeding or other purposes), manure storage areas including lagoons (where manure and other wastes are collected and stored or treated prior to final disposal), raw materials storage areas (where materials used in feeding operations are stored), and waste containment areas (where wastes other than manure are stored until final use or disposal). 40 C.F.R. § 122.23(b)(8). Land-application areas are fields where manure, litter, and process wastewater are applied as fertilizer. 40 C.F.R. § 122.23(b)(3). Both production and land-application areas are possible sources of discharges of pollutants into navigable waters. *See* 2003 Rule at 7,181.

Animal waste contains a number of pollutants. Pollutants associated with CAFO animal waste include nitrogen and phosphorus; solids, including manure and animal corpses; disease-causing viruses and bacteria including *E. coli*; trace elements such as arsenic; odorous/volatile compounds such as methane, hydrogen sulfide, and ammonia; antibiotics; pesticides; and hormones. *See* NPDES Permit Regulation and Effluent Limitations Guidelines and Standards for CAFOs, 66 Fed. Reg. 2960, 2976–79 (Jan. 12, 2001) [hereinafter "2001 Proposed Rule"]. Pollutants can reach surface water and groundwater in a variety of ways, including overflows and underground leaks from lagoons, and surface runoff from land-application areas. 68 Fed. Reg. at 7,181.

Recognizing the threats CAFOs pose to water quality, the EPA began revising its CAFO regulations in 2001. After a two-year rulemaking process, the EPA promulgated a final Rule in 2003 (the "2003 Rule"). Among other things, the 2003 Rule required a CAFO either to apply for an NPDES permit or to demonstrate that it did not have the potential for discharge. *See* 2003 Rule at 7,181–82. The 2003 Rule also required permittees to develop and implement site-specific nutrient management plans ("NMPs"), and it exempted wet weather discharges under an exemption for agricultural stormwater. *See* 2003 Rule at 7,176. The 2003 Rule did not establish any general groundwater requirements.

The Second Circuit upheld the 2003 Rule's incorporation of the agricultural stormwater exemption into its regulation, as well as the EPA's decision to impose groundwater requirements on a "case-by-case" basis. *See Waterkeeper*, 399 F.3d at 497, 507–09, 515. However, the court held that the Rule was arbitrary, capricious, and contrary to law in failing to require review by the permitting authority of a CAFO's proposed NMP, and in failing to require that the terms of the NMP be included in an issued permit. *Id.* at 498–503. The court also held that, in the absence of actual discharge of a pollutant, the CWA did not authorize the EPA to impose on CAFOs a general "duty to apply" for an NPDES permit. *Id.* at 504–06.

In the wake of *Waterkeeper*, the EPA revised its CAFO regulations in 2008 (the "2008 Rule"). In place of the 2003 Rule's duty to apply, the 2008 Rule required that a CAFO owner or operator apply for a permit only if the CAFO "discharge[d] or propose[d] to discharge" pollutants. 2008 Rule at 70,424. The 2008 Rule provided that, in the event of a discharge, a CAFO could be liable for both the discharge and for the failure to apply for a permit. *Id.* at 70,426–27. However, a CAFO operator could apply for a "certification" that the CAFO would not discharge a pollutant. If a certified CAFO discharged, the CAFO would violate the discharge prohibition, but would not be liable for failing to apply. The 2008 Rule also required that all NPDES permits include a requirement that CAFO operators develop and implement an NMP, and specified that the NMP must be reviewed by the permitting agency and included in the issued permit. *Id.* at 70,440–70,457.

In *National Pork Producers Council v. U.S. E.P.A.*, 635 F.3d 738, 750–53 (5th Cir. 2011), the Fifth Circuit, elaborating on the analysis of *Waterkeeper*, held that a non-certified CAFO could be held liable under the CWA for actual discharges, but could not be held liable for failing to apply for a permit. In response, the EPA again amended its regulations. *See* NPDES Permit Regulation for CAFOs: Removal of Vacated Elements in Response to 2011 Court Decision, 77 Fed. Reg. 44,494 (July 30, 2012).

Under current CAFO regulations, any permit issued to a CAFO must include a requirement to formulate and implement an NMP. 40 C.F.R. § 122.42(e)(1). The NMP must ensure (1) adequate storage of animal waste, (2) proper management of mortalities, (3) that clean water is diverted from the production area, (4) that animals do not interact with clean water; (5) that chemicals and other contaminants are properly disposed of; (6) that site-specific conservation practices are used to control runoff; (7) that proper protocols are used for testing manure, litter, or process wastewater, and soil; and (8) that manure, litter, or process wastewater is land-applied in a manner that ensures appropriate agricultural utilization of the nutrients in the manure, litter, or process wastewater. *Id.* § 122.42(e)(1)(i)–(viii). Additionally, the NMP must include a waste "application rate" that "minimize[s] phosphorus and nitrogen transport from the field to surface waters." *Id.* § 412.4(c)(2).

Current CAFO regulations prohibit the discharge of manure, litter, or process wastewater pollutants into waters of the United States from production areas, unless the discharge is precipitation-related and the production area is designed, constructed, and maintained to contain all manure, litter, and process wastewater, including the runoff and the direct precipitation from a 25-year, 24-hour rainfall event. *Id.* § 412.31(a). The regulations allow wet-weather discharges of manure, litter, or process wastewater from land-application areas if the CAFO has identified and implemented appropriate site-specific measures to minimize discharges. *Id.* §§ 122.23(e), 122.42(e)(1)(vi)–(ix). The regulations do not address dry-weather discharges from land-application areas.

C. The Idaho Permit

Idaho is home to a large and growing number of CAFOs, primarily dairy farms and cattle feed lots in the Snake River watershed in southern Idaho. Improper management of CAFO waste has resulted in serious water quality problems in Idaho. State of Idaho Dep't of Env't Quality, Idaho's 2016 Integrated Report App'x K (2018). Watersheds in CAFO-dominated areas have excessive and unsafe levels of *E. coli*, fecal coliform, and nutrients, as well as low levels of dissolved oxygen, which is essential to healthy aquatic life.

Idaho's 2016 Integrated Report documented 1,989 miles of streams and 471 acres of lakes that were contaminated with *E. coli*, 239 miles of streams and 55,509 acres of lakes that were burdened with excessive nutrients, and 920 miles of streams that contained unsafe levels of fecal coliform. *See id.* at 39–40. Many Idaho waterways that pass through CAFO-dominated areas are classified as "impaired waters" by the EPA. *Id.* App'x H at 89–113 (listing waterways in the Southwest Basin).

Several Idaho waterways in CAFO-dominated areas show levels of *E. coli* that far exceed the Water Quality Criterion geometric mean of 126 cfu/100 mL. *See, e.g.*, *id.* at App'x H at 31 (Hatwai Creek, which borders a CAFO, had elevated levels of *E. coli*, nitrogen/nitrate, and phosphorus); *see also id.* App'x K at 36 (listing *E. coli* levels with a geometric mean of 1,108 cfu/100 mL near Grand View, which houses one of the world's largest CAFOs); *id.* App'x K at 58 (*E. coli* levels of 811 cfu/100 mL in Yahoo Creek, which is adjacent to a number of animal feeding operations); *id.* App'x K at 59 (*E. coli* contamination in Pioneer Reservoir). The leading causes of water impairment in Idaho's streams are "combined biota/habitat bioassessments, temperature, sedimentation/siltation, and *Escherichia coli*." State of Idaho Dep't of Env't Quality, Idaho's 2018/2020 Integrated Report at xiii (2020). "*E. coli* in water is a strong indicator of sewage or animal waste contamination." U.S. Dep't of Interior, Bacteria & *E. Coli* in Water, https://www.usgs.gov/special-topic/water-science-school/science/bacteria-and-e-coli-water?qt-science_center_objects=0#qt-science_center_objects (last visited Aug. 16, 2021).

On October 23, 2019, the EPA issued for public comment a draft Permit and Fact Sheet for Idaho CAFOs. 84 Fed. Reg.

56,809. On May 13, 2020, the EPA issued the Idaho Permit, with an effective date of June 15, 2020. 85 Fed. Reg. 28,624.

With one exception, the Idaho Permit forbids discharges of pollutants from production areas. Pollutants may be discharged from the production area only if "[t]he production area is designed, constructed, operated, and maintained to contain all manure, litter, process wastewater, and the runoff and direct precipitation from the 25-year, 24-hour storm event for the location of the CAFO." CAFOs must perform daily inspections of all water lines, and must perform weekly visual inspections of all storm water diversion devices, runoff diversion structures, devices channeling contaminated storm water, and waste storage structures. All open surface liquid waste storage structures must have a depth marker that clearly indicates the minimum capacity necessary to contain the runoff and direct precipitation of a 25-year, 24-hour rainfall event. The inspection must note the level in liquid impoundments as indicated by the depth marker. Deficiencies found during inspections must be corrected as soon as possible.

Also with one exception, the Permit forbids discharges of pollutants from land-application areas. Wet-weather discharges are permitted only when manure, litter, and process wastewater have been applied in accordance with a site-specific NMP. 40 C.F.R. §§ 122.23(e), 122.42(e)(1)(vi)–(ix). Dry-weather discharges from the land-application area are flatly prohibited. Idaho Permit at 10.

The Permit requires CAFOs to make records available to the EPA upon request. Production area records include documents of all inspections of storage, containment, and treatment structures; the depth of the manure and process wastewater in those structures; and inspections of all stormwater diversions and channel structures. Land-application area records include documentation of the dates of manure, litter, or process wastewater application for each field; the methods of the land application; the results of soil and manure samples; the dates on which the land-application equipment was inspected; and that all setback requirements and conservation practices identified in the NMP were followed.

The Permit also requires CAFOs to submit annual reports by March 1 of each year to the EPA and to relevant state regulatory authorities. If lagoons or other storage structures have overflowed, operators must analyze the discharges for various pollutants, including *E. coli*, nitrogen, nitrate nitrogen, ammonia nitrogen, phosphorus, and suspended solids. Reports must describe, *inter alia*, the quantity of manure, litter, and process wastewater applied to fields, as well as the results of manure and soil sample analyses.

II. Standard of Review

We review general NPDES permits issued by the EPA, such as the Idaho Permit, under Section 509 of the CWA. 33 U.S.C. § 1369(b)(1)(F). Under the Administrative Procedure Act, we must set aside an agency's decision if it is "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law." 5 U.S.C. § 706(2)(A). We must set aside an agency's decision if "the agency has relied on factors which Congress has not intended it to consider, entirely failed to consider an important aspect of the problem, offered an explanation for its decision that runs counter to the evidence before the agency, or is so implausible that it could not be ascribed to a difference in view or the product of agency expertise." *Motor Vehicle Mfrs. Ass'n of U.S., Inc. v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983). The scope of our review is narrow. We may not substitute our judgment for that of the agency. *Id.* However, the agency must "examine the relevant data" and "articulate a satisfactory explanation for its action including a 'rational connection between the facts found and the choice made.'" *Id.* (*quoting Burlington Truck Lines v. United States*, 371 U.S. 156, 168 (1962)).

III. Discussion

A. Timeliness of Petition

Petitions for review of the type of NPDES permit at issue must be filed in a court of appeals within 120 days of the permit's issuance. 33 U.S.C. § 1369(b)(1); *see also Tex. Mun. Power Agency v. Adm'r of U.S. E.P.A.*, 799 F.2d 173, 174 (5th Cir. 1986) (interpreting provision to be jurisdictional). The parties agree that Petitioners challenged the Idaho Permit within 120 days of its issuance. However, the EPA argues that the Permit largely relies on and incorporates the 2003 Rule, and that Petitioners' challenge is therefore untimely.

The EPA relies on the Fifth Circuit's reasoning in *National Pork Producers*, 635 F.3d 738. As described above, after the Second Circuit's decision in *Waterkeeper*, the EPA revised its earlier 2003 Rule and issued a new final rule in 2008. The 2008 Rule changed the NMP's procedural provisions, but did not change the NMP's substantive requirements. *See* 2008 Rule at 70,437 ("[*Waterkeeper*] did not affect the substantive requirements for NMPs established

. . . in the 2003 CAFO rule."). In *National Pork Producers*, petitioners argued that the EPA exceeded its authority in the 2008 Rule by requiring all permit applicants to develop and implement NMP protocols. 635 F.3d at 754. However, because the 2003 Rule had included this requirement, the Fifth Circuit deemed the challenge to the 2008 Rule untimely. *Id.*

By contrast, Petitioners do not challenge any part of the 2003 and 2008 Rules. Rather, they challenge the Idaho Permit, arguing that its requirements for monitoring effluent discharges are insufficient. This challenge is new and specific to the Idaho Permit. The novelty of the challenge is confirmed in the 2003 Rule itself, where the EPA rejected a proposed provision that would have required discharge monitoring by CAFOs. The EPA concluded that "factors affecting whether such discharges are occurring at CAFOs are so variable from site to site that a national technology-based standard is inappropriate." 2003 Rule at 7,216. In the view of the EPA, discharge monitoring was "more appropriately addressed through NPDES permit conditions established by the permitting authority." *Id.* at 7,217; *see also Waterkeeper*, 399 F.3d at 515 ("Studies do show that variability in topography, climate, distance to surface water, and geologic factors influence whether and how pollutant discharges at a particular site enter surface water via groundwater."). Petitioners' challenge is therefore timely.

B. Petitioners' Challenge

An NPDES permit must ensure that discharges comply with effluent limitations in the permit. As stated by the Second Circuit in *Waterkeeper*,

> Under the Act, permits authorizing the discharge of pollutants may issue only where such permits *ensure* that every discharge of pollutants will comply with all applicable effluent limitations and standards.

Waterkeeper, 399 F.3d at 498 (emphasis in original). Petitioners argue that the Permit lacks sufficient monitoring provisions to ensure compliance with the Permit's "zero discharge" requirements, for both production and land-application areas. They argue that the issuance of the Idaho Permit is therefore arbitrary, capricious, an abuse of discretion, and not in accordance with law. For the reasons that follow, we agree with Petitioners.

1. Discharge Monitoring Under the CWA

To ensure that NPDES permittees comply with the effluent limitations contained in their permits, the CWA requires that permits contain "all applicable requirements [including the effluent limitations statutorily required by 33 U.S.C. § 1311]," and "prescribe conditions . . . *to assure compliance with* [all applicable requirements, including effluent limitations]." 33 U.S.C. § 1342(a)(1)–(2) (emphasis added). The CWA "demands regulation in fact, not only in principle." *Waterkeeper*, 399 F.3d at 498.

EPA regulations incorporate the monitoring requirements of the CWA. Under 40 C.F.R. § 122.48(b), permits must specify "[r]equired monitoring including type, intervals, and frequency sufficient to yield data which are representative of the monitored activity including, when appropriate, continuous monitoring[.]" A permit must "assure compliance with [the] permit limitations" by including requirements to monitor the "mass (or other measurement specified in the permit) for each pollutant limited in the permit; the volume of effluent discharged from each outfall; other measurements as appropriate." 40 C.F.R. § 122.44(i)(1)(i)–(iii); *see also* U.S. EPA, NPDES Permit Writers' Manual at 8-2 (Sept. 2010), https://www.epa.gov/sites/default/files/2015-09/documents/pwm_2010.pdf ("Monitoring is performed to determine compliance with effluent limitations established in NPDES permits, establish a basis for enforcement actions, assess treatment efficiency, characterize effluents and characterize receiving water.").

This statutory and regulatory framework gives discretion to the EPA in crafting appropriate monitoring requirements for each NPDES permit. However, the EPA's discretion is not unlimited. While 40 C.F.R. § 122.44(i) contemplates that the EPA has discretion to decide which monitoring requirements to include in an NPDES permit, 40 C.F.R. § 122.48(b) specifies that a permit must contain monitoring provisions "sufficient to yield [representative] data." *See NLRB v. Brown*, 380 U.S. 278, 291 (1965) ("Reviewing courts are not obliged to stand aside and rubberstamp their affirmance of administrative decisions that they deem inconsistent with a statutory mandate or that frustrate the congressional policy underlying a statute."); *Buffalo Crushed Stone, Inc. v. Surface Transp. Bd.*, 194 F.3d 125, 128–29 (D.C. Cir. 1999) ("[D]eference is not without limit. We will reject an agency's interpretation if an alternative reading is compelled by the regulation's plain language . . . ." (quotation marks and citation omitted)).

Our case law confirms that NPDES permits must contain monitoring provisions sufficient to ensure compliance with the terms of a permit. For example, in *NRDC v. County of*

Los Angeles, 725 F.3d 1194, 1207 (9th Cir. 2013), we held that an NPDES permit is "unlawful if a permittee is not required to effectively monitor its permit compliance." We concluded that the CWA "*requires* every NPDES permittee to monitor its discharges into the navigable waters of the United States in a manner sufficient to determine whether it is in compliance with the relevant NPDES permit." *Id.* at 1207 (emphasis in original) (citing 33 U.S.C. § 1342(a)(2); 40 C.F.R. § 122.44(i)(1)); *see also NRDC v. U.S. EPA*, 863 F.2d 1420, 1433–34 (9th Cir. 1988) (finding EPA acted reasonably by using visual sheen test because it monitored compliance with the permit's prohibition on the discharge of free oil).

Similarly, in *NRDC v. U.S. EPA*, 808 F.3d 556, 583–84 (2d Cir. 2015), the Second Circuit rejected an NPDES permit because it lacked monitoring provisions. The EPA had issued a general permit for the discharge of ballast waters from vessels. *Id.* at 583. The permit required vessels to report the expected dates, times, locations, volumes, and salinities of its discharges. *Id.* But the required reports provided little information on the quality of the ballast water. *Id.* Because the reports did not reveal whether a vessel was actually in compliance with the effluent limitations, the permit violated the statutory command that NPDES permits include monitoring sufficient to ensure compliance with applicable effluent limitations. *Id.*

Issuance of an NPDES permit is thus arbitrary, capricious, and contrary to law if the permit fails to include monitoring provisions that ensure compliance with the permit's effluent limitations. As we have previously recognized, "[t]he NPDES program fundamentally relies on self-monitoring." *Sierra Club v. Union Oil Co. of Cal.*, 813 F.2d 1480, 1491

(9th Cir. 1987), *vacated and remanded on other grounds*, 485 U.S. 931 (1988), *and reinstated and amended by* 853 F.2d 667 (9th Cir. 1988). Effective self-monitoring reveals permit violations, thereby promoting enforcement of the CWA. *See id.* at 1492; *see also County of Los Angeles*, 725 F.3d at 1208 ("The [Act] is viewed by many as the easiest of the federal environmental statutes to enforce. This is because persons regulated under the act normally must report their own compliance and noncompliance to the regulating agency." (quotation marks and citation omitted)).

2. Monitoring Under the Idaho Permit

The EPA does not quarrel with the foregoing. It concedes that a permit must contain sufficient monitoring requirements to ensure that a CAFO complies with the effluent limitations in its permit. However, the EPA argues that the Idaho Permit contains sufficient monitoring requirements to ensure compliance, and that we must defer to its expertise.

As described above, the Idaho Permit requires CAFO operators to implement various measures to prevent discharges from the production and land-application areas. Petitioners argue the Permit does not require monitoring that would ensure detection of unpermitted discharges. We agree with Petitioners.

a. Production Areas

The Permit has sufficient monitoring requirements for above-ground discharges from production areas. As noted above, CAFOs are required to perform daily inspections of water lines, and weekly inspections of storm water diversion devices, runoff diversion structures, devices channeling contaminated storm water, and waste storage containers. These mandated inspections are, in effect, monitoring requirements. We defer to the EPA's expertise and hold that these provisions are sufficient to ensure compliance with the Permit's zero-discharge effluent limitation from production areas. For example, the visual inspection of a waste container's depth marker ensures that containers maintain enough space to handle any excess water, thereby preventing runoff in all but the extreme circumstance of a 25-year, 24-hour rainfall event. *See NRDC*, 863 F.2d at 1433–34 (visual inspections that identify whether effluent limitation is met are reasonable).

However, the Permit has no monitoring provisions for underground discharges from production areas. The record before the EPA showed that leaky containment structures—especially lagoons—are sources of groundwater pollution and that "groundwater flow is the primary contributor of nitrate to surface water from agriculture." *See Cow Palace, LLC*, 80 F. Supp. 3d at 1223. Despite this, the Idaho Permit has no monitoring requirement for underground discharges. The failure of the Permit to require such monitoring is striking, given the EPA's conclusion in the 2003 Rule that requirements in local permits rather than nationally uniform requirements are the best means to address underground discharges. In rejecting a proposal that monitoring of underground discharges be included in the nationwide 2003 Rule, the EPA wrote:

> The proposed rule *would have imposed explicit national requirements for certain CAFOs to address possible discharges to surface water via ground waters that have a direct hydrologic connection to surface*

> *waters*. These operations would have been required to sample groundwaters. . . .
>
> In today's effluent limitation guidelines, EPA is rejecting establishing requirements related to discharges to surface water that occur via ground water with a direct hydrologic connection.
>
> Pollutant discharges from CAFOs to surface water via a groundwater pathway are highly dependent on site-specific variables, such as topography, climate, distance to surface water, and geologic factors such as depth of groundwater, soil porosity and permeability, and subsurface structure. The factors affecting whether such discharges are occurring at CAFOs are so variable from site to site that a national technology-based standard is inappropriate.

2003 Rule at 7,216 (emphasis added); *see also Waterkeeper*, 399 F.3d at 515 ("Studies do show that variability in topography, climate, distance to surface water, and geologic factors influence whether and how pollutant discharges at a particular site enter surface water via groundwater.").

The CWA requires that the EPA ensure that every NPDES permittee "monitor its discharges . . . in a manner sufficient to determine whether it is in compliance with the relevant NPDES permit." *County of Los Angeles*, 725 F.3d at 1207. With one exception not relevant here, the Idaho Permit does not allow *any* discharges from the production area. Without a requirement that CAFOs monitor waste containment structures for underground discharges, there is no way to ensure that production areas comply with the Permit's zero-discharge requirement. *See Waterkeeper*, 399 F.3d at 499 (failure of permit to include any mechanism for evaluating compliance with effluent limitation was arbitrary and capricious).

b. Land-Application Areas

As noted above, CAFO regulations allow discharges from CAFO land-application areas during wet weather, provided the CAFO has complied with its NMP. *See* 40 C.F.R. § 122.23(e) ("[W]here the manure, litter or process wastewater has been applied in accordance with site specific nutrient management practices . . . a precipitation-related discharge of manure, litter or process wastewater from land areas under the control of a CAFO is an agricultural stormwater discharge."). However, the Idaho Permit flatly prohibits discharges from land-application areas during dry weather:

> There shall be no dry weather discharge of manure, litter, or process wastewater to a water of the United States from a CAFO as a result of the application of manure, litter or process wastewater to land areas under the control of the CAFO. This prohibition includes discharges to waters of the United States through tile drains, ditches or other conveyances, and irrigation return.

The Permit has no monitoring provisions for dry weather discharges from land-application areas, even though the record before the EPA showed that such discharges can occur during irrigation of fertilized CAFO fields. The Permit assumes that because the NMP requires CAFOs to apply manure, litter, and process wastewater at the agronomic rates established by the NMP, irrigation-produced runoff of pollutants will never occur. There is little in the record to support that assumption. Without a requirement to monitor runoff from irrigated CAFO fields, there is no way to ensure that a CAFO is complying with the Permit's dry weather no-discharge requirement for land-application areas. *See Cnty. of L.A.*, 725 F.3d at 1207 (holding that an NPDES permit must include compliance monitoring measures).

Conclusion

The Idaho Permit forbids underground discharges from production areas and dry weather discharges from land-application areas. However, the Permit contains no monitoring requirements for either kind of discharge. Because the Permit does not require monitoring that would ensure compliance with its effluent limitations, the EPA's issuance of the Permit was arbitrary, capricious, and a violation of law. We grant the petition and vacate the Permit.

Petition **GRANTED** and Permit **VACATED.**

Bacteria and E. Coli in Water

Water, like everything else on Earth, including you, is full of bacteria. Some bacteria are beneficial and some are not. *Escherichia coli* (*E. coli*) bacteria, found in the digestive tract of animals, can get into the environment, and if contacted by people, can cause health problems and sickness. Find out the details here.

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Escherichia coli *or* E. coli *is a type fecal coliform bacteria that is commonly found in the intestines of animals and humans.* E. coli *in water is a strong indicator of sewage or animal waste contamination. Sewage and animal waste can contain many types of disease causing organisms. Consumption may result in severe illness; children under five years of age, those with compromised immune systems, and the elderly are particularly susceptible.*

Credit: U.S. Environmental Protection Agency

Bacteria are common single-celled organisms and are a natural component of **lakes, rivers, and streams**. Most of these bacteria are harmless to humans; however, certain bacteria, some of which normally inhabit the intestinal tract of warm-blooded animals, have the potential to cause sickness and disease in humans. High numbers of these harmless bacteria often indicate high numbers of harmful bacteria as well as other disease-causing organisms such as viruses and protozoans.

One method of determining bacteria counts is to count the number of bacteria colonies that grow on a prepared medium.

Escherichia coli (abbreviated as *E. coli*) are bacteria found in the environment, foods, and intestines of people and animals. *E. coli* are a large and diverse group of bacteria. Although most strains of *E. coli* are harmless, others can make you sick. Some kinds of *E. coli* can cause diarrhea, while others cause urinary tract infections, respiratory illness and pneumonia, and other illnesses.

Total coliform

Total coliforms are gram-negative, aerobic or faculative anaerobic, nonspore forming rods. These bacteria were originally believed to indicate the presence of fecal contamination, however total coliforms have been found to be widely distributed in nature and not always associated with the gastrointestinal tract of warm blooded animals. The number of total coliform bacteria in the environment is still widely used as an indicator for potable water in the U.S.

Fecal coliform

Fecal coliform bacteria are a subgroup of coliform bacteria that were used to establish the first microbial water quality criteria. The ability to grow at an elevated temperature (44.5 degrees Celsius) separate this bacteria from the total coliforms and make it a more accurate indicator of fecal contamination by warm-blooded animals. Fecal- coliform bacteria are detected by counting the dark-blue to blue-grey colonies that grow on a 0.65 micron filters placed on mFC agar incubated in a 44.5° C oven for 22-24 hours. The presence of fecal coliforms in water indicates that fecal contamination of the water by a warm-blooded animal has occurred, however, recent studies have found no statistical relationship between fecal coliform concentrations and swimmer-associated sickness.

E. coli

Escherichia coli (*E. coli*) is a rod-shaped bacteria commonly found in the gastrointestinal tract and feces of warm-blooded animals. It is a member of the fecal coliform group of bacteria and is distinguished by its inability to break down urease. *E. coli* numbers in freshwater are determined by counting the number of yellow and yellow brown colonies growing on a 0.45 micron filter placed on m-TEC media and incubated at 35.0° C for 22-24 hours. The addition of urea substrate confirms that colonies are *E. coli*. This bacteria is a preferred indicator for freshwater recreation and its presence provides direct evidence of fecal contamination from warm-blooded animals. Although usually harmless, *E. coli* can cause illnesses such as meningitis, septicemia, urinary tract, and intestinal infections. A recently discovered strain of *E. coli* (*E. coli* 0157:H7) can cause severe disease and may be fatal in small children and the elderly.

The relation between bacteria counts and sickness

Consumption of or contact with water contaminated with feces of warm-blooded animals can cause a variety of illnesses. Minor gastrointestinal discomfort is probably the most common symptom; however, pathogens that may cause only minor sickness in some people may cause serious conditions or death in others, especially in the very young, old, or those with weakened immunological systems.

U.S. Environmental Protection Agency

NPDES Permit Writers' Manual

U.S. Environmental Protection Agency
Office of Wastewater Management, Water Permits Division
State and Regional Branch

EPA-833-K-10-001 • September 2010

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United States
Environmental Protection
Agency

Office of Water
Washington, DC

United States Environmental Protection Agency

National Pollutant Discharge Elimination System (NPDES) Permit Writers' Manual

This guidance was developed by staff within the U.S. Environmental Protection Agency's (EPA's) Office of Wastewater Management and addresses development of wastewater discharge permits under the National Pollutant Discharge Elimination System (NPDES). NPDES permit development is governed by existing requirements of the Clean Water Act (CWA) and the EPA NPDES implementing regulations. CWA provisions and regulations contain legally binding requirements. This document does not substitute for those provisions or regulations. Recommendations in this guidance are not binding; the permitting authority may consider other approaches consistent with the CWA and EPA regulations. When EPA makes a permitting decision, it will make each decision on a case-by-case basis and will be guided by the applicable requirements of the CWA and implementing regulations, taking into account comments and information presented at that time by interested persons regarding the appropriateness of applying these recommendations to the situation. This guidance incorporates, and does not modify, existing EPA policy and guidance on developing NPDES permits. EPA may change this guidance in the future.

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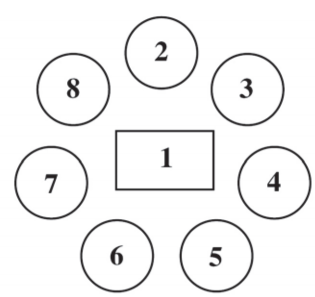
5. Incidental Vessel Discharges—Smithsonian Environmental Research Center, National Ballast Information Clearinghouse
6. Non-Municipal (Industrial)—EPA
7. Construction Stormwater—Barry Tonning, Tetra Tech, Inc.
8. Combined Sewer Overflow—EPA



Contents

Exhibits

Introduction to the Manual

This manual reviews the statutory and regulatory framework of the National Pollutant Discharge Elimination System (NPDES) program and examines technical considerations for developing NPDES permits for wastewater discharges. The manual is designed, primarily, for new permit writers becoming acquainted with the NPDES program and the process of permit writing, but can also serve as a reference for experienced permit writers or anyone interested in learning about the legal and technical aspects of developing NPDES permits. This manual replaces the *1996 U.S. EPA NPDES Permit Writers' Manual*[1] <www.epa.gov/npdes/pubs/owm0243.pdf>, which updated the *1993 Training Manual for NPDES Permit Writers*[2] <www.epa.gov/npdes/pubs/owm0339.pdf>.

To assist the reader, acronyms and abbreviations are defined for the first use in each chapter and in Appendix A of the manual. Endnotes are provided at the end of each chapter.

Purpose of this Manual

The purpose of this *NPDES Permit Writers' Manual* (manual) is to provide a general reference for permitting authorities that outlines and explains the core elements of the NPDES permit program. The core elements form the foundation of the NPDES program on which guidance for specific areas of the program (e.g., stormwater, concentrated animal feeding operations) can be built. While the guidance for these core program areas will be applicable in many cases, the U.S. Environmental Protection Agency (EPA) recognizes that each EPA Regional Office or authorized state, territory, or tribe (hereafter *state*) will tailor specific aspects of its NPDES permitting procedures to address state and local laws and site-specific concerns and conditions.

The specific objectives and functions of this manual are as follows:

- Provide an overview of the scope and the statutory and regulatory framework of the NPDES program.
- Describe the essential components of a permit and provide an overview of the permitting process.
- Describe the different types of effluent limitations and the legal and technical considerations involved in developing effluent limitations.
- Describe the legal and technical considerations involved in developing other permit conditions including
  - Monitoring and reporting requirements.
  - Special conditions.
  - Standard conditions.
- Describe other permitting considerations including
  - Variances.
  - Anti-backsliding.
  - Other applicable statutes.

- Explain the administrative process for issuing, modifying, revoking and terminating NPDES permits.

This manual is not intended to be a standalone reference document. Rather, it establishes the framework for NPDES permit development and should be supplemented, where necessary, by additional EPA and state regulations, policy, and detailed guidance applicable to specific types of dischargers and circumstances. To that end, this manual identifies and references relevant regulations, policy, and other guidance documents throughout the text.

Publications Referenced

This manual provides links to publications available online that supplement the information in the manual. All documents available electronically were accessed and available as of the date of this manual's publication. Some documents are not available in an electronic format. In those instances, readers should check the following sources to determine the availability of and to obtain printed copies of the documents:

- Office of Water Resource Center (OWRC) <www.epa.gov/safewater/resource/>
  OWRC is a contractor-operated facility providing document delivery, information/referral, and reference services to public users and EPA staff interested in Office of Water Program information
  phone: 202-566-1729 or 800-832-7828, fax: 202-566-1736, e-mail:
  <center.water-resource@epa.gov>.
- EPA Library Services and Repositories <www.epa.gov/natlibra/libraries.htm>
  EPA's library services and repositories provide access to information about the environment and related scientific, technical, management, and policy information. Library services <www.epa.gov/natlibra/library_services.html> are delivered through the National Library Network <www.epa.gov/natlibra/index.html>.
- National Service Center for Environmental Publications (NSCEP) <www.epa.gov/ncepihom/>
  NSCEP, formerly NCEPI, maintains and distributes EPA publications in hardcopy, CD ROM and other multimedia formats. The publication inventory includes more than 7,000 titles
  phone: 513-489-8190 or 800-490-9198, fax: 513-489-8695, e-mail: ncepimal@one.net.
- National Technical Information Service (NTIS) <www.ntis.gov/>
  NTIS is the largest central resource for government-funded scientific, technical, engineering, and business related information covering more than 350 subject areas from more than 200 federal agencies
  phone: 703-605-6050 or 888-584-8332, fax: 703-605-6900, e-mail: customerservice@ntis.gov.

Legislative and Regulatory Citations

There are a number of different conventions used to cite legislation and regulations. In this manual, the following conventions have been used:

- When citing the *United States Code*, the abbreviation U.S.C. is used. The abbreviation is preceded by the Title of the U.S.C. and then followed by the section number.
  Example: 16 U.S.C. 1531 *et seq*. and 33 U.S.C. §§ 1251-1387.

- When citing the Clean Water Act, the abbreviation CWA is used. The abbreviation is followed by the word *section* and then the section number.
  Example: CWA section 402 and CWA section 402(o).
- When citing the *Code of Federal Regulations* (CFR), the convention depends on the location of the reference. For first references, the abbreviation CFR is preceded by the title number of the CFR and followed either by the word *Part* (if it is a part—a whole number) or the number of the subsection (if it is a subpart/subsection). For subsequent references, the title and CFR are omitted and just the word *Part* or the section symbol (§) is used.
  Example: First citation: 40 CFR Part 136 or 40 CFR 122.44
  Subsequent citations: Part 136 or § 122.44.

Almost all the regulatory citations in this manual are for Title 40 of the CFR (with the exception of the other federal laws referenced in section 11.1 of this manual). Any other Titles are explicitly referenced and in the format for the first regulatory citation (e.g., 50 CFR Part 402).

Electronic NPDES Information

Websites and electronically stored publications and data are available to help permit writers draft NPDES permits. Tools have been created to assist permit writers with specific aspects of permit development and are discussed in their respective sections. The electronic tools listed below apply to all aspects of permit development and serve as valuable references for the permit writer.

NPDES Website and Resources

The Water Permits Division (WPD) within the EPA Office of Water (OW), Office of Wastewater Management, has developed a comprehensive NPDES Website <www.epa.gov/npdes> with technical and regulatory information about the NPDES permit program, information on related programs and initiatives, and documents published by WPD. Where applicable, this manual references the NPDES Website and provides links to relevant documents on that site. This manual also references other EPA and non-EPA websites that contain information that might be helpful to NPDES permit writers. Note, however, that EPA is not responsible for information provided on websites outside the EPA Website <www.epa.gov>.

WPD also has prepared several websites and other resources to help permit writers draft permits. This manual references those websites and resources in the appropriate section of this manual.

Electronic Permitting Tools

Many EPA Regions and authorized states have developed tools to help them manage the permit issuance process. Electronic permitting tools range from spreadsheets and word processing applications to sophisticated Web-based systems that enable permitting authorities to manage their entire environmental program. For example, some states have built systems that enable dischargers to electronically sign and submit discharge reports; create, track, and store permit documents; and manage enforcement, compliance, and inspections related to permits. As technologies continue to evolve, many permitting authorities are likely to begin using more information technology applications to manage the process of permitting.

ICIS-NPDES

Together with OW, the Office of Enforcement and Compliance Assurance (OECA) is responsible for oversight of implementation of the NPDES program. OW is responsible for the NPDES implementing regulations and oversight of permit issuance by states and EPA Regions. OECA, along with its regional, state, tribal and local counterparts, is responsible for tracking and maintaining enforcement and compliance activities, monitoring and enforcement and compliance status of the regulated community, and reviewing and evaluating program performance. OECA also maintains national data systems to support program management and oversight of the NPDES program.

The Permit Compliance System (PCS), one of two national NPDES electronic databases, supports the management and oversight of the NPDES program. Since the last modernization of PCS in 1985, the NPDES program has evolved significantly to include additional program requirements, such as the NPDES program for stormwater and implementation of the Combined Sewer Overflow Control Policy. Because of limitations to PCS, OECA is working to phase out this system and move to a more modern data management system described below.

The Integrated Compliance Information System for NPDES permits (ICIS-NPDES) <https://icis.epa.gov/icis>, the successor to PCS, provides an updated system that enables national program management and oversight activities such as

- Permit tracking and management.
- Compliance monitoring.
- NPDES program management.
- Enforcement actions.

ICIS-NPDES is a Web-based system with an electronic database capable of handling the large amount of data generated by and about the NPDES program. Section 11.5.1.1 of this manual provides more information on ICIS-NPDES as it relates to NPDES permit compliance.

Hyperlinks in this Document

Where a website provides supplementary information or is referenced in this manual, the actual site or higher level site address appears in the symbols < > so that readers will have a reference to the address even in a printed version of this document. In the electronic version of the manual, the text in carats is also the hyperlink to the referenced website. Care has been taken to provide the correct Web addresses and hyperlinks; however, these references can change or become outdated after this manual's publication.

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[1] U.S. Environmental Protection Agency. 1996. *U.S. EPA NPDES Permit Writers' Manual*. EPA-833-B-96-003. U.S. Environmental Protection Agency, Office of Water, Washington, DC. <www.epa.gov/npdes/pubs/owm0243.pdf>. Separate sections of this document are also available on the NPDES Website by going to <www.epa.gov/npdes>, clicking on Publications and entering NPDES Permit Writers' Manual in the Search box.

[2] U.S. Environmental Protection Agency. 1993. *Training Manual for NPDES Permit Writers*. EPA-833-B-93-003. U.S. Environmental Protection Agency, Office of Wastewater Management, Washington, DC. <www.epa.gov/npdes/pubs/owm0339.pdf>.

CHAPTER 1. Development of the Clean Water Act and the NPDES Program

This chapter presents an overview of the history of water pollution control in the United States and the evolution and accomplishments of the National Pollutant Discharge Elimination System (NPDES) Program.

1.1 History of Water Pollution Control in the United States

Major water pollution control legislation in the United States dates back to the end of the 19th century. Exhibit 1-1 presents a summary of key legislative and executive actions in the history of clean water program development in the United States.

Exhibit 1-1 Important milestones of clean water program development

1899 Rivers and Harbors Act
1948 Federal Water Pollution Control Act (FWPCA)
1965 Water Quality Act
1970 Executive Order–U.S. Environmental Protection Agency (EPA) established
1970 Refuse Act Permit Program (RAPP)
1972 FWPCA Amendments
1977 Clean Water Act (CWA)
1987 Water Quality Act (WQA)

The first major water pollution control statute was the **1899 Rivers and Harbors Act**, which established permit requirements to prevent unauthorized obstruction or alteration of any navigable water of the United States. That act focused on navigation rather than water quality.

The **1948 Federal Water Pollution Control Act (FWPCA)** initiated the federal government's involvement in water pollution control for public health protection. The act allotted funds to state and local governments for water pollution control and emphasized the states' role in controlling and protecting water resources with few federal limitations or guidelines. The act, however, did charge the U.S. Surgeon General with developing comprehensive programs to eliminate or reduce the pollution of interstate waters.

Over the next two decades, Congress became increasingly interested in the problem of water quality degradation. From 1956 through 1966, it enacted four major laws to strengthen the federal role in water pollution control, including the FWPCA Amendments of 1956 and the FWPCA Amendments of 1961. Those statutes focused primarily on providing funding to municipalities to construct wastewater treatment plants.

Just a few years later, Congress further strengthened federal water pollution control laws by enacting the **1965 Water Quality Act**. This law created the Federal Water Pollution Control Administration and represented a major regulatory advancement in water pollution control by requiring states to develop water quality standards for interstate waters by 1967. The Water Quality Act also called for states to quantify the amount of pollutants that each discharger could release without exceeding the water quality standards (i.e., pollutant loadings). Despite escalating public concern and increased public spending, only about half of the states developed water quality standards by 1971. Furthermore, enforcement of the federal statute was minimal because the regulatory agencies had to demonstrate a direct link between a discharge and a health or water quality problem, and the scientific data to make such demonstrations were often lacking. Finally, there were no criminal or civil penalties for violations of statutory requirements.

Growing concern about the environment prompted President Nixon to form the **U.S. Environmental Protection Agency (EPA**) in 1970 to enforce environmental compliance and consolidate federal pollution control activities. That year, the President also created the **Refuse Act Permit Program (RAPP)** through Executive Order 11574 and under the authority of section 13 of the 1899 Rivers and Harbors Act (a section also known as the Refuse Act). This new permitting program was focused on controlling industrial water pollution. EPA and the U.S. Army Corps of Engineers (Corps) would prepare the program requirements and the Corps would administer the program. EPA was tasked with developing *guidelines on effluent quality* for 22 different categories of sources. A discharger would apply for a permit, and the Corps would ask EPA if the proposed effluent levels were consonant with state water quality standards and with the newly developed guidelines on effluent quality. States would be asked to examine permit applications and advise EPA whether existing or proposed treatment processes would ensure that established water quality standards would be met. EPA would review the state's response for interstate waters and instruct the Corps whether to issue the permit. However, the U.S. District Court for the District of Columbia struck down RAPP (*Kalur v. Resor*, Civ. Action No. 1331-71 [D.D.C. Dec. 21, 1971]) because the program would allow the issuance of permits to discharge refuse to non-navigable tributaries of navigable waterways, which the Court said exceeded the authority given in the Act, and because the regulations implementing the program did not require compliance with certain procedural requirements of the National Environmental Policy Act.

Because of the perceived need for a discharge permit program, and to rectify the problems encountered in earlier water pollution control legislation, Congress enacted the **FWPCA Amendments of 1972**. This legislation, which was passed over a Presidential veto in November 1972, provided a comprehensive re-codification and revision of past federal water pollution control law. The 1972 amendments marked a distinct change in the philosophy of water pollution control in the United States and marked the beginning of the present water programs, including the NPDES permit program. Under those amendments, the federal government assumed a major role in directing and defining water pollution control programs. In establishing the basis for clean water programs, Congress sought a balance between economics (considering both the costs and benefits of cleanup) and ecology (setting deadlines and ambitious requirements for reducing discharges and restoring water quality).

The FWPCA Amendments of 1972 established a series of goals in section 101. Perhaps the most notable goal was that the discharge of pollutants into navigable waters be eliminated by 1985. Although that goal remains unmet, it underlies the CWA approach to establishing the technology standards that are implemented through technology-based effluent limitations (TBELs) in NPDES permits. The FWPCA Amendments of 1972 also set an interim goal of achieving, "water quality [that] provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water" by July 1, 1983. That goal is commonly referred to as the *fishable, swimmable* goal of the act and is one of the factors that states must consider in the development of their water quality standards. The water quality standards are implemented in NPDES permits through water quality-based effluent limitations (WQBELs). By prohibiting the discharge of a pollutant or pollutants from a point source to waters of the United States—except as in compliance with the statute, the FWPCA Amendments of 1972 also established the important principle that the discharge of pollutants to navigable waters is not a right.

Since 1972, the FWPCA has been further amended on several occasions, including the **1977 Clean Water Act** (CWA), which is now the name for the statute, and the **1987 Water Quality Act** (WQA). Both of these statutes are discussed further in section 1.2 below with regard to their impact on the evolution of the NPDES program. Exhibit B-1, Index to Sections of the CWA, in Appendix B of this document matches the key sections of the CWA to their appropriate reference in the *United States Code* (U.S.C.). This information is at U.S.C., Title 33 (Navigation and Navigable Waters), Chapter 26 (Water Pollution Prevention and Control), 1251-1387 (33 U.S.C. §§ 1251-1387) <www.epa.gov/lawsregs/laws/cwa.html>.

1.2 Evolution of the NPDES Program

Section 402 of Title IV of the FWPCA, Permits and Licenses, created today's system for permitting wastewater discharges, known as the NPDES program. Under the requirements of the program, a point source may be authorized to discharge pollutants into waters of the United States by obtaining a permit. Section 1.3 below discusses this basic statutory framework in detail. A permit provides two types of control: technology-based limitations (based on the technological and economic ability of dischargers in the same category to control the discharge of pollutants in wastewater) and water quality-based limitations (to protect the quality of the specific waterbody receiving the discharge).

The FWPCA Amendments of 1972 established several important requirements and deadlines. Municipal facilities were required to meet secondary treatment standards by July 1, 1977. Industrial facilities were required to meet two levels of technology standards: *Best Practicable Control Technology Currently Available* (BPT) and *Best Available Technology Economically Achievable* (BAT), which would bring them further toward the goal of eliminating the discharge of all pollutants. [CWA section 301 (b)(2)(A)]. Compliance deadlines for BPT and BAT were established as of July 1, 1977, and July 1, 1983, respectively.

In addition to BPT and BAT requirements for industrial categories, the 1972 FWPCA Amendments established *new source performance standards* (NSPS) or best available demonstrated control technology including where practicable a standard permitting no discharge of pollutants [CWA section 306(a)]. The Legislative History indicates that Congress believed that technologies would be more affordable for new dischargers who could plan control technologies at the design phase. The standards represent state-of-the-art control technologies for new sources because the permittees have the opportunity to install the most efficient production processes and the latest in treatment technologies during construction. NSPS are effective on the date the facility begins operation, and the facility must demonstrate compliance within 90 days of start-up.

EPA tried to set national, uniform effluent limitations guidelines and standards (effluent guidelines) as a basis for technology-based limitations; however, most effluent guidelines were not in place when the first set of permits was issued between 1973 and 1976. About 75 percent of the first round permits were issued under a section of the act that allows a permit writer to use his or her best professional judgment to establish case-by-case limitations. Using that approach, a single permit writer developed effluent limitations for a specific facility using his or her knowledge of the industry and the specific discharge, rather than using a set of national standards and limitations developed by EPA for the entire industry.

This first round of permitting focused on *conventional pollutants*, which generally are found in sanitary waste from households, businesses, and industries. CWA section 304(a)(4) and Title 40 of the *Code of Federal Regulations* (CFR) 401.16 designate the conventional pollutants with oil and grease added to § 401.16 in 1979. The following are formally designated as conventional pollutants:

- Five-day Biochemical Oxygen Demand (BOD_5).
- Total Suspended Solids (TSS).
- pH.
- Fecal Coliform.
- Oil and Grease.

The 1972 FWPCA Amendments, however, also required that EPA publish a list of toxic pollutants within 90 days and propose effluent standards for those pollutants 6 months later. EPA was not able to meet those requirements because of the lack of information on treatability. The Natural Resources Defense Council (NRDC) sued EPA, resulting in a court supervised *consent decree* (*NRDC et al. v. Train, 8 E.R.C. 2120*, DDC 1976) that identified the following:

- Toxic (priority) pollutants to be controlled.
- Primary industries for technology-based control.
- Methods for regulating toxic discharges through the authorities of the FWPCA Amendments.

The provisions of the consent decree were incorporated into the framework of the 1977 FWPCA Amendments, formally known as the CWA. This statute shifted the emphasis of the NPDES program from controlling conventional pollutants to controlling toxic pollutant discharges. CWA section 307(a)(1) required EPA to publish a list of toxic pollutants or combination of pollutants. Those pollutants often are called the priority pollutants and are listed in § 401.15. The terms *toxic pollutant* and *priority pollutant* are used interchangeably throughout this document.

CWA section 307(a) originally identified 65 toxic pollutants and classes of pollutants for 21 major categories of industries (known as *primary industries*). That list was later further defined as the current list of 126 toxic pollutants. The priority pollutants are listed in Appendix C of this document and in Appendix A of Part 423. Note that the list goes up to 129; however, there are only 126 priority pollutants because 017, 049, and 050 were deleted.

The 1977 CWA adjusted technology standards to reflect the shift toward control of toxics, clarified and expanded the concept of BAT controls, created a new level of control for conventional pollutants, and made changes to strengthen the industrial pretreatment program. The 1977 law created a new pollutant category, nonconventional pollutants, that included pollutants (such as chlorine and ammonia) not specifically categorized as conventional or toxic. The CWA clarified that BAT covers both toxic and nonconventional pollutants, extended the compliance deadline for BAT for toxic pollutants to July 1, 1984, established a three-year deadline for compliance with BAT for newly listed toxics, and gave industries until as late as July 1, 1987 to meet BAT requirements for nonconventional pollutants. In addition, conventional pollutants, controlled by BPT and BAT in the first round of permitting, were now subject to a new level of control termed *Best Conventional Pollutant Control Technology* (BCT). The CWA established a compliance deadline for BCT of July 1, 1984. BCT was not an additional performance standard, but replaced BAT for the control of conventional pollutants. Finally, among other changes, the 1977 CWA authorized EPA to approve local pretreatment programs and required authorized states to modify their programs to provide for local pretreatment program oversight.

The 1977 CWA recognized that the technology-based limitations were not able to prevent the discharge of toxic substances in toxic amounts in all waterways. To complement its work on technology-based limitations, EPA initiated a national policy in February 1984 to control toxics using a water quality approach. On February 4, 1987, Congress amended the CWA with the 1987 WQA that outlined a strategy to accomplish the goal of meeting state water quality standards. The 1987 WQA required all states to identify waters that were not expected to meet water quality standards after technology-based controls on point source were imposed. Each state then had to prepare individual control strategies to reduce toxics from point and nonpoint sources to meet the water quality standards. Among other measures, those plans were expected to address control of pollutants beyond technology-based levels.

The 1987 WQA further extended the compliance deadline for BAT- and BCT-based effluent limitations, this time to a new deadline of March 31, 1989. The 1987 WQA also established new schedules for issuing NPDES permits to industrial and municipal stormwater dischargers. In addition to meeting water quality-based standards, industrial stormwater discharges must meet the equivalent of BAT and BCT effluent quality standards. *Municipal separate storm sewer systems* (MS4s) were required to have controls to reduce pollutant discharges to the *maximum extent practicable* (MEP), including management practices, control techniques and system design and engineering methods, and such other provisions as the Administrator deems appropriate for the control of such pollutants [CWA section 402(p)(3)(B)]. The 1987 WQA also required EPA to identify toxics in sewage sludge and establish numeric limitations to control such toxics. A statutory *anti-backsliding* requirement in the WQA specified the circumstances under which an existing permit can be modified or reissued with less stringent effluent limitations, standards, or conditions than those already imposed.

Since 1987, there have been minor revisions to the CWA (e.g., Combined Sewer Overflow program requirements). However, the basic structure of the NPDES program remains unchanged from the framework established in the 1972 FWPCA Amendments.

1.3 NPDES Statutory Framework

As noted in section 1.2 above, under the NPDES program any point source that discharges or proposes to discharge pollutants into waters of the United States is required to obtain an NPDES permit. Understanding how each of these terms (i.e., permit, pollutant, waters of the United States, and point source) is defined is the key to defining the scope of the NPDES program.

1.3.1 Permit

A permit is a license, issued by the government to a person or persons granting permission to do something that would otherwise be illegal without the permit. An NPDES permit typically is a license for a facility to discharge a specified amount of a pollutant into a receiving water under certain conditions; however, NPDES permits can also authorize facilities to process, incinerate, landfill, or beneficially use biosolids (sewage sludge). A discharger does not have a right to receive a permit, and permits may be revoked for cause such as noncompliance with the conditions of the permit.

1.3.2 Pollutant

The term *pollutant* is defined in CWA section 502(6) and § 122.2. The statute defines pollutant very broadly and includes any type of industrial, municipal, or agricultural waste (including heat) discharged into water. For regulatory purposes, pollutants are grouped into three categories under the NPDES program: conventional, toxic, and nonconventional.

- **Conventional** pollutants are those defined in CWA section 304(a)(4) and § 401.16 (BOD_5, TSS, fecal coliform, pH, and oil and grease).
- **Toxic (priority)** pollutants are those defined in CWA section 307(a)(1) (and listed in § 401.15 and Appendix A of Part 423) and include 126 metals and manmade organic compounds (see Exhibit C-1 in Appendix C of this document).
- **Nonconventional** pollutants are those that do not fall under either of the above categories (conventional or toxic pollutants) and include parameters such as chlorine, ammonia, nitrogen, phosphorus, chemical oxygen demand (COD), and whole effluent toxicity (WET).

Sewage from vessels and, under certain conditions, water, gas, or other material injected into wells to facilitate production of oil or gas or water derived in association with oil and gas production and disposed of in a well are specifically excluded from the definition of pollutant under the NPDES program.

1.3.3 Waters of the United States

The CWA regulates discharges to *navigable waters*. CWA section 502(7) defines navigable waters as "waters of the United States, including the territorial seas." NPDES regulations define *waters of the United States* to mean,

- Waters that are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including waters subject to the ebb and flow of the tide.
- Interstate waters including interstate *wetlands*.
- Other waters that could affect interstate or foreign commerce.
- Impoundments of waters of the United States.
- Tributaries of the above categories of waters.
- Territorial seas.
- Wetlands adjacent to other waters (except wetlands themselves) in the above categories.

Wetlands are further defined in § 122.2. In addition, the definition of waters of the United States contains exclusions for waste treatment systems (other than certain cooling ponds) designed to meet the requirements of the CWA and also for *prior converted croplands*, which is mostly relevant to the CWA section 404 permitting program administered by the Corps.

Waters of the United States covers a broad range of surface waters. The CWA does not give EPA the authority to regulate ground water quality through NPDES permits. If a discharge of pollutants to ground water reaches waters of the United States, however, it could be a discharge to the surface water (albeit indirectly via a direct hydrological connection, i.e., the ground water) that needs an NPDES permit.

The scope of waters of the United States has been the subject of several U.S. Supreme Court cases (the most recent as of the time of publication of this manual being a decision from 2006 in the combined Rapanos/Carabell wetland cases) and numerous lower court cases. The court cases often have been difficult to interpret, resulting in much litigation and an evolving understanding of the exact scope of waters subject to CWA jurisdiction. Also, permit writers should keep in mind that discharges through non-jurisdictional features that reach waters of the United States may need a permit even if the discharge is not directly to a jurisdictional waterbody. EPA Regional wetlands staff have significant expertise in jurisdictional issues related to the scope of waters of the United States. Some Regions have interoffice teams to address jurisdictional issues that come up in the different CWA programs. In addition, guidance on waters of the United States is on EPA's Office of Wetlands, Oceans, and Watersheds Website <www.epa.gov/wetlands/guidance/CWAwaters.html>.

1.3.4 Point Source

Pollutants can enter water via a variety of pathways including agricultural, domestic and industrial sources. For regulatory purposes, these sources generally are categorized as either point sources or nonpoint sources. The term *point source* is defined in CWA section 502(14) and § 122.2 to include any discernible, confined, and discrete conveyance from which pollutants are or may be discharged. Point source discharges include discharges from publicly owned treatment works (POTWs), industrial process wastewater discharges, runoff conveyed through a storm sewer system, and discharges from concentrated animal feeding operations (CAFOs), among others (see Exhibit 1-2). Return flows from irrigated agriculture and agricultural stormwater runoff specifically are excluded from the definition of a point source.

Pollutant contributions to waters of the United States may come from both direct and indirect discharges. Direct discharge (which is synonymous with *discharge of a pollutant*) is defined by the NPDES regulations at § 122.2 to include any addition of any pollutant or combination of pollutants to a water of the United States from any point source. An *indirect discharger* is defined as, "a nondomestic discharger introducing pollutants to a POTW." Under the national program, NPDES permits are issued only to direct dischargers. The National Pretreatment Program controls industrial and commercial indirect dischargers (for more on pretreatment, see section 2.3.1.2 of this manual).

Exhibit 1-2 Common point source discharges of pollutants to waters of the United States

CHAPTER 2. Regulatory Framework and Program Areas of the NPDES Program

This chapter discusses the regulatory framework of the National Pollutant Discharge Elimination System (NPDES) program, identifies the types of activities regulated under the NPDES program, describes the roles and responsibilities of federal and state governments, and presents the program areas that address the various types of regulated activities.

2.1 Regulatory Framework of the NPDES Program

Chapter 1 discussed how Congress, in Clean Water Act (CWA) section 402, required the U.S. Environmental Protection Agency (EPA) to develop and implement the NPDES permit program. While Congress' intent was established in the CWA, EPA was required to develop specific regulations to carry out the congressional mandate. The regulations developed by EPA to implement and administer the NPDES program primarily are in Title 40 of the *Code of Federal Regulations* (CFR) Part 122 <www.epa.gov/lawsregs/search/40cfr.html>.

The CFR is an annual codification of the general and permanent rules published in the *Federal Register* (FR) by the executive departments and agencies of the federal government. The CFR is divided into 50 titles that represent broad areas subject to federal regulation. Title 40 covers protection of the environment. The FR is a legal publication that contains federal agency regulations; proposed rules and notices; and executive orders, proclamations and other presidential documents. The National Archives and Records Administration, an independent federal agency responsible for managing all federal records, publishes the FR and CFR. The text of all final regulations is found in the CFR. The background and implementation information related to these regulations, however, are found in the preamble to the regulations contained in the FR. This information is important to permit writers because it explains the legal, technical, and scientific bases on which regulatory decisions are made.

Exhibit 2-1 lists regulations in 40 CFR that are related to the NPDES program, and Exhibit 2-2 is an outline of the federal NPDES regulations from Part 122. The regulations at § 123.25 should be referenced for information applicable to state NPDES programs. Exhibit B-2 in Appendix B of this document is an Index to NPDES Regulations that provides regulatory citations by topic area.

Exhibit 2-1 Regulations related to the NPDES program

Regulation (40 CFR)	Subject
Part 121	State certification
Part 122	The federal NPDES permit program
Part 123	State program requirements
Part 124	Procedures for decision making
Part 125	Technology standards
Part 129	Toxic pollutant effluent standards
Part 130	Water quality planning and management
Part 131	Water quality standards
Part 133	Secondary treatment regulations
Part 135	Citizen suits
Part 136	Analytical procedures
Part 257	State sludge disposal regulations
Part 401	General provisions for effluent limitations guidelines and standards (effluent guidelines)
Part 403	General pretreatment regulations
Parts 405-471	Effluent guidelines
Part 501	State sewage sludge management program requirements
Part 503	Standards for use or disposal of sewage sludge

2.2 Federal and State Responsibilities

This section discusses the relationship between federal and state governments in the administration of the NPDES program and the process by which a state can become *authorized*.

2.2.1 State NPDES Program Authority

EPA may authorize qualified state, territorial, or tribal government agencies to implement all or parts of the NPDES program. States, territories, or tribes (hereafter *states*) are authorized through a process defined by the CWA section 402(b) and NPDES regulations Part 123. A state wanting to be authorized to administer the NPDES program submits to EPA a letter from the governor requesting review and approval of its program submission, a Memorandum of Agreement (MOA), a Program Description, a Statement of Legal Authority (also known as an *Attorney General's Statement* or *AG Statement*), and the underlying state laws and regulations. EPA determines whether the package is complete within 30 days of receipt. Within 90 days of receipt, EPA renders a decision to approve or disapprove the program. The time for review can be extended by agreement. The process of authorization includes a public review and comment period, and a public hearing.

States may apply for the authority to issue one or more of the following five types of NPDES authorization:

- NPDES Base Program for individual municipal and industrial facilities.
- General Permit Program.
- Pretreatment Program.
- Federal Facilities Program.
- Biosolids (Sewage Sludge) Program.

Exhibit 2-2 Federal NPDES regulations (40 CFR Part 122)

Subpart A–Definitions and General Program Requirements

§ 122.1 Purpose and scope
§ 122.2 Definitions
§ 122.3 Exclusions
§ 122.4 Prohibitions
§ 122.5 Effect of a permit
§ 122.6 Continuation of expiring permits
§ 122.7 Confidentiality of information

Subpart B–Permit Application and Special NPDES Program Requirements

§ 122.21 Applications
§ 122.22 Signatories to permit applications and reports
§ 122.23 Concentrated animal feeding operations
§ 122.24 Concentrated aquatic animal production
§ 122.25 Aquaculture projects
§ 122.26 Stormwater discharges
§ 122.27 Silviculture activities
§ 122.28 General permits
§ 122.29 New sources and new dischargers
§ 122.30-122.37 MS4s

Subpart C–Permit Conditions

§ 122.41 Standard conditions applicable to all permits
§ 122.42 Standard conditions applicable to specified categories of permits
§ 122.43 Establishing permit conditions
§ 122.44 Establishing limitations, standards, and other permit conditions

(a) Technology basis
(b) Other basis (not WQ)
(c) Reopeners
(d) Water quality basis
(e) Toxic (priority) pollutants
(f) Notification levels
(g) 24 Hour reporting
(h) Duration of permits
(i) Monitoring
(j) Pretreatment program
(k) Best management practices (BMPs)
(l) Anti-backsliding
(m) Privately owned treatment works
(n) Grants
(o) Sewage sludge
(p) Coast Guard
(q) Navigation
(r) Great Lakes
(s) Qualifying programs

§ 122.45 Calculating limitations

(a) Outfalls and discharge points
(b) Production basis
(c) Metals
(d) Continuous discharges
(e) Non-continuous discharges
(f) Mass limitations
(g) Pollutants in intake water
(h) Internal waste streams
(i) Discharge into wells, into publicly owned treatment works or by land application

§ 122.46 Duration of permits
§ 122.47 Schedules of compliance
§ 122.48 Requirements for recording and reporting of monitoring results
§ 122.49 Consideration under federal law
§ 122.50 Disposal into wells, into publicly owned treatment works or by land application

Subpart D–Transfer, Modification, Revocation and Reissuance, and Termination of Permit

§ 122.61 Transfer of permits
§ 122.62 Modification or revocation and reissuance of permits
§ 122.63 Minor modifications of permits
§ 122.64 Termination of permits

A state can receive authorization for one or more of the NPDES program components. For example, a state might receive authorization for the NPDES Base Program, General Permit Program, and Pretreatment Program, but not the Federal Facilities Program or Biosolids Program. In such a case, EPA continues to issue permits to federal facilities (e.g., facilities on military installations, federal lands) for discharges originating within the state and continues to implement the Biosolids Program. (Section 2.2.2 below provides additional discussion of Biosolids Program implementation.)

If EPA approves a program, the state assumes permitting authority in lieu of EPA. All new permit applications would then be submitted to the state agency for NPDES permit issuance. Certain permits issued before authorization might continue under EPA administration as set forth in the MOA. Even after a state receives NPDES authorization, EPA continues to issue NPDES permits on tribal lands within the boundaries of the state (if the tribe is not administering its own approved NPDES program). Following authorization, EPA also continues its national program management responsibilities by ensuring that state programs meet applicable federal requirements. If EPA disapproves the program, EPA remains the permitting authority for that state.

The State Program Status Website <www.epa.gov/npdes/authorization> provides the current authorization status for the states.

2.2.2 Roles and Responsibilities of the Federal and State Authorities

Until a state program is authorized, EPA is the permitting authority that issues all permits, conducts all compliance and monitoring activities, and enforces all program requirements.

As noted above, if a state has only partial authority, EPA will implement the other program activities. For example, where a state has an approved NPDES program but has not received EPA approval of its state sewage sludge management program, the EPA Region is responsible for including conditions to implement the Part 503 Standards for the Use or Disposal of Sewage Sludge in permits issued to treatment works treating domestic sewage (TWTDS) in that state. EPA could issue a separate permit with the applicable sewage sludge standards and requirements, or collaborate with the state on joint issuance of NPDES permits containing the Part 503 sewage sludge standards. The same process also applies where a state has not received approval of its pretreatment program or federal facilities program. One exception to that process is where an NPDES-authorized state is not approved to implement the general permit program. In such cases, EPA may not issue a general permit in that state as clarified in the memorandum *EPA's Authority to Issue NPDES General Permits in Approved NPDES States*[1] <www.epa.gov/npdes/pubs/owm0444.pdf>.

Once a state is authorized to issue permits, EPA generally is precluded from issuing permits in the state; however, EPA must be provided with an opportunity to review certain permits and may formally object to elements that conflict with federal requirements. If the permitting agency does not satisfactorily address the points of objection, EPA will issue the permit directly. Once a permit is issued through a government agency, it is enforceable by the approved state and federal agencies (including EPA) with legal authority to implement and enforce the permit. Private citizens may also bring a civil action in federal court against an alleged violator or against the EPA Administrator for alleged failure to enforce NPDES permit requirements. Exhibit 2-3 presents a summary of federal and state roles before and after program authorization.

Exhibit 2-3 Summary of federal and state/territorial/tribal roles in the NPDES permitting program

Before state/territorial/tribal program approval:
- EPA issues permits
- EPA conducts compliance and monitoring activities
- EPA enforces
- State/territory/tribe reviews permits and grants CWA section 401 certification

After state/territorial/tribal program approval:
- State/territory/tribe issues permits
- State/territory/tribe conducts compliance and monitoring activities
- State/territory/tribe enforces
- EPA provides administrative, technical and legal support
- EPA ensures state program meets federal requirements
- EPA offers NPDES program training
- EPA oversees grants to states (e.g., CWA section 106)
- EPA reviews permits and, as necessary, comments or objects
- EPA oversees and, as necessary, assumes enforcement of permits

2.3 NPDES Program Areas

NPDES permittees can be broadly classified as municipal (publicly owned treatment works [POTWs] and related discharges) and non-municipal facilities. Federal facilities fall into the broader category of non-municipal facilities. Within those broad categories, there might also be specific types of activities that are subject to unique programmatic requirements in the NPDES regulations. Exhibit 2-4 provides an overview of the different activities related to municipal and non-municipal sources; identifies the NPDES program areas that address these activities; and identifies the applicable regulations for each NPDES program area.

2.3.1 NPDES Program Areas Applicable to Municipal Sources

The NPDES regulations establish technology-based effluent requirements applicable to discharges from POTWs. In addition to effluent requirements, the NPDES regulations establish other programmatic requirements applicable to other POTW activities (e.g., sewage sludge disposal and management, stormwater discharges from the treatment plant site) or activities that may be conducted by a municipality (e.g., municipal separate storm sewer systems, combined sewer overflows). A description of those programs and how they relate to NPDES permits is provided in the following sections.

2.3.1.1 Publicly Owned Treatment Works (POTWs)

The federal regulations at § 403.3 define a POTW as a treatment works (as defined in CWA section 212) that is owned by a state or municipality [as defined in CWA section 502(4)]. The definition includes any devices and systems used in the storage, treatment, recycling, and reclamation of municipal sewage or industrial wastes of a liquid nature. It also includes sewers, pipes, and other conveyances only if they convey wastewater to a POTW. Finally, the term also means the municipality that has the jurisdiction over the indirect discharges to and the discharges from the treatment works. Federally owned treatment works, privately owned treatment works, and other treatment plants not owned by a state or municipality are not considered POTWs.

Exhibit 2-4 NPDES program areas and applicable regulations

Source	Program areas	Applicable regulations (40 CFR)
Municipal	Municipal (POTWs) effluent discharges	Part 122 Part 125 Part 133
	Indirect non-municipal discharges (Pretreatment)	Part 122 Part 403 Parts 405-471
	Biosolids (sewage sludge) use and disposal	Part 122 Part 257 Part 501 Part 503
	Combined sewer overflow (CSO) discharges	Part 122 Part 125
	Sanitary sewer overflow (SSO) discharges	Part 122
	Municipal separate storm sewer systems (MS4s) discharges	Part 122 Part 125
Non-municipal (Industrial)	Process wastewater discharges	Part 122 Part 125 Parts 405-471
	Non-process wastewater discharges	Part 122 Part 125
	Stormwater discharges associated with industrial activity	Part 122 Part 125
	Stormwater discharges from construction activities*	Part 122 Part 125
	Cooling water intake structures (CWIS)	Part 122 Part 125 Part 401
	Concentrated animal feeding operations (CAFOs)	Part 122 Part 123 Part 125 Part 412
	Concentrated aquatic animal production (CAAP) facilities	Part 122 Part 125 Part 451
	Vessel Discharges	Part 122

* Though stormwater discharges from construction activity resulting in disturbance of 5 or more acres of total land area technically are considered, "stormwater discharges associated with industrial activity" as defined by §122.26(b)(14)(x), these discharges are commonly referred to as stormwater discharges from *large* construction activities.

POTWs receive, primarily, domestic sewage from residential and commercial customers. Larger POTWs also typically receive and treat wastewater from industrial facilities (indirect dischargers) connected to the collection system. The types of pollutants treated by a POTW always include conventional pollutants and may include nonconventional and toxic pollutants, depending on the characteristics of the sources discharging to the POTW. The treatment provided by a POTW typically produces a treated effluent and a biosolids (sewage sludge) residual.

2.3.1.2 The National Pretreatment Program

The National Pretreatment Program <www.epa.gov/npdes/pretreatment> regulates the introduction of nondomestic (i.e., industrial and commercial) wastewater to POTWs. Because such discharges are treated by the POTW before release to a water of the United States, they are termed *indirect discharges*. The pretreatment program prohibits industrial and commercial indirect dischargers from discharging pollutants to a POTW that will pass through the POTW to receiving waters or interfering with POTW treatment processes or contaminating sewage sludge. The federal program also requires certain indirect dischargers to meet technology-based requirements developed specifically for such POTW users that are similar to those for direct dischargers.

EPA's pretreatment regulations require certain POTWs to develop a pretreatment program, the requirements of which are generally included as conditions of a POTW's NPDES permit. The federal regulations specifying which POTWs must have pretreatment programs, and the authorities and procedures that must be developed by the POTW before program approval, are in Part 403. The requirement to develop and implement a local pretreatment program typically is included as a special condition in the POTW's NPDES permit. Section 9.2.1 of this manual includes a discussion on incorporating pretreatment special conditions into permits.

2.3.1.3 Biosolids (Sewage Sludge)

In 1987 Congress amended CWA section 405 to establish a comprehensive sewage sludge program <www.epa.gov/OW-OWM.html/mtb/biosolids/index.htm>. The program regulates the use and disposal of sewage sludge by POTWs and by other TWTDS. TWTDS include facilities that generate sewage sludge, provide commercial treatment of sewage sludge, manufacture a product derived from sewage sludge, or provide disposal of sewage sludge. CWA section 405 required EPA to develop technical standards that establish sewage sludge management practices and acceptable levels of toxic pollutants in sewage sludge. The terms *biosolids*, *sewage sludge*, and *municipal sludge* are used interchangeably throughout this document.

Regulations for state sewage sludge program approval are at Part 123 or Part 501 (depending on whether the state wishes to administer the sewage sludge program under its NPDES program or under another program, e.g., a solid waste program). The technical standards governing sewage sludge use and disposal are in Part 503. TWTDS not otherwise subject to the NPDES permit requirements under CWA section 402 must apply for and receive a permit addressing standards for use and disposal of sewage sludge in Part 503. Details of this rule are described in *A Plain English Guide to the EPA Part 503 Biosolids Rule*[2] <www.epa.gov/owm/mtb/biosolids/503pe/>. Where applicable, sewage sludge management requirements may be included as a special condition in permits issued to POTWs. Section 9.2.2 of this manual includes a discussion on incorporating special conditions that address sewage sludge requirements.

2.3.1.4 Combined Sewer Overflows (CSOs)

An additional concern for some older POTWs may be combined *sewer systems* (CSS), which are wastewater collection systems owned by a state or municipality [as defined by CWA section 502(4)] that convey sanitary wastewater (domestic, commercial and industrial wastewaters) and stormwater through a single-pipe system to a POTW [as defined by § 403.3(q)]. EPA estimates that CSSs serve about 40 million people in 772 communities nationwide <www.epa.gov/npdes/cso/csodem>. During dry weather, CSSs collect and convey domestic, commercial, and industrial wastewater to a POTW; however, during periods of rainfall, snowmelt, and other forms of precipitation, the systems can become overloaded. When that overloading occurs, the CSS can overflow at designed relief points and discharge a combination of untreated sanitary wastewater and stormwater directly to a surface waterbody.

A combined sewer overflow (CSO) <www.epa.gov/npdes/cso> is the discharge from a CSS at a point before the POTW. CSOs can be a major source of water pollution in communities served by CSSs. CSOs often contain high levels of suspended solids (SS), pathogenic microorganisms, toxic pollutants, floatables, nutrients, oxygen-demanding organic compounds, oil and grease, and other pollutants, causing water quality standards to be exceeded.

To address CSOs, EPA issued the National CSO Control Strategy (54 FR 37370, September 8, 1989). While implementation of the 1989 strategy has resulted in progress toward controlling CSOs, significant public health and water quality risks remain. To expedite compliance with the CWA, and to elaborate on the 1989 strategy, EPA, after collaboration with other CSO stakeholders (communities with CSSs, state water quality authorities, and environmental groups), published the CSO Control Policy <www.epa.gov/npdes/cso/controlpolicy> (59 FR 18688, April 19, 1994). The 1994 CSO policy represents a comprehensive national strategy to ensure that municipalities, permitting authorities, water quality standards authorities, and the public engage in a comprehensive and coordinated planning effort to achieve cost-effective CSO controls that ultimately meet appropriate health and environmental objectives. The Wet Weather Water Quality Act of 2000 stipulates that NDPES permits, enforcement orders, or decrees must conform to the 1994 CSO Policy [CWA section 402(q)].

Before issuing a permit with conditions that address CSOs, permit writers should consult the CSO Control Policy and associated guidance. Section 9.2.3 of this manual includes a discussion on incorporating appropriate CSO permit conditions.

2.3.1.5 Sanitary Sewer Overflows (SSOs)

Properly designed, operated, and maintained sanitary sewer systems are meant to collect and transport all the sewage that flows into them to a POTW. However, occasional, unintentional spills of raw sewage from municipal sanitary sewers occur in almost every system. Such types of releases are called sanitary sewer overflows (SSOs) <www.epa.gov/npdes/sso>.

SSOs have a variety of causes including severe weather, improper system operation and maintenance, and vandalism. EPA estimates that over 40.000 SSO events occur per year in the United States (excluding basement backups). Overflows of untreated wastewater can present risks of human exposure when released to certain areas, such as streets, private property, basements, and receiving waters used for drinking water, fishing and shellfishing, or contact recreation. A description of the extent of human health and environmental impacts caused by releases of untreated sewage, along with other information, is provided in the *Report to Congress on the Impacts and Control of CSOs and SSOs*[3] <www.epa.gov/npdes/csossoreport2004>. That 2004 report shows that NPDES permit requirements establishing clear reporting, record keeping, third party notification of overflows from municipal sewage collection systems, and clear requirements to properly operate and maintain the collection system, are critical to effective program implementation.

EPA has developed a draft fact sheet <www.epa.gov/npdes/pubs/sso_fact_sheet_model_permit_cond.pdf> and draft model permit conditions <www.epa.gov/npdes/pubs/sso_model_permit_conditions.pdf> that explain how NPDES permitting authorities can better address SSOs and sanitary sewer collection systems. Section 9.2.4 of this manual discusses incorporation of conditions to address SSOs in NPDES permits.

2.3.1.6 Municipal Separate Storm Sewer Systems (MS4s)

Stormwater from major metropolitan areas is a significant source of pollutants discharged to waters of the United States. While rainfall and snow are natural events, the nature of stormwater discharges and their impact on receiving waters are greatly affected by human activities and land use. Stormwater from lands modified by human activities, such as metropolitan areas and urban streets, can affect surface water resources by modifying natural flow patterns or by elevating pollution concentrations and loadings.

To address such concerns, the 1987 amendments to the CWA added section 402(p), a provision that directed EPA to establish phased NPDES requirements for stormwater discharges. Phase I of the stormwater program addresses permits for discharges from medium and large MS4s serving a population of 100,000 or more, as well as certain categories of industrial activity, including construction activity disturbing greater than 5 acres. Phase II expanded the stormwater program to include small MS4s and construction activity disturbing between 1–5 acres.

The MS4 stormwater application regulations (Phase I) established requirements for a two-part permit application that allowed large and medium local governments to help define priority pollutant sources in the municipality and to develop and implement appropriate controls for such discharges to MS4s (55 FR 47990, November 16, 1990). Part II of the application requires municipal applicants to propose municipal stormwater management programs to control pollutants to the *maximum extent practicable* (MEP) and to effectively prohibit non-stormwater discharges to the municipal system. Medium and large MS4 operators are required to submit comprehensive permit applications and are issued individual permits.

Phase II of the stormwater program extended the NPDES permitting program to small MS4s in urbanized areas (64 FR 68722, December 8, 1999). The Phase II MS4 regulations require small MS4s to develop a program to address six *minimum control measures* that include BMPs and measurable goals for each BMP. Permit writers have the option of permitting regulated small MS4 operators using an individual permit, a general permit, or a modification of an existing Phase I MS4's individual permit (although the vast majority of small MS4s have been covered under general permits).

Municipal stormwater management programs combine source controls and management practices that address targeted sources in the boundaries of the municipal system. For example, a municipality that expects significant new development may focus more on proposing requirements for new development and construction. On the other hand, a municipality that does not expect significant new development could focus more on municipal activities that affect stormwater quality such as: maintenance of leaking sanitary sewers, road de-icing and maintenance, operation of municipal landfills, flood control efforts, and control of industrial contributions of stormwater.

MEP is not precisely defined so as to allow maximum flexibility in MS4 permitting to optimize reductions in stormwater pollutants on a location-by-location basis (64 FR 68754, December 8, 1999). Therefore, permit writers must rely on application requirements specified in the regulations and the applicant's proposed management program when developing appropriate permit conditions. The stormwater Phase II rule was challenged in the courts, with the U.S. Court of Appeals for the Ninth Circuit generally upholding the Phase II rule but remanding three issues back to EPA. EPA issued guidance on April 16, 2004 for how new general permits should address the remanded issues of public availability of notices of intent (NOIs), opportunity for public hearings, and permitting authority reviews of NOIs titled *Implementing the Partial Remand of the Stormwater Phase II Regulations Regarding*

Notices of Intent & NPDES General Permitting for Phase II MS4s[4]
<www.epa.gov/npdes/pubs/hanlonphase2apr14signed.pdf>.

In addition to information on the Stormwater Discharges From Municipal Separate Storm Sewer Systems (MS4s) Website <www.epa.gov/npdes/stormwater/municipal>, EPA has developed the following guidance documents and memoranda to help permit writers and permittees implement the municipal stormwater program:

- *Guidance Manual for the Preparation of Part 2 of the NPDES Permit Applications for Discharge from Municipal Separate Storm Sewer Systems*[5] <www.epa.gov/npdes/pubs/owm0246.pdf>.
- *Interim Permitting Approach for Water Quality-Based Effluent Limitations in Stormwater Permits*[6] <www.epa.gov/npdes/pubs/swpol.pdf>.
- *Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs*[7] <www.epa.gov/npdes/pubs/final-wwtmdl.pdf>.
- *MS4 Program Evaluation Guidance*[8] <www.epa.gov/npdes/pubs/ms4guide_withappendixa.pdf>.
- *MS4 Permit Improvement Guide*[9] <www.epa.gov/npdes/pubs/ms4permit_improvement_guide.pdf>.

The application requirements for stormwater discharges from MS4s serving a population greater than 100,000 and for stormwater discharges from small MS4s are discussed in sections 4.3.10 and 4.3.11 of this manual.

2.3.2 NPDES Program Areas Applicable to Non-Municipal Sources

Non-municipal sources include industrial and commercial facilities, industrial stormwater (including large construction activities), and discharges from small construction activity, concentrated animal feeding operations (CAFOs) and concentrated aquatic animal production (CAAP) facilities. Unlike municipal sources, the types of raw materials, production processes, treatment technologies used and pollutants discharged at industrial facilities vary widely and are dependent on the type of industry and specific facility characteristics. The operations, however, generally are carried out within a more clearly defined area; thus, the collection systems are less complex than POTW collection systems. In addition, unlike biosolids at POTWs, the NPDES program does not regulate residuals (sludge) generated by non-municipal facilities.

Non-municipal facilities can have discharges of stormwater that might be contaminated through contact with manufacturing activities or raw material and product storage, or they can have non-process wastewater discharges such as non-contact cooling water. In addition, some non-municipal facilities take in cooling water. Those discharges and intakes may be regulated under an NPDES permit in addition to any process wastewater.

2.3.2.1 Process Wastewater

Industrial and commercial facilities often use water in the manufacture and processing of products. The regulations at § 122.2 define process wastewater as, "[a]ny water which, during manufacturing or processing, comes into direct contact with, or results from the production or use of any raw material, intermediate product, finished product, byproduct, or waste product."

Process wastewater can contain pollutants at levels that could affect the quality of receiving waters. The NPDES permit program establishes specific requirements for discharges of process wastewater from industrial and commercial sources. If a facility discharges directly to surface water, it would require an individual or general NPDES permit. An industrial or commercial facility also may discharge wastewater to a municipal sewer system, which would be covered under the NPDES pretreatment program. Many types of industrial facilities, whether they discharge directly to surface water or to a municipal sewer system, are covered by effluent guidelines and standards (see section 5.2 of this manual). The stormwater that runs off the property of an industrial or commercial facility or from a construction site might require an NPDES permit under the industrial stormwater program (see section 2.3.2.3 below).

2.3.2.2 Non-Process Wastewater

Industrial and commercial facilities often use water for purposes other than processing products, such as using non-contact cooling water for heat exchange, and may discharge wastewater from sources such as sanitary or cafeteria wastes. Like process wastewater, non-process wastewater is regulated under the NPDES program. Non-process wastewater might also be important to the permit writer when drafting monitoring conditions for facilities where the non-process wastewater dilutes the concentration of pollutants of concern in process wastewater. The permit writer must ensure that specified monitoring locations ensure accurate measurement for compliance with all effluent limitations.

2.3.2.3 Stormwater Associated with Industrial Activity

To minimize the impact of stormwater discharges from industrial facilities, the NPDES program includes an industrial stormwater permitting component. Operators of industrial facilities included in 1 of the 11 categories of stormwater discharges associated with industrial activity that discharge or propose to discharge stormwater to an MS4 or directly to waters of the United States require authorization under an NPDES industrial stormwater permit. EPA published permit regulations and permit application requirements for stormwater discharges associated with industrial activity in 55 FR 48063, November 16, 1990.

Permit Regulations for Stormwater Associated with Industrial Activity

The regulations define stormwater discharges associated with industrial activity as discharges from any conveyance used for collecting and conveying stormwater and that is directly related to manufacturing, processing, or raw materials storage areas at an industrial plant. The regulations at § 122.26(b)(14)(i - xi) identify the following 11 industrial categories required to apply for NPDES permits for stormwater discharges:

- Facilities subject to stormwater effluent guidelines, new source performance standards, or toxic pollutant effluent standards under Parts 400-471 (Subchapter N).
- Certain heavy manufacturing facilities (lumber, paper, chemicals, petroleum refining, leather tanning, stone, clay, glass, concrete, ship construction).
- Active and inactive mining operations and oil and gas operations with contaminated stormwater.
- Hazardous waste treatment, storage, or disposal facilities, including Resource Conservation and Recovery Act (RCRA) Subtitle C facilities.
- Landfills, land application sites, open dumps, and RCRA Subtitle D facilities.

- Recycling facilities, including metal scrap yards, battery reclaimers, salvage yards, and automotive junkyards.
- Steam electric power generating facilities, including coal-handling sites.
- Transportation facilities that have vehicle maintenance shops, equipment cleaning operations, or airport deicing operations.
- Major POTW sludge handling facilities, including on-site application of sewage sludge.
- Construction activities that disturb five acres or more (see subsection below).
- Light industrial manufacturing facilities.

Operators of industrial facilities that are federally, state- or municipally owned or operated that meet the above descriptions must also submit applications.

EPA issued a final rule for Phase II of the stormwater program in 64 FR 68722, December 8, 1999. That rule clarified that stormwater discharges from industrial facilities that have *no exposure* of industrial activities or materials to stormwater may be conditionally excluded from the stormwater permitting program. To qualify for the no exposure exclusion, the industrial operator must complete a no exposure certification form and submit this to EPA once every 5 years. For more information, see the Conditional No Exposure Exclusion Website <www.epa.gov/npdes/stormwater/noexposure>.

Generally, EPA- or state-issued general permits regulate stormwater discharges from industrial, construction and Phase II municipal sources, while Phase I municipal sources usually are issued individual permits. In some cases, stormwater conditions may be incorporated into a comprehensive individual NPDES permit for a facility or a stormwater-specific individual NPDES permit. Incorporating permit conditions to address stormwater discharges associated with industrial and construction activities into an individual facility permit is discussed in the subsections below. For more information regarding the scope of the NPDES stormwater program, see the NPDES Stormwater Program Website <www.epa.gov/npdes/stormwater>.

Permit Conditions for Stormwater Discharges Associated with Industrial Activity

All stormwater discharges associated with industrial activity that discharge stormwater through a separate MS4 or discharge directly to waters of the United States are required to obtain an NPDES permit. Because of the large number of facilities requiring permits, EPA and most NPDES-authorized states choose to issue general permits to regulate stormwater discharges. The Phase I rule in 1990 established the concept of a permitting exemption for industrial facilities with little or no likelihood of discharging contaminated stormwater; however, this exemption was not well-defined or required to be submitted to the NPDES permitting authority. The Phase II rule in December 1999 clarified and expanded the no exposure certification requirement to require industrial facilities with no exposure of industrial processes to stormwater to submit a written certification notifying EPA or the authorized state that the facility wishes to be excluded from the NPDES program.

Each industrial facility covered under an EPA-issued stormwater general permit must meet the numeric and non-numeric effluent limitations established in the general permit. Industrial facilities can meet those effluent limitations by implementing control measures, including BMPs, that control the discharge of stormwater associated with industrial activity.

The EPA- and state-issued stormwater general permits generally require the facility to develop and implement a site-specific *stormwater pollution prevention plan* (SWPPP). The SWPPP describes the control measures, whether structural or nonstructural, which are used for controlling stormwater discharges from the industrial facility. The special conditions component of EPA's stormwater general permits identifies the requirements that must be documented in the SWPPP, including the following:

- A description of potential pollutant sources at the facility, including the following:
  - A map of the facility indicating the drainage areas of the site and the industrial activities that occur in each drainage area.
  - An inventory of materials that could be exposed to stormwater.
  - A description of the likely sources of pollutants from the site and a prediction of the pollutants likely to be present in the stormwater.
  - The history of spills and leaks of toxic and hazardous materials over the past 3 years.
- The measures and controls that will be implemented to prevent or minimize pollution of stormwater, including the following:
  - Good housekeeping or upkeep of industrial areas exposed to stormwater.
  - Preventive maintenance of stormwater controls and other facility equipment.
  - Spill prevention and response procedures.
  - Testing of outfalls to ensure that there are no illicit discharges.
  - Employee training on pollution prevention measure and controls, and record keeping.

A permit writer's best sources of information for developing appropriate special conditions for stormwater control measures are other stormwater general permits. Using existing general permits as the basis for special conditions is encouraged because doing so will reduce duplication of effort. A listing of individual and general permits (stormwater and non-stormwater) issued by EPA and authorized states is on the View NPDES Individual and General Permits Website <www.epa.gov/npdes/permitsearch>. In addition to the Stormwater Discharge From Industrial Facilities Website <www.epa.gov/npdes/stormwater/indust>, EPA published *Developing Your Stormwater Pollution Prevention Plan: A Guide for Industrial Operators*[10] <www.epa.gov/npdes/pubs/industrial_swppp_guide.pdf> to help permit writers identify components of SWPPPs and BMPs and to help permittees develop their own plans. Section 4.3.8 of this manual discusses Form 2F and individual permit requirements for stormwater discharges associated with industrial activity.

Permit Conditions for Stormwater Discharges associated with Construction Activities

EPA and most NPDES-authorized states have issued NPDES general stormwater permits for discharges associated with construction activity that are separate from the industrial stormwater general permits. The Phase I stormwater regulations require permit coverage for all construction activity that results in the disturbance of five acres or greater of the total land area. This includes disturbance of less than five acres of total land area that is part of larger common plan of development or sale if the larger common plan will ultimately disturb five acres of more. The Phase II stormwater regulations require permit coverage for all construction activity that result in land disturbance of equal to or greater than one acre and less than five acres. This includes the disturbance of less than one acre of total land area that is part of a larger common plan of development or sale if the larger common plan will ultimately disturb equal to or greater than one and less than five acres. Since March 2003, most construction activity disturbing one to five acres has been required to comply with the conditions of the relevant NPDES permit (typically under the relevant construction general permit for stormwater discharges), though states have the option of not requiring the submittal of NOIs for stormwater discharges associated with small construction activity.

EPA and NPDES-authorized state permitting authorities may include permit conditions that incorporate qualifying state or local erosion and sediment control program requirements by reference. A qualifying state or local erosion and sediment control program is one that includes the requirements at § 122.44(s). Once EPA or an NPDES authorized state identifies and incorporates a qualifying local program in their NPDES construction general permit, operators can follow the erosion and sediment control requirements of the qualifying local program. By incorporating the qualifying local program by reference the permitting authority can avoid duplicative or conflicting erosion and sediment control requirements between the local program requirements and the NPDES general permit control requirements addressing stormwater discharges associated with construction activity. Operators that are engaged in construction activity within a qualifying program must still submit an NOI under the appropriate construction general permit and comply with all other permit conditions.

The permit requirements in a construction general permit may be similar to those in an industrial general permit, including the development of a SWPPP. In addition to the Stormwater Discharges from Construction Activities Website <www.epa.gov/npdes/stormwater/construction>, EPA also developed the Stormwater Pollution Prevention Plans for Construction Activities Website <www.epa.gov/npdes/swpppguide>. Section 4.3.9 of this manual discusses individual permit requirements for stormwater discharges associated with construction activity.

2.3.2.4 Cooling Water Intake Structures

CWA section 316(b) provides that any standard established pursuant to CWA sections 301 or 306 and applicable to a point source will require that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact. This CWA provision is unique because it addresses the *intake* of water, in contrast to other provisions that regulate the discharge of pollutants into waters of the United States. EPA has established national performance standards under CWA section 316(b) designed to reduce the impingement and entrainment of fish and other aquatic organisms as they are drawn into a facility's cooling water intake structure(s). Impingement occurs when organisms are trapped against cooling water intake structures by the force of water being drawn through the intake structure. Entrainment occurs when organisms are drawn through a cooling water intake structure into a cooling system, through the heat exchanger, and then pumped back out into the waterbody. For more information, see section 4.3.12 of this manual.

In April 1976, EPA published regulations at Part 402 to address cooling water intake structures. Fifty-eight electric utility companies challenged the final rule. The U.S. Court of Appeals for the Fourth Circuit remanded the rule in 1977, and in 1979, EPA withdrew Part 402. Beginning in 1977, NPDES permit authorities made decisions implementing CWA section 316(b) on a case-by-case basis using best professional judgment (BPJ) (§§ 125.90(b) and 401.14).

In the 1990s, EPA began developing CWA section 316(b) regulations establishing national standards. EPA divided the rulemaking into three phases:

- Phase I addressed new facilities and was completed in December 2001 (Part 125, Subpart I).
- Phase II addressed existing electric generating plants that use at least 50 million gallons per day (mgd) of cooling water was completed in July 2004 (Part 125, Subpart J).

- Phase III addressed other existing facilities, including small existing electric generating plants that use less than 50 mgd of cooling water, manufacturers, and new offshore and coastal oil and gas extraction facilities.

The Phase III regulations, finalized in June 2006, establish national standards only for new offshore and coastal oil and gas extraction facilities (Part 125, Subpart N). EPA decided that other Phase III industrial facilities withdrawing water for cooling purposes would not be covered by national standards but would continue to be subject to CWA section 316(b) requirements set by the NPDES Permitting Director on a case-by-case, BPJ basis (§§ 125.90(b) and 401.14).

All three regulations were subject to judicial challenges. While the Phase I rule was largely upheld, the court reviewing the Phase II regulation rejected a number of its provisions. Under remands from the reviewing courts, EPA is reevaluating the Phase II regulation and the decision in the Phase III regulation not to establish national standards for existing Phase III facilities. In the interim, as noted above, NPDES permits must include CWA section 316(b) conditions developed on a case-by-case basis. For the most current information on regulatory requirements, see the Cooling Water Intake Structure Program Website <www.epa.gov/waterscience/316b/>, and for additional Cooling Water Intake Structures regulatory requirements, see section 4.3.12 of this manual.

2.3.2.5 Concentrated Animal Feeding Operations (CAFOs)

Animal feeding operations (AFOs) are agricultural facilities where animals are kept and raised in confined situations. AFOs typically maintain animals, feed, and manure and have production operations in a limited land area. Manure and wastewater from AFOs have the potential to contribute pollutants such as nitrogen and phosphorus, organic matter, sediments, pathogens, heavy metals, hormones, antibiotics, and ammonia to the environment. An AFO is a lot or facility (other than an aquatic animal production facility) where the following conditions are met:

- Animals have been, are, or will be stabled or confined and fed or maintained for a total of 45 days or more in any 12-month period.
- Crops, vegetation, forage growth, or post-harvest residues are not sustained in the normal growing season over any portion of the lot or facility.

AFOs that meet the regulatory definition of a CAFO, or that are designated as CAFOs by the permitting authority, and that discharge or propose to discharge are required to be permitted under the NPDES permitting program.

An animal operation must meet the definition of an AFO [§ 122.23(b)(1)] before it can be considered a CAFO. To be defined as a CAFO, an AFO must meet the regulatory definition [§§ 122.23(b)(4) or 122.23(b)(6)] of a large or medium CAFO or must be designated by the permitting authority [§ 122.23(c)]. Only CAFOs that discharge or propose to discharge are subject to NPDES permitting requirements.

CAFOs are subject to requirements that limit discharges from the production area and requirements applicable to land application areas under the control of the CAFO operator. Large CAFOs are subject to a no discharge requirement for production areas, whereas other CAFOs are subject to BPJ requirements for their production areas. One of the principal substantive pollution control conditions in any CAFO permit is the requirement to implement the terms of the nutrient management plan (NMP) incorporated into the permit when permit authorization is granted. For more information, see the Animal Feeding Operations Website <www.epa.gov/npdes/cafo>. In addition, section 4.3.4 of this manual discusses application requirements for CAFOs.

2.3.2.6 Concentrated Aquatic Animal Production (CAAP) Facilities

CAAP facilities also are regulated under the NPDES program. In 2004 EPA promulgated new effluent guidelines that address CAAP facilities. The effluent guidelines apply to CAAP facilities (flow-through, recirculating, and net pen) that directly discharge wastewater and have annual production equal to or greater than 100,000 pounds of aquatic animals. The rule requires a BMP plan and implementation of measures, including recordkeeping and reporting requirements, to minimize discharges of solids, to prevent spills of drugs, feed, and chemicals that could result in discharges to waters of the United States, and to ensure proper maintenance of the facility. A facility that does not meet the effluent guideline threshold might still need an NPDES permit if it meets the CAAP facilities thresholds established in the NPDES regulations at § 122.24(b) or if it is designated as a CAAP facility under the designation authority in § 122.24(c). For more information, see the Aquatic Animal Production Industry Effluent Guidelines Website <www.epa.gov/guide/aquaculture/>.

2.3.2.7 Vessel Discharges

On March 30, 2005, the U.S. District Court for the Northern District of California (in *Northwest Environmental Advocates et al. v. EPA*) ruled that the EPA regulation excluding discharges incidental to the normal operation of a vessel from NPDES permitting exceeded the Agency's authority under the CWA. On September 18, 2006, the Court issued an order revoking this regulation [40 CFR 122.3(a)] as of September 30, 2008. EPA appealed the District Court's decision, and on July 23, 2008, the Ninth Circuit upheld the decision, leaving the September 30, 2008, *vacatur* date in effect. In response to the Court order, EPA developed two proposed permits to regulate discharges from vessels. The district court ultimately extended the date of *vacatur* to February 6, 2009.

In July 2008, Congress amended the CWA (P.L. No. 110-288) to add a new section 402(r), which excludes discharges incidental to the normal operation of a recreational vessel from NPDES permitting. Instead, it directs EPA to regulate those discharges under a newly created CWA section 312(o). As a result of the law, EPA did not finalize the previously proposed Recreational Vessel General Permit and is instead undertaking rulemaking to develop BMPs for these vessels under the authority of CWA section 312(o).

In July 2010 P.L. 111-215 (Senate Bill S. 3372) was signed into law. This law amends P.L. 110-299 (Senate Bill S. 3298), which generally imposes a moratorium during which time neither EPA nor states may require NPDES permits for discharges incidental to the normal operation of commercial fishing vessels and other non-recreational vessels less than 79 feet. As a result, of P.L. 110-299, the Vessel General Permit (VGP) does not cover vessels less than 79 feet, or commercial fishing vessels, unless they have ballast water discharges. P.L. 111-215 extended the expiration date of the moratorium from July 31, 2010, to December 18, 2013.

As a result of the court ruling, EPA issued the VGP on December 18, 2008. The 2008 VGP regulates discharges incidental to the normal operation of vessels operating in a capacity as a means of transportation. The VGP includes the following:

- general effluent limits applicable to all discharges.
- general effluent limits applicable to 26 specific discharge streams.
- narrative water-quality based effluent limits.
- inspection, monitoring, recordkeeping, and reporting requirements.
- additional requirements applicable to certain vessel types.

EPA estimates that approximately 61,000 domestically flagged commercial vessels and approximately 8,000 foreign flagged vessels could be affected by this permit.

Because this area of the NPDES permit program is relatively new and continues to evolve, for the most current information, see EPA's Vessel Discharges Website <www.epa.gov/npdes/vessels>.

2.4 Major/Minor Facility Designation

In addition to categorizing facilities as municipal and non-municipal, EPA has also developed criteria to determine which of the sources should be considered *major facilities*. The distinction was made initially to assist EPA and states in setting priorities for permit issuance and reissuance. The regulations at § 122.2 define major facility as, "any NPDES *facility or activity* classified as such by the Regional Administrator, or in the case of *approved state programs*, the Regional Administrator in conjunction with the [s]tate Director." All facilities that are not designated as *majors* are considered *minor* facilities.

Through policy, including the memoranda *Procedures for Revising the Major Permit List*[11] <www.epa.gov/npdes/pubs/owm0364.pdf> and *Delegation of Updates to Major/Minor Lists*[12] <www.epa.gov/npdes/pubs/owm0142.pdf>, EPA has established working definitions for POTW and non-municipal major facilities. For POTWs, major facilities are those that have a design flow of one million gallons per day or greater or serve a population of 10,000 or more or cause significant water quality impacts. Non-POTW discharges are classified as major facilities on the basis of the number of points accumulated using the NPDES Permit Rating Work Sheet <www.epa.gov/npdes/pubs/owm0116.pdf>. The worksheet evaluates the significance of a facility using several criteria, including toxic pollutant potential, flow volume, and water quality factors such as impairment of the receiving water or proximity of the discharge to coastal waters.

2.5 Growth and Change in the NPDES Program

The basic structure of the NPDES program has remained the same since the 1972 Federal Water Pollution Control Act amendments, but as EPA develops new regulations, policies, and guidance or modifies existing program requirements and guidance, the existing program is refined and new aspects of the program can emerge. To stay informed about the most recent program developments, permit writers should visit EPA's NPDES Program Website <www.epa.gov/npdes/> frequently.

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[3] U.S. Environmental Protection Agency. 2004. *Report to Congress on the Impacts and Control of CSOs and SSOs.* EPA 833-R-04-001. U.S. Environmental Protection Agency, Office of Water, Washington, DC. <www.epa.gov/npdes/csossoreport2004>.

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[9] U.S. Environmental Protection Agency. 2010. *MS4 Permit Improvement Guide*. EPA833-R-10-001. U.S. Environmental Protection Agency. Office of Water, Washington, DC. <www.epa.gov/npdes/pubs/ms4permit_improvement_guide.pdf>

[10] U.S. Environmental Protection Agency. 2009. *Developing Your Stormwater Pollution Prevention Plan: A Guide for Industrial Operators*. EPA 833-B-09-002. U.S. Environmental Protection Agency, Office of Water, Washington, DC. <www.epa.gov/npdes/pubs/industrial_swppp_guide.pdf>.

[11] Dougherty, Cynthia. 1988. *Procedures for Revising the Major Permit List.* U.S. Environmental Protection Agency, Permits Division. Memorandum, December 28, 1988. <www.epa.gov/npdes/pubs/owm0364.pdf>.

[12] Pendergast, James F. 1995. *Delegation of Updates to Major/Minor Lists.* U.S. Environmental Protection Agency, Office of Wastewater Management. Memorandum, February 6, 1995. <www.epa.gov/npdes/pubs/owm0142.pdf>.

CHAPTER 3. Overview of the NPDES Permitting Process

This chapter presents an overview of the different types of National Pollutant Discharge Elimination System (NPDES) permits, the major permit components, and the permit development and issuance process. The permit process is illustrated by flow charts. The tasks identified within the flow charts are described in detail in subsequent chapters.

3.1 Types of Permits

The two basic types of NPDES permits are individual and general permits. These permit types share the same components but are used under different circumstances and involve different permit issuance processes.

3.1.1 Individual Permits

An individual permit is a permit specifically tailored to an individual facility. Upon receiving the appropriate application form(s), the permitting authority develops a permit for that facility on the basis of information from the permit application and other sources (e.g., previous permit requirements, discharge monitoring reports, technology and water quality standards, total maximum daily loads, ambient water quality data, special studies). The permitting authority then issues the permit to the facility for a specific period not to exceed 5 years, with a requirement to reapply before the expiration date.

3.1.2 General Permits

A permitting authority develops and issues a general permit to cover multiple facilities in a specific category of discharges or of sludge use or disposal practices. General permits can be a cost-effective option for agencies because of the large number of facilities that can be covered under a single permit. According to Title 40 of the *Code of Federal Regulations* (CFR) 122.28(a)(2), general permits may be written to cover stormwater point sources or other categories of point sources having the following common elements:

- Sources that involve the same or substantially similar types of operations.
- Sources that discharge the same types of wastes or engage in the same types of sludge use or disposal.
- Sources that require the same effluent limitations or operating conditions, or standards for sewage sludge use or disposal.
- Sources that require the same monitoring where tiered conditions may be used for minor differences within a class (e.g., size or seasonal activity).
- Sources that are more appropriately regulated by a general permit.

The regulations at § 122.28(a)(1) provide for general permits to cover dischargers within an area corresponding to specific geographic or political boundaries such as the following:

- Designated planning area.
- Sewer district.
- City, county, or state boundary.

- State highway system.
- Standard metropolitan statistical area.
- Urbanized area.

The regulation also allows a general permit to cover any other appropriate division or combination of such boundaries. For example, EPA has issued general permits that cover multiple states, territories, and tribes where EPA is the permitting authority.

Where a large number of similar facilities require permits, a general permit allows the permitting authority to allocate resources in a more efficient manner and to provide more timely permit coverage than issuing an individual permit to each facility. In addition, using a general permit ensures consistent permit conditions for comparable facilities.

3.2 Major Components of a Permit

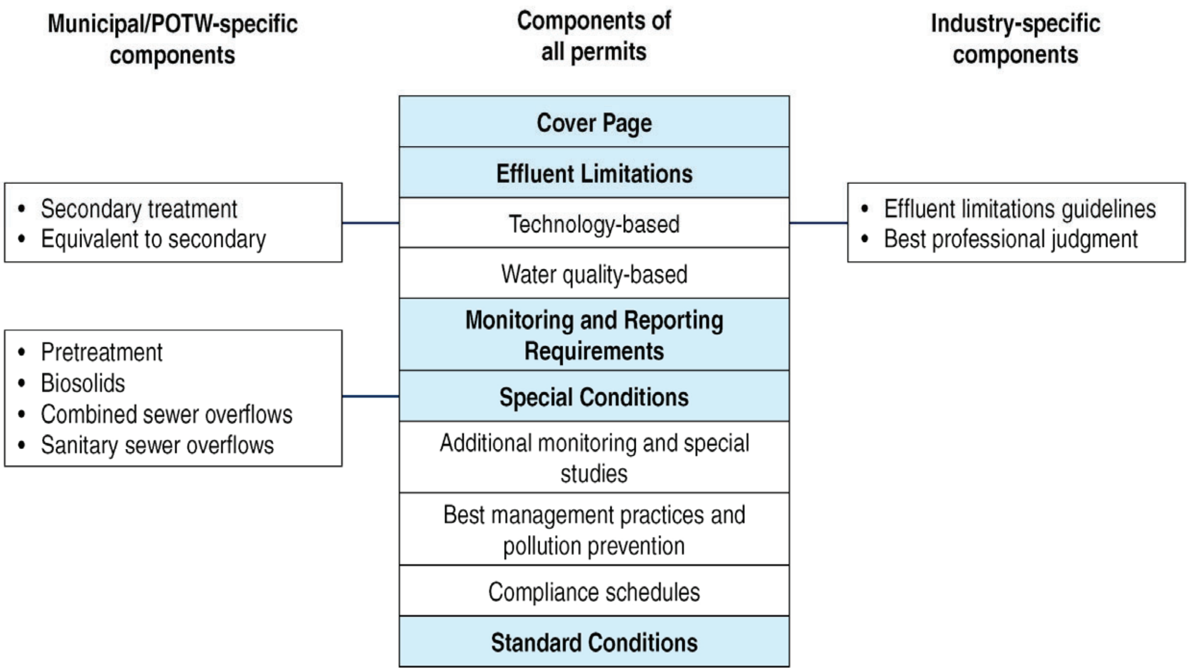
All NPDES permits consist, at a minimum, of five sections:

- **Cover Page:** Contains the name and location of the permittee, a statement authorizing the discharge, and a listing of the specific locations for which a discharge is authorized.
- **Effluent Limitations:** The primary mechanism for controlling discharges of pollutants to receiving waters. A permit writer spends the majority of his or her time, when drafting a permit, deriving appropriate effluent limitations on the basis of applicable technology and water quality standards.
- **Monitoring and Reporting Requirements:** Used to characterize wastestreams and receiving waters, evaluate wastewater treatment efficiency, and determine compliance with permit conditions.
- **Special Conditions:** Conditions developed to supplement numeric effluent limitations. Examples include additional monitoring activities, special studies, best management practices (BMPs), and compliance schedules.
- **Standard Conditions:** Pre-established conditions that apply to all NPDES permits and delineate the legal, administrative, and procedural requirements of the NPDES permit.

In addition to the components of the permit, a fact sheet or statement of basis explaining the rationale for permit conditions makes up part of the documentation that supports a draft permit. Section 11.2 of this manual includes additional discussion of permit documentation and the required elements of a fact sheet or statement of basis.

Although the major sections of a permit listed above are part of all permits, the contents of some sections vary depending on the nature of the discharge (e.g., municipal effluent, industrial process wastewater, stormwater, vessel discharges) and whether the permit is issued to an individual facility or to multiple dischargers (i.e., a general permit). Exhibit 3-1 shows the components of a permit and highlights some distinctions between the contents of NPDES permits for municipal (i.e., POTW) and industrial facilities. Permit writers should note that it is common for different permitting authorities to use different names for each section of a permit.

Exhibit 3-1 Permit components



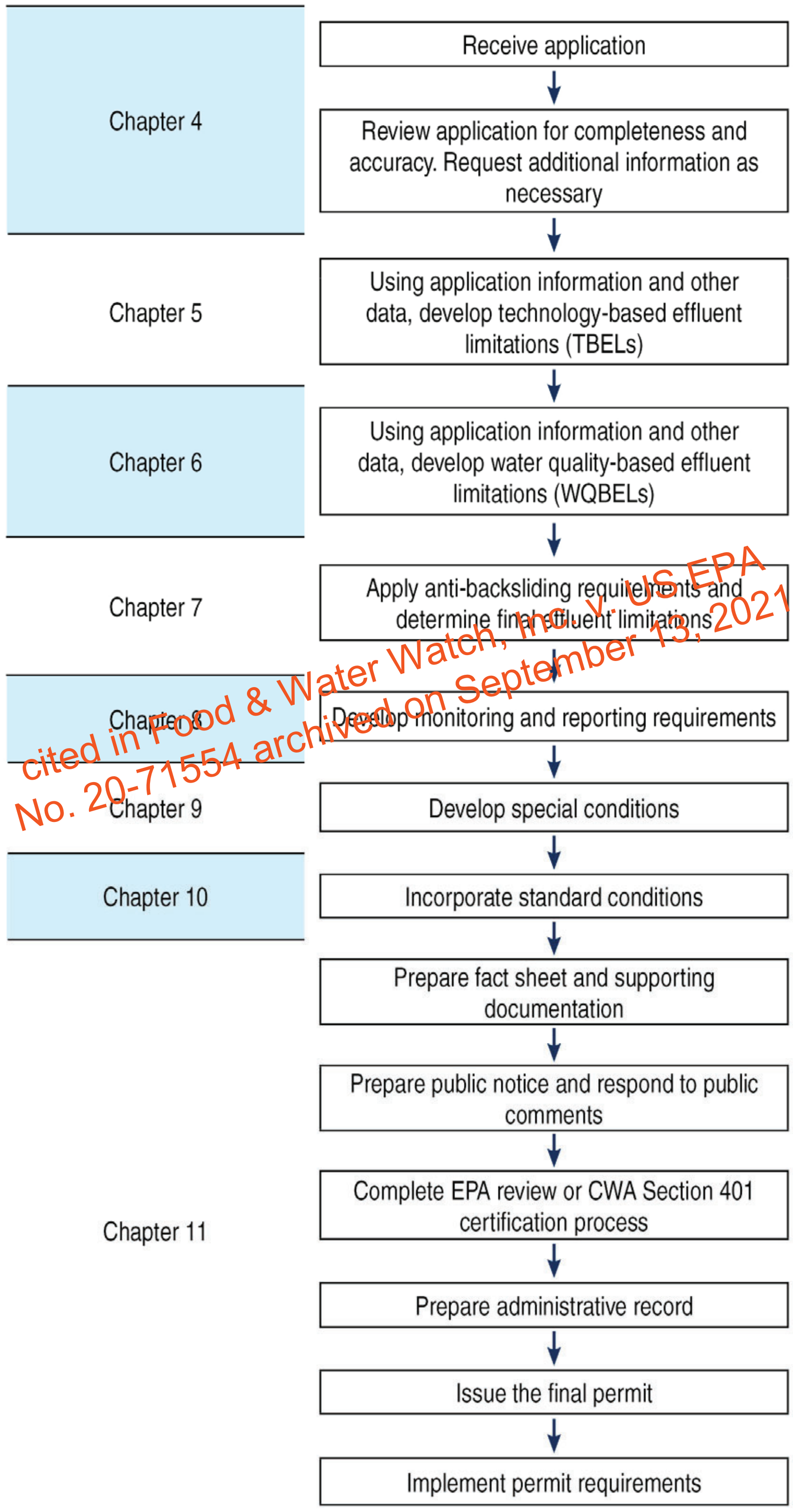
3.3 Overview of the Development and Issuance Process for NPDES Individual Permits

While the limitations and conditions in NPDES individual permits are unique to each permittee, the process used to develop the limitations and conditions and issue each permit generally follows a common set of steps. Exhibit 3-2 illustrates the major steps to develop and issue NPDES individual permits and also serves as an index for the subsequent chapters of this manual by identifying which chapter presents more detailed information on each step.

For individual permits, the permitting process generally begins when a facility operator submits an application. After receiving the application and making a decision to proceed with the permit, the permit writer reviews the application for completeness and accuracy. When the permit writer determines that the application is complete and has any additional information needed to draft the permit, the permit writer develops the draft permit and the justification for the permit conditions (i.e., the fact sheet or statement of basis).

The first major step in the permit development process is deriving technology-based effluent limitations (TBELs). Following that step, the permit writer derives effluent limitations that are protective of state water quality standards (i.e., water quality-based effluent limitations [WQBELs]) as needed. The permit writer then compares the TBELs with the WQBELs and, after conducting an anti-backsliding analysis if necessary, applies the final limitations in the NPDES permit. The permit writer must document the decision-making process for deriving limitations in the permit fact sheet. It is quite possible that a permit will have limitations that are technology-based for some parameters and water quality-based for others. For example, a permit could contain effluent limitations for total suspended solids (TSS) based on national effluent limitations guidelines and standards (effluent guidelines) (technology-based), limitations for ammonia based on preventing toxicity to aquatic life (water quality-based), and limitations for 5-day biochemical oxygen demand (BOD_5) that have different bases, such as an average monthly limitation based on effluent guidelines and a maximum daily limitation based on water quality standards.

Exhibit 3-2 Major steps to develop and issue NPDES individual permits



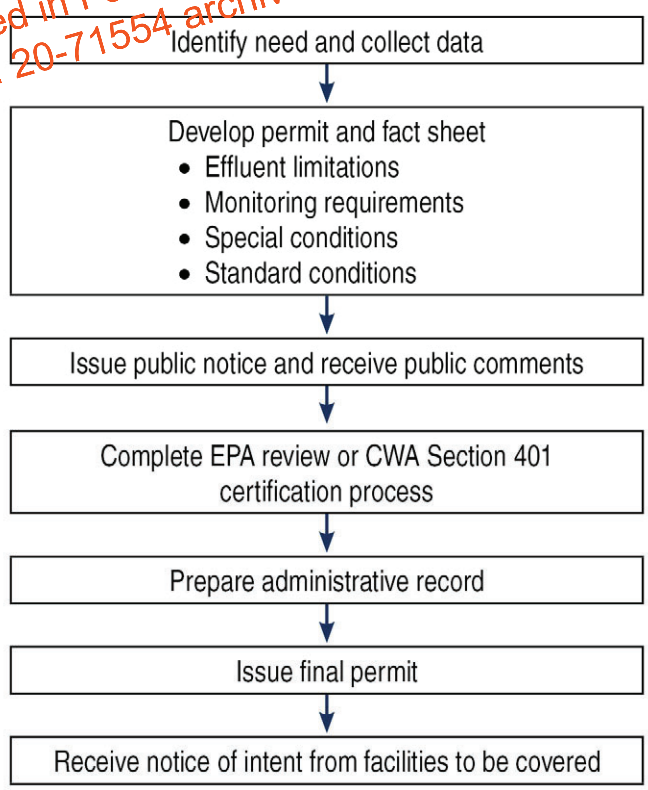
After effluent limitation development, the permit writer develops appropriate monitoring and reporting requirements and facility-specific special conditions. The permit writer then adds standard conditions, which are the same for all permits.

The next step is to provide an opportunity for public participation in the permit process and EPA review of the permit or, in the case of an EPA-issued permit, certification under CWA section 401 by the state with jurisdiction over the receiving water that the permit will comply with its water quality standards. The permitting authority issues a public notice announcing the draft permit and inviting interested parties to submit comments. If there is significant public interest, the permitting authority can hold a public hearing. Taking into consideration the public comments, the permitting authority then produces a final permit, with careful attention to documenting the process and decisions for the administrative record, and issues the final permit to the facility. The permitting authority might decide to make significant changes to the draft permit according to public comment and then provide another opportunity for public review and comment on the revised permit. Section 11.3 of this manual discusses items to address before final permit issuance in more detail.

3.4 Overview of the Development and Issuance Process for NPDES General Permits

The process for developing and issuing NPDES general permits is similar to the process for individual permits; however, there are some differences in the sequence of events. Exhibit 3-3 illustrates the major steps to develop and issue NPDES general permits.

Exhibit 3-3 Major steps to develop and issue NPDES general permits



For general permits, the permitting authority first identifies the need for a general permit and collects data that demonstrate that a group or category of dischargers has similarities that warrant a general permit. In deciding whether to develop a general permit, permitting authorities consider whether

- A large number of facilities will be covered.
- The facilities have similar production processes or activities.
- The facilities generate similar pollutants.
- Whether uniform WQBELs (where necessary) will appropriately implement water quality standards.

The remaining steps of the permit process are the same as for individual permits. The permitting authority develops a draft permit that includes effluent limitations, monitoring conditions, special conditions, and standard conditions. The permitting authority then issues a public notice and addresses public comments, completes the EPA review or CWA section 401 certification process, develops the administrative record, and issues the final permit. The final permit will also establish the requirements for the specific information that must be submitted by a facility that wishes to be covered under the general permit.

After the final general permit has been issued, facilities that wish to be covered under the general permit typically submit a Notice of Intent (NOI) to the permitting authority. After receiving the NOI, the permitting authority can request additional information describing the facility, notify the facility that it is covered by the general permit, or require the facility to apply for an individual permit.

The following chapters in this manual describe steps in the permitting process in detail. In general, the chapters focus on the steps necessary to develop and issue an individual permit, but much of the technical discussion applies equally to general permit development.

CHAPTER 4. NPDES Permit Application Process

This chapter describes the National Pollutant Discharge Elimination System (NPDES) permit application process, including the permit writer's role in reviewing the application and evaluating background information about the applicant. Through this process the permit writer gains an understanding of the circumstances of the discharge and the characteristics of the proposed effluent, which is necessary to develop appropriate permit limitations and conditions.

4.1 Who Applies for an NPDES Permit?

The NPDES regulations at Title 40 of the *Code of Federal Regulations* (CFR) 122.21(a) require that any person, except persons covered by general permits under § 122.28, who discharges pollutants or proposes to discharge pollutants to waters of the United States must apply for a permit. Further, § 122.21(e) prohibits the permitting authority from issuing an individual permit until and unless a prospective discharger provided a complete application. This regulation is broadly inclusive and ties back to the Clean Water Act (CWA) section 301(a) provision that, except as in compliance with the act, "…the discharge of any pollutant by any person shall be unlawful."

In most instances, the permit applicant will be the owner (e.g., corporate officer) of the facility. However, the regulations at § 122.21(b) require that when a facility or activity is owned by one person but is operated by another person, it is the operator's duty to obtain a permit. The regulations also require the application to be signed and certified by a high-ranking official of the business or activity. The signatory and certification requirements are at § 122.22.

Permits (and applications) are required for most discharges or proposed discharges to waters of the United States; however, NPDES permits are not required for some activities as specified under the *Exclusions* provision in § 122.3. Exceptions include the following:

- Discharge of dredged or fill materials into waters of the United States which are regulated under CWA section 404.
- The introduction of sewage, industrial wastes or other pollutants into publicly owned treatment works (POTWs) by indirect dischargers.
- Any discharge in compliance with the instructions of an On-Scene Coordinator pursuant to Part 300 (The National Oil and Hazardous Substances Pollution Contingency Plan) or 33 CFR 153.10(e) (Pollution by Oil and Hazardous Substances).
- Any introduction of pollutants from nonpoint source agricultural and silvicultural activities, including stormwater runoff from orchards, cultivated crops, pastures, range lands, and forest lands, but not discharges from concentrated animal feeding operations as defined in § 122.23, discharges from concentrated aquatic animal production facilities as defined in § 122.24, discharges to aquaculture projects as defined in § 122.25, and discharges from silvicultural point sources as defined in § 122.27.
- Return flows from irrigated agriculture.

- Discharges into a privately owned treatment works, except as the Director may otherwise require under § 122.44(m).

While those types of discharges have been excluded from permitting requirements under the NPDES program, they might be subject to controls under other federal or state regulatory programs.

As of the date of this manual's publication, the exclusion for certain discharges incidental to the normal operation of a vessel is still in the CFR. Similarly, discharges from the application of pesticides consistent with all relevant requirements under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) (i.e., those relevant to protecting water quality) are excluded from NPDES permit coverage in the following two circumstances: (1) the application of pesticides directly to waters of the United States to control pests, and (2) the application of pesticides to control pests that are present over waters of the United States, including near such waters, where a portion of the pesticides will unavoidably be deposited to waters of the United States to target the pests effectively. However, because of court decisions, the exclusions for vessels and pesticides are vacated as of February 6, 2009, and April 9, 2011, respectively. The effect of the *vacaturs* on the exclusions in § 122.3 is presented in Exhibit 4-1.

Exhibit 4-1 Effect of court decisions on § 122.3

Exclusion	Issue
Vessel Discharges (www.epa.gov/npdes/vessels)	The Court's ruling does not affect vessel discharge exemptions from permitting that are specifically provided for in the CWA itself. For example, § 502(6)(A) excludes from the act's definition of *pollutant* sewage from vessels (including graywater in the case of commercial vessels operating on the Great Lakes) and discharges incidental to the normal operation of a vessel of the Armed Forces within the meaning of CWA section 312. As another example, the CWA section 502(12)(B) provides that discharges from vessels (i.e., discharges other than those when the vessel is operating in a capacity other than as a means of transportation) do not constitute the, "discharge of a pollutant" when such discharges occur beyond the limit of the 3-mile territorial sea. Because both *a pollutant* and a *discharge of a pollutant* are prerequisites to the requirement to obtain an NPDES permit, those two statutory provisions have the effect of exempting the vessel discharges they address from the requirement to obtain an NPDES permit. In addition, in July 2008, Congress amended the CWA to add a new section 402(r) to the act, which excludes discharges incidental to the normal operation of a recreational vessel from NPDES permitting. For more information, see section 2.3.2.7 of this manual.
Pesticides (www.epa.gov/npdes/aquaticpesticides)	On January 7, 2009, the 6th Circuit Court vacated the final rule in *The National Cotton Council of America et al. v. United States Environmental Protection Agency*. The court held that while an NPDES permit is not required for chemical pesticide applications that leave no residuals, an NPDES permit is required for discharges (1) from chemical pesticide applications to or over, including near water, where there is a residual, or excess pesticide, in the water following the application, and (2) from all biological pesticide applications regardless of whether a residual is left. On June 8, 2009, the court granted a request from the U.S. Department of Justice for a 2-year stay of its decision, until April 9, 2011, to provide time for EPA and the states to develop and issue NPDES general permits for the discharge of pollutants from the application of pesticides. Before April 9, 2011, permits are not required for discharges from these applications when applied in accordance with the product's FIFRA label. Certain related activities continue to be exempt from permitting under the CWA (i.e., irrigation return flow and agricultural stormwater runoff).

4.2 Application Deadlines

The regulations at § 122.21(c) and (d) specify the time to apply for NPDES permits. Exhibit 4-2 summarizes the application deadline requirements for dischargers to be covered by an NPDES permit.

Exhibit 4-2 When to apply for an NPDES permit

Type of permit	Type of discharge	Schedule*
Individual	New	At least 180 days before the date on which the discharge is to commence
	Existing	At least 180 days before expiration date of existing permit
	Construction Stormwater	At least 90 days before the date on which construction is to commence
General	New	Specified in general permit
	Existing	X number of days following issuance of permit (specified in the general permit)

* Authorized states may use more stringent deadlines.

Anyone proposing a new discharge must apply to the permitting authority no later than 180 days before the expected commencement of the discharge if applying for an individual permit. Any person with an currently effective individual permit must submit an application to the permitting authority at least 180 days before the expiration of its existing individual permit unless permission for a later date has been granted in accordance with § 122.21(d). For general permits, the deadline for new dischargers to apply is specified in the general permit. A general permit also may specify a number of days after the general permit's issuance that operators of existing facilities are given to apply for coverage. Authorized states may have different schedules for permit applications, but their schedules may be no less stringent than the federal deadlines. The State Director or the Regional Administrator may allow an individual application to be submitted at dates later than those specified in the regulations, but not later than the expiration date of the existing permit.

Note that, according to § 122.6, the conditions of an expired NPDES permit remain in effect until the new permit is issued, as long as the discharger submitted a complete application in accordance with the timeframes prescribed in the regulations (or in accordance with state law, in the case of state-administered NPDES programs). If state law does not allow expired permits to remain in effect until a permit is reissued, or if the permit application is not on time and complete, the facility may be considered to be discharging without a permit from the time the permit expired until the effective date of the new permit.

4.3 Application Forms and Requirements for Individual Permits

When a facility needs an individual NPDES permit, it must submit a permit application. Application forms and requirements are specific to the type of facility and discharge. NPDES permit application requirements are in Part 122, Subpart B and identified on forms developed by the U.S. Environmental Protection Agency (EPA). Authorized states are not required to use the EPA application forms; however, any alternative form used by an authorized state must include the federal requirements at a minimum.

Exhibit 4-3 provides an overview of the types of dischargers required to submit NPDES application forms, identifies the forms that must be submitted, and references the corresponding NPDES regulatory citation. In some cases, a facility might need to file more than one application form. For example, an existing industrial facility (i.e., renewal) discharging stormwater combined with process and non-process wastewater might need to submit Form 1, Form 2C, and Form 2F. Section 2.3 of this manual discusses the NPDES program areas that have application requirements presented below.

Exhibit 4-3 EPA application requirements for NPDES individual permits

Type of facility or program area	Status	Forms	Regulatory citations and additional application requirements (40 CFR)
Municipal facilities • POTWs with design flows greater than or equal to 0.1 million gallons per day (mgd)	New and existing	**Form 2A**, Parts A, B and C; Parts D, E, F, or G as applicable	• § 122.21(a)(2)(i)(B) • § 122.21(j)
• POTWs with design flows less than 0.1 mgd	New and existing	**Form 2A**, Parts A and C; Parts D, E, F, or G as applicable	• § 122.21(a)(2)(i)(B) • § 122.21(j)
TWTDS (sewage sludge)	New and existing	**Form 2S**	• § 122.21(a)(2)(i)(H) • § 122.21(q)
Concentrated animal production facilities • Concentrated animal feeding operations • Concentrated aquatic animal production facilities	New and existing	**Form 1** and **Form 2B**	• § 122.21(a)(2)(i)(A) and (C) • § 122.21(f) and (i)
Industrial facilities • Manufacturing facilities • Commercial facilities • Mining activities • Silvicultural activities	Existing	**Form 1** and **Form 2C**	• § 122.21(a)(2)(i)(A) and (D) • § 122.21(f) and (g)
	New (process wastewater)	**Form 1** and **Form 2D**	• § 122.21(a)(2)(i)(A) and (E) • § 122.21(f) and (k)
	New and existing (non-process wastewater)	**Form 1** and **Form 2E**	• § 122.21(a)(2)(i)(A) and (F) • § 122.21(f) and (h)
Stormwater discharges associated with industrial activities (except stormwater discharges associated with construction activity)	New and existing	**Form 1** and **Form 2F**	• § 122.21(a)(2)(i)(A) and (G) • § 122.21(f) • § 122.26(c)
Stormwater discharges associated with construction activity	New and existing	**Form 1**	• § 122.21(a)(2)(i)(A) • § 122.21(f) • § 122.26(c)(1)(ii)
Stormwater discharges from MS4s serving a population greater than 100,000	New and existing	None	• § 122.26(d)
Stormwater discharges from small MS4s	New and existing	None	• § 122.33 • § 122.21(f)
Cooling water intake structures	New and existing	None	• § 122.21(r)

4.3.1 Form 1: General Information

All facilities applying for an individual NPDES permit, with the exception of POTWs, treatment works treating domestic sewage (TWTDS), and municipal separate storm sewer systems (MS4s) applying for a municipal stormwater permit, must submit Form 1 <www.epa.gov/npdes/pubs/form_1.pdf>. The type of general facility information required by Form 1 is specified in §§ 122.21(a)(2)(i)(A) and 122.21(f) and includes the following:

- Name, mailing address, facility contact, and facility location.
- Standard industrial classification (SIC) code and a brief description of the nature of the business.
- Topographic map showing the location of the existing or proposed intake and discharge structures.

4.3.2 Form 2A: New and Existing POTWs

All new and existing POTWs must submit Form 2A <www.epa.gov/npdes/pubs/final2a.pdf>. EPA issued a final rule amending permit application requirements and application forms for POTWs and other TWTDS (64 FR 42433, August 4, 1999). The rule consolidated POTW application requirements, expanded toxic monitoring requirements for POTWs, and revised the forms used to submit permit applications. POTWs must also submit the form for permit renewals. Form 2A replaces Standard Form A and Short Form A.

POTWs with design influent flows equal to or greater than 100,000 gallons per day (gpd) (0.1 mgd) must submit Parts A, B, and C of Form 2A. POTWs with design flows of less than 100,000 gpd must submit Parts A and C of Form 2A. Parts A, B and C are referred to as Basic Application Information:

- Part A of Form 2A contains basic application information for all applicants:
  - Facility and applicant information.
  - Collection system type, areas served, and total population served.
  - Discharges and other disposal methods.
  - If the treatment works discharges effluent to waters of the United States, a description of outfalls, receiving waters, and treatment and effluent testing information.
- Part B of Form 2A collects additional information for applicants with a design flow greater than or equal to 0.1 mgd, including inflow and infiltration estimates, a topographic map, process flow diagram, and effluent testing data for additional parameters.
- Part C is a certification that all applicants must complete.

Form 2A also includes Supplemental Application Information (Parts D–G). POTWs complete these additional forms, as applicable, depending on the characteristics of the municipal discharge:

- Part D requests expanded effluent testing data for metals, volatile organic compounds, acid-extractable compounds, and base-neutral compounds. A POTW that discharges effluent to waters of the United States and meets one or more of the following criteria must complete Part D:
  - Has a design flow rate greater than or equal to 1 mgd.
  - Is required to have a pretreatment program (or has one in place).
  - Is otherwise required by the permitting authority to provide the information.

- A POTW that meets one or more of the following criteria must complete Part E (Toxicity Testing Data):
  - Has a design flow greater than or equal to 1 mgd.
  - Is required to have a pretreatment program (or has one in place).
  - Is otherwise required by the permitting authority to submit results of toxicity testing.
- A POTW that accepts process wastewater from any significant industrial users (SIUs) or receives Resource Conservation and Recovery Act (RCRA) or Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or other remedial wastes must complete Part F. SIUs are defined as:
  - All industrial users subject to Categorical Pretreatment Standards under § 403.6 and 40 CFR Chapter I, Subchapter N.
  - Any other industrial user for which any of the following is true
    - Discharges an average of 25,000 gpd or more of process wastewater to the POTW (excluding sanitary, non-contact cooling, and boiler blowdown wastewater).
    - Contributes a process wastestream that makes up 5 percent or more of the average dry-weather hydraulic or organic capacity of the treatment plant.
    - Is designated an SIU by the control authority on the basis that it has a reasonable potential for adversely affecting the POTWs operation or for violating any pretreatment standard or requirement.
  - The control authority can determine that an industrial user subject to categorical pretreatment standards is a nonsignificant categorical industrial user, rather than an SIU, on a finding that it never discharges more than 100 gpd of total categorical wastewater and if:
    - Before that finding, the industrial user has consistently complied with all applicable categorical pretreatment standards and requirements.
    - The industrial user annually submits a certification statement required in § 403.12(q) and any information necessary to support the certification statement.
    - The industrial user never discharges any untreated concentrated wastewater.
  - If an industrial user meets one of the other criteria for determining that it is an SIU (i.e., discharges an average of 25,000 gpd of process wastewater), but the control authority finds that it has no reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standards or requirement, the control authority can determine that the industrial user is not an SIU.
- A POTW that has a combined sewer system must complete Part G. Information that must be provided in the section includes a system map and diagram, and descriptions of outfalls, combined sewer overflow (CSO) events, receiving waters, and operations.

4.3.3 Form 2S: New and Existing TWTDS

New TWTDS and TWTDS with effective NPDES permits must submit a new or renewal permit application, respectively, using new Form 2S <www.epa.gov/npdes/pubs/final2s.pdf>. Part 1 of Form 2S is to be completed by *sludge-only* facilities; that is, facilities that do not have, and are not applying for, an NPDES permit for a direct discharge to surface water. Part 1 collects background information on the facility, including identification information, quantities of sewage sludge handled, pollutant concentrations, treatment methods, and use and disposal information.

Part 2 is used by facilities that already have or are applying for an NPDES permit. It includes five sections:

- All applicants using Part 2 must complete the general information collected by **section A**.
- Applicants who either generate sewage sludge or derive a material from sewage sludge must complete **section B**.
- Applicants who either apply sewage sludge to the land or generate sewage sludge that is applied to the land by others (unless the sludge from the facility meets certain exemption criteria) must complete **section C**.
- Applicants who own or operate a surface disposal site must complete **section D**.
- Applicants who own or operate a sewage sludge incinerator must complete **section E**.

4.3.4 Form 2B: New and Existing Concentrated Animal Feeding Operations (CAFOs) and Concentrated Aquatic Animal Production (CAAP) Facilities

In addition to Form 1, owners of new and existing CAFOs (defined in § 122.23) and CAAP facilities (defined in § 122.24) must submit Form 2B <www.epa.gov/ne/npdes/2010RevisedCafoFedRegstrForm2b.pdf>. Form 2B was significantly modified as part of the final CAFO Rules (68 FR 7176, February 12, 2003, and 73 FR 70418, November 20, 2008). The type of information required by Form 2B consists of the following:

- For CAFOs
  - The name of the owner or operator.
  - The facility location and mailing addresses.
  - Latitude and longitude of the production area.
  - A topographic map of the geographic area in which the CAFO is located.
  - Specific information about the number and type of animals.
  - The type of containment and total capacity for storage (tons/gallons).
  - The total number of acres under control of the applicant available for land application.
  - Estimated amounts of manure, litter, and process wastewater generated and amounts transferred to other persons per year.
  - A nutrient management plan (NMP) that satisfies the requirements of § 122.42(e).
- For CAAP facilities
  - The maximum daily and average monthly flow from each outfall.
  - The number of ponds, raceways, and similar structures.
  - The name of the receiving water and the source of intake water.
  - For each species of aquatic animals, the total yearly and maximum harvestable weight.
  - The calendar month of maximum feeding and the total mass of food fed during that month.

Note that recent revisions to the NPDES regulations require that a CAFO seeking coverage under a permit submit its NMP with its application for an individual permit or notice of intent (NOI) to be authorized under a general permit. Permitting authorities are required to review the plan and provide the public with an opportunity for meaningful public review and comment. Permitting authorities also are required to incorporate terms of the NMP as NPDES permit conditions. For more information on the revisions to the CAFO regulations, see the Animal Feeding Operations Website <www.epa.gov/npdes/cafo>.

Sections 2.3.2.5 and 2.3.2.6 of this manual provide additional information on CAFOs and CAAP facilities, respectively.

4.3.5 Form 2C: Existing Manufacturing, Commercial, Mining, and Silvicultural Discharges

In addition to Form 1, operators of existing (i.e., currently permitted) manufacturing, commercial, mining, and silvicultural discharges must submit Form 2C <www.epa.gov/npdes/pubs/3510-2C.pdf>. The type of information required in Form 2C includes:

- Outfall locations.
- A line drawing of the water flow through the facility.
- Flow characteristics, sources of pollution, treatment technologies.
- Production information (if applicable).
- Improvements (if applicable).
- Intake and effluent characteristics for conventional, nonconventional and toxic (priority) pollutants.
- Potential discharges not covered by analysis.
- Biological testing data.
- Contract laboratory information.
- Certification and signature.

Quantitative effluent data requirements for existing industrial dischargers vary depending on the industrial category of the facility, the facility's discharge characteristics and the types of pollutants expected to be present in the discharge.

4.3.6 Form 2D: New Manufacturing, Commercial, Mining, and Silvicultural Discharges of Process Wastewater

In addition to Form 1, operators of new manufacturing, commercial, mining, and silvicultural discharges of process wastewater must submit Form 2D <www.epa.gov/npdes/pubs/3510-2D.pdf>. *New* dischargers are those that have not previously obtained permits for a discharge and have not commenced operation. The type of information required in Form 2D includes the following:

- Expected outfall locations.
- Date of expected commencement of discharge.
- Expected flow characteristics.
- Sources of pollutants.
- Treatment technologies.
- Production information (if applicable).
- Expected intake and effluent characteristics.

4.3.7 Form 2E: Manufacturing, Commercial, Mining, and Silvicultural Facilities that Discharge Only Non-Process Wastewater

In addition to Form 1, operators applying for an individual NPDES permit for manufacturing, commercial, mining, and silvicultural facilities that are not regulated by effluent limitations guidelines and standards (effluent guidelines) or new source performance standard, and that discharge only non-process wastewaters, must submit Form 2E <www.epa.gov/npdes/pubs/3510-2E.pdf>. *Non-process wastewater* includes sanitary wastes, restaurant or cafeteria wastes, and non-contact cooling water, but it does not include stormwater. Stormwater is specifically excluded from the definition of non-process wastewater. Form 2E also may not be used for discharges by educational, medical, or commercial chemical laboratories or by POTWs. The type of information required in Form 2E includes the following:

- Outfall locations.
- Type of waste discharged.
- Effluent characteristics, including quantitative data for selected parameters.
- Flow characteristics.
- Treatment technologies.

4.3.8 Form 2F: Stormwater Discharges Associated with Industrial Activities

In addition to Form 1, operators applying for an individual NPDES permit for discharges composed entirely of stormwater associated with industrial activity must submit Form 2F <www.epa.gov/npdes/pubs/3510-2F.pdf>. Applicants whose discharge is composed of stormwater and non-stormwater must also submit Form 2C, 2D, or 2E as appropriate. The type of information required in Form 2F includes the following:

- A topographic map and estimates of impervious surface area.
- Descriptions of material management practices and control measures.
- A certification that outfalls have been evaluated for non-stormwater discharges.
- Descriptions of past leaks and spills.
- Analytical data from each outfall for several specified parameters.

EPA developed the *Guidance Manual For the Preparation of NPDES Permit Applications For Stormwater Discharges Associated With Industrial Activity*[1] <www.epa.gov/npdes/pubs/owm0241.pdf> to assist operators of facilities that discharge stormwater associated with industrial activity in complying with the requirements for applying for an NPDES permit.

4.3.9 Stormwater Discharges Associated with Construction Activity

Most stormwater discharges associated with construction activities that result in the disturbance of one acre or more are covered under a general permit issued by EPA or the authorized state. In cases that a general permit does not cover the discharge or the discharger decides that an individual permit is necessary for stormwater discharges associated with construction activity, the discharger is required to submit Form 1, along with a narrative description of the following:

- The location (including a map) and the nature of the construction activity.
- The total area of the site and the area of the site that is expected to undergo excavation during the life of the permit.
- Proposed measures, including best management practices (BMPs), to control pollutants in stormwater discharges during construction, including a brief description of applicable state and local erosion and sediment control requirements.

- Proposed measures to control pollutants in stormwater discharges that will occur after construction operations have been completed, including a brief description of applicable state or local erosion and sediment control requirements.
- An estimate of the runoff coefficient of the site and the increase in impervious area after the construction addressed in the permit application is completed, the nature of fill material and existing data describing the soil or the quality of the discharge.
- The name of the receiving water.

4.3.10 Stormwater Discharges from MS4s Serving a Population Greater than 100,000

The stormwater application regulations (55 FR 47990, November 16, 1990) require operators of large or medium MS4s to submit two-part applications. Part 1 application information was required to be submitted by large MS4s (serving a population greater than 250,000) by November 18, 1991, and by medium MS4s (serving a population greater than 100,000 but less than or equal to 250,000) by May 18, 1992. Part 2 application information was required to be submitted by large MS4s by November 16, 1992, and by medium MS4s by May 17, 1993. Those applications could be submitted on a system- or jurisdiction-wide basis. Key requirements of each part of the application include [and are further addressed in § 122.26(d)] the following:

- Part 1
  - General information (e.g., name, address).
  - Existing legal authorities to control discharges to the storm sewer system and any additional authority that might be required.
  - Source identification information (e.g., storm sewer outfalls, land use information).
  - Discharge characterization, including monthly precipitation estimates, average number of storm events, and results from dry-weather flow screening.
  - Characterization plan, including identification of 5 to 10 representative outfalls for stormwater sampling.
  - Description of existing stormwater management practices.
  - Descriptions of existing budget and resources available to complete Part 2 of the application and implement the stormwater program.
- Part 2
  - Demonstration of adequate legal authority.
  - Identification of any major storm sewer outfalls not included in Part 1 of the application.
  - Discharge characterization data from three representative storm events.
  - Proposed stormwater management program.
  - Assessment of controls, including expected reductions in pollutant loadings.
  - Fiscal analysis, including necessary capital and operation and maintenance expenditures for each year of the permit.

Under the NPDES regulations, permittees are required to reapply for a new NPDES permit before the expiration of their existing permit; however, in the case of stormwater permits for MS4s, Part 1 and Part 2 application requirements described above were intended only for the initial issuance of an MS4 permit and specific requirements for reapplication have not been defined in the regulations. On May 17, 1996, EPA issued a policy that sets forth a streamlined approach for reapplication requirements for operators of

MS4s (61 FR 41698, August 9, 1996) that allows municipalities to use recommended changes submitted in their fourth year annual report required under § 122.42(c)(2), as the principal component of their reapplication package. It also encourages changes to monitoring programs to make them appropriate and useful to stormwater management decisions. With the policy, EPA seeks to improve municipal stormwater management efforts by allowing municipalities to target their resources for the greatest environmental benefit.

4.3.11 Stormwater Discharges from Small MS4s

The application requirements for small MS4s are addressed in § 122.33. Most states have issued general permits for small MS4s; however, regulated small MS4s may seek authorization to discharge under an individual permit. The application requirements are different depending on whether the MS4 will implement a program under § 122.34 (i.e., a program that follows EPA's six minimum control measures) or a program that varies from § 122.34. EPA anticipates that most MS4s will follow the § 122.34 requirements.

Regulated small MS4s seeking an individual permit and wishing to implement a program under § 122.34 (the six minimum control measures) must submit an application to their NPDES permitting authority that includes the following:

- The information required under §§ 122.21(f) and 122.34(d).
- An estimate of square mileage served by the small MS4.
- Any additional information that the NPDES permitting authority requests.

A storm sewer map that satisfies the requirement of § 122.34(b)(3)(i) will also satisfy the map requirement in § 122.21(f)(7).

Regulated small MS4s seeking an individual permit and wishing to implement a program that is different from the program under § 122.34 must comply with the permit application requirements of § 122.26(d) (for additional information, see section 4.3.10 above). Under § 122.33, the regulated small MS4 is required to submit both parts of the application requirements in §§ 122.26(d)(1) and (2) by March 10, 2003. Small MS4s are not required to submit the information required by §§ 122.26(d)(1)(ii) and (d)(2) regarding their legal authority, unless they intend for the permit writer to take such information into account when developing their other permit conditions. Regulated small MS4s may jointly apply with another regulated entity consistent with the same requirements.

Additionally, another regulated entity may seek a modification of an existing MS4 permit to include a regulated small MS4 as a co-permittee. In such a case, the regulated small MS4 must apply consistent with § 122.26 rather than § 122.34. Application requirements of §§ 122.26(d)(1)(iii) and (iv) and (d)(2)(iii) do not apply and compliance with §§ 122.26(d)(1)(v) and (d)(2)(iv) can be met by referring to the other MS4's stormwater management program.

4.3.12 Cooling Water Intake Structures

Phase I of the CWA section 316(b) rule was finalized on December 18, 2001, in 66 FR 65256. The Phase I Rule (Part 125, Subpart I) implements CWA section 316(b) for most new facilities. The rule applies to new facilities that use cooling water intake structures to withdraw water from waters of the United States and that have or require an NPDES permit. This rule includes new facilities that have a design intake flow of greater than 2 mgd and that use at least 25 percent of water withdrawn for cooling purposes. For other new facilities that have or require an NPDES permit but do not meet the 2-mgd intake flow threshold or use less than 25 percent of their water for cooling water purposes, the permit authority must implement CWA section 316(b) on a case-by-case basis, using best professional judgment (BPJ) (§§ 125.90(b) and 401.14).

Phase II of the CWA section 316(b) rule was finalized on July 9, 2004, in 69 FR 41576. In 2007 EPA suspended the rule following remand of a number of its provisions by the U.S. Court of Appeals for the Second Circuit. CWA section 316(b) requirements for such facilities must be developed on a case-by-case basis.

Phase III of the CWA section 316(b) rule was finalized on June 16, 2006, in 71 FR 35006. The Phase III rule (Part 125, Subpart N) implements CWA section 316(b) for new offshore oil and gas extraction facilities that use cooling water intake structures to withdraw water from waters of the United States and that have or require an NPDES permit. The rule includes facilities with a design intake flow of greater than 2 mgd and that use at least 25 percent of water withdrawn for cooling purposes.

EPA has not established national standards for existing Phase III facilities and is reevaluating its decisions in both Phase II and Phase III because of court remands. In the interim, for Phase III facilities not regulated under national categorical standards, the permitting authority must implement CWA section 316(b) on a case-by-case basis, using BPJ (§§ 125.90(b) and 401.14). For the most current information on regulatory requirements, see the Cooling Water Intake Structure Program Website <www.epa.gov/waterscience/316b/>.

4.4 Requirements for NPDES General Permits

As previously discussed in section 3.12 of this manual, general permits (§ 122.28) are permits developed for a specific category of dischargers within a specified geographic or political boundary. Using a general permit could simplify the permitting process for both EPA and the discharger. Owners/operators may seek coverage under a general permit only if one has been issued that is applicable to the type of facility for which coverage is sought and the permit covers the facility's activities. In addition, the permitting authority may determine that a general permit is not appropriate for a facility seeking coverage under the general permit and can require the facility to apply for an individual permit. Furthermore, a facility that otherwise qualifies for a general permit may opt to apply for an individual permit.

In most cases, a facility or activity seeking coverage under a general permit must seek coverage by submitting an NOI. The information that must be provided by the facility or activity in the NOI is specified in the general permit and must include, at a minimum, the following:

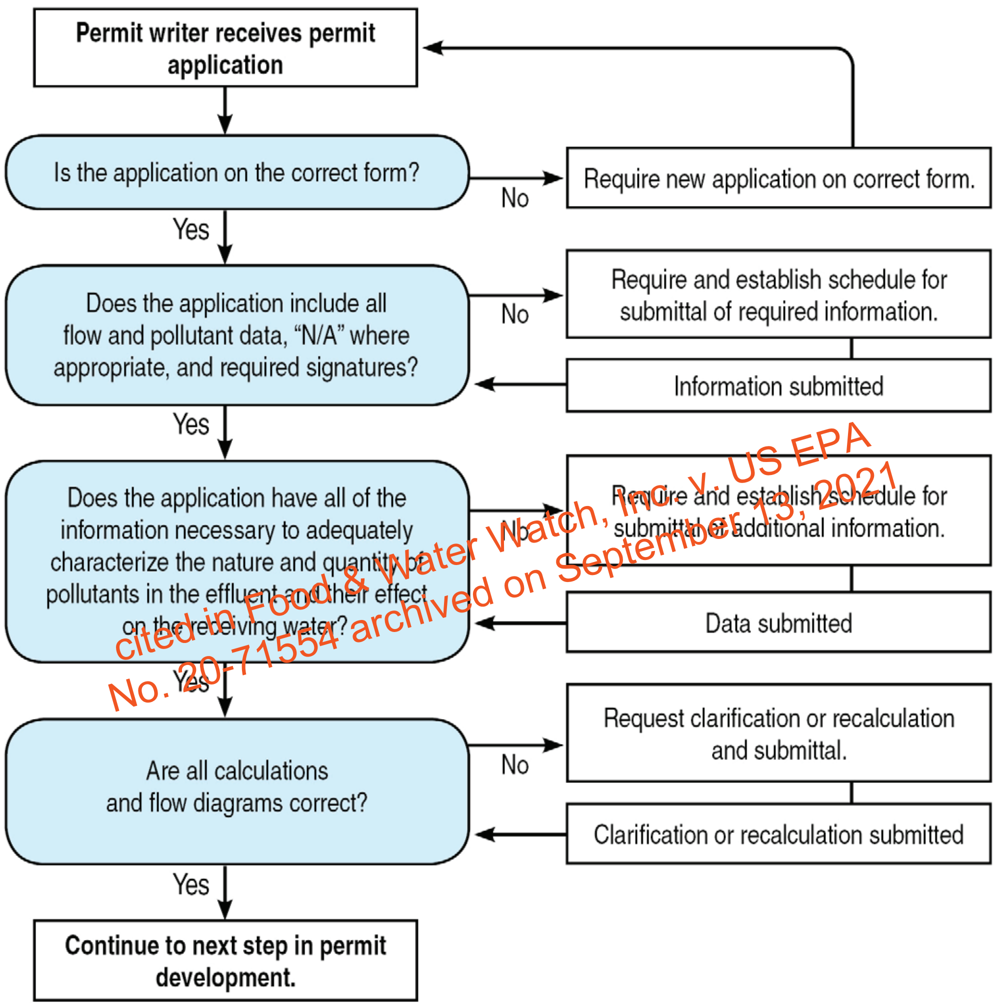
- Legal name and address of the owner or operator.
- Name and address of the facility.
- Type of facility or discharges.
- The receiving stream(s).

EPA has developed the Electronic NOI (eNOI) for construction sites and industrial facilities that need to apply for coverage under EPA's Construction General Permit (CGP) or Multi-Sector General Permit (MSGP), respectively. EPA's Electronic Stormwater Notice of Intent (eNOI) Website <www.epa.gov/npdes/stormwater/enoi> presents additional information about eNOI.

4.5 Application Review

The contents of individual NPDES permits are based, in part, on the information included in the application. Thus, the application must be complete and accurate before a permit writer can properly develop a permit. Exhibit 4-4 depicts the general process for reviewing a permit application, based on a chart provided in the *Washington Department of Ecology's Permit Writers' Manual*[2].

Exhibit 4-4 Permit application review process



After the initial application review, the permit writer may request that an applicant submit other information needed to decide whether to issue a permit and for permit development. The requested information could include the following:

- Additional information, quantitative data, or recalculated data.
- Submission of a new form (if an inappropriate form was used).
- Resubmission of the application (if incomplete or outdated information was initially submitted).

In some situations, a considerable amount of correspondence might be required before the permit writer obtains all the information that he or she believes is necessary to draft the permit.

4.5.1 The Complete Application

The regulations at § 122.21(e) state that the Director, "[must] not issue a permit before receiving a complete application..." At a minimum, the application form must have all applicable spaces filled in. Instructions for the application form state that all items must be completed and that applicants use the statement *not applicable* (N/A) to indicate that the item had been considered. Blanks on a form can occur for a number of reasons, such as the following:

- The response was inadvertently omitted.
- The applicant had difficulty determining the correct response and rather than provide misleading or incorrect information, left the space blank.
- The applicant was unwilling to provide the response.

A permit writer must obtain a response to the blank items by contacting the facility in writing or, in some cases, by telephone. Only minor changes should be handled by telephone and even minor items should be documented in writing in the permit file. Under no circumstances should a permit writer edit or modify the application, which is a legal document that has been signed and certified by the applicant. The original application, any subsequent clarifications, and any supplemental information provided by the applicant should be clearly identified in the file. The information will become part of the administrative record (§ 124.9) for the permit (see section 11.2.1 of this manual), which is critical if any legal challenges regarding permit decisions arise. If the changes or corrections to any application are extensive, the permit writer may require the permit applicant to submit a new application.

The permit writer may also require supplementary information, such as more detailed production information or maintenance and operating data for a treatment system, to process the permit. According to § 122.21(e), an application is considered complete when the permitting authority is satisfied that all required information has been submitted. Supplementary information also can be obtained later when the permit writer is actually drafting the permit. The applicant may submit additional information voluntarily or be required to do so under CWA section 308 or under a similar provision of state law.

4.5.2 Common Omissions in Applications

This section identifies some of the most common omissions and errors found in NPDES permit applications and provides examples of ways to identify missing information and verify the accuracy of certain data.

One of the most commonly omitted items from NPDES permit applications is a topographic map of the area around the discharge, which is required as an attachment to Form 1, Form 2A, and Form 2S. Other industry- or municipality-specific information is also often omitted. For example, industrial applicants sometimes fail to submit a line drawing of the water flow through the facility required by Part II-A of Form 2C. The line drawing is important for ensuring that the location and description of the outfalls and the description of processes (Parts I and II-B of Form 2C) provided by the applicant are accurate.

Sometimes applicants do not properly submit the effluent data necessary to characterize the facility. Below are some required data elements that are commonly omitted from permit applications:

- Valid whole effluent toxicity (WET) testing data, required from POTWs with design flows greater than 1 mgd or those with a pretreatment program. This requirement may be satisfied if the expiring permit contains a requirement for effluent characterization of WET. The permit writer should note the use of this option on the fact sheet.

- Biosolids (sewage sludge) monitoring data; a description of biosolids use and disposal procedures; annual biosolids production volumes; and information on the suitability of the site and a description of the site management for land application sites from POTWs and other TWTDS. A land application plan is required for any sites not identified in the application.
- Expected toxics and other pollutants. Non-municipal dischargers categorized as *primary industries* have some mandatory testing requirements for toxic pollutants (see § 122.21, Appendix D, Table I and Table II and also listed in Application Form 2C).
- Production rates and flow data from industrial facilities that are subject to production- or flow-based effluent guidelines. Applicants must use units of measure corresponding to applicable effluent guidelines to allow calculation of effluent limitations.
- Appropriate sample types for all required pollutants and parameters being analyzed (Part 136) (see sections 8.1.4 and 8.3 of this manual for more information). For example, only grab samples or continuous monitoring may be used for pH, total residual chlorine, and temperature, and only grab samples may be used for total phenols and volatile organics.

Exhibit 4-5 presents three examples of the types of questions that the permit writer should consider to determine whether an application is complete.

Exhibit 4-5 Considerations for an application to be complete

Example 1:

A plastics processor submits Form 1 and Form 2C but fails to indicate *testing required* for any gas chromatograph/mass spectrometer (GC/MS) fractions in section V.C. of Form 2C and does not provide any data for these pollutants.

Question:
Did the applicant provide all the required data for the toxic organic pollutants in Form 2C?

Answer:
No. The plastics processor is required to indicate *testing required* (in the check box) and provide data from at least one sample for each pollutant in the volatile GC/MS fraction (Table 2C-2 in the application form instructions and § 122.21(g)(7)(v)(A) of the NPDES regulations).

Example 2:

A soap and detergent manufacturing facility in the liquid detergents subcategory submits Form 1 and Form 2C but marks thallium and beryllium as *believed absent* in section V.C. of Form 2C and did not provide any data for these pollutants.

Question:
Is it appropriate for this applicant to mark *believed absent* in this section of Form 2C?

Answer:
No. Although an applicant that manufactures liquid detergents is not expected to discharge thallium and beryllium, page 2C-3 of the application form instructions and § 122.21(g)(7)(v)(B) require testing for all listed metals by all applicants in a primary industry category, such as soap and detergent manufacturers. The indication of *believed absent* is incorrect. The applicant should have indicated *testing required* and provided the results of at least one sample per pollutant. Occasionally, unexpected contaminants could be present in a wastestream.

Exhibit 4-5 Considerations for an application to be complete (continued)

Example 3:
An integrated slaughterhouse and meat processing facility submits Form 1 and Form 2C and indicates that zinc is *believed absent* from its wastewater.

Question:
Is *believed absent* a proper indication for zinc for this wastewater?

Answer:
Possibly. After consulting the effluent guidelines development documents for the Meat and Poultry Products Point Source Category, the permit writer determines that metals, including zinc, are often used as feed additives and in sanitation products and might be present in the effluent, even though there are no effluent limitations specified for zinc in the applicable effluent guideline. The permit writer should contact the applicant and clarify whether zinc would be expected to be present in the discharge.

The comprehensive testing requirements that apply to the various categories of industry are designed to determine whether any contaminants (some expected, some unexpected) are present in significant quantities and to determine levels of pollutants that are known to be present. Exhibit 4-6 presents an example of how a permit writer makes the determination of pollutant data required in the application.

Exhibit 4-6 Example of required testing during application review

Consider the plastics processor and the liquid detergents manufacturer mentioned above, and answer the following questions:

Question:
What pollutant data are needed to characterize the industries above?
- For which toxic organic pollutants are they required to test?
- For which heavy metals are they required to test?
- Which metals would you expect to find in their wastewaters regardless of whether testing is required?

Answer:
The application form in Table 2C-2 and § 122.21(g)(7)(ii)(A) of the NPDES regulations require testing of the volatile GC/MS fraction by the plastics processor and the volatile, acid, and base/neutral fractions by the liquid detergent manufacturer. Page 2C-3 of the application instructions and § 122.21(g)(7)(ii)(B) require testing of all the metals listed in item V, Part C1 of the application form as well as cyanide and total phenols by both of these primary industry facilities. For information on which, if any, metals might be expected in wastewater discharged by these applicants, see the effluent guidelines development documents.

4.5.3 The Accurate Application

All information submitted on a permit application must be accurate. Although it might be difficult to detect certain inaccuracies, a number of common mistakes can be readily detected. When mistakes are detected, they must be corrected. Generally, any correction or edit to the application should be obtained from the applicant in writing and will become a part of the administrative record for the permit.

In most cases, errors in the application will be inadvertent because of the length and complexity of the form. Note, however, that the application certification statement indicates, "…that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." If the permit writer believes that falsification has occurred, he or she should refer the findings to the agency's enforcement staff.

Some of the most common mistakes on permit applications include failing to provide the correct long-term average and daily maximum values, reporting quantified values below known detection limits, and using misplaced decimal points or incorrect concentration units. Exhibit 4-7 presents three examples of the types of questions that the permit writer should consider while reviewing the permit application for accuracy. Additional guidance from EPA might be available to assist permit writers in reviewing applications for some of these common errors. For example, an August 23, 2007, memorandum *Analytical Methods for Mercury in National Pollutant Discharge Elimination System (NPDES) Permits*[3] <www.epa.gov/npdes/pubs/mercurymemo_analyticalmethods.pdf> describes when a method for mercury is sufficiently sensitive for purposes of permit applications and monitoring under a permit. In the memorandum, EPA strongly recommends that a permitting authority determine that a permit application that lacks effluent data analyzed with a sufficiently sensitive EPA-approved method (such as Method 1631E) is incomplete unless and until the facility supplements the original application with data analyzed with such a method.

4.6 Facility Information Review

In addition to the submitted application form, the permit writer should assemble other information that could be used to develop permit limitations and conditions.

4.6.1 Permit File Review

Before developing the draft permit and fact sheet, the permit writer should assemble and review any additional background information on the facility. If the permit writer is reissuing an existing permit, much of the information should be available in the permit file. Such information would typically include

- The current permit.
- The fact sheet or statement of basis for the current permit.
- Discharge monitoring reports (DMRs).
- Compliance inspection reports.
- Engineering reports.
- Correspondence or information on changes in plant conditions, problems, and compliance issues.

Much of this information, particularly DMR data, is stored in automated data tracking systems such as

- Permit Compliance System (PCS) or state databases.
- Integrated Compliance Information System (ICIS)-NPDES <https://icis.epa.gov>.
- Online Tracking Information System (OTIS) <www.epa.gov/idea/otis/>.
- Envirofacts Warehouse <www.epa.gov/enviro/>.

The permit writer can check with other permit writers who have permitted similar types of facilities to see if there are any special considerations related to the type of facility to be permitted. A permit writer might also wish to discuss compliance issues, changes, or history of complaints with compliance personnel who conducted previous inspections of the facility or with permit writers for other media (e.g., air, solid waste). Examples of some other sources of information that the permit writer could use for permit development include the following:

- Receiving water quality data from databases such as the EPA STOrage and RETrieval database (STORET) <www.epa.gov/STORET/>.

Exhibit 4-7 Considerations for an application to be accurate

Example 1:

An industrial applicant provides a daily maximum effluent flow value of 50,000 gpd in its permit application Form 2C. However, a review of historical water usage records and an old permit application indicate estimated wastewater flows ranged from 100,000 to 150,000 gpd. The applicant had not instituted any water use reduction measures, significantly changed its process operations, or decreased its number of employees.

Question:
Are reported values consistent with historical information?

Answer:
No. An inspection of the facility revealed two separate water meters (one for sanitary and one for process water); the applicant had overlooked the sanitary meter. Further, the process water meter was found to be defective. Subsequent flow monitoring of the actual total wastestream recorded a flow of 125,000 gpd. A new water meter was installed, and concurrent wastestream flow monitoring and water meter readings resulted in the following water balances:

- **Water In** (based on both water meter readings):
  148,000 gpd (131,000 gpd process line and 17,000 gpd sanitary line).
- **Water Out** (based on effluent flow monitoring):
  125,000 gpd total treated effluent discharged to the receiving water.
  Evaporative and consumption losses were estimated at 23,000 gpd (15% of total water usage).

The permit writer should require the applicant to submit a signed and certified letter with the revised flow estimates and a new water balance diagram or submit a revised application.

Example 2:

An applicant reported its maximum daily flow as 1.2 mgd, the maximum daily suspended solids concentration as 23 milligrams per liter (mg/L), and the maximum daily mass discharge as 690 pounds per day (lbs/day).

Question:
Do the concentration, mass, and flow values correspond?

Discussion:
No. Even in the unlikely event that the maximum daily flow and the maximum daily concentration occurred on the same day, the mass discharged would be well below the reported value of 690 lbs/day. Using the calculation below, the mass discharge that corresponds to the solids concentration (23 mg/L) and flow (1.2 mgd) would be 230 lbs/day:

$$23 \text{ mg/L} \times 1.2 \text{ mgd} \times \underset{\text{(conversion factor)}}{8.34\ \text{(lbs)(L)/(mg)(millions of gallons)}} = 230 \text{ lbs/day}$$

Because the applicant reported a maximum mass discharge of 690 lbs/day, a significant discrepancy is indicated. The permit writer should contact the applicant to resolve the discrepancy. The applicant should submit a signed and certified letter clarifying the correct maximum daily mass discharge of suspended solids or submit a revised application.

Example 3:

The results submitted in the application for total cyanide are all reported as < 1,000 micrograms per liter (µg/L). When asked, the applicant indicated that total cyanide was analyzed using EPA Method 335.3 (Color, Auto).

Question:
Do concentration values correspond with published method detection limits for the method used?

Answer:
No. EPA Method 335.3 for total cyanide has a published method detection limit (MDL) of 5 µg/L. The applicant should be able to quantify results for total cyanide at values well below 1,000 µg/L using this method. The applicant has most likely used Standard Method 4500-CN (titrimetric) for total cyanide, rather than the testing procedure indicated. If total cyanide is expected to be present in the discharge and would be of concern at effluent concentrations below 1,000 µg/L, the permit writer should require the applicant to retest for total cyanide using the more sensitive method and to submit the results in a signed, certified letter.

- Supporting documentation collected by EPA for effluent guidelines and categorical pretreatment standards for a variety of industrial categories.
- Reference textbooks and technical documents that provide information about manufacturing processes and wastestreams for specific industry categories, which are available from libraries such as
  - National Technical Information Service (NTIS) <www.ntis.gov>.
  - EPA libraries <www.epa.gov/natlibra/libraries.htm>.
  - Office of Water Resource Center (OWRC) <www.epa.gov/safewater/resource/>.
  - National Service Center for Environmental Publications (NSCEP) <www.epa.gov/ncepihom/>.
- Related environmental permits that could provide site-specific background information about the types of pollutants and wastestreams at a facility, including, for example
  - RCRA permits, which regulate the management of hazardous waste by owners and operators of treatment, storage, and disposal facilities.
  - Clean Air Act permits, which regulate the discharge of atmospheric pollutants.
- EPA's *Treatability Manual*[4], which is a five-volume guidance manual that provides detailed descriptions of industrial processes, potential pollutants from each process, appropriate treatment technologies, and cost estimating procedures.
- The Toxic Release Inventory (TRI) <www.epa.gov/tri/>, which is accessible on EPA's mainframe and through a public online service. The TRI contains information on more than 300 listed toxic chemicals released by specific facilities, including chemical identification, quantity of chemicals released to various environmental media, off-site waste transfer, and waste treatment and minimization information.

If the permit writer must address special conditions in a permit for a municipal discharger to develop or implement a pretreatment program or to address discharges other than the wastewater treatment plant discharge, he or she should obtain the information needed to develop these special conditions. For example, the permit writer might need information on pretreatment program implementation, combined sewer overflows (CSOs), sanitary sewer overflows (SSOs), sewage sludge use or disposal, or stormwater discharges relevant to the facility. Such information is in

- Annual pretreatment reports, pretreatment compliance inspections and audits.
- CSO reports.
- Bypass notifications or SSO reports.
- Stormwater discharge applications or NOIs for a general permit.

4.6.2 Facility Site Visits

Facility site visits are an invaluable way to update information on manufacturing processes; obtain information about the facility's operations, equipment or management; and verify application information. A site visit also acquaints the permit writer with the people who will be operating under the permit and participating in the permit development process.

Site visits can also allow the permit writer to gain a better understanding of more complex facilities. Site visits are especially warranted if significant pollution control or treatment improvements will be required, if there have been frequent problems in complying with the existing permit, if there are known problems with spills or leaks or with contaminated surface runoff, or if there are other unique on-site activities that could affect the characteristics of the discharge from the facility.

The site visit should include a detailed review of production processes to evaluate the types of toxic or hazardous substances that might be present in raw materials, products, and by-products. The permit writer should review the water uses, the resulting wastewater streams, and any in-process pollution controls. This review is needed to assist in selecting toxic and other pollutants to be limited and in evaluating possible in-process control improvements.

In addition, the site visit should include a review of the performance and operation and maintenance practices of wastewater treatment facilities. The review is useful in evaluating the adequacy of existing treatment performance and assessing the feasibility of improvements in performance. The permit writer should examine effluent monitoring points, sampling methods, and analytical techniques to identify any needed changes to monitoring requirements and to evaluate the quality of DMR data.

Raw material and product storage and loading areas, sludge storage and disposal areas, hazardous waste management facilities, including on-site disposal areas, and all process areas should be observed to determine the need for controls on surface runoff and specific BMPs. Information from other environmental programs (e.g., CERCLA or RCRA) might be important in this regard.

While on-site, the permit writer should note any housekeeping problems or the need for spill prevention actions, which are not usually detectable from permit applications. If allowed, photographs of problem areas should be taken for future use during permit preparation. If necessary, the permit writer should meet with management to ask questions or clarify information provided on the permit application. If any inaccuracies in the application were found because of the site visit, that is the time for the permit writer to request corrected information.

The time required to conduct a site visit will vary according to the complexity of the facility. For facilities with only a few basic processes, one main waste treatment system, limited in-process controls, few surface runoff outfalls, and limited on-site management of sludge or hazardous wastes, an adequate site visit can most likely be completed in one day. Visits to complex, larger plants with several treatment systems, numerous outfalls, and extensive ancillary activities may require several days.

Time spent on site visits often results in time savings during permit preparation. However, time and travel resources might not be adequate to allow visits to all facilities to be permitted. In such cases, the permit writer might be able to obtain much of the desired information from facility compliance inspections and should try to coordinate the timing of compliance inspections with the timing of permit development.

Aerial photographs may provide much of the needed information on the potential for contamination of surface runoff and on ancillary activities without a site visit or inspection. In addition, comparing aerial photographs with site and process diagrams provided with the application can provide the permit writer with a complete visual description of the facility. Aerial photographs are available from a variety of sources, including the U.S. Geological Survey Earth Resources Observation and Science Center <eros.usgs.gov/#/Find_Data>; TerraServer <www.terraserver.com>; Google Earth <earth.google.com>; and other private contractors.

4.7 Confidential Information

In accordance with Part 2, information submitted to EPA pursuant to the NPDES permitting regulations under Part 122 may be claimed as confidential; however, EPA has determined that the following information will not be held confidential (§ 122.7):

- Name and address of the applicant.
- Permit applications and information submitted with applications.
- Permits.
- Effluent data.

Information that may be claimed as confidential includes material related to manufacturing processes unique to the applicant, or information that might adversely affect the competitive position of the applicant if released to the public. Under such circumstances, the permit writer will be required to treat the information as confidential in accordance with the requirements in Part 2. Any claims of confidentiality must be made at the time of submission or the information will not be considered confidential.

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[1] U.S. Environmental Protection Agency. 1991. *Guidance Manual For the Preparation of NPDES Permit Applications For Stormwater Discharges Associated With Industrial Activity.* EPA-505/8-91-002. U.S. Environmental Protection Agency, Office of Water, Washington DC, <www.epa.gov/npdes/pubs/owm0241.pdf>.

[2] Bailey, Gary. 2008. *Water Quality Program Permit Writer's Manual*. Publication Number 92-109. Washington State Department of Ecology, Water Quality Program, Olympia, WA. <www.ecy.wa.gov/pubs/92109.pdf>

[3] Hanlon, James A. 2007. *Analytical Methods for Mercury in National Pollutant Discharge Elimination System (NPDES) Permits.* U.S. Environmental Protection Agency, Office of Wastewater Management. Memorandum, August 23, 2007. <www.epa.gov/npdes/pubs/mercurymemo_analyticalmethods.pdf>.

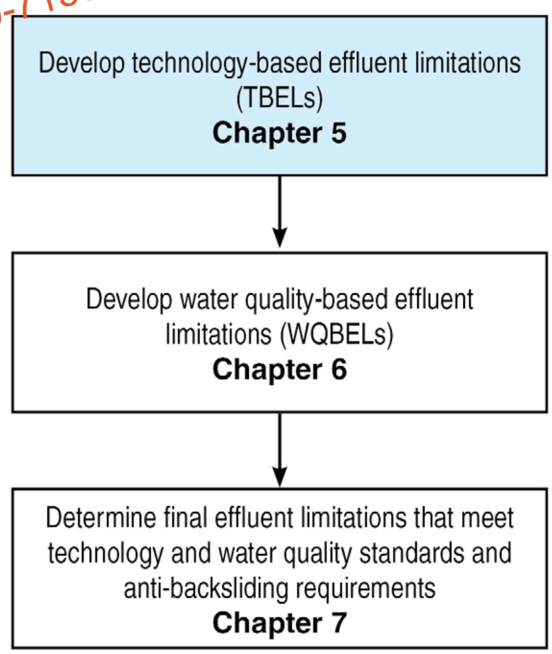
[4] U.S. Environmental Protection Agency. 1980. *Treatability Manual: Vol. I. Treatability Data* (EPA-600/8-80-042a) publications available on NEPIS Website <www.epa.gov/nscep/> as document 600880042A*; Vol. II. Industrial Descriptions* (EPA-600/8-80-042b) as document 600880024B*; Vol. III. Technologies* (EPA-600/8-80-042c) as document 600880024C*; Vol. IV. Cost Estimating* (EPA-600/8-80-042d) as document 600880042d; *Vol. V. Summary* (EPA-600/8-80-042e) as document 600880024E. U.S. Environmental Protection Agency, Office of Research and Development, Washington, DC.

CHAPTER 5. Technology-Based Effluent Limitations

One of the major strategies of the Clean Water Act (CWA) in making "reasonable further progress toward the national goal of eliminating the discharge of all pollutants" is to require effluent limitations based on the capabilities of the technologies available to control those discharges. Technology-based effluent limitations (TBELs) aim to prevent pollution by requiring a minimum level of effluent quality that is attainable using demonstrated technologies for reducing discharges of pollutants or pollution into the waters of the United States. TBELs are developed independently of the potential impact of a discharge on the receiving water, which is addressed through water quality standards and water quality-based effluent limitations (WQBELs). The NPDES regulations at Title 40 of the *Code of Federal Regulations* (CFR) 125.3(a) require NPDES permit writers to develop technology-based treatment requirements, consistent with CWA section 301(b), that represent the minimum level of control that must be imposed in a permit. The regulation also indicates that permit writers must include in permits additional or more stringent effluent limitations and conditions, including those necessary to protect water quality. As described in Chapter 7 of this manual, the permit writer might also need to apply anti-backsliding requirements to determine the final effluent limitations for the NPDES permit.

This chapter discusses development of TBELs for publicly owned treatment works (POTWs) and industrial (non-POTW) dischargers. Chapter 6 discusses development of WQBELs. Exhibit 5-1 illustrates the relationship between TBELs and WQBELs in an NPDES permit and the determination of final effluent limitations.

Exhibit 5-1. Developing effluent limitations



5.1 Technology-based Effluent Limitations for POTWs

The largest category of dischargers requiring individual NPDES permits is POTWs. The federal regulations at § 403.3(q) define a POTW as a treatment works (as defined in CWA section 212) that is owned by a state or municipality [as defined in CWA section 502(4)]. Under § 403.3(q), that definition includes "any devices and systems used in the storage, treatment, recycling and reclamation of municipal sewage or industrial wastes of a liquid nature." The definition also includes "sewers, pipes, and other conveyances only if they convey wastewater to a POTW Treatment Plant," as defined in § 403.3(r). Under § 403.3(q), the term POTW "also means the municipality as defined in section 502(4) of the Act, which has jurisdiction over the Indirect Discharges to and the discharges from such a treatment works."

CWA section 304(d) required the U.S. Environmental Protection Agency (EPA) to publish information on the degree of effluent reduction attainable through the application of secondary treatment. Under CWA section 301(b)(1)(B), in general, POTWs in existence on July 1, 1977, were required to meet discharge limitations based on secondary treatment (or any more stringent limitations established under state law, including those necessary to meet state water quality standards). On the basis of those statutory provisions, EPA developed secondary treatment regulations, which are specified in Part 133. Later amendments to CWA section 304(d) called for EPA to develop alternative standards for certain types of POTWs. Those standards are referred to as "equivalent to secondary treatment" standards.

5.1.1 Secondary and Equivalent to Secondary Treatment Standards

Several regulations implement the statutory requirements for developing standards and discharge limitations based on secondary treatment. EPA has promulgated regulations in Part 133 establishing secondary treatment standards, equivalent to secondary treatment standards, and a number of special considerations applied on a case-by-case basis. In addition, § 122.44(a)(1) requires that NPDES permits include applicable technology-based limitations and standards, while regulations at § 125.3(a)(1) state that TBELs for POTWs must be based on secondary treatment standards (which includes the "equivalent to secondary treatment standards") specified in Part 133.

5.1.1.1 Secondary Treatment Standards

In Part 133, EPA published secondary treatment standards based on an evaluation of performance data for POTWs practicing a combination of physical and biological treatment to remove biodegradable organics and suspended solids. The regulation applies to all POTWs and identifies the technology-based performance standards achievable based on secondary treatment for 5-day biochemical oxygen demand (BOD_5), total suspended solids (TSS), and pH. Exhibit 5-2 summarizes the standards.

Exhibit 5-2 Secondary treatment standards

Parameter	30-day average	7-day average
BOD_5	30 mg/L (or 25 mg/L $CBOD_5$)	45 mg/L (or 40 mg/L $CBOD_5$)
TSS	30 mg/L	45 mg/L
BOD_5 and TSS removal (concentration)	not less than 85%	--
pH	within the limits of 6.0–9.0*	

* unless the POTW demonstrates that: (1) inorganic chemicals are not added to the waste stream as part of the treatment process; and (2) contributions from industrial sources do not cause the pH of the effluent to be less than 6.0 or greater than 9.0

mg/L = milligrams per liter

The regulation also includes an alternate set of standards that apply to certain facilities employing waste stabilization ponds or trickling filters as the principal process. Those standards are called equivalent to secondary treatment standards.

5.1.1.2 Equivalent to Secondary Treatment

Some biological treatment technologies, such as trickling filters or waste stabilization ponds, are capable of achieving significant reductions in BOD_5 and TSS but might not consistently achieve the secondary treatment standards for these parameters. Congress recognized that unless alternate limitations were set for facilities with trickling filters or waste stabilization ponds, which often are in small communities, such facilities could be required to construct costly new treatment systems to meet the secondary treatment standards even though their existing treatment technologies could achieve significant biological treatment. To prevent requiring upgrades where facilities were achieving their original design performance levels, Congress included provisions in the 1981 amendments to the Clean Water Act Construction Grants program (*Public Law 97-117, Section 23*) that required EPA to make allowances for alternative biological treatment technologies, such as a trickling filters or waste stabilization ponds. In response to that requirement, in 1984, EPA promulgated regulations at § 133.105 that include alternative standards that apply to facilities using "equivalent to secondary treatment." A facility must meet the criteria in § 133.101(g) to qualify for application of those alternative standards.

Equivalent to Secondary Standards

The equivalent to secondary treatment standards, as specified in § 133.105, are shown in Exhibit 5-3.

Exhibit 5-3 Equivalent to secondary treatment standards

Parameter	30-day average	7-day average
BOD_5	not to exceed 45 mg/L (or not to exceed 40 mg/L $CBOD_5$)	not to exceed 65 mg/L (or not to exceed 60 mg/L $CBOD_5$)
TSS	not to exceed 45 mg/L	not to exceed 65 mg/L
BOD_5 and TSS removal (concentration)	not less than 65%	--
pH	within the limits of 6.0–9.0*	

* unless the POTW demonstrates that: (1) inorganic chemicals are not added to the waste stream as part of the treatment process; and (2) contributions from industrial sources do not cause the pH of the effluent to be less than 6.0 or greater than 9.0

Criteria to Qualify for Equivalent to Secondary Standards

To be eligible for discharge limitations based on equivalent to secondary standards, a POTW must meet all three of the following criteria:

Criterion #1—Consistently Exceeds Secondary Treatment Standards: The first criterion that must be satisfied to qualify for the equivalent to secondary standards is demonstrating that the BOD_5 and TSS effluent concentrations consistently achievable through proper operation and maintenance of the treatment works exceed the secondary treatment standards set forth in §§ 133.102(a) and (b). The regulations at § 133.101(f) define "effluent concentrations consistently achievable through proper operation and maintenance" as

- (f)(1): For a given pollutant parameter, the 95th percentile value for the 30-day average effluent quality achieved by a treatment works in a period of at least 2 years, excluding values attributable to upsets, bypasses, operational errors, or other unusual conditions.
- (f)(2): A 7-day average value equal to 1.5 times the value derived under paragraph (f)(1).

Some facilities might meet this criterion only for the BOD_5 limitations or only for the TSS limitations. EPA believes that it is acceptable for the permit writer to adjust the limitations for only one parameter (BOD_5 or TSS) if the effluent concentration of only one of the parameters is demonstrated to consistently exceed the secondary treatment standards.

Criterion #2—Principal Treatment Process: The second criterion that a facility must meet to be eligible for equivalent to secondary standards is that its principal treatment process must be a trickling filter or waste stabilization pond (i.e., the largest percentage of BOD and TSS removal is from a trickling filter or waste stabilization pond system).

Criterion #3—Provides Significant Biological Treatment: The third criterion for applying equivalent to secondary standards is that the treatment works provides significant biological treatment of municipal wastewater. The regulations at § 133.101(k) define *significant biological treatment* as using an aerobic or anaerobic biological treatment process in a treatment works to consistently achieve a 30-day average of at least 65 percent removal of BOD_5.

A permit writer should consider each facility on a case-by-case basis to determine whether it meets those three criteria. To apply the criteria, the permit writer should assemble enough influent, effluent, and flow data from the facility to adequately characterize the facility's performance or require the discharger to provide an appropriate analysis. If the facility has made substantial changes in its operations or treatment processes during the current permit term, the permit writer, using his or her best professional judgment (BPJ), may elect to use data for a period that is representative of the discharge at the time the permit is being drafted. Facilities that do not meet all three criteria do not qualify as equivalent to secondary treatment facilities. For such facilities, the secondary treatment standards apply. EPA noted in its December 1985 *Draft Guidance for NPDES Permits and Compliance Personnel—Secondary Treatment Redefinition*[1] that a treatment works operating beyond its design hydraulic or organic loading limit is not eligible for application of equivalent to secondary standards. If overloading or structural failure is causing poor performance, the solution to the problem is construction, not effluent limitations adjustment.

5.1.2 Adjustments to Equivalent to Secondary Standards

In addition to providing secondary treatment standards and equivalent to secondary treatment standards, the federal regulations allow states to make adjustments to the standards and to apply those adjusted standards on a case-by-case basis.

5.1.2.1 Adjusted TSS Requirements for Waste Stabilization Ponds

In accordance with regulations adopted by EPA in 1977 and revised in 1984, states can adjust the maximum allowable TSS concentration for waste stabilization ponds upward from those specified in the equivalent to secondary treatment standards to conform to TSS concentrations achievable with waste stabilization ponds. The regulation, found at § 133.103(c), defines "SS concentrations achievable with waste stabilization ponds" as the effluent concentration achieved 90 percent of the time within a state or appropriate contiguous geographical area by waste stabilization ponds that are achieving the levels of effluent quality for BOD_5 specified in § 133.105(a)(1) (45 milligrams per liter [mg/L] as a 30-day average). To qualify for an adjustment up to as high as the maximum concentration allowed, a facility must use a waste stabilization pond as its principal process for secondary treatment and its operations and maintenance data must indicate that it cannot achieve the equivalent to secondary standards. EPA has published approved alternate TSS requirements in 49 *Federal Register* (FR) 37005, September 20, 1984. Exhibit 5-4 is a summary from the FR notice of the adjusted TSS requirements for each state.

Exhibit 5-4 State-specific adjusted TSS requirements*

Location	Alternate TSS limitation (30-day average) (mg/L)	Location	Alternate TSS limitation (30-day average) (mg/L)
Alabama	90	Nebraska	80
Alaska	70	North Carolina	90
Arizona	90	North Dakota	
Arkansas	90	• North and east of Missouri R.	60
California	95	• South and west of Missouri R.	100
Colorado		Nevada	90
• Aerated ponds	75	New Hampshire	45
• All others	105	New Jersey	None
Connecticut	None	New Mexico	90
Delaware	None	New York	70
District of Columbia	None	Ohio	65
Florida	None	Oklahoma	90
Georgia	90	Oregon	
Guam	None	• East of Cascade Mountains	85
Hawaii	None	• West of Cascade Mountains	50
Idaho	None	Pennsylvania	None
Illinois	37	Puerto Rico	None
Indiana	70	Rhode Island	45
Iowa		South Carolina	90
• Controlled discharge, 3 cell	Case-by-case but not greater than 80	South Dakota	120
• All others	80	Tennessee	100
Kansas	80	Texas	90
Kentucky	None	Utah	None
Louisiana	90	Vermont	55
Maine	45	Virginia	
Maryland	90	• East of Blue Ridge Mountains	60
Massachusetts	None	• West of Blue Ridge Mountains	78
Michigan: Controlled seasonal discharge		• East slope counties: Loudoun, Fauquier, Rappahannock, Madison, Green, Albemarle, Nelson, Amherst, Bedford, Franklin, Patrick.	Case-by-case application of 60/78 limits
• Summer	70	Virgin Islands	None
• Winter	40	Washington	75
Minnesota	40	West Virginia	80
Mississippi	None	Wisconsin	80
Missouri	80	Wyoming	100
Montana	100	Trust Territories and N. Marianas	None

* (49 FR 37005, September 20, 1984)

5.1.2.2 Alternative State Requirements (ASRs)

To further address the potential variations in facility performance arising from geographic, climatic, or seasonal conditions in different states, the revised secondary treatment regulations (adopted in 1984) also included provisions in § 133.105(d) for ASRs. The ASR provisions give states flexibility to modify the maximum allowable concentrations of both BOD_5 and TSS for trickling filter facilities and for BOD_5 for waste stabilization pond facilities. ASRs are set at levels consistently achievable through proper operation and maintenance [§ 133.101(f)] by the median facility in a representative sample of facilities within a state or appropriate continuous geographical area that meet the definition of facilities eligible for treatment equivalent to secondary treatment. Qualifying facilities are eligible to receive limitations up to the concentrations specified by the ASRs.

5.1.3 Applying Secondary Treatment Standards, Equivalent to Secondary Treatment Standards, and Adjusted Standards

Determining whether secondary treatment standards or equivalent to secondary standards apply to a POTW and determining the specific discharge limitations for the facility based on either set of standards and any other special considerations that might apply can be a complex process. Permit writers should remember that compliance with limitations must be measurable and percent removal limitations require influent monitoring (for more on establishing monitoring conditions, see section 8.1 of this manual). This section presents a step-by-step procedure to establishing technology-based effluent limitations for POTWs as shown in Exhibit 5-5.

Exhibit 5-5 Steps to establish technology-based discharge limitations for POTWs

Step 1.	Determine whether secondary treatment standards or equivalent to secondary treatment standards or adjusted standards apply
Step 2.	Calculate effluent limitations based on secondary treatment standards or
Step 3.	Calculate effluent limitations based on equivalent to secondary standards or
Step 4.	Calculate effluent limitations based on adjusted standards
Step 5.	Apply special considerations for further adjustments
Step 6.	Document the application of secondary or equivalent to secondary treatment standards or adjusted standards and all special considerations in the fact sheet

5.1.3.1 Step 1: Determine Whether Secondary Treatment Standards or Equivalent to Secondary Treatment Standards or Adjusted Standards Apply

The first step for permit writers to develop TBELs for municipal dischargers is to determine whether secondary treatment standards (discussed in section 5.1.1 above), equivalent to secondary standards (discussed in section 5.1.1.2 above), or some adjustments to the equivalent to secondary standards (discussed in section 5.1.2 above) apply to the POTW.

An important consideration for permitting authorities is how to treat new POTW discharges that use a waste stabilization pond or trickling filter, or a combination of the two. New facilities or new discharges from trickling filters or waste stabilization ponds often are capable of achieving secondary treatment standards. In the preamble to the secondary treatment regulation (49 FR 37002, September 20, 1984) and in § 133.105(f)(2), EPA noted that when developing permits for new trickling filter and waste stabilization pond facilities, permitting authorities should consider the ultimate design capability of the treatment process, geographical and climatic conditions, and the performance capabilities of recently constructed facilities in similar situations.

After determining whether secondary treatment standards or equivalent to secondary treatment standards apply to a facility or a discharge, the permit writer applies the appropriate standards to develop effluent limitations. Section 5.1.3.2 below (Step 2) details development of effluent limitations for facilities or discharges where secondary treatment standards apply; section 5.1.3.3 below (Step 3) details development of limitations for facilities that qualify for equivalent to secondary standards; and section 5.1.3.4 below (Step 4) details development of limitations for facilities where adjusted standards apply. It is possible that a facility with multiple biological treatment processes could have limitations based on a combination of the standards (see section 5.1.3.5 below [Step 5]); therefore, those sections are presented as separate steps.

5.1.3.2 Step 2: Calculate Effluent Limitations Based on Secondary Treatment Standards

If the facility being permitted is subject to the secondary treatment standards, the permit writer should complete Step 2. Otherwise, he or she should move to Step 3 in section 5.1.3.3 below.

Applying the secondary treatment standards in NPDES permits is straightforward. Where secondary treatment standards apply, the permit should include effluent limitations in the permit as presented in Exhibit 5-6 below, consistent with the secondary treatment standards and the regulatory requirements in § 122.45(d)(2).

Exhibit 5-6 Effluent limitations calculated from secondary treatment standards

Parameter	Average monthly limitation	Average weekly limitation
BOD_5	30 mg/L (or 25 mg/L $CBOD_5$)	45 mg/L (or 40 mg/L $CBOD_5$)
TSS	30 mg/L	45 mg/L
BOD_5 and TSS removal (concentration)	not less than 85%	N/A
pH	Within the range of 6.0–9.0 standard units at all times (or expressed as instantaneous minimum and maximum limitations)*	

* unless the POTW demonstrates that: (1) inorganic chemicals are not added to the waste stream as part of the treatment process; and (2) contributions from industrial sources do not cause the pH of the effluent to be less than 6.0 or greater than 9.0

Certain provisions in the EPA regulations warrant some clarification.

First, the secondary treatment standards are stated as 30-day and 7-day averages, whereas § 122.45(d)(2) requires that effluent limitations for POTWs be expressed, unless impracticable, as average monthly and average weekly limitations. The NPDES regulations in § 122.2 define average monthly and average weekly limitations on a calendar period basis. Therefore, EPA recommends that permit writers apply the 30-day and 7-day average secondary treatment standards directly as average monthly (calendar month) and average weekly (calendar week) discharge limitations.

Second, § 122.45(f)(1) requires that all permit limitations, standards, or prohibitions be expressed in terms of mass except in any of the following cases:

- For pH, temperature, radiation or other pollutants that cannot appropriately be expressed by mass limitations.

- When applicable standards and limitations are expressed in terms of other units of measure.
- If in establishing permit limitations on a case-by-case basis under § 125.3, limitations expressed in terms of mass are infeasible because the mass of the pollutant discharged cannot be related to a measure of operation, and permit conditions ensure that dilution will not be used as a substitute for treatment.

The first condition applies to pH requirements established by secondary treatment standards. In addition, because the 30-day and 7-day average requirements for BOD_5 and TSS, including percent removal, are expressed in terms of concentration, the second condition applies to the standards. Thus, mass-based discharge limitations are not specifically required to implement secondary treatment standards; however, permit writers can choose to include mass-based limitations in a permit. In general, regulations at § 122.45(b)(1) require using the design flow rate of the POTW to calculate limitations. To calculate a mass-based limitation for a POTW (in pounds per day [lbs/day]) a permit writer would use the equation and follow the example calculations in Exhibit 5-7.

Exhibit 5-7 POTW mass based limitation calculation equation and example calculations

POTW design flow in million gallons per day (mgd)	x	**Concentration-based limitation** in milligrams per liter (mg/L)	x	**Conversion factor** 8.34 with units of (lbs)(L) / (mg)(millions of gallons)

A POTW with a design flow of 2.0 mgd would have mass-based limitations calculated from secondary treatment standards as follows:

Mass-based limitation*	=	**POTW design flow** x **Concentration-based limitation** x **Conversion factor**		
BOD_5				
Average monthly	=	2.0 mgd x 30 mg/L x 8.34 (lbs)(L) / (mg)(millions of gallons)	=	**500 lbs/day**
Average weekly	=	2.0 mgd x 45 mg/L x 8.34 (lbs)(L) / (mg)(millions of gallons)	=	**750 lbs/day**
TSS				
Average monthly	=	2.0 mgd x 30mg/L x 8.34 (lbs)(L) / (mg)(millions of gallons)	=	**500 lbs/day**
Average weekly	=	2.0 mgd x 45mg/L x 8.34 (lbs)(L) / (mg)(millions of gallons)	=	**750 lbs/day**

* calculated to 2 significant figures

5.1.3.3 Step 3: Calculate Effluent Limitations Based on Equivalent to Secondary Standards

If a facility being permitted is subject to the equivalent to secondary standards without any further adjustments by the state (e.g., ASRs), the permit writer should complete Step 3. Otherwise, he or she should move to Step 4 in section 5.1.3.4 below.

For facilities that qualify for equivalent to secondary standards, effluent limitations must meet the requirements specified in § 133.105 and summarized above in Exhibit 5-3 (not accounting for any further approved adjustments). It is important to note that the equivalent to secondary standards specify the maximum allowable discharge concentration of BOD_5 and TSS and a minimum percent removal requirement for qualified facilities. The regulations at § 133.105(f) require a permitting authority to include more stringent limitations when it determines that the 30-day average and 7-day average BOD_5 and TSS concentrations are achievable through proper operation and maintenance of the treatment works (based on an analysis of the past performance for an existing facility or considering the design capability of the treatment process and geographical and climatic conditions for a new facility) would enable the treatment works to achieve more stringent limitations than the least stringent effluent quality allowed by the equivalent to secondary standards. As noted above, the regulations at § 133.101(f) define, "effluent concentrations consistently achievable through proper operation and maintenance" as the 95th percentile value for the 30-day average effluent quality achieved by a treatment works in a period of at least 2 years, excluding values attributable to upsets, bypasses, operational errors, or other unusual conditions. The 7-day average value is set equal to 1.5 times the 30-day average value.

If an existing facility does not have sufficient data to establish past performance, the permit writer could include the limitations from the previous permit in the new permit and require monitoring to generate the necessary data. In addition, the permit writer could choose to include a provision allowing the permitting authority to reopen and, if necessary, modify the permit after reviewing the additional data collected by the discharger.

As with limitations based on secondary treatment standards (shown in Exhibit 5-6 above), limitations based on equivalent to secondary standards are expressed as average monthly (calendar month) and average weekly (calendar week) limitations. Mass-based limitations can be calculated using the procedures outlined above.

5.1.3.4 Step 4: Calculate Effluent Limitations Based on Adjusted Standards

If a facility being permitted is subject to the adjusted standards as described in section 5.1.2 above, the permit writer should complete Step 4. Otherwise, he or she should move to section 5.1.3.5 below (Step 5).

As discussed in sections 5.1.2.1 and 5.1.2.2 above, the federal regulations at § 133.103(c) allow states to adjust the maximum allowable discharge concentration of TSS for waste stabilization ponds upward from what would otherwise be required by the equivalent to secondary standards, and the regulations at § 133.105(d) give states flexibility to adopt ASRs that modify equivalent to secondary requirements for both BOD_5 and TSS for trickling filter facilities and BOD_5 requirements for waste stabilization pond facilities. Where one or more of the adjusted standards apply, average monthly limitation(s) generally should be set at the lower of the following:

- The 30-day average concentration of the pollutant that could be achievable through proper operation and maintenance of the treatment works.
- The maximum concentration of the pollutant that would be allowed under the adjusted standard.

Permit writers should note, however, that if the state has developed an adjusted TSS standard for waste stabilization ponds consistent with § 133.103(c), the regulations would allow uniform application of that standard to POTWs where waste stabilization ponds are the principal process used for secondary treatment and operation and maintenance data indicate that the equivalent to secondary treatment standards for TSS cannot be achieved.

The average weekly limitation can be set equal to 1.5 times the average monthly limitation and mass-based limitations may be calculated using the procedures outlined above.

5.1.3.5 Step 5: Apply Special Considerations for Further Adjustments

Part 133 allows a permit writer to make further adjustments when calculating effluent limitations derived from secondary treatment standards or equivalent to secondary standards based on several special considerations. The permit writer should determine whether any of the special considerations outlined in this section apply and, as appropriate, make any further adjustments to the concentration limitations or percent removal requirements. The calculated limitations, after making such adjustments, are the final technology-based effluent limitations for the POTW.

Substitution of $CBOD_5$ for BOD_5

Wastewater contains carbonaceous oxygen demanding substances and nitrogenous oxygen demanding substances. A $CBOD_5$ test measures the 5-day carbonaceous biochemical oxygen demand while the BOD_5 test measures the both carbonaceous biochemical oxygen demand and nitrogenous biochemical oxygen demand. During nitrification, nitrifying bacteria use a large amount of oxygen to consume nitrogenous oxygen demanding substances (unoxidized nitrogen and ammonia-nitrogen) and convert these to oxidized nitrate. For wastewaters with significant nitrogen content, basing permit limitations on $CBOD_5$ instead of BOD_5 eliminates the impact of nitrification on discharge limitations and compliance determinations. EPA recognizes that the $CBOD_5$ test can provide accurate information on treatment plant performance in many cases and, in Part 133, allows permit writers to use $CBOD_5$ limitations in place of BOD_5 limitations to minimize false indications of poor facility performance as a result of nitrogenous oxygen demand.

EPA has established $CBOD_5$ standards for cases where secondary treatment standards or equivalent to secondary treatment standards are applied:

- **Secondary Treatment:** The $CBOD_5$ secondary treatment performance standards specified by the regulations are as follows:
  - 25 mg/L as a 30-day average.
  - 40 mg/L as a 7-day average.
- The EPA-approved test procedures in Part 136 include a $CBOD_5$ (nitrogen inhibited) test procedure. Subject to any state-specific requirements, a permit writer can specify these $CBOD_5$ limitations along with $CBOD_5$ monitoring requirements in any POTW permit requiring performance based on secondary treatment standards [§ 133.102(a)(4)].
- **Equivalent to Secondary Treatment:** The $CBOD_5$ equivalent to secondary treatment performance standards specified by the regulations are as follows:
  - No greater than 40 mg/L as a 30-day average.
  - No greater than 60 mg/L as a 7-day average.
- Where data are available to establish $CBOD_5$ limitations, and subject to any state-specific requirements, a permit writer may substitute $CBOD_5$ for BOD_5 and specify $CBOD_5$ limitations and monitoring requirements when applying equivalent to secondary standards.

Substitution of COD or TOC for BOD_5

Chemical oxygen demand (COD) and total organic carbon (TOC) laboratory tests can provide an accurate measure of the organic content of wastewater in a shorter time frame than a BOD_5 test (i.e., several hours versus five days). The regulations at § 133.104(b) allow a permit writer to set limitations for COD or TOC instead of BOD_5 if a long-term BOD_5:COD or BOD_5:TOC correlation has been demonstrated.

Adjustments for Industrial Contributions

Under § 133.103(b), treatment works receiving wastes from industrial categories with effluent limitations guidelines and standards (effluent guidelines) requirements or new source performance standards for BOD_5 or TSS, which are less stringent than the secondary treatment standards or, if applicable, the equivalent to secondary treatment standards in Part 133, can qualify to have their 30-day BOD_5 or TSS limitations adjusted upward provided that the following are true:

- The adjusted 30-day limitations are not greater than the limitations in effluent guidelines or new source performance standards, as applicable, for the industrial category.
- The flow or loading of BOD_5 or TSS introduced by the industrial category exceeds 10 percent of the design flow or loading to the POTW.

When making this adjustment, the Part 133 values for BOD_5 and TSS should be adjusted proportionately. Accordingly, a permit writer should make the adjustment using a flow-weighted or loading-weighted average of the two concentration limitations (i.e., the limitations developed from effluent guidelines for the industrial facility and the secondary or equivalent to secondary limitations).

Adjustments to Percent Removal Requirements

The 85 percent removal requirement (for a 30-day average) in secondary treatment standards was originally established to achieve two basic objectives:

- To encourage municipalities to remove high quantities of infiltration and inflow (I/I) from their sanitary sewer systems.
- To prevent intentional dilution of influent wastewater.

In facilities with dilute influent that is not attributable to high quantities of I/I or intentional dilution, the percent removal requirement could result in forcing *advanced treatment* rather than the intended secondary treatment. Advanced treatment generally refers to treatment processes following secondary treatment (e.g., filtration, chemical addition, or two-stage biological treatment). Advanced treatment can achieve significantly greater pollutant removals than secondary treatment processes but at a higher cost.

The regulations at §§ 133.103(a), (d) and (e) provide that, under certain circumstances, permit writers may set less stringent limitations for BOD_5 and TSS percent removal. The specific circumstances and the potential adjustments to the percent removal requirement are as follows:

- **Treatment works that receive less concentrated wastes from combined sewer systems** are eligible to have less stringent monthly percent removal limitations during wet-weather events [§ 133.103 (a)] and, under certain conditions, less stringent percent removal requirements or a mass loading limitation instead of a percent removal requirement during dry weather [§ 133.103 (e)]. The permit writer must determine on a case-by-case basis whether any attainable percentage removal level can be defined during wet weather and, if so, what the level should be. To qualify for a less stringent percent removal requirement or substitution of a mass limitation during dry weather, the discharger must satisfactorily demonstrate the following:
    1. <u>The facility is consistently meeting, or will consistently meet, its permit effluent concentration limitations, but cannot meet its percent removal limitations because of less concentrated influent</u>. A permitting authority should consider establishing criteria for

documenting what constitutes consistently meeting concentration limitations and what constitutes being unable to meet percent removal limitations because of less concentrated influent.

2. To meet the percent removal requirements, the facility would have to achieve significantly more stringent effluent concentrations than would otherwise be required by the concentration-based standards. Each permitting authority also should consider establishing criteria for demonstrating that this condition is met (e.g., because of dilute influent, X percent of the time a discharger would be forced to meet concentration requirements that are X percent more stringent than the concentration limitations otherwise applicable to satisfy the percent removal requirements).

3. The less concentrated influent wastewater does not result from either excessive infiltration or clear water industrial discharges during dry weather periods. The determination of whether the less concentrated wastewater results from excessive infiltration is discussed in regulations at § 35.2005(b)(28). This regulation defines nonexcessive infiltration as the quantity of flow that is less than 120 gallons per capita per day (domestic base flow and infiltration) or the quantity of infiltration that cannot be economically and effectively eliminated from a sewer system as determined in a cost-effectiveness analysis. The regulations at § 133.103(e) include the additional criterion that either 40 gallons per capita per day or 1,500 gallons per inch diameter per mile of sewer may be used as the threshold value for that portion of dry-weather base flow attributed to infiltration. If the less concentrated influent wastewater is the result of clear water industrial discharges, then the treatment works must control such discharges pursuant to Part 403.

- **Treatment works that receive less concentrated wastes from separate sewer systems** can qualify to have less stringent percent removal requirement or receive a mass loading limitation instead of the percent removal requirement provided the treatment plant demonstrates all of the following [§ 133.103(d)]:

1. The facility is consistently meeting or will consistently meet its permit effluent concentration limitations but cannot meet its percent removal limitations because of less concentrated influent wastewater. For additional detail on this criterion, see discussion above for combined sewers during dry weather.

2. To meet the percent removal requirements, the facility would have to achieve significantly more stringent limitations than would otherwise be required by the concentration-based standards. For additional detail on this criterion, see the discussion above for combined sewers during dry weather.

3. The less concentrated influent wastewater does not result from excessive infiltration and inflow (I/I). The regulation indicates that the determination of whether the less concentrated wastewater is the result of excessive I/I will use the definition of excessive I/I at § 35.2005(b)(16), plus the additional criterion that flow is nonexcessive if the total flow to the POTW (i.e., wastewater plus inflow plus infiltration) is less than 275 gallons per capita per day. The regulation at § 35.2005(b)(16) defines excessive I/I as the quantities of I/I that can be economically eliminated from a sewer system as determined in a cost-effectiveness analysis that compares the costs for correcting the I/I conditions to the total costs for

transportation and treatment of the I/I. This regulation also refers to definitions of nonexcessive I/I in §§ 35.2005(b)(28) and 35.2005(b)(29).

Secondary Treatment Variance for Ocean Discharge—CWA Section 301(h) Variance

CWA section 301(h) provides for variances from secondary treatment standards for POTWs that discharge into ocean waters if the modified requirements do not interfere with attainment or maintenance of water quality. Permit writers should note that the deadline to apply for a CWA section 301(h) variance (December 29, 1982) has passed, thus no new facilities may apply for this variance.

Eligible POTW applicants meeting the set of environmentally stringent criteria in CWA section 301(h) receive a modified NPDES permit waiving the secondary treatment requirements for the conventional pollutants of BOD_5, TSS, and pH. EPA issued regulations, developed the *Amended Section 301(h) Technical Support Document*[2], and prepared a website titled Amendments to Regulations Issued, the Clean Water Act Section 301 (h) Program <www.epa.gov/owow/oceans/discharges/301h.html>. EPA has promulgated specific regulations pertaining to CWA section 301(h) that are provided in Part 125, Subpart G.

All CWA section 301(h) variance modified permits must contain the following specific permit conditions:

- Effluent limitations and mass loadings that will assure compliance with Part 125, Subpart G.
- Requirements for pretreatment program development, a nonindustrial toxics control program, and control of combined sewer overflows.
- Monitoring program requirements that include biomonitoring, water quality, and effluent monitoring.
- Reporting requirements that include the results of the monitoring programs.

No new or substantially increased discharges from the point source of the affected pollutant can be released above that volume of discharge specified in the permit.

5.1.3.6 Step 6: Document the Application of Secondary or Equivalent to Secondary Treatment Standards and all Adjustments and Considerations in the Fact Sheet

Permit writers need to document their application of secondary or equivalent to secondary treatment standards in the NPDES permit fact sheet for municipal facilities. The permit writer should clearly identify the data and information used to determine whether secondary treatment standards or equivalent to secondary treatment standards or adjusted standards apply and how that information was used to derive effluent limitations for the permit. The permit writer should also note all adjustments and special considerations in the fact sheet. The information in the fact sheet should provide the NPDES permit applicant and the public a transparent, reproducible, and defensible description of how the NPDES permit properly incorporates secondary treatment standards.

5.2 Technology-Based Effluent Limitations for Industrial (Non-POTW) Dischargers

EPA is required to promulgate technology-based limitations and standards that reflect pollutant reductions that can be achieved by categories, or subcategories, of industrial point sources using specific technologies (including process changes) that EPA identifies as meeting the statutorily prescribed level of control under the authority of CWA sections 301, 304, 306, 307, 308, 402, and 501 (33 *United States Code* [U.S.C.] 1311, 1314, 1316, 1318, 1342, and 1361). Those national industrial wastewater controls are called effluent limitations guidelines and standards (effluent guidelines). Unlike other CWA tools, such as water quality standards, effluent guidelines are national in scope and establish performance standards for all facilities within an industrial category or subcategory.

For point sources that introduce pollutants directly into the waters of the United States (direct dischargers), the effluent guidelines promulgated by EPA are implemented through NPDES permits as authorized in CWA sections 301(a), 301(b), and 402. For sources that discharge to POTWs (indirect dischargers), EPA promulgates pretreatment standards that apply directly to those sources and are enforced by POTWs and state and federal authorities as authorized in CWA sections 307(b) and (c).

When developing TBELs for industrial (non-POTW) facilities, the permit writer must consider all applicable technology standards and requirements for all pollutants discharged. Without applicable effluent guidelines for the discharge or pollutant, permit writers must identify any needed TBELs on a case-by-case basis, in accordance with the statutory factors specified in CWA sections 301(b)(2) and 304(b). The site-specific TBELs reflect the BPJ of the permit writer, taking into account the same statutory factors EPA would use in promulgating a national effluent guideline regulation, but they are applied to the circumstances relating to the applicant. The permit writer also should identify whether state laws or regulations govern TBELs and might require more stringent performance standards than those required by federal regulations. In some cases, a single permit could have TBELs based on effluent guidelines, BPJ, and state law, as well as WQBELs based on water quality standards.

Sections 5.2.1 and 5.2.2 below provide an overview of effluent guidelines and development of TBELs in NPDES permits using the effluent guidelines. Section 5.2.3 below discusses the development of TBELs in the absence of effluent guidelines (i.e., case-by-case limitations developed using BPJ).

5.2.1 Effluent Guidelines

Congress saw the creation of a single national pollution control requirement for each industrial category, based on the best technology the industry could afford, as a way to reduce the potential creation of *pollution havens* and to attain a high-level water quality in the nation's waters. Consequently, EPA's goal in establishing effluent guidelines is to ensure that industrial facilities with similar characteristics will meet similar effluent limitations representing the best pollution control technologies or pollution prevention practices regardless of their location or the nature of the receiving water into which the discharge is made. In establishing the effluent guidelines, EPA must consider the industry-wide economic achievability of implementing the technology and the incremental costs in relation to the pollutant-reduction benefits.

Effluent guidelines can include numeric and narrative limitations, including best management practices (BMPs), to control the discharge of pollutants from categories of point sources. The limitations are based on data characterizing the performance of technologies available and, in some cases, from modifying process equipment or the use of raw materials. Although the regulations do not require the use of any particular treatment technology, they do require facilities to achieve effluent limitations that reflect the proper operation of the *model* technologies selected as the basis for the effluent guidelines and from which the performance data were obtained to generate the limitations. Therefore, each facility has the discretion to select any technology design and process changes necessary to meet the performance-based discharge limitations and standards specified by the effluent guidelines.

As of the date of this manual's publication, EPA has issued effluent guidelines for 56 industrial categories, which apply to between 35,000 and 45,000 facilities that discharge directly to waters of the United States and another 12,000 facilities that discharge into POTWs. The regulations prevent the discharge of more than 1.2 billion pounds of toxic (priority) and nonconventional pollutants each year. EPA's Effluent Guidelines Program Website <www.epa.gov/guide/> provides information on existing effluent guidelines, current effluent guidelines rulemaking, and the effluent guidelines planning process.

5.2.1.1 Statutory Foundation for Effluent Guidelines

The CWA directs EPA to promulgate effluent guidelines reflecting pollutant reductions that can be achieved by existing facilities in categories or subcategories of industrial point sources using specific control technologies. In addition, EPA is required to develop effluent guidelines for new sources. Those levels of control are summarized below and in Exhibit 5-8.

Exhibit 5-8 Summary of CWA technology levels of control

Type of sites regulated	**BPT**	**BCT**	**BAT**	**NSPS**	**PSES**	**PSNS**
Existing Direct Dischargers	X	X	X			
New Direct Dischargers				X		
Existing Indirect Dischargers					X	
New Indirect Dischargers						X
Pollutants regulated	**BPT**	**BCT**	**BAT**	**NSPS**	**PSES**	**PSNS**
Conventional Pollutants	X	X		X		
Nonconventional Pollutants	X		X	X	X	X
Toxic (Priority) Pollutants	X		X	X	X	X

Best Practicable Control Technology Currently Available (BPT)

BPT is the first level of technology-based effluent controls for direct dischargers and it applies to all types of pollutants (conventional, nonconventional, and toxic). The Federal Water Pollution Control Act (FWPCA) amendments of 1972 require that when EPA establishes BPT standards, it must consider the industry-wide cost of implementing the technology in relation to the pollutant-reduction benefits. EPA also must consider the age of the equipment and facilities, the processes employed, process changes, engineering aspects of the control technologies, non-water quality environmental impacts (including energy requirements), and such other factors as the EPA Administrator deems appropriate [CWA section 304(b)(1)(B)]. Traditionally, EPA establishes BPT effluent limitations on the basis of the average of the best performance of well-operated facilities in each industrial category or subcategory. Where existing performance is uniformly inadequate, BPT may reflect higher levels of control than currently in place in an industrial category if the Agency determines that the technology can be practically applied. See CWA sections 301(b)(1)(A) and 304(b)(1)(B).

Best Conventional Pollutant Control Technology (BCT)

The 1977 CWA requires EPA to identify effluent reduction levels for conventional pollutants associated with BCT for direct discharges from existing industrial point sources. As with BPT, when establishing BCT the Agency considers the age of the equipment and facilities, the processes employed, process changes, engineering aspects of the control technologies, non-water quality environmental impacts (including energy requirements), and such other factors as the EPA Administrator deems appropriate [CWA section 304(b)(4)(B)]. In addition, EPA also considers a two-part *cost reasonableness* test, as required by CWA section 304(b)(4)(B), which includes (1) consideration of the reasonableness of the relationship between the costs of attaining a reduction in effluent and the effluent reduction benefits derived and (2) a comparison of the cost and level of reduction of such pollutants from the discharge from POTWs to the cost and level of reduction of such pollutants from a class or category of industrial sources. EPA explained its methodology for developing BCT limitations in detail in 51 FR 24974, July 9, 1986 <www.epa.gov/npdes/pubs/fr_bct_1986.pdf>. See CWA sections 301(b)(2)(E) and 304(b)(4).

Best Available Technology Economically Achievable (BAT)

For the direct discharge of toxic and non-conventional pollutants, EPA promulgates effluent guidelines based on BAT. The FWPCA amendments of 1972 require EPA to consider the cost of achieving effluent reductions when defining BAT; however, they do not specifically require EPA to balance the cost of implementation against the pollution reduction benefit. The technology selected for BAT must be economically achievable [CWA section 301(b)(2)(A)]. EPA generally defines BAT on the basis of the performance associated with the best control and treatment measures that facilities in an industrial category are capable of achieving. Like BPT and BCT, other factors EPA must consider in assessing BAT include the age of equipment and facilities involved, the process employed, process changes, non-water quality environmental impacts, including energy requirements, and other such factors as the EPA Administrator deems appropriate [CWA section 304(b)(2)(B)]. The Agency retains considerable discretion in assigning the weight accorded to these factors. BAT limitations may be based on effluent reductions attainable through changes in a facility's processes and operations. Where existing performance is uniformly inadequate, BAT may reflect a higher level of performance than is currently being achieved within a subcategory on the basis of technology transferred from a different subcategory or category. BAT may be based on process changes or internal controls, even when those technologies are not common industry practice. See CWA sections 301(b)(2)(A), (C), (D) and (F) and 304(b)(2).

New Source Performance Standards (NSPS)

NSPS reflect effluent reductions that are achievable by direct dischargers based on the best available demonstrated control technology. New sources have the opportunity to install the best and most efficient production processes and wastewater treatment technologies at the time of construction. As a result, NSPS should represent the most stringent controls attainable through the application of the best available demonstrated control technology for all pollutants (i.e., conventional, nonconventional, and toxic pollutants). In establishing NSPS, EPA is directed to take into consideration the cost of achieving the effluent reduction and any non-water quality environmental impacts and energy requirements. See CWA section 306.

Pretreatment Standards for Existing Sources (PSES)

PSES are designed to prevent the discharge of pollutants that pass through, interfere with, or are otherwise incompatible with the operation of POTWs, including incompatibility with the POTW's chosen biosolids (sewage sludge) disposal methods. The categorical pretreatment standards for existing indirect dischargers are technology-based and are analogous to BAT. The general pretreatment regulations, which set forth the framework for the implementation of national pretreatment standards, are at Part 403. See CWA section 307(b).

Pretreatment Standards for New Sources (PSNS)

Like PSES, PSNS are designed to prevent the discharges of pollutants that pass through, interfere with, or are otherwise incompatible with the operation of POTWs. PSNS are to be issued at the same time as NSPS. New indirect dischargers have the opportunity to incorporate into their facilities the best available demonstrated technologies at the time of construction. The Agency considers the same factors in promulgating PSNS as it considers in promulgating NSPS. See CWA section 307(c).

EPA typically does not establish pretreatment standards for conventional pollutants (e.g., BOD_5, TSS, oil and grease) because POTWs are designed to treat such pollutants, but EPA has exercised its authority to establish categorical pretreatment standards for conventional pollutants as surrogates for toxic or nonconventional pollutants or to prevent interference. For example, EPA established categorical pretreatment standards for new and existing sources with a one-day maximum concentration of 100 mg/L oil and grease in the Petroleum Refining Point Source Category in Part 419 based on "the necessity to minimize [the] possibility of slug loadings of oil and grease being discharged to POTWs."[3]

The final statutory deadline for meeting BPT requirements was July 1, 1977, and the final statutory deadline for meeting BCT and BAT requirements was March 31, 1989. When applying applicable effluent guidelines, permit writers should note that they do not have the authority to extend the statutory deadlines in an NPDES permit; thus, all applicable technology-based requirements (i.e., effluent guidelines and case-by-case limitations based on BPJ) must be applied in NPDES permits without the benefit of a compliance schedule. In addition, though NSPS do not have specific dates as compliance deadlines, they are effective on the date the new source begins discharging. The facility must demonstrate compliance with NSPS within 90 days of discharge [see § 122.29(d)]. For more information on determining whether a discharge is subject to NSPS, see Appendix D of this manual. For additional information on the statutory and regulatory history of the NPDES program, see section 1.2 of this manual.

5.2.1.2 EPA's Development of Effluent Guidelines

EPA establishes national effluent guidelines for a specific industrial sector by regulation after considering an in-depth engineering and economic analysis of the industrial sector. EPA's Industrial Regulations Website <www.epa.gov/guide/industry.html> provides development documents for some specific industry categories (e.g., Iron and Steel Manufacturing and Metal Products and Machinery). Those documents contain additional information on how EPA develops effluent guidelines.

For each industrial sector, EPA assesses the performance and availability of the best pollution control technologies and pollution prevention practices that are available for an industrial category or subcategory. The effluent guidelines are promulgated for various industrial categories in 40 CFR, Chapter I, Subchapter N - Effluent Guidelines and Standards - Parts 400-471 <www.epa.gov/lawsregs/search/40cfr.html>.

In promulgating effluent guidelines, EPA may divide an industrial point source category into groupings of subcategories to provide a method for addressing variations between products, raw materials, processes, and other factors that result in distinctly different characteristics. Regulation of an industrial category using subcategories allows each subcategory to have a uniform set of requirements that take into account technological achievability and economic impacts unique to that subcategory. Grouping similar facilities into subcategories increases the likelihood that the regulations are practicable and diminishes the need to address variations between facilities within a category through a variance process. For more on variances, see section 5.2.2.7 below. EPA considers a number of different subcategorization factors during an effluent guidelines rulemaking, including the following:

- Manufacturing products and processes.
- Raw materials.
- Wastewater characteristics.
- Facility size.
- Geographical location.
- Age of facility and equipment.
- Wastewater treatability.

For each possible treatment technology option for an industry, EPA conducts an analysis of industry-wide incremental compliance costs, pollutant loadings and removals, and related non-water quality effects. The Agency also performs an economic analysis to assess the financial impact on the industry of implementing each option. That entire process involves data collection, rigorous data review, engineering analysis, and public comment. EPA selects a technology to serve as the *model* technology for pollutant removal for each required level of control (i.e., BPT, BCT, BAT, NSPS, PSES, and PSNS). Limitations and other requirements in the effluent guidelines for each level of control are based on application of the model technology to the category or subcategory of facilities.

Effluent guidelines are not always established for every pollutant present in a point source discharge. In many instances, EPA promulgates effluent guidelines for an *indicator* pollutant. Industrial facilities that comply with the effluent guidelines for the indicator pollutant will also control other pollutants (e.g., pollutants with a similar chemical structure). For example, EPA may choose to regulate only one of several metals present in the effluent from an industrial category, and compliance with the effluent guidelines will ensure that similar metals present in the discharge are adequately controlled. Additionally, for each industry sector EPA typically considers whether a pollutant is present in the process wastewater at treatable concentrations and whether the model technology for effluent guidelines effectively treats the pollutant. For example, see Figure 6-1 Pollutant of Concern Methodology <www.epa.gov/guide/cwt/final/develop/ch6.pdf> on page 6-4 of the *Centralized Waste Treatment category Technical Development Document*.

The CWA requires EPA to annually review existing effluent guidelines for both direct and indirect dischargers. CWA section 304(m) also requires EPA to publish an effluent guidelines program plan every 2 years. As part of the development of the biennial plan, the public is provided an opportunity to comment on a *preliminary* plan before it is finalized. The preliminary plan is published in odd-numbered years, and the final plan is published in even-numbered years. EPA encourages permit writers to participate in the effluent guidelines planning process and comment on the preliminary effluent guidelines program plans presented on the Effluent Guidelines Biennial Plan Website <www.epa.gov/guide/304m/index.html>.

5.2.1.3 Types of Limitations in Effluent Guidelines

Although the requirements in effluent guidelines generally are numeric limitations on the mass or concentration of a pollutant that can be discharged directly into waters of the United States, CWA section 502(11) defines *effluent limitation* broadly. This section describes several types of possible expressions for the limitations found in effluent guidelines. The permit writer should note that the limitations in effluent guidelines might need to be translated into an appropriate form to be included as effluent limitations in an NPDES permit. That process is discussed further in section 5.2.2 below.

Mass- or Concentration-based Numeric Limitations

Limitations in effluent guidelines generally are expressed as numeric values, which are upper bounds of the amount of pollutant that may be discharged. For most pollutants, these limitations are mass-based or concentration-based values. They are, in effect, measures of how well the production, wastewater treatment, and pollution prevention processes must be operated. In the course of developing effluent guidelines regulations, EPA uses data on a number of different pollutants from facilities with the selected model technologies to determine the appropriate numeric limitations. The limitations generally consist of upper bounds (maximum values) established for both the daily discharge and for the average monthly discharge.

In developing numeric limitations in effluent guidelines, EPA first determines an average performance level (the *long-term average*) that a facility with well-designed and operated model technologies reflecting the appropriate level of control is capable of achieving. That long-term average is calculated from data taken from facilities using the model technologies that were selected as a basis for the limitations. EPA expects that all facilities subject to the limitations will design and operate their treatment systems to achieve the long-term average performance level consistently because facilities with well-designed and operated model technologies have demonstrated that it can be done. The technical development document for the effluent guidelines usually identifies the long-term average for the model technologies; however, they generally are not part of the limitations in the effluent guidelines or TBELs in the permit. The limitations generally are expressed as *maximum daily* and *average monthly limitations* (see definitions in Exhibit A-2 in Appendix A of this document) that include an allowance for variability around the long-term average.

EPA acknowledges that process and treatment systems have inherent variability and, therefore, incorporates an allowance for this variation into the limitations specified in the effluent guidelines. That allowance is based on statistical analysis of the data from facilities using the model technologies. The limitations included in effluent guidelines incorporate all components of variability including shipping, sampling, storage, and analytical variability. By accounting for those reasonable excursions above the long-term average, the limitations in effluent guidelines generally are well above the actual long-term averages. If a facility operates its treatment system to meet the long-term average, EPA expects the facility will be able to meet the limitations specified in the effluent guidelines based on that long-term average.

EPA has different objectives in establishing maximum daily and average monthly limitations in effluent guidelines. In establishing maximum daily limitations, EPA's objective is to restrict the discharges on a daily basis at a level that is achievable for a facility that targets its treatment at the long-term average. In establishing average monthly limitations, EPA's objective is to provide an additional restriction to help ensure that facilities target their average discharges in a manner that will achieve the long-term average. The average monthly limitation requires continuous dischargers to provide ongoing control on a monthly basis that complements controls imposed by the maximum daily limitation. To meet the average monthly limitation, a facility must counterbalance a value near the maximum daily limitation with one or more values well below the maximum daily limitation. To achieve compliance, the values must result in an average monthly value at or below the average monthly limitation. As explained below, EPA uses a smaller percentile basis for the average monthly limitation than the maximum daily limitation to encourage facilities to target their systems to a value closer to the long-term average.

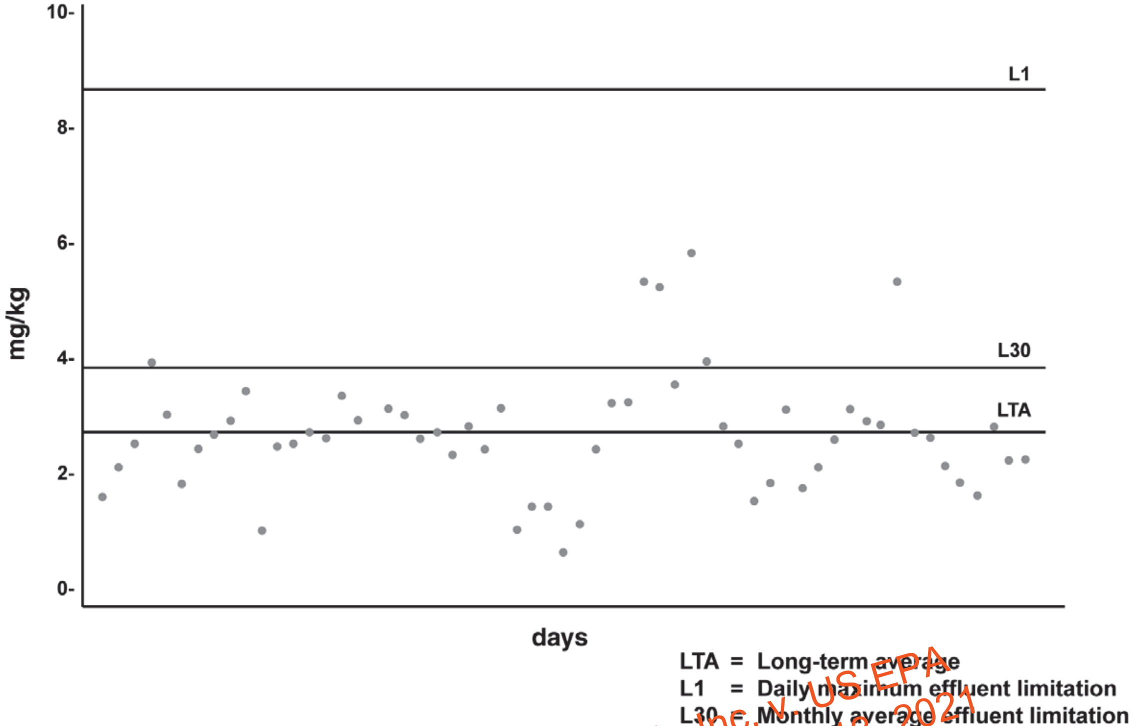
EPA generally uses statistical procedures to determine the values of the limitations specified in the effluent guidelines. Those procedures involve fitting effluent data to distributions and using estimated upper percentiles of the distributions. EPA defines the maximum daily limitation as an estimate of the 99th percentile of the distribution of the daily measurements. The average monthly limitation is an estimate of the 95th percentile of the distribution of the monthly averages of the daily measurements. EPA bases its limitations on percentiles chosen with the intention that they be high enough above the long-term average to accommodate reasonably anticipated variability within control of the facility. In conjunction with the statistical methods, EPA performs an engineering review to verify that the limitations are reasonable on the basis of the design and expected operation of the control technologies and the facility process conditions. Such limitations are translated into effluent limitations in a facility's NPDES permit. Facilities must comply with the effluent limitations in their permits at all times. EPA has prevailed in several judicial challenges to its selection of percentiles and on other issues related to limitations specified in effluent guidelines. [See, for example, *Chemical Manufacturers Association v. U.S. Environmental Protection Agency*, 870 F.2d 177, 230 (5th Cir. 1989) and *National Wildlife Federation, et al v. Environmental Protection Agency*, 286 F.3d 554 (D.C. Cir. 2002)]

Exhibit 5-9 depicts an example of TSS data for a facility that is operating around a required long-term average level for TSS. The dots represent daily measurements, and the reference lines show the values for the long-term average (LTA), the maximum daily limitation (L1), and the average monthly limitation (L30). The facility has demonstrated compliance with both the maximum daily and average monthly limitations. Daily measurements include values both above and below the long-term average; however, all the data values are below the maximum daily limitation. Some individual daily values exceed the average monthly limitation; however, within each month, the average of the daily values is less than the average monthly limitation.

EPA generally exercises four basic alternatives in setting mass- or concentration-based numeric limitations specified in effluent guidelines:

- Mass-based, production-normalized limitations (e.g., the pollutant discharge is not to exceed 1 pound per 1,000 pounds of production).
- Mass-based, flow-normalized limitations (e.g., the pollutant discharge is not to exceed the mass determined by multiplying the process wastewater flow subject to the effluent guideline by the concentration requirement in the guideline).
- Concentration-based limitations (e.g., the pollutant discharge is not to exceed 1 mg of pollutant per liter of wastewater).
- Limitations requiring *zero discharge* of specific pollutants or all pollutants.

Exhibit 5-9 Visual example of TSS LTA, maximum daily limitation and average monthly limitation



Except where a limitation requiring *zero discharge* of pollutants is applicable, EPA generally prefers setting production-normalized, mass-based limitations specified in effluent guidelines, where feasible, because production normalized limitations can reflect some expectation that the facility will conserve water and can reduce any potential for substituting dilution for treatment. EPA generally establishes concentration-based effluent guidelines when production and achievable wastewater flow cannot be correlated nationally. For example, in the Metal Finishing point source Category (Part 433), the Agency considered but decided against expressing the effluent guidelines as production-normalized mass-based effluent guidelines, "With the wide range of operations, product quality requirements, existing process configurations, and difficulties in measuring production, no consistent production normalizing relationship could be found. Concentration-based limits, however, can be consistently attained throughout the industry." [See 47 FR 38465, 31 August 1982.]

Numeric Limitations Established at Minimum Levels

Using percentile estimates to set limitations in effluent guidelines is not a requirement under the CWA. In some cases, the model technology for treating a pollutant might be capable of removing that pollutant to levels that cannot be reliably measured with existing analytical methods. EPA sometimes sets a requirement in the effluent guidelines that the concentration of a pollutant in the discharge must be below a *minimum level* or ML. The ML is the lowest level at which the entire analytical system must give a recognizable signal and an acceptable calibration point for the pollutant being analyzed. Where a limitation in the effluent guidelines is set at *less than the ML*, the value of the ML is specified in the effluent guidelines regulation on the basis of the analytical methods that EPA used to chemically analyze wastewaters in developing the regulation. For example, in the Pulp, Paper, and Paperboard point source category (Part 430) the Daily Maximum BAT effluent guideline for the Tetrachlorodibenzofuran (TCDF) congener of dioxin is expressed as <*ML* for papergrade sulfite (Subpart E) mills, which means "less than the minimum level specified in part 430.01(i)" (i.e., 10 picograms/liter for TCDF). If, in the future, analytical methods become more sensitive with lower MLs, EPA would determine whether the technologies for reducing the amount of the pollutant in the discharge are capable of achieving more stringent limitations and, thus, whether it would be appropriate to modify the requirements of the effluent guideline.

EPA has not established average monthly limitations in effluent guidelines when the maximum daily limitation is an ML limitation. The purpose of an average monthly limitation is to require continuous dischargers to provide better control, on a monthly basis, than required by the maximum daily limitation. However, for these pollutants, the data were determined by analytical methods that could not measure below the ML specified in the regulations. Thus, even if a permitting authority requires monitoring for the pollutants more frequently than once a month, average monthly limitations would still be expressed as *less than the ML* or < *ML*.

Other Expressions for Numeric Limitations

EPA also promulgates effluent guidelines for pollutants that cannot be expressed in terms of mass or concentration (e.g., pH, temperature, radiation) or are better expressed through other means (e.g., unitless ratios). For example, pH is generally expressed as an acceptable range (e.g., 6.0–9.0 standard pH units).

Nonnumeric Effluent Limitations

In some cases, EPA includes nonnumeric or narrative effluent limitations rather than, or in addition to, numeric limitations in effluent guidelines. Nonnumeric effluent limitations might include specific BMPs or requirements to minimize or eliminate discharges. CWA sections 304(e), 308(a), 402(a), and 501(a) authorize the Administrator to prescribe BMPs as part of effluent guidelines and as part of an NPDES permit. CWA section 304(e) authorizes EPA to include supplemental BMPs in effluent guidelines for toxic or hazardous pollutants for the purpose of controlling "plant site runoff, spillage or leaks, sludge or waste disposal, and drainage from raw material storage." Several effluent guidelines include BMPs as requirements. Some effluent guidelines, such as the Concentrated Aquatic Animal Production point source category (Part 451), include the BMPs requirement exclusively. Section 9.1.2 of this manual further discusses BMPs.

CWA section 402(a)(1) and (2) and the NPDES regulations at § 122.44(k) also authorize BMPs in NPDES permits to control or abate the discharge of pollutants when numeric effluent limitations are infeasible, or when the practices are reasonably necessary to achieve effluent limitations and standards or to carry out the purposes and intent of the CWA.

Once EPA establishes effluent guidelines, the permit writer is responsible for translating the limitations and other requirements of the effluent guidelines into TBELs and other conditions appropriate for inclusion in an NPDES permit. Section 5.2.2 below discusses a step-by-step approach for applying effluent guidelines through NPDES permits.

5.2.2 Applying Effluent Guidelines through NPDES Permits

Permit writers need to have a detailed knowledge of the industrial facility applying for a new or reissued NPDES permit to identify applicable effluent guidelines and know how to use them to derive TBELs. This section provides a step-by-step procedure for applying effluent guidelines to direct discharges through NPDES permits as shown in Exhibit 5-10.

Exhibit 5-10 Steps for applying effluent guidelines to direct discharges

Step 1.	Learn about the industrial discharger
Step 2.	Identify the applicable effluent guidelines category(ies)
Step 3.	Identify the applicable effluent guidelines subcategory(ies)
Step 4.	Determine whether existing or new source standards apply
Step 5.	Calculate TBELs from the effluent guidelines
Step 6.	Account for overlapping or multiple effluent guidelines requirements
Step 7.	Apply additional regulatory considerations in calculating TBELs
Step 8.	Apply additional effluent guidelines requirements
Step 9.	Document the application of effluent guidelines in the fact sheet

5.2.2.1 Step 1: Learn About the Industrial Discharger

To write a defensible permit, the permit writer should have a solid understanding of the facility's operations. The permit writer should gather sufficient information to identify applicable effluent guidelines and derive TBELs. Facility-specific information the permit writer is likely to need includes the following:

- Industrial processes and raw materials.
- Products and services.
- Amount of manufacturing production or servicing.
- Number of production and non-production days.
- Current pollution prevention practices and wastewater treatment technology(ies).
- Discharge location of the wastewater pollutants and potential compliance sampling points.
- The source and characteristics of the wastewaters (including flow) and pollutants that are being discharged or have the potential to be discharged from the facility.

Sources of information include the facility's permit application, the current permit and fact sheet (if the facility is permitted), discharge monitoring reports, site visits, site inspections (such as compliance evaluation inspections for an existing permit), and other information submitted by the facility. The permit writer also should identify any information that would assist in determining whether the facility or part of the facility is considered a new source (e.g., age of facility and equipment).

5.2.2.2 Step 2: Identify the Applicable Effluent Guidelines Category(ies)

As noted above, EPA's effluent guidelines are at 40 CFR, Chapter I, Subchapter N - Effluent Guidelines and Standards, Parts 400–471 <www.epa.gov/lawsregs/search/40cfr.html>. A summary of promulgated effluent guidelines is presented on EPA's Industrial Regulations Website <www.epa.gov/guide/industry.html> and in Exhibit 5-11 below.

Exhibit 5-11 Table of existing point source categories (June 2010)

Industry category (listed alphabetically)	40 CFR Part	Industry category (listed alphabetically)	40 CFR Part
Aluminum Forming	467	Meat and Poultry Products	432
Asbestos Manufacturing	427	Metal Finishing	433
Battery Manufacturing	461	Metal Molding and Casting	464
Canned and Preserved Fruits and Vegetable Processing	407	Metal Products and Machinery	438
Canned and Preserved Seafood Processing	408	Mineral Mining and Processing	436
Carbon Black Manufacturing	458	Nonferrous Metals Forming and Metal Powders	471
Cement Manufacturing	411	Nonferrous Metals Manufacturing	421
Centralized Waste Treatment	437	Oil and Gas Extraction	435
Coal Mining	434	Ore Mining and Dressing	440
Coil Coating	465	Organic Chemicals, Plastics, and Synthetic Fibers	414
Concentrated Animal Feeding Operations (CAFOs)	412	Paint Formulating	446
Concentrated Aquatic Animal Production	451	Paving and Roofing Materials (Tars and Asphalt)	443
Copper Forming	468	Pesticide Chemicals	455
Dairy Products Processing	405	Petroleum Refining	419
Electrical and Electronic Components	469	Pharmaceutical Manufacturing	439
Electroplating*	413	Phosphate Manufacturing	422
Explosives Manufacturing	457	Photographic	459
Ferroalloy Manufacturing	424	Plastic Molding and Forming	463
Fertilizer Manufacturing	418	Porcelain Enameling	466
Glass Manufacturing	426	Pulp, Paper, and Paperboard	430
Grain Mills	406	Rubber Manufacturing	428
Gum and Wood Chemicals	454	Soaps and Detergents Manufacturing	417
Hospitals	460	Steam Electric Power Generating	423
Ink Formulating	447	Sugar Processing	409
Inorganic Chemicals	415	Textile Mills	410
Iron and Steel Manufacturing	420	Timber Products Processing	429
Landfills	445	Transportation Equipment Cleaning	442
Leather Tanning and Finishing	425	Waste Combustors	444

* This category contains only categorical pretreatment standards (no effluent guidelines for direct dischargers).

The following sources of information might be helpful in identifying applicable effluent guidelines for a facility:

- **CFR titles and applicability section of the effluent guidelines**. This is first place to look for information for identifying applicable effluent guidelines. Each effluent guidelines regulation includes an applicability section for the category or each subcategory of the industry. The applicability section gives a general description of the types of facilities regulated by the effluent guidelines. The applicability sections often define certain industrial operations or other criteria (e.g., production or process wastewater flow thresholds) that identify whether a facility is regulated by the effluent guidelines.

- **North American Industry Classification System (NAICS) and Standard Industrial Classification (SIC)**. The current NAICS <www.census.gov/epcd/www/naics.html> and former SIC codes <www.census.gov/epcd/www/naicstab.htm> could be helpful to determine the appropriate industrial category(ies) for a facility. NAICS and SIC codes were developed and are maintained by the federal government as a way to classify establishments by type of activity for comparing economic and other types of facility-specific data. Although SIC codes provide a helpful starting point for categorizing a facility, permit writers should be cautious of relying exclusively on SIC codes for determining the appropriate industrial category. SIC codes were not developed using EPA's industrial classification scheme, or vice versa, and, therefore, the codes might not always correspond exactly with the categorization process. In addition, more than one SIC code might apply to a single facility. Item V-II of NPDES Application Form l requires that the applicant provide the SIC code for the activity covered by the permit application. In some instances, the SIC code will identify both the industrial category and the subcategory of a facility. Sometimes the SIC code might identify the appropriate industrial category but not the subcategory. Exhibit 5-12 presents two examples of how a permit writer might identify the applicable effluent guidelines using the facilities SIC codes.

Exhibit 5-12 Examples of identifying applicable effluent guidelines using SIC codes

Example 1

A facility that performs the primary smelting and refining of copper reports SIC code 3331 in its NPDES permit application. By scanning the list of industrial point source categories, the permit writer can determine that the facility is regulated by effluent guidelines in the Nonferrous Metals Manufacturing point source category (Part 421). In this case, the SIC code also indicates that the facility is likely regulated by effluent guidelines in the Primary Copper Smelting Subcategory.

Example 2

A facility that manufactures ethyl acrylate and 2-ethylhexyl acrylate (acrylic acid esters) reports the SIC code 2869 (Industrial Organic Chemicals, Not Elsewhere Classified) in its NPDES permit application. By scanning the list of industrial point source categories, the permit writer can determine that facility is likely regulated by effluent guidelines in the Organic Chemicals, Plastics, and Synthetic Fibers (OCPSF) category (Part 414).

- **EPA's Development Documents and Compliance Guides**. EPA produces a number of documents that will aid permit writers in identifying applicable effluent guidelines and incorporating them into NPDES permits. In particular, development documents summarize the data and information EPA used to develop the effluent guidelines. Such documents are extremely useful in identifying the applicability of the effluent guidelines and how to incorporate the effluent guidelines into NPDES permits. EPA may also publish a compliance guide for permit writers and industry. EPA's Effluent Guidelines Website <www.epa.gov/guide/> provides available documents for specific industrial categories.

- **FR Notices**. The preamble text to the FR notices containing the proposed and final effluent guidelines rulemakings also provide additional insight into applicability of the effluent guidelines. EPA's Effluent Guidelines Website <www.epa.gov/guide/> provides FR notices for specific industrial categories. For example, the preambles to recently promulgated effluent guidelines typically list the SIC and NAICS codes for the potentially regulated facilities. Each Part in the CFR identifies the relevant FR notices. For example, § 419.11 (i.e., specialized definitions for

Subpart [subcategory] A for the Petroleum Refining point source category) identifies 47 FR 46446, October 18, 1982, as amended at 50 FR 28522, July 12, 1985, as its source.

- **EPA Industry Experts**. EPA has a number of subject matter experts <www.epa.gov/guide/contacts.html> at its headquarters office in Washington, D.C. that are available to answer questions on specific effluent guidelines. EPA's NPDES Contacts in Regional Offices <www.epa.gov/npdes/regionalcontacts> also offer assistance in sorting through the different effluent guidelines and NPDES regulations.

- **EPA's Effluent Guidelines Planning Support Documents.** EPA's Effluent Guidelines Biennial Plan Website <http://water.epa.gov/lawsregs/lawsguidance/cwa/304m/> provides technical support documents and other information supporting EPA's biennial effluent guidelines program plans.

- **EPA's Sector Notebooks.** EPA's Sector Notebooks <www.epa.gov/compliance/resources/publications/assistance/sectors/notebooks/index.html> describe specific U.S. industries and governments and provide a holistic approach by integrating processes, applicable regulations, and other relevant environment information.

- **Other Sources**. Other sources of information include resources identified below in Exhibit 5-23, BPJ Permitting Tools. Permit and fact sheet and information from similar facilities might aid in identifying applicable effluent guidelines. However, the permit writer should not assume that a similar facility was correctly categorized in its permit and should examine the rationale for how the other permit writer identified any applicable effluent guidelines before relying on another permit to identify the applicable category.

Permit writers should be aware that effluent guidelines from two or more industrial point source categories might apply to a single facility. Step 6 below, provides additional information on overlapping or multiple effluent guidelines requirements.

5.2.2.3 Step 3: Identify the Applicable Effluent Guidelines Subcategory(ies)

In promulgating effluent guidelines, EPA may divide an industrial point source category into groupings called *subcategories* to provide a method for addressing variations between products, raw materials, processes, and other factors that result in distinctly different effluent characteristics or treatment options. Some effluent guidelines categories cover a variety of industrial sectors (e.g., the Nonferrous Metals Manufacturing point source category has 31 subcategories). It is important for the permit writer to correctly identify the applicable subcategory to derive TBELs.

The process of identifying the applicable effluent guidelines requires close review and comparison of information obtained from Step 1 and Step 2 above. Just as effluent guidelines from two or more industrial categories can apply to a single facility, it also is true that requirements from two or more subcategories could apply to a single facility.

Exhibit 5-13 presents two examples of how a permit writer can identify the subcategory containing the applicable effluent guidelines using information from the NPDES permit application.

Exhibit 5-13 Examples of identifying the subcategory with the applicable effluent guidelines

Example 1

A permit writer has identified the facility from Example 2 in Exhibit 5-12 above as potentially regulated by the effluent guidelines in the OCPSF point source category (Part 414) <www.epa.gov/guide/ocpsf/>. The permit writer can determine from a further review of the industrial categorization discussion in the *OCPSF Development Document* and the guidance document that the facility is likely subject to effluent guidelines in Subpart G (Bulk Organic Chemicals). Specifically, the applicability criteria section in Subpart G (§ 414.70) states, "The provisions of this subpart are applicable to the process wastewater discharges resulting from the manufacture of the following: SIC 2865 and 2869 bulk organic chemicals and bulk organic chemical groups." Further, acrylic acid esters are listed in § 414.70 as an OCPSF product group.

Example 2

A large poultry slaughterhouse annually produces 200 million pounds of whole, halved, quarter or smaller meat cuts and reports SIC Code 2015 in its NPDES permit application. The permit writer reviewed the list of effluent guidelines and identified that the facility is likely regulated by effluent guidelines in the Meat and Poultry Products point source category (Part 432) <www.epa.gov/guide/mpp/>. The permit writer reviewed the preamble to the final effluent guidelines rule and the rule's development document. In that effluent guidelines regulation, EPA used NAICS codes to assist in applicability decisions. See 69 FR 54475, September 8, 2004. The permit writer used the U.S. Census Bureau's SIC to NAICS crosswalk website <www.census.gov/epcd/www/naicstab.htm> to identify the NAICS code (311615). Using the NAICS code, the permit writer can narrow the list of potentially applicable subcategories to the Poultry First Processing (Subpart K) or the Poultry Further Processing (Subpart L) subcategories. After reviewing the applicability criteria of both subcategories, the permit writer determined that only the effluent guidelines in Subpart K are likely applicable because the facility performs slaughtering operations, which are not regulated by Subpart L. Finally, the permit writer also needed to compare the average annual production of the facility (200 million pounds) with the production threshold in the effluent guidelines (100 million pounds per year). Because the facility produces more than the production threshold, the effluent guidelines in Subpart K are applicable to this facility. See §§ 432.112 and 432.113. In this example the permit writer would use the effluent guidelines for ammonia (as N), BOD_5, fecal coliform, oil and grease (as HEM), TSS, and total nitrogen to derive effluent limitations as detailed in section 5.2.2.5 below.

5.2.2.4 Step 4: Determine whether Existing or New Source Standards Apply

Section 5.2.1.1 above defines the different control technologies that apply to direct dischargers: BPT, BCT, BAT, and NSPS. The first three apply to existing direct dischargers, and the fourth to new sources. To determine whether existing source standards (i.e., BPT, BCT, and BAT) or NSPS apply to the facility, the permit writer must determine whether the facility or any part of the facility is a new source. A new source is defined in § 122.2 as a building, structure, facility, or installation that discharges pollutants or could discharge pollutants and for which construction began after promulgation of the applicable effluent guidelines or after proposal of the applicable effluent guidelines, but only if the effluent guidelines are promulgated within 120 days. Thus, the discharger's entire facility could be subject to new source standards (e.g., a brand new facility). Permit writers should note that the new source date for indirect dischargers is the date on which the pretreatment standard for new sources is proposed. See §403.3(m)(1).

Additional criteria for determining whether a discharge is a new source are defined in § 122.29(b) to cover situations where a facility is adding a new building or process line that results in a discharge to the waters of the United States. Such an addition would result in a new source if any of the following is true for the source:

- Is constructed at a site at which no other source is located.
- Totally replaces the process causing the discharge from an existing source.
- Has processes that are substantially independent of an existing source at the same site.

Furthermore, some effluent guidelines, such as the effluent guidelines for the Pulp, Paper, and Paperboard Point Source Category in Part 430, include additional criteria for making new source determinations. See § 430.01(j).

Appendix D of this manual provides the applicable new source dates used in making new source determinations by effluent guideline category as provided in Appendix B of the EPA memorandum *New Source Dates for Direct and Indirect Dischargers*[4] <www.epa.gov/npdes/pubs/newsource_dates.pdf> sent by the directors of the Water Permits Division and the Engineering and Analysis Division to the Regional Water Division Directors. Permit writers can use Appendix D of this manual to find the date for determining whether a facility or part of a facility is subject to NSPS.

Where a new source is the result of a new installation of process equipment at an existing facility, part of the facility might be subject to existing source standards and other parts of the facility subject to new source standards. Permit writers should identify whether the facility has installed any process equipment after the last issuance of the NPDES permit and apply the criteria from § 122.29(b) on a case-by-case basis to new construction or new processes, while applying existing source requirements to the existing portions of the facility. Sometimes it can be difficult to distinguish between a new source and a modification or alteration of an existing source, especially when modifications have occurred slowly over time. The permit writer should consult the effluent guidelines regulation to determine if it defines more specifically what constitutes a new source.

It is important to remember that after the effective date of a new source standard, the CWA stipulates that it is unlawful for any owner or operator to operate such a source in violation of those standards. See 33 U.S.C. 1316(e) and 1317(d). EPA's regulations specify that a new source "[must] install and have in operating condition, and [must] *start up* all pollution control equipment" required to meet applicable standards before beginning to discharge. The regulations also indicate that the owner or operator of a new source must meet all applicable standards within "the shortest feasible time (not to exceed 90 days)." See § 122.29(d)(4).

In addition to the requirement to meet NSPS upon beginning to discharge, an EPA-issued NPDES permit for a new source is a federal action subject to the requirements of the National Environmental Policy Act (NEPA), 33 U.S.C. 1371(c)(1). For more information on NEPA and the NPDES program, see section 11.1.2 of this manual.

For existing facilities and existing sources (where NSPS do not apply), existing source standards (i.e., BPT, BCT, BAT) apply. The permit writer would use the more stringent technology level of control for each pollutant. For example, the BPT level of control in the Veneer Subcategory of the Timber Products Processing category (Part 429, Subpart B) allows a discharge of process wastewater and identifies effluent guidelines for BOD_5 and pH, while the BAT level of control bans the direct discharge of process wastewater. Consequently, the NPDES permit for a facility regulated by the Veneer Subcategory must use the more stringent BAT requirements and prohibit the direct discharge of process wastewater. The effluent guidelines for the Renderers subcategory of the Meat and Poultry Products point source category (Subpart J, Part 432) provide another example. In those effluent guidelines, the BCT requirements for BOD_5, oil and grease, and TSS are more stringent than the corresponding BPT requirements. Accordingly, the permit writer would use the more stringent BCT requirements, rather than the BPT requirements, to derive numeric permit limitations for an existing renderer.

5.2.2.5 Step 5: Calculate TBELs from the Effluent Guidelines

Once a permit writer has identified the effluent guidelines that apply to a facility, he or she then uses those effluent guidelines to calculate applicable TBELs.

EPA's regulations at § 122.45(f)(1) stipulate that all pollutants limited in permits must have limitations, standards or prohibitions expressed in terms of mass except under any of the following conditions:

- For pH, temperature, radiation, or other pollutants that cannot appropriately be expressed by mass limitations.
- When applicable standards or limitations are expressed in terms of other units of measure.
- If in establishing technology-based permit limitations on a case-by-case basis, limitations based on mass are infeasible because the mass or pollutant cannot be related to a measure of production (e.g., discharges of TSS from certain mining operations). The permit conditions must ensure that dilution will not be used as a substitute for treatment.

Thus, the type of limitation (i.e., mass, concentration, or other units) calculated for a specific pollutant at a facility will depend on the type of pollutant and the way limitations are expressed in the applicable effluent guideline. Generally, effluent guidelines include both maximum daily and monthly average limitations for most pollutants. Though the effluent guidelines use different terms for monthly effluent limitations (e.g., monthly average, maximum for monthly average, average of daily values for 30 consecutive days), the requirements are expressed in NPDES permits as average monthly limitations as defined in § 122.2.

As stated in Steps 1 and 2 above, the permit writer would use many sources of information to calculate TBELs. From those sources, the permit writer should identify the source and characteristics of the wastewaters (including flow) and pollutants being discharged, or that have the potential to be discharged, and whether and how those pollutants are regulated by effluent guidelines. In particular, the permit writer should identify the following:

- The appropriate permit compliance point(s) (which might be specified in the effluent guidelines).
- Wastewaters subject to the applicable effluent guidelines and whether they are commingled with other wastewaters not regulated by effluent guidelines (e.g., sanitary wastewaters before the permit compliance point).
- Reasonable measure of the facility's actual long-term daily production and average number of production days per year regulated by effluent guidelines (necessary for derived effluent limitations from production-normalized effluent guidelines).
- Average daily facility flows at the compliance point(s) regulated by effluent guidelines.
- Average daily facility flows at the compliance point(s) not regulated by effluent guidelines.

That information is used in conjunction with the effluent guidelines for TBEL calculations as discussed below.

Calculating Mass-based TBELs from Production-Normalized Effluent Guidelines

Most effluent guidelines requirements are mass-based and expressed in terms of allowable pollutant discharge per unit of production or some other measure of production (i.e., production normalized). Permit writers incorporate such production-normalized effluent guidelines into NPDES permits as mass-based TBELs by using a reasonable measure of the permittee's actual long-term daily production. The objective in determining the production for a facility is to develop a single estimate of the long-term average daily production that can reasonably be expected to prevail during the next term of the permit (i.e., not the design production rate). Permit writers may establish such a production rate using the past 3 to 5 years of facility data. For example, the permit writer might wish to use the average daily production rate calculated using the highest annual production from the previous 3 to 5 years. Whatever value is selected, the permit writer should ensure that the production rate used in deriving mass-based effluent limitations is representative of the actual production likely to prevail during the next term of the permit.

The examples in Exhibit 5-14 illustrate the application of production-based effluent guidelines using the approach where annual production data are available. In Example 1 in Exhibit 5-14, the highest annual production rate during the past 5 years was used as the estimate of production. If historical trends, market forces, company plans to decrease production, or plant designs and capital expenditures for an increase in production indicated that a different level of production would prevail during the permit term, the permit writer could consider a different basis for estimating production or establish tiered discharge limitations, as discussed in section 5.2.2.7 below.

Calculating Mass-based TBELs from Flow-Normalized Effluent Guidelines

In some cases, permit writers are directed to calculate mass-based TBELs from flow-normalized effluent guidelines that are expressed as concentrations. For example, the Organic Chemicals, Plastics, and Synthetic Fibers (OCPSF) effluent guidelines <www.epa.gov/waterscience/guide/ocpsf/> in Part 414 state that facilities "must achieve discharges not exceeding the quantity (mass) determined by multiplying the process wastewater flow subject to [the effluent guideline] times the concentration listed in the [effluent guideline]…" The *Development Document for Effluent Limitations Guidelines and Standards for the Organic Chemicals, Plastics and Synthetic Fibers Point Source Category*[5] <www.epa.gov/waterscience/guide/ocpsf/#guidance> directs the permit writer to "use a reasonable estimate of process wastewater discharges and the concentration limitations [in the effluent guideline] to develop mass limitations for the NPDES permit." Thus, the process for calculating the TBELs is similar to the process used with production-normalized effluent guidelines, but rather than using a reasonable measure of the actual daily production, the permit writer would use a reasonable measure of the actual daily flow rate as the basis for calculating the TBELs.

As with estimating production to calculate TBELs, the objective in determining a flow estimate for a facility is to develop a single estimate of the actual daily flow rate (in terms of volume of process wastewater per day), which can reasonably be expected to prevail during the next term of the permit (i.e., not the design flow rate). Permit writers can establish that flow rate using the past 3 to 5 years of facility data in a manner similar to the method used to determine production. For example, the permit writer might wish to use the highest average daily flow rate from the average daily flows calculated for each of the past 3 to 5 years. The value selected should be representative of the actual flow likely to prevail during the next term of the permit.

Exhibit 5-14 Example of calculating mass-based effluent limitation from production-normalized effluent guidelines[6]

Example 1

Facility A has produced 331,000 tons, 301,500 tons, 321,500 tons, 330,000 tons, and 331,500 tons of product per year for the previous 5 years operating 255 days per year.

Question:
What would be a reasonable measure of production for permitting purposes?

Answer:
Using the highest year of production (331,500 tons per year) might be an appropriate and reasonable measure of production, if this figure is representative of the actual production expected to occur over the next term of the permit. Permit writers also should check to see if the maximum yearly value is within a certain percentage (e.g., 20 percent–see section 5.2.2.7 below) of the average value. In evaluating gross production figures, the number of production days should be considered. If the number of production days per year is not comparable, the permit writer would need to convert the numbers to production per day before comparing them. In this example, all the yearly production figures were based on 255 days per year of production, so they may be compared directly. The 331,500 tons per year figure is the maximum for the past 5 years, which is only 2.6 percent above the average annual production of 323,100 tons. Therefore, 331,500 tons is a reasonable measure of the annual production for the facility.

Example 2

For the same facility in Example 1 above with an annual production of 331,500 tons, the production-normalized effluent guidelines for zinc are 0.1 lbs/1,000 lbs as monthly average and 0.15 lbs/1,000 lbs as daily maximum.

Question:
What are the resulting zinc technology-based effluent limitations for the NPDES permit?

Answer:
The annual production would be converted to an average daily production rate to apply the effluent guidelines. To convert from the annual production rate to an average daily rate, divide the annual production rate by the number of production days per year. To determine the number of production days, subtract the total number of normally scheduled non-production days from the total days in a year. Because Company A normally has 255 production days per year, the annual production rate of 331,500 tons per year would yield an average production daily rate of 1,300 tons per day.

Monthly average discharge limitation for zinc*:

1,300 tons/day	x	2,000 lbs/ton	x	0.10 lbs/1,000 lbs	=	**260 lbs/day**

Daily maximum discharge limitation for zinc*:

1,300 tons/day	x	2,000 lbs/ton	x	0.15 lbs/1,000 lbs	=	**390 lbs/day**

* calculated to 2 significant figures

Calculating TBELs from Concentration-based Effluent Guidelines

Permit writers might want to develop mass-based limitations for facilities with concentration-based effluent guidelines (e.g., for a facility does not have adequate water conservation practices). Mass-based permit effluent limitations encourage water conservation (e.g., minimize the potential for diluting process wastewaters by non-process wastewater, more efficient use of water) and pollution prevention (e.g., reduce waste loads to wastewater treatment facilities by physically collecting solid materials before using water to clean equipment and facilities). Additionally, for facilities with on-site wastewater treatment systems, the combination of water-reduction technologies and practices and well-operated wastewater treatment will reduce the volume and mass of discharged wastewater pollution (i.e., after treatment). Another benefit of mass-based permit effluent limitations is that they provide the permittee with more flexibility. Permittees may elect to control their wastewater discharges through more efficient wastewater control technologies and pollution-prevention practices that result in lower pollutant concentrations in the discharged wastewater, or more efficient water conservation practices that result in less wastewater volume discharged from industrial operations), or both.

"EPA strongly supports water conservation and encourages all sectors, including municipal, industrial, and agricultural, to achieve efficient water use. EPA does not intend for its regulations to present a barrier to efficient water use in any industrial sector." See final 2006 Effluent Guidelines Program Plan in 71 FR 76655, December 21, 2006.

When calculating mass-based effluent limitations, the permit writer should use a conversion factor and document in the fact sheet the conversion factors used to calculate the permit limitations (e.g., concentration [mg/L] × flow [mgd] × 8.34 [conversion factor] = permit limitation [lbs/day]).

Additionally, guidance for implementing concentration-based limitations in effluent guidelines may direct permit writers to develop mass-based TBELs. For example, the *Permit Guidance Document Transportation Equipment Cleaning Point Source Category (40 CFR 442)*[7] industry states:

> The effluent limitations guidelines and standards for the TEC industry are concentration-based and adhere to the *building block* concept. Each regulated wastestream in an outfall is typically assigned a mass-based discharge allowance based on a calculation of its applicable concentration-based limitation and annual average flow. The sum of the allowances is the total mass discharge allowance for the outfall. In other words, the applicable permit limitations for facilities in more than one subcategory is the sum of the mass loadings based upon production in each subcategory and the respective subcategory effluent limitations guidelines. Mass-based limitations for unregulated or dilution wastewater streams at direct discharging facilities are established using [BPJ].

Where a permit writer cannot determine a reasonable measure of actual flow for a regulated discharge, concentration-based TBELs may be determined by directly applying the concentration-based limitations in effluent guidelines to the regulated flow and accounting for non-regulated flows at the point of compliance for the TBELs.

Supplementing Mass-based TBELs with Concentration Limitations

Even where effluent guidelines require permit writers to calculate mass-based TBELs, a permit writer may determine that it is beneficial to include concentration-based limitations to supplement the mass-based limitations. Where effluent limitations are expressed in terms of mass, a provision at § 122.45(f)(2) allows the permit writer, at his or her discretion, to express limitations in additional units (e.g., concentration units). Where limitations are expressed in more than one unit, the permittee must comply with both. The permit writer may determine that expressing limitations in terms of both concentration and mass encourages the proper operation of a treatment facility at all times.

Supplementing mass-based limitations with concentration-based limitations may be especially appropriate where the requirements in the effluent guidelines are flow-normalized (i.e., the effluent guidelines includes a concentration requirement but directs the permit writer to calculate a mass-based TBEL using the concentration requirement and the wastewater flow). The permit writer may determine that if the permit includes only mass-based limitations derived from the concentration-based limitations in the effluent guidelines, a permittee could increase its effluent pollutant concentrations above the applicable concentration requirements during low flow periods (i.e., reduce the efficiency of the wastewater treatment) and still meet its mass-based permit limitations. Supplementing the mass-based TBELs with concentration limitations would discourage the reduction in treatment efficiency during low-flow periods and require proper operation of treatment units at all times.

Incorporating Narrative Requirements from Effluent Guidelines

The permit writer should also ensure that any applicable narrative effluent guidelines controls or requirements are included in the permit. For example, the effluent guidelines for Concentrated Aquatic Animal Production facilities (Part 451) consist of narrative requirements implemented through BMPs. Another example, related to monitoring and compliance rather than effluent limitations, is found in the Metal Finishing effluent guidelines. The effluent guidelines allow a facility to make a statement regarding total toxic organics (TTO) in lieu of monitoring for toxic organics. Exhibit 5-15 provides an example narrative requirement representing BPT performance standards for Concentrated Aquatic Animal Production facilities, Subpart A (flow through and recirculating systems) § 455.11(a).

Exhibit 5-15 Example narrative requirement from the Concentrated Aquatic Animal Production effluent guideline—Subpart A [§ 455.11(a)]

Except as provided in [§§] 125.30 through 125.32, any existing point source subject to this subpart must meet the following requirements, expressed as practices (or any modification to these requirements as determined by the permitting authority based on its exercise of its best professional judgment) representing the application of BPT:

(a) Solids control. The permittee must:

(1) Employ efficient feed management and feeding strategies that limit feed input to the minimum amount reasonably necessary to achieve production goals and sustain targeted rates of aquatic animal growth in order to minimize potential discharges of uneaten feed and waste products to waters of the [United States]

(2) In order to minimize the discharge of accumulated solids from settling ponds and basins and production systems, identify and implement procedures for routine cleaning of rearing units and off-line settling basins, and procedures to minimize any discharge of accumulated solids during the inventorying, grading and harvesting aquatic animals in the production system.

(3) Remove and dispose of aquatic animal mortalities properly on a regular basis to prevent discharge to waters of the [United States], except in cases where the permitting authority authorizes such discharge in order to benefit the aquatic environment.

5.2.2.6 Step 6: Account for Overlapping or Multiple Effluent Guidelines Requirements

There are instances when one facility includes both new and existing sources, produces multiple products or services, or includes production or services belonging to more than one category or subcategory. In such cases, the permit writer must examine the applicable effluent guidelines closely to ensure that (1) one guideline does not supersede another; and (2) the effluent guidelines are properly applied.

Superseding Effluent Guidelines

EPA tries to minimize the overlap of different effluent guidelines by providing exclusions in the applicability sections. The effluent guidelines in the Metal Finishing point source category (Part 433) are an example of where EPA has tried to minimize the overlap of multiple effluent guidelines for certain wastewater discharges. Exhibit 5-16 presents the applicability section in Part 433 [§ 433.10(b)], which specifically excludes certain wastewaters from the Metal Finishing effluent guidelines. Another example is the preamble to the OCPSF effluent guidelines. The preamble identifies numerous circumstances where the OCPSF regulations are superseded by effluent guidelines for other industrial categories. Exhibit 5-17 presents excerpts from the preamble (52 FR 42523, November 5, 1987) to illustrate the point.

Exhibit 5-16 Exclusion of wastewaters in metal finishing effluent guidelines

In some cases, effluent limitations and standards for the following industrial categories might be effective and applicable to wastewater discharges from the metal finishing operations listed above [in paragraph (a)]. In such cases these Part 433 limitations shall not apply and the following regulations shall apply: [emphasis added]

- Nonferrous metal smelting and refining (40 CFR part 421)
- Coil coating (40 CFR Part 465)
- Porcelain enameling (40 CFR Part 466)
- Battery manufacturing (40 CFR Part 461)
- Iron and steel (40 CFR Part 420)
- Metal casting foundries (40 CFR Part 464)
- Aluminum forming (40 CFR Part 467)
- Copper forming (40 CFR Part 468)
- Plastic molding and forming (40 CFR Part 463)
- Nonferrous forming (40 CFR Part 471)
- Electrical and electronic components (40 CFR Part 469)

Exhibit 5-17 Excerpts from preamble to OCPSF effluent guidelines regarding applicability of effluent guidelines

- For the purposes of this regulation, OCPSF process wastewater discharges are defined as discharges from all establishments or portions of establishments that manufacture products or product groups listed in the applicability sections of this regulation, and are included within the following U.S. Department of Commerce Bureau of the Census Standard Industrial Classification (SIC) major groups:
  - SIC 2865: Cyclic Crudes and Intermediates, Dyes, and Organic Pigments.
  - SIC 2869: Industrial Organic Chemicals, not Elsewhere Classified.
  - SIC 2821: Plastic Materials, Synthetic Resins, and Nonvulcanizable Elastomers.
  - SIC 2823: Cellulosic Man-Made Fibers.
  - SIC 2824: Synthetic Organic Fibers, Except Cellulosic.

  The OCPSF regulation does not apply to process wastewater discharges from the manufacture of organic chemical compounds solely by extraction from plant and animal raw materials or by fermentation processes.

- The OCPSF regulation does not apply to discharges from OCPSF product/process operations [that] are covered by the provisions of other categorical industry effluent limitations guidelines and standards if the wastewater is treated in combination with the non-OCPSF industrial category regulated wastewater. (Different processes manufacture some products or product groups and some processes with slight operation condition variations give different products. EPA uses the term *product/process* to mean different variations of the same basic process to manufacture different products as well as to manufacture the same product using different processes.)

- The process wastewater discharges by petroleum refineries and pharmaceutical manufacturers from production of organic chemical products specifically covered by 40 CFR Part 419 Subparts C and E and Part 439 Subpart C, respectively, that are treated in combination with other petroleum refinery or pharmaceutical manufacturing wastewater, respectively, are not subject to the OCPSF regulation no matter what SIC code they use to report their products.

- Today's OCPSF category regulation applies to plastics molding and forming processes when plastic resin manufacturers mold or form crude intermediate plastic material for shipment off-site. The regulation also applies to the extrusion of fibers. Plastics molding and forming processes, other than those described above are regulated by the Plastics Molding and Forming effluent guidelines and standards (40 CFR Part 463).

Exhibit 5-17 Excerpts from preamble to OCPSF effluent guidelines regarding applicability of effluent guidelines (continued)

- Public comments requested guidance relating to the coverage of OCPSF research and development facilities, standalone OCPSF research and development, pilot plant, technical service, and laboratory bench scale-operations are not covered by the OCSPF regulation. However, wastewater from such operations conducted in conjunction with and related to existing OCPSF manufacturing operations at OCPSF facilities is covered by the OCPSF regulation because these operations would most likely generate wastewater with characteristics similar to the commercial manufacturing facility. Research and development, pilot plant technical service, and laboratory operations [that] are unrelated to existing OCPSF plant operations, even though conducted on-site, are not covered by the OCPSF regulation because they may generate wastewater with characteristic dissimilar to that from the commercial OCPSF manufacturing facility.
- Finally, as described in the following paragraphs, this regulation does not cover certain production that has historically been reported to the Bureau of Census under a non-OCPSF SIC subgroup heading, even if such production could be reported under one of the five SIC code groups covered by today's regulation.

Multiple Effluent Guidelines Requirements

NPDES permit writers often find that a facility employs multiple processes each with its own effluent guidelines requirement. In addition, sometimes effluent guidelines from multiple categories and subcategories apply to wastewaters for a single facility. When a facility is subject to effluent guidelines for two or more processes in a subcategory or to effluent guidelines from two or more categories or subcategories, the permit writer must apply each of the applicable effluent guidelines to derive TBELs. In applying multiple effluent guidelines, the permit writer should use measures of actual production or flow that are reasonable with respect to operation of multiple processes at the same time. For example, if maximum production for one process can occur only when there is reduced production for a second process, it might not be reasonable to assume maximum production levels for both processes at the same time when applying the effluent guidelines. If all wastewaters regulated by effluent guidelines are treated separately but are combined before the discharge, the permit writer may establish internal outfalls and separately apply the effluent guidelines at the respective internal outfall as discussed in § 122.45(h) and in Step 7 below.

More commonly, wastewater streams regulated by effluent guidelines are combined during or before treatment. In such a case, the permit writer combines the allowable pollutant loadings from each set of requirements or from each set of effluent guidelines to arrive at a single TBEL for the facility using a *building block* approach. The building block approach as applied to a facility with multiple processes in the Primary Tungsten subcategory of the Primary Nonferrous Metals Manufacturing point source category (Part 421, Subpart J) is presented in Exhibit 5-18. The same principles illustrated in the exhibit would apply to a facility with processes subject to requirements from multiple subcategories or categories that are combined before or during treatment.

Exhibit 5-18 Building block approach for applying effluent guidelines

A facility is subject to Part 421, Subpart J (Primary Tungsten). The facility uses a tungstic acid rinse, an acid leach wet air pollution control system, and an alkali leach wash in its manufacturing process.

The Maximum daily production rate for the facility is:
4.7 million pounds per day of Tungstic Acid (as W)
3.5 million pounds per day of Sodium Tungstate (as W)

Question:
What is the technology-based effluent limit for lead at the facility?

Answer:
BPT calculation for lead (§ 421.102):

a) **Tungstic acid rinse:**
(4.7 million lbs/day) × (17.230 lbs/million lbs) = 80.981 lbs/day

b) **Acid leach wet air pollution control:**
(4.7 million lbs/day) × (15.040 lbs/million lbs) = 70.688 lbs/day

c) **Alkali leach wash:**
(3.5 million lbs/day) × (0.000 lbs/million lbs) = 0.000 lbs/day

d) **Total allowable discharge** = 80.981 + 70.688 + 0.000 = 151.669 = **152 lbs/day**

BAT calculation for lead (§ 421.103):

a) **Tungstic acid rinse:**
(4.7 million lbs/day) × (11.490 lbs/million lbs) = 54.003 lbs/day

b) **Acid leach wet air pollution control:**
(4.7 million lbs/day) × (1.003 lbs/million lbs) = 4.7141 lbs/day

c) **Alkali leach wash:**
(3.5 million lbs/day) × (0.000 lbs/million lbs) = 0.000 lbs/day

d) **Total allowable discharge** = 54.003 + 4.7141 + 0.000 = 58.7171 = **59 lbs/day***

The technology-based maximum daily limitation for lead at the facility is the BAT limitation of **59 lbs/day**. That value is compared with the water quality-based effluent limitation for lead, to ensure that all applicable standards are implemented through the final effluent limitations.

* calculated to 2 significant figures

The building block approach is applied in other circumstances as well, such as

- **Mixture of mass-based and concentration-based requirements:** The limitations in effluent guidelines for some pollutants are mass-based, production-normalized limitations in some subparts and concentration-based limitations in other subparts. When all the wastewater streams go to the same treatment system, the permit writer would need to convert the concentration-based limitations to mass-based limitations so they could be combined with the mass-based, production-normalized limitations and applied to the combined wastewater streams.
- **Mixture of different concentration-based requirements:** Some facilities could have multiple operations that are each subject to different concentration-based requirements for the same pollutant but with wastewater streams that combine before treatment. In such a case, the permit writer can establish a flow-weighted concentration-based limitation as the TBEL for the combined wastewater streams or convert the concentration-based requirements to equivalent mass-based requirements using flow data and then combine the mass-based requirements into a single limitation for the combined wastewater streams.

- **Mixture of regulated and unregulated wastewater streams:** In some cases, wastewater streams containing a pollutant regulated by the applicable effluent guidelines requirements can combine with other wastewater streams that do not have effluent guidelines requirements that regulate the pollutant. In such a case, the permit writer could use BPJ to establish a TBEL for the unregulated wastewater stream(s) (see section 5.2.3 below) and, as appropriate, calculate a final TBEL for the combined wastewater streams. For example, if one of the wastewater streams contributing to an industrial facility's discharge is sanitary wastewater, the permit writer might use BPJ to apply the treatment standards for domestic wastewater and calculate BOD_5 limitations for that wastewater stream. The secondary treatment standards, discussed in section 5.1 above, could be used to calculate mass-based limits for the sanitary wastewater using the concentration-based requirements and an estimate of flow rate that is expected to represent the flow rate during the proposed permit term. A final TBEL for BOD_5 could be calculated for the combined sanitary and process wastewater streams by combining the two mass limitations using the building block approach.
- **Mixture of wastewater streams containing a pollutant with wastewater streams not containing the pollutant:** If a wastewater stream that does not contain a pollutant is combined with another wastewater stream that contains the pollutant (and has applicable requirements in the effluent guidelines or requirements determined by the permit writer using BPJ), the permit writer must ensure that the non-regulated waste stream does not dilute the regulated waste stream to the point where the pollutant is not analytically detectable. If that occurs, the permit writer will most likely need to establish internal outfalls, as allowed under § 122.45(h) and in Step 7 below.

For examples of addressing combined wastewater streams, see section 15.3.3 on page 15-10 of EPA's *Technical Development Document for the Final Effluent Limitations Guidelines and Standards for the Meat and Poultry Products Point Source Category (40 CFR 432)*[8] <www.epa.gov/waterscience/guide/mpp/final/tdd15.pdf>.

Facilities with Both New and Existing Sources

Finally, as noted above, if effluent guidelines are applicable to an existing facility, and that facility adds a new production line, which becomes a *new source*, the permit writer should calculate TBELs for the subsequent permit using BPT, BCT, and BAT standards for the existing production line and NSPS for the new production line, as discussed in section 5.2.2.4 above.

5.2.2.7 Step 7: Apply Additional Regulatory Considerations in Calculating TBELs

The permit writer must consider several additional requirements when deriving TBELs from effluent guidelines. Those additional requirements consist of evaluating or accounting for the following:

- Expected significant increases or decreases in production during the permit term for tiered discharger limitations.
- Internal outfalls.
- Requests for a variance from effluent guidelines.

The following sections provide an overview of those topics.

Tiered Discharge Limitations

If production rates are expected to change significantly during the life of the permit, the permit writer can include tiered (alternate) TBELs as allowed by § 122.45(b)(2)(ii)(A)(i). Tiered TBELs would apply to mass-based effluent limitations and would become effective when production or flow (or some other measure of production) exceeded a threshold value, such as during seasonal production variations. Generally, up to a 20 percent fluctuation in production is considered to be within the range of normal variability, while changes in production higher than 20 percent could warrant consideration of tiered limitations. Exhibit 5-19 illustrates application of tiered limitations.

Exhibit 5-19 Example of tiered discharge limitations

Plant B produced approximately 40 tons per day of product during spring and summer months (i.e., March through August) and 280 tons per day during fall and winter months during the previous 5 years. Production during the fall and winter months is significantly higher than during the off-season, and the discharger has made a plausible argument that production is expected to continue at that level. The effluent guidelines requirements for Pollutant Z are 0.08 lbs/1,000 lbs for the average monthly limitation and 0.14 lbs/1,000 lbs for the maximum daily limitation.

Question:
What are appropriate tiered effluent limitations for Plant B?

Answer:
The first tier or lower limitations would be based on a production rate of 40 tons per day. The limitations would apply between March and August.

Monthly average limitation:
40 tons/day × 2,000 lbs/ton x 0.08 lbs/1,000 lbs = **6.4 lbs/day***

Daily maximum limitation:
40 tons/day × 2,000 lbs/ton x 0.14 lbs/1,000 lbs = 11.2 lbs/day = **11 lbs/day***

The second tier or higher limitations would be based on a production rate of 280 tons per day. Those limitations would apply between September and February.

Monthly average limitation:
280 tons/day × 2,000 lbs/ton x 0.08 lbs/1,000 lbs = 44.8 lbs/day = **45 lbs/day***

Daily maximum limitation
280 tons/day × 2,000 lbs/ton x 0.14 lbs/1,000 lbs = 78.4 lbs/day = **78 lbs/day***

* calculated to 2 significant figures

Permit writers should include tiered limitations in a permit only after careful consideration of production data and only when a substantial increase or decrease in production is likely to occur. In the example above, the lower limitations would be in effect when production was at low levels (March through August). During periods of significantly higher production (September through February), the higher limitations would be in effect. In addition, a tiered or alternate set of limitations might be appropriate in the case of special processes or product lines that operate during certain times only.

Permit writers could base thresholds for tiered limitations on an expected increase in production during the term of the permit that will continue through the duration of the permit term. For example, if a facility plans to add a process line and significantly expand production in year 3 of the permit term, the permit could specify a higher tier of limitations that go into effect when the facility reports reaching a production level specified in the permit.

Permit writers must detail in the permit the thresholds and time frames when each tier applies, measures of production, and special reporting requirements. Special reporting requirements include provisions such as the following:

- The facility notifying the permitting authority a specified number of business days before the month it expects to be operating at a higher level of production and the duration this level of production is expected to continue.
- The facility reporting, in the discharge monitoring report, the level of production and the limitation and standards applicable to that level.

A detailed discussion of the rationale and requirements for any tiered limitations should be provided in the fact sheet for the permit.

Internal Outfalls

The NPDES regulations at § 122.45(h) give NPDES permit writers the authority to identify internal outfalls when effluent limitations at the final outfall are impractical or infeasible. These internal compliance points might be necessary to ensure proper treatment of persistent, bioaccumulative, and toxic pollutants that are discharged in concentrations below analytic detection levels at the final effluent outfall or other pollutants that may be diluted by flows (e.g., cooling water) not containing the pollutant. Some effluent guidelines may *require* the use of internal outfalls unless the effluent limitations are adjusted based on the dilution ratio of the process wastewater to the wastewater flow at the compliance point. Examples of effluent guidelines with required internal compliance points include the Metal Finishing effluent guidelines (Part 433) and the Pulp, Paper, and Paperboard effluent guidelines (Part 430). Accordingly, the permit writer should identify any internal outfall monitoring that might be required by the applicable effluent guidelines and include monitoring requirements in the final permit.

Effluent Guidelines Variances

The CWA and federal regulations provide limited mechanisms for variances from requirements in effluent guidelines. An NPDES permit applicant must meet very specific data and variance application deadline requirements before a variance may be granted. A variance provides a unique exception to a particular requirement, and the permit writer should not expect to routinely receive variance requests. Nevertheless, the permit writer should be aware of the major types of variances and the basic requirements for each, because the permit writer will most likely be the person to conduct the initial reviews of such requests before submitting them for review to the State Director (if applicable) or to EPA.

Variance applications are submitted by the NPDES permit applicant and must be submitted before the close of the public comment period of the permit, except for Fundamentally Different Factors (FDF) variance requests, which must be requested by the NPDES permit applicant within 180 days of the effluent guidelines publication. The permit writer should consult § 124.62 for the specific procedures for decisions regarding various types of variances. Exhibit 5-20 lists the available variances from effluent guidelines.

Exhibit 5-20 Variances from effluent guidelines

Legislation (CWA section)	Type	Regulation (40 CFR)	Approval authority	Application deadline
301(g)	Nonconventional Pollutant	Part 125, Subpart F (Reserved)	EPA Region HQ delegated authority	During permit comment period
301(n)	Fundamentally Different Factors (FDF)	Part 125, Subpart D	EPA Region HQ delegated authority	180 days from the date the limitation or standard is published in the FR
—	Net Intake or Net/Gross	§ 122.45(g)	NPDES state or EPA Region in absence of approved state NPDES program	During permit comment period

The following paragraphs further discuss the variances listed in Exhibit 5-20 and the factors that are considered in a technical review of a variance request.

Nonconventional Pollutant—CWA Section 301(g) Variance

CWA section 301(g) and the regulations at § 122.21(m)(2) provide for a variance from new or revised BAT effluent guidelines for certain nonconventional pollutants because of local environmental factors, so long as the discharger demonstrates that it is meeting BPT and that the discharge does not prevent attainment of water quality standards and would not result in additional requirements on other point or nonpoint sources. The pollutants for which a facility may request a CWA section 301(g) variance are ammonia, chlorine, color, iron, and phenols (as measured by the colorimetric 4-aminoantipyrine [4AAP] method). The CWA also provides a process to petition to include additional pollutants on this list. Industries with facilities that have applied for CWA section 301(g) variances include Iron and Steel Manufacturing (Part 420), Steam Electric Power Generating (Part 423), Inorganic Chemicals Manufacturing (Part 415), Nonferrous Metals Manufacturing (Part 421), Aluminum Forming (Part 467), and Pesticides Chemicals (Part 455) facilities.

In addition to meeting the application deadline, the discharger must file a variance application that meets the following requirements:

- The proposed modified requirements must result in compliance with BPT and water quality standards of the receiving stream.
- No additional treatment will be required of other point or nonpoint source dischargers as a result of the variance approval.
- The modified requirements will not interfere with attainment or maintenance of water quality to protect public water supplies, or with protection and propagation of a balanced population of shellfish, fish, and wildfowl, and will allow recreational activities in and on the water.
- The modified requirements will not result in quantities of pollutants that can reasonably be anticipated to pose an unacceptable risk to human health or the environment, cause acute or chronic toxicity, or promote synergistic properties.

The permit writer should review the request to ensure that it complies with each of the requirements for this type of variance. This variance request can involve a great deal of water quality assessment, including aquatic toxicity, mixing zone and dilution model analysis, and possible site-specific criterion development. In addition, it might be necessary to assess many complex human health effects, including carcinogenicity, teratogenicity, mutagenicity, bioaccumulation, and synergistic propensities. Permit writers may use EPA's *Draft Technical Guidance Manual for the Regulations Promulgated Pursuant to Section 301(g) of the Clean Water Act of 1977 40 CFR Part 125 (Subpart F)* <www.epa.gov/npdes/pubs/owm0008.pdf> to assess a completed variance request.

Fundamentally Different Factors—FDF Variance

Alternative effluent limitations or standards different from the otherwise applicable requirements in effluent guidelines may be authorized by EPA if an individual facility is fundamentally different with respect to factors considered in establishing the limitations or standards otherwise applicable to that facility's industrial category. Such a modification is known as a *fundamentally different factors* (FDF) variance.

Facilities must submit all FDF variance applications to the appropriate Director, as defined at § 122.2, no later than 180 days from the date the limitations or standards are published in the FR [see CWA section 301(n)(2) and § 122.21(m)(1)(i)(B)(2)]. An FDF variance is not available to a new source subject to NSPS.

EPA regulations at Part 125, Subpart D, authorizing the EPA Regional Administrators to establish alternative limitations and standards, further detail the substantive criteria used to evaluate FDF variance requests for direct dischargers. The regulations at § 125.31(d) identify six factors that may be considered in determining if a facility is fundamentally different:

- Nature or quality of pollutants contained in the raw process wastewater.
- Volume of the process wastewater and effluent discharged.
- Non-water quality environmental impact of control and treatment of the raw wasteload.
- Energy requirements of the application of control and treatment technology.
- Age, size, land availability, and configurations of discharger's equipment or facilities as well as processes employed, process changes, and engineering aspects of the application of control technology.
- Cost of compliance with required control technology.

The Agency must determine whether, on the basis of one or more of those six factors, the facility in question is fundamentally different from the facilities and factors considered by EPA in developing the nationally applicable effluent guidelines. The regulation also lists four other factors that may not provide a basis for an FDF variance:

- Infeasibility of installation within the time allowed by the CWA.
- Assertion that the national limitations cannot be achieved with the appropriate waste treatment facilities installed (if the assertion is not based on one or more of the six FDF factors above).
- A discharger's ability to pay for the required water treatment.

- The impact of a discharge on local receiving water quality.

In addition, under § 125.31(b)(3), a request for limitations less stringent than the national limitation may be approved only if compliance with the national limitations would result in either of the following:

- Removal cost wholly out of proportion to the removal cost considered during development of the national limitations.
- Non-water quality environmental impact (including energy requirements) fundamentally more adverse than the impact considered during development of the national limitations.

The conditions for approval of a request to modify applicable pretreatment standards and factors considered are the same as those for direct dischargers.

The legislative history of CWA section 301(n) underscores the necessity for the FDF variance applicant to establish eligibility for the variance. EPA's regulations at § 125.32(b)(1) are explicit in imposing that burden on the applicant. The applicant must show that the factors relating to the discharge controlled by the applicant's permit, which are claimed to be fundamentally different are, in fact, fundamentally different from those factors considered by the EPA in establishing the applicable effluent guidelines. The pretreatment regulations incorporate a similar requirement at § 403.13(h)(9).

Intake Allowance or Net/Gross Variance

Some facilities might be unable to comply with effluent guidelines because of pollutants in their intake water. Under certain circumstances, the NPDES regulations allow credit for pollutants in intake water. Specifically, permit writers are authorized to grant net credits for the quantity of pollutants in the intake water where (1) the applicable effluent guidelines specify that the guidelines are to be applied on a net basis; or (2) the pollution control technology would, if properly installed and operated, meet applicable effluent guidelines without the pollutants in the intake waters. The following requirements are included in § 122.45(g) for establishing net limitations:

- Credit for conventional pollutants, such as BOD_5 or TSS, are only authorized where the constituents resulting in the effluent BOD_5 and the TSS are similar between the intake water and the discharge.
- Credit is authorized only up to the extent necessary to meet the applicable limitation or standard, with a maximum value equal to the influent concentration.
- Intake water must be taken from the same body of water into which the discharge is made.
- Net credits do not apply to the discharge of raw water clarifier sludge generated during the treatment of intake water.

Permit writers must include influent monitoring in the permit when this type of variance is granted.

Thermal Discharge—CWA Section 316(a) Variance

CWA section 316(a) and the regulations at § 122.21(m)(6) provide for variances from thermal effluent limitations in NPDES permits. EPA has only promulgated thermal limitations in effluent guidelines for two industrial sectors: Beet Sugar Processing Subcategory of the Sugar Processing Point Source Category (Part 409 Subpart A) and the Cement Manufacturing Point Source Category (Part 411, Subparts A and B).

Most thermal limitations are based on water quality standards, so most thermal variances actually are not true *technology-based* variances. Dischargers must apply for a thermal discharge variance with its permit application if the thermal effluent limitation is based on an effluent guideline or during the permit comment period if the thermal effluent limitation is based on a WQBEL.

Regulations for submitting and reviewing thermal discharge variance requests are promulgated at Part 125, Subpart H. The approval authority for a thermal discharge variance request is the state permitting authority or the EPA Region if there is no approved state NPDES program. Less stringent alternative thermal effluent limitations may be included in permits if the discharger properly demonstrates that such effluent limitations are more stringent than necessary to assure the protection and propagation of a balanced, indigenous community of shellfish, fish and wildlife in and on the body of water into which the discharge is made, taking into account the cumulative impact of its thermal discharge together with all other significant impacts on the species affected. Once a variance is granted, the discharger must still reapply for the variance each permit term. The majority of thermal variance requests are from power plants seeking relief from water-quality based effluent limitations.

Climate Change Considerations

Evaluation of requests for variances under CWA section 316(a) requires consideration of the change to the ambient water temperature because of an effluent discharge. The studies provided by applicants to support their requests frequently include historical thermal data for the receiving water. Permitting authorities should be aware that the effects of global climate change could alter the thermal profile of some receiving waters making the historical record of thermal conditions less representative of future conditions. Where appropriate, water quality models should take these potential changes into account.

5.2.2.8 Step 8: Apply Additional Requirements in Effluent Guidelines

The effluent guidelines could provide additional requirements for permit writers to consider when applying them in NPDES permits.

Industrial Stormwater

Industrial stormwater is sometimes regulated by effluent guidelines. In particular, effluent guidelines often regulate stormwater for industrial activities that are unsheltered (e.g., mining, outdoor processing, outside storage of product materials). Examples of contaminated stormwater regulated by effluent guidelines include the Concentrated Animal Feeding Operations (Part 412), Fertilizer Manufacturing (Part 418), Petroleum Refining (Part 419), Iron and Steel Manufacturing (Part 420), Pulp, Paper, and Paperboard (Part 430), Metal Products and Machinery (Part 438), and Ore Mining and Dressing (Part 440) point source categories. The permit writer should identify any specific stormwater controls that may be required by the applicable effluent guidelines accordingly.

Stormwater not regulated by effluent guidelines that is commingled with process wastewater will require the adjustment of the effluent limitations as discussed in Step 6 above. Section 2.3.2.3 of this manual provides additional information about stormwater discharges associated with industrial activities.

Identify the Analytical Methods for Measuring Compliance with TBELs

The permit writer should ensure that the permit specifies the use of the correct analytical methods for demonstrating compliance with TBELs derived from effluent guidelines. The effluent guidelines often require specific analytical methods. For example, the *General Definitions* section of the Meat and Poultry Products effluent guidelines [§ 432.2(l)] states, "The approved methods of analysis for the following six parameters [Ammonia (as N), BOD_5, Oil and Grease (O&G), O&G as hexane extractable material (HEM), Total Nitrogen, TSS] are found in Table 1B in [§] 136.3. The nitrate/nitrite part of total nitrogen may also be measured by EPA Method 300.0 (incorporated by reference, see § 432.5)." Section 8.3 of this manual provides additional information on analytical methods in the NPDES permitting process.

Documentation and Recordkeeping Requirements

Specific documentation and recordkeeping requirements (e.g., solvent management plans, BMP plans, alternative monitoring requirements) may be included in the applicable effluent guidelines. The permit writer should ensure that the documentation and recordkeeping requirements are included in the NPDES permit. For example, to use the alternative monitoring compliance method for controlling toxic organics in the Metal Finishing effluent guidelines, the NPDES permit applicant must not only make a certification statement (see Exhibit 5-15), but must also "submit a solvent management plan that specifies to the satisfaction of the permitting authority (or, in the case of indirect dischargers, the control authority) the toxic organic compounds used; the method of disposal used instead of dumping, such as reclamation, contract hauling, or incineration; and procedures for ensuring that toxic organics do not routinely spill or leak into the wastewater" as required by § 433.12(b). Other examples of such documentation and recordkeeping requirements include the BMP Plans used in the Oil and Gas Extraction (Part 435) and the Concentrated Aquatic Animal Production effluent guidelines (Part 451), the pollution prevention alternative in the Pesticide Chemicals effluent guidelines (Part 455), and alternative monitoring requirements (e.g., certification in lieu of monitoring for chloroform, in the Pulp, Paper, and Paperboard effluent guidelines (Part 430).

5.2.2.9 Step 9: Document the Application of Effluent Guidelines in the Fact Sheet

Permit writers need to document their application of effluent guidelines in the NPDES permit fact sheet. The permit writer should clearly identify the data and information used to determine the applicable effluent guidelines and how that information was used to derive effluent limitations for the permit. The information in the fact sheet should provide the NPDES permit applicant and the public a transparent, reproducible, and defensible description of how the NPDES permit properly incorporates effluent guidelines.

Similarly, permit writer should also document the rationale for concluding that there are no applicable effluent guidelines for a discharge or pollutant. In such cases, TBELs may be determined by the permit writer on a case-by-case basis as discussed in section 5.2.3 below.

5.2.3 Case-by-Case TBELs for Industrial Dischargers

As previously stated, § 125.3(a) indicates that technology-based treatment requirements under CWA section 301(b) represent the minimum level of control that must be imposed in an NPDES permit.

Where EPA-promulgated effluent guidelines are not applicable to a non-POTW discharge, such requirements are established on a case-by-case basis using BPJ.

5.2.3.1 Legal Authority to Establish Case-by-Case TBELs

Case-by-case TBELs are developed pursuant to CWA section 402(a)(1), which authorizes the EPA Administrator to issue a permit that will meet either all applicable requirements developed under the authority of other sections of the CWA (e.g., technology-based treatment standards, water quality standards, ocean discharge criteria) or, before taking the necessary implementing actions related to those requirements, "such conditions as the Administrator determines are necessary to carry out the provisions of this Act." The regulation at § 125.3(c)(2) specifically cites this section of the CWA, stating that technology-based treatment requirements may be imposed in a permit "on a case-by-case basis under section 402(a)(1) of the Act, to the extent that EPA-promulgated effluent limitations are inapplicable." Further, § 125.3(c)(3) indicates that "where promulgated effluent limitations guidelines only apply to certain aspects of the discharger's operation, or to certain pollutants, other aspects or activities are subject to regulation on a case-by-case basis to carry out the provisions of the Act." When establishing case-by-case effluent limitations using BPJ, the permit writer should cite in the fact sheet or statement of basis both the approach used to develop the limitations, which is discussed further below, and how the limitations carry out the intent and requirements of the CWA and the NPDES regulations.

5.2.3.2 Identifying the Need for Case-by-Case TBELs

As noted above, case-by-case TBELs are established in situations where EPA-promulgated effluent guidelines are inapplicable. That includes situations such as the following:

- When EPA has not yet promulgated effluent guidelines for the point source category to which a facility belongs (e.g., a facility that produced distilled and blended liquors [SIC code 2085] and is part of the miscellaneous foods and beverages category, which does not now have any applicable effluent guidelines).
- When effluent guidelines are available for the industry category, but no effluent guidelines are available for the facility subcategory (e.g., discharges from coalbed methane wells are not now regulated by effluent guidelines; however, EPA considers the coalbed methane industrial sector as a potential new subcategory of the existing Oil and Gas Extraction point source category [Part 435] because of the similar industrial operations performed [i.e., drilling for natural gas extraction]).
- When effluent guidelines are available for the industry category but are not applicable to the NPDES permit applicant (e.g., facilities that do not perform the industrial operation triggering applicability of the effluent guidelines or do not meet the production or wastewater flow cutoff applicability thresholds of the effluent guidelines). For example, assume that the poultry slaughterhouse in Example 2 of Exhibit 5-13 above produces 50 million pounds of whole, halved, quarter or smaller meat cuts annually. In that case, any TBELs for the facility would be case-by-case limitations developed using BPJ because the facility is below the annual production threshold of 100 million pounds listed in the effluent guideline (Part 432, Subpart K).
- When effluent guidelines are available for the industry category, but no effluent guidelines requirements are available for the pollutant of concern (e.g., a facility is regulated by the effluent guidelines for Pesticide Chemicals [Part 455] but discharges a pesticide that is not regulated by

these effluent guidelines). The permit writer should make sure that the pollutant of concern is not already controlled by the effluent guidelines and was not considered by EPA when the Agency developed the effluent guidelines.

Generally, case-by-case limitations are appropriate when at least one of the conditions listed above applies and the pollutant is present, or expected to be present, in the discharge in amounts that can be treated or otherwise removed (e.g., implementation of pollution prevention measures). The resources listed in sections 5.2.2.2 above and 5.2.3.4 below will help the permit writer in making such determinations. For example, EPA's effluent guidelines planning support documents on EPA's Effluent Guidelines Biennial Plan Website <http://water.epa.gov/lawsregs/lawsguidance/cwa/304m/> identify facilities and industrial sectors that currently are not regulated by effluent guidelines.

5.2.3.3 Factors Considered When Developing Case-by-Case TBELs

The NPDES regulations at § 125.3(c)(2) require that permit writers developing case-by-case effluent limitations consider the following:

- The appropriate technology for the category class of point sources of which the applicant is a member, based on all available information.
- Any unique factors relating to the applicant.

The regulations also require that, in setting case-by-case limitations, the permit writer consider several specific factors established in § 125.3(d) to select a model treatment technology and derive effluent limitations on the basis of that treatment technology. That process and the factors considered by the permit writer are the same factors required to be considered by EPA in developing effluent guidelines and, therefore, are often referred to as the CWA section 304(b) factors. The factors are summarized below in Exhibit 5-21. The permit writer evaluates case-by-case limitations based on BPT, BCT, and BAT and uses the more stringent technology level of control for each pollutant of concern.

Exhibit 5-21 Summary of factors considered when developing case-by-case TBELs

For BPT requirements (all pollutants)
- The age of equipment and facilities involved*
- The process(es) employed*
- The engineering aspects of the application of various types of control techniques*
- Process changes*
- Non-water quality environmental impact including energy requirements*
- The total cost of application of technology in relation to the effluent reduction benefits to be achieved from such application

For BCT requirements (conventional pollutants)
- All items in the BPT requirements indicated by an asterisk (*) above
- The reasonableness of the relationship between the costs of attaining a reduction in effluent and the derived effluent reduction benefits
- The comparison of the cost and level of reduction of such pollutants from the discharge of POTWs to the cost and level of reduction of such pollutants from a class or category of industrial sources

For BAT requirements (toxic and non-conventional pollutants)
- All items in the BPT requirements indicated by an asterisk (*) above
- The cost of achieving such effluent reduction

The CWA also gives the permit writer the authority to consider process changes to evaluate case-by-case limitations. As previously stated, technology-based controls in NPDES permits are performance-based measures. EPA incorporates technology-based controls in NPDES permits that correspond to the application of an identified technology (including process changes) but does not require dischargers to install the identified technology. Therefore, EPA leaves to each facility the discretion to select the technology design or process changes necessary to meet the TBELs specified in the NPDES permit.

The permit writer might need to establish a monitoring-only requirement in the current NPDES permit to identify pollutants of concern and potential case-by-case limitations for the subsequent NPDES permit renewal.

5.2.3.4 Resources for Developing Case-by-Case TBELs

There are numerous resources for identifying candidates for model technologies or process changes and developing case-by-case TBELs using BPJ. Exhibit 5-22 lists some example references that permit writers can use to derive such limitations.

5.2.3.5 Statistical Considerations When Establishing Case-by-Case TBELs

The quality of the effluent from a treatment facility will normally vary over time. If, for example, BOD_5 data for a typical treatment plant were plotted against time, one would observe day-to-day variations of effluent concentrations. Some of that behavior can be described by constructing a frequency-concentration plot. From the plot, one could observe that for most of the time, BOD_5 concentrations are near some average value. Any treatment system can be described using the mean concentration of the parameter of interest (i.e., the long-term average) and the variance (or coefficient of variation) and by assuming a particular statistical distribution (usually lognormal).

When developing a case-by-case limitation, permit writers can use an approach consistent with the statistical approach EPA has used to develop effluent guidelines. Specifically, the maximum daily limitation could be calculated by multiplying the long-term average achievable by implementation of the model technology or process change by a daily variability factor determined from the statistical properties of a lognormal distribution. The average monthly limitation can be calculated similarly except that the variability factor corresponds to the distribution of monthly averages instead of daily concentration measurements. The daily variability factor is a statistical factor defined as the ratio of the estimated 99th percentile of a distribution of daily values divided by the mean of the distribution. Similarly, the monthly variability factor is typically defined as the estimated 95th percentile of the distribution of monthly averages divided by the mean of the distribution of monthly averages.

A modified delta-lognormal distribution could be fit to concentration data and variability factors computed for the facility distribution. The modified delta-lognormal distribution models the data as a mixture of measured values and observations recorded as values less than the detectable level. This distribution often is selected because the data for many analytes consist of such a mixture of measured values and results below the detectable level. The modified delta-lognormal distribution assumes that all non-detected results have a value equal to the detection limitations and that the detected values follow a lognormal distribution.

Exhibit 5-22 Tools for developing case-by-case TBELs using BPJ

Permit file information
- Current and previous NPDES application forms.
- Previous NPDES permit and fact sheet.
- Discharge monitoring reports.
- Compliance inspection reports.

Information from existing facilities and permits
- NPDES Individual and General Permits for other NPDES permits issued to facilities in the same region or state, or that include case-by-case limitations for the same pollutants.
- Toxicity reduction evaluations for selected industries.
- Other media permit files (e.g., Resource Conservation and Recovery Act [RCRA] permit applications and Spill Prevention Countermeasure and Control [SPCC] plans.
- ICIS-NPDES <https://icis.epa.gov/icis> data.
- Literature (e.g., technical journals and books).

Effluent guidelines development and planning information
- Industry experts within EPA headquarters, EPA Regions, and states <www.epa.gov/guide/contacts.html>.
- Development Documents, CWA section 308 questionnaires, screening and verification data, proposed and final regulations, contractor's reports, and project officer contacts <www.epa.gov/guide>.
- EPA's Technical Support Documents <http://water.epa.gov/lawsregs/lawsguidance/cwa/304m/> and records supporting EPA's biennial effluent guidelines program plans also provide additional useful information. In particular, such resources provide a sample of the current limitation and latest developments in industrial pollutant prevention, water conservation, and wastewater treatment. The Technical Support Documents also identify industrial sectors not currently regulated by effluent guidelines.

Statistical guidance
- Effluent Guidelines Technical Development Support Documents, such as the Development Document for Final Effluent Limitations Guidelines and Standards for the Iron and Steel Manufacturing Point Source Category <www.epa.gov/guide/>.

Economics guidance
- *Protocol and Workbook for Determining Economic Achievability for NPDES Permits*[9] <www.epa.gov/npdes/pubs/protocol_npdespermits.pdf> and <www.epa.gov/npdes/pubs/workbook_econ_permits.pdf>.
- *BCT Cost Test Guidance* <www.epa.gov/npdes/pubs/owm0009.pdf>.

Guidance for BMP-based limitations
- *Guidance Manual for Developing Best Management Practices (BMPs)*[10] <www.epa.gov/npdes/pubs/owm0274.pdf>.
- *Storm Water Management for Industrial Activities: Developing Pollution Prevention Plans and BMPs*[11] <www.epa.gov/npdes/pubs/contents_indguide.pdf>.
- National Menu of Stormwater Best Management Practices <www.epa.gov/npdes/stormwater/menuofbmps>.

For more details on EPA's use of statistical methods for developing effluent guidelines, refer to *Development Document for Final Effluent Limitations Guidelines and Standards for the Iron and Steel Manufacturing Point Source Category* <www.epa.gov/guide/ironsteel/reg/tdd.htm>.

5.2.3.6 Documenting Case-by-Case TBELs in the Permit Fact Sheet

Permit writers will need to document the development of case-by-case limitations in the NPDES permit fact sheet. The permit writer should clearly identify the data and information used in developing these effluent limitations and how that information was used. The permit writer also should document the rationale for concluding that there are no applicable effluent guidelines for the industrial wastewater or pollutant discharge. The information in the fact sheet should provide the NPDES permit applicant and the public a transparent, reproducible, and defensible description of how the BPJ limitations comply with the CWA and EPA regulations.

[1] U.S. Environmental Protection Agency. 1985. *Draft Guidance for NPDES Permits and Compliance Personnel—Secondary Treatment Redefinition.* U.S. Environmental Protection Agency. Office of Water Enforcement and Permits. Washington, DC.

[2] U.S. Environmental Protection Agency. 1994. *Amended Section 301(h) Technical Support Document*. EPA-842-B-94-007. U.S. Environmental Protection Agency. Office of Wetlands Oceans and Watersheds, Washington, DC.

[3] U.S. Environmental Protection Agency. 1977. *Interim Final Supplement for Pretreatment to the Development Document for the Petroleum Refining Industry Existing Point Source Category*, EPA-440-1-76-083A. Page 92. U.S. Environmental Protection Agency, Office of Water and Hazardous Materials, Washington, DC. Publication available on NEPIS Website <www.epa.gov/nscep/> as document 440176083A.

[4] Boornazian, Linda and Mary Smith. 2006. *New Source Dates for Direct and Indirect Dischargers*. U.S. Environmental Protection Agency, Office of Water Memorandum. September 28, 2006. <www.epa.gov/npdes/pubs/newsource_dates.pdf>.

[5] U.S. Environmental Protection Agency. 1987. *Development Document for Effluent Limitations Guidelines and Standards for the Organic Chemicals, Plastics and Synthetic Fibers Point Source Category*. EPA 440-1-87-009. Page IX-9. <www.epa.gov/waterscience/guide/ocpsf/#guidance>.

[6] Jordan, J.W. 1984. *Calculations of Production-Based Effluent Limits*. U.S. Environmental Protection Agency, Office of Water, Washington, DC. Memorandum, December 18, 1984. <www.epa.gov/npdes/pubs/owm0427.pdf>.

[7] U.S. Environmental Protection Agency. 2001. *Permit Guidance Document: Transportation Equipment Cleaning Point Source Category (40 CFR 442)*, p. 30. EPA-821-R-01-021. U.S. Environmental Protection Agency, Office of Water, Washington, DC. <www.epa.gov/waterscience/guide/teci/tecguid.pdf>.

[8] U.S. Environmental Protection Agency. 2004. *Technical Development Document for the Final Effluent Limitations Guidelines and Standards for the Meat and Poultry Products Point Source Category (40 CFR 432),* EPA-821-R-04-011. U.S. Environmental Protection Agency, Office of Water, Washington, DC. <www.epa.gov/waterscience/guide/mpp/final/tdd15.pdf>.

[9] Putnam, Hayes and Bartlett, Inc. 1982. *Protocol and Workbook for Determining Economic Achievability for National Pollutant Discharge Elimination System Permits*. U.S. Environmental Protection Agency, Permits Division, Washington, DC. <www.epa.gov/npdes/pubs/protocol_npdespermits.pdf.> and <www.epa.gov/npdes/pubs/workbook_econ_permits.pdf>

[10] U.S. Environmental Protection Agency. 1993. *Guidance Manual for Developing Best Management Practices (BMP)*. EPA 833-B-93-004. U.S. Environmental Protection Agency, Office of Water, Washington, DC. <www.epa.gov/npdes/pubs/owm0274.pdf>.

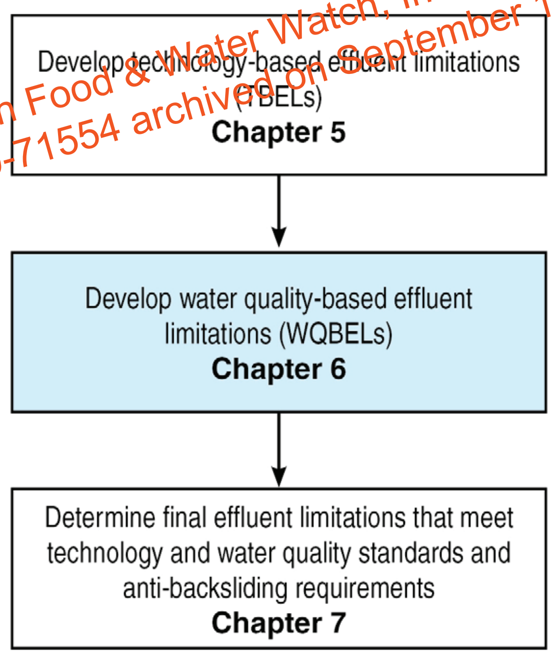
[11] U.S. Environmental Protection Agency. 1992. *Storm Water Management for Industrial Activities: Developing Pollution Prevention Plans and BMPs*. EPA 832-R-92-006. U.S. Environmental Protection Agency, Office of Water, Washington, DC. <www.epa.gov/npdes/pubs/contents_indguide.pdf>.

CHAPTER 6. Water Quality-Based Effluent Limitations

When drafting a National Pollutant Discharge Elimination System (NPDES) permit, a permit writer must consider the impact of the proposed discharge on the quality of the receiving water. Water quality goals for a waterbody are defined by state water quality standards. By analyzing the effect of a discharge on the receiving water, a permit writer could find that technology-based effluent limitations (TBELs) alone will not achieve the applicable water quality standards. In such cases, the Clean Water Act (CWA) and its implementing regulations require development of water quality-based effluent limitations (WQBELs). WQBELs help meet the CWA objective of restoring and maintaining the chemical, physical, and biological integrity of the nation's waters and the goal of water quality that provides for the protection and propagation of fish, shellfish, and wildlife and recreation in and on the water (*fishable/swimmable*).

WQBELs are designed to protect water quality by ensuring that water quality standards are met in the receiving water. On the basis of the requirements of Title 40 of the *Code of Federal Regulations* (CFR) 125.3(a), additional or more stringent effluent limitations and conditions, such as WQBELs, are imposed when TBELs are not sufficient to protect water quality. Exhibit 6-1 illustrates the relationship between TBELs and WQBELs in an NPDES permit, as well as the determination of final effluent limitations.

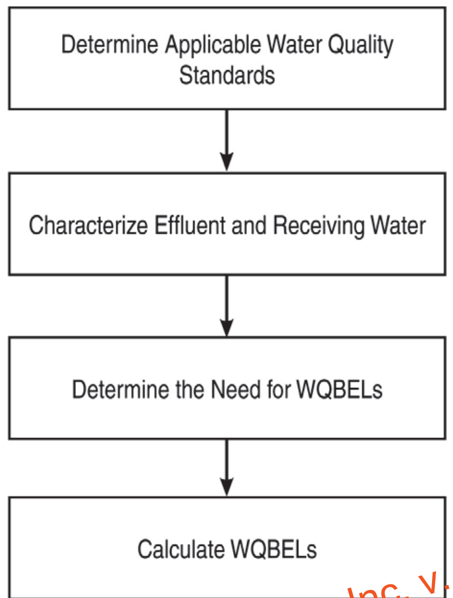
Exhibit 6-1 Developing effluent limitations



CWA section 301(b)(1)(C) requires that permits include any effluent limitations necessary to meet water quality standards. As illustrated above, to satisfy that requirement, permit writers implement a process to determine when existing effluent limitations (e.g., TBELs) and existing effluent quality are not sufficient to comply with water quality standards and to, where necessary, develop WQBELs. Exhibit 6-2 illustrates the four basic parts of the *standards-to-permits* process used to assess the need for and develop WQBELs.

After completing that process, the permit writer determines the final effluent limitations, includes any compliance schedules and interim effluent limitations, as appropriate, and documents all his or her decisions and calculations.

Exhibit 6-2 Standards-to-permits process



This chapter provides basic information on the standards-to-permits process. For more detailed information on water quality standards and water quality-based permitting, and some of the specific topics discussed in this chapter, refer to the NPDES Website <www.epa.gov/npdes> and Water Quality Standards Website <www.epa.gov/waterscience/standards>.

6.1 Determine Applicable Water Quality Standards

CWA section 303(c) and Part 131 establish the framework for water quality standards. The CWA and implementing regulations require states to develop and, from time to time, revise water quality standards applicable to waters of the United States, or segments of such waterbodies, that are in the jurisdiction of the state. States must review their water quality standards at least once every 3 years and revise them as appropriate. Wherever attainable, water quality standards should protect water quality that provides for the protection and propagation of fish, shellfish and wildlife, and recreation in and on the water (i.e., the CWA section 101(a)(2) *fishable/swimmable* goal). In establishing standards, states must consider the use and value of their waters for public water supplies, propagation of fish and wildlife, recreation, agriculture and industrial purposes, and navigation. The U.S. Environmental Protection Agency (EPA) has provided information regarding procedures for developing water quality standards in the Water Quality Standards Regulation at Part 131 and EPA's *Water Quality Standards Handbook: Second Edition*[1] <www.epa.gov/waterscience/library/wqstandards/handbook.pdf.> (hereafter *WQS Handbook*). Under CWA section 510, states may develop water quality standards that are more stringent than those required by the CWA.

EPA Regions review and approve or disapprove new and revised water quality standards adopted by states. The purpose of EPA's review is to ensure that the new and revised water quality standards meet the requirements of the CWA and the Water Quality Standards Regulation. Water quality standards adopted and submitted to EPA after May 30, 2000, must be approved by EPA before they may be used to implement the CWA (e.g., used in NPDES permitting). If an EPA Region disapproves a submitted new or revised state water quality standard, and the state does not adopt the necessary changes within 90 days of notification of the disapproval, EPA must promptly propose and promulgate a replacement standard [see § 131.22(a)].

When writing an NPDES permit, the permit writer must identify and use the state water quality standards in effect for CWA purposes. EPA maintains a compilation of current state water quality standards on the Water Quality Standards: State, Tribal, & Territorial Standards Website <www.epa.gov/waterscience/standards/wqslibrary/>. In addition, EPA's Water Quality Standards: Laws and Regulations Website <www.epa.gov/waterscience/standards/rules/> provides federally promulgated standards applicable to specific states. The remainder of this section provides permit writers with a general overview of water quality standards and how they are implemented in NPDES permits.

6.1.1 Components of Water Quality Standards

Water quality standards comprise three parts:

- Designated uses.
- Numeric and/or narrative water quality criteria.
- Antidegradation policy.

Each of those three components, along with general policies that also may be included in state water quality standards, is described below.

6.1.1.1 Designated Uses (§ 131.10)

The first part of a state's water quality standards is a classification system for waterbodies based on the expected uses of those waterbodies. The uses in this system are called *designated uses*. The regulations at § 131.10(a) describe various uses of waters that are considered desirable and that must be considered when establishing water quality standards. Those uses include public water supplies, propagation of fish, shellfish, and wildlife, recreation in and on the water, agricultural, industrial, and other purposes including navigation. The regulations allow states to designate more specific uses (e.g., cold water aquatic life) [see § 131.10(c)] or uses not specifically mentioned in the CWA, with the exception of waste transport and assimilation, which are not acceptable designated uses [see § 131.10(a)]. States must also consider and ensure the attainment and maintenance of the water quality standards of downstream waters when establishing designated uses [see § 131.10(b)].

The regulations in § 131.10(j) effectively establish a *rebuttable presumption* that the uses in CWA section 101(a)(2) (fishable/swimmable) are attainable. If a state fails to designate a given waterbody for such uses, or wishes to remove such uses, it must provide appropriate documentation demonstrating why such uses are not attainable. This analysis is commonly called a *Use Attainability Analysis* (UAA) (see § 131.3(g) and section 6.1.2.1 below).

6.1.1.2 Water Quality Criteria (§ 131.11)

The second part of a state's water quality standards is the set of water quality criteria sufficient to support the designated uses of each waterbody. EPA's Water Quality Standards Regulation at § 131.11(a) requires states to adopt water quality criteria using sound scientific rationale and to include sufficient parameters or constituents to protect the designated use. If a waterbody has multiple use designations, the criteria must support the most sensitive use. The regulation at § 131.11(b) allows states to adopt both numeric and narrative water quality criteria. Numeric water quality criteria are developed for specific parameters to protect aquatic life and human health and, in some cases, wildlife from the deleterious effects of pollutants. States establish narrative criteria where numeric criteria cannot be established, or to supplement numeric criteria. Criteria newly adopted or revised on or after May 30, 2000, do not become effective for purposes of the CWA until approved by EPA [see § 131.21(c)].

CWA section 304(a) directs EPA to develop, publish, and, from time to time, revise criteria for water quality accurately reflecting the latest scientific knowledge on the following:

- The kind and extent of all identifiable effects on health and welfare, including effects on aquatic life and recreational uses, that may be expected from the presence of pollutants in any body of water.
- The concentration and dispersal of pollutants or their byproducts through biological, physical, and chemical processes.
- The effects of pollutants on biological community diversity, productivity, and stability.

EPA's recommended criteria developed under CWA section 304(a) assist states in developing their water quality standards. EPA's numeric criteria are ambient levels of individual pollutants or parameters or they describe conditions of a waterbody that, if met, generally will protect the CWA section 101(a)(2) fishable and swimmable uses. EPA's recommended criteria developed under CWA section 304(a) do not reflect consideration of economic impacts or the technological feasibility of meeting the chemical concentrations in ambient water. EPA provides a table of the nationally recommended CWA section 304(a) criteria on the National Recommended Water Quality Criteria Website <www.epa.gov/waterscience/criteria/wqctable/>. The regulation at § 131.11(b)(1) indicates that, in establishing numeric criteria, states may (1) adopt EPA's recommended criteria published under CWA section 304(a), (2) adopt those criteria modified to reflect site-specific conditions, or (3) adopt criteria based on other scientifically defensible methods.

CWA section 303(c)(2)(B) specifically requires states to adopt numeric criteria for CWA section 307(a) toxic (priority) pollutants for which EPA has published recommended criteria if the discharge or presence of the pollutant can reasonably be expected to interfere with designated uses. Furthermore, § 131.11(a)(2) requires states to review water quality data and information on discharges to identify specific water bodies where toxic pollutants might be adversely affecting water quality or attainment of designated uses or where levels of toxic pollutants would warrant concern and to adopt criteria for such toxic pollutants applicable to the waterbody that are sufficient to protect the designated use. As discussed in section 1.2 and presented in Exhibit C-1 in Appendix C of this manual, the CWA section 307(a) list contains 65 compounds and families of compounds, which EPA has interpreted to include 126 toxic (priority) pollutants.

Numeric Criteria—Aquatic Life

Numeric criteria for the protection of aquatic life are designed to protect aquatic organisms, including both plants and animals. EPA's aquatic life criteria address both short-term (acute) and long-term (chronic) effects on both freshwater and saltwater species. Each of those criteria generally consists of three components:

- **Magnitude:** The level of pollutant (or pollutant parameter), usually expressed as a concentration, that is allowable.
- **Duration:** The period (averaging period) over which the in-stream concentration is averaged for comparison with criteria concentrations.
- **Frequency:** How often criteria may be exceeded.

Are criteria and effluent limitations expressed in the same terms?

Generally, criteria and effluent limitations are not expressed in the same terms. As discussed above, criteria are generally expressed as a magnitude, duration and frequency. Effluent limitations in NPDES permits are generally expressed as a magnitude (e.g., milligrams per liter, micrograms per liter) and an averaging period (e.g., maximum daily, average weekly, average monthly). A permit writer should be aware of the procedures used by his or her permitting authority to appropriately reflect the magnitude, duration, and frequency components of aquatic life criteria when determining the need for and calculating effluent limitations for NPDES permits. Typically, the components of the criteria are addressed in water quality models through the use of statistically derived receiving water and effluent flow values that ensure that criteria are met under *critical conditions* (see section 6.2 below).

Exhibit 6-3 is an example of freshwater aquatic life criteria for cadmium from the National Recommended Water Quality Criteria Website <www.epa.gov/waterscience/criteria/wqctable/> and at 66 FR 18935, April 12, 2001, Notice of Availability of 2001 Update: Aquatic Life Criteria Document for Cadmium <www.epa.gov/EPA-WATER/2001/April/Day-12/w9056.htm>.

Exhibit 6-3 Aquatic life criteria example: Cadmium (dissolved)

Except possibly where a locally important species is unusually sensitive, freshwater aquatic organisms and their uses should not be affected unacceptably if

Chronic criterion:
The 4-day average concentration (in micrograms per liter [µg/L]) does not exceed the numerical value given by $e^{(0.7409[\ln(\text{hardness})]-4.719)}$ (1.101672 – [(ln hardness)(0.041838)]) more than once every 3 years on average.

Acute criterion:
The 24-hour average concentration (in µg/L) does not exceed the numerical value given by $e^{(1.0166[\ln(\text{hardness})]-3.924)}$ (1.136672 – [(ln hardness)(0.041838)]) more than once every 3 years on average.

It is apparent that the acute and chronic aquatic life criteria for cadmium are not simply single numbers. Rather, they are expressed as a magnitude, a duration (4-day average or 24-hour average), and a frequency (not more than once every 3 years). Furthermore, the magnitude is expressed by a formula that is hardness-dependent, as is the case for most criteria for metals.

The magnitude of other aquatic life criteria can vary according to other conditions in the water or even based on the presence or absence of certain aquatic life. For example, EPA's 1999 recommended ammonia criteria vary according to pH, temperature, the presence or absence of salmonid species, and the presence or absence of early life stages of fish. A permit writer must be aware of the applicable criteria and any state regulations, policies, and procedures for interpreting numeric criteria and for implementing the criteria in NPDES permits. The durations of aquatic life criteria vary as well. For example, EPA's criteria recommendations for ammonia include a 30-day average chronic criterion. Also, many acute criteria for toxic pollutants are expressed as a 1-hour average. The frequency component of most aquatic life criteria specifies that they should be exceeded no more than once every three years.

Some states have adopted numeric criteria for nutrients as part of their water quality standards. EPA has developed nutrient criteria recommendations that are numeric values for both causative (phosphorus and nitrogen) and response (chlorophyll *a* and turbidity) variables associated with the prevention and assessment of eutrophic conditions. EPA's recommended nutrient criteria are different from most of its other recommended criteria, such as the criteria for cadmium and ammonia. First, EPA's recommended nutrient criteria are *ecoregional* rather than nationally applicable criteria, and they can be refined and localized using nutrient criteria technical guidance manuals. Second, the recommended nutrient criteria represent conditions of surface waters that have minimal impacts caused by human activities rather than values derived from laboratory toxicity testing. Third, the recommended nutrient criteria are do not include specific duration or frequency components; however, the ecoregional nutrient criteria documents indicate that states may adopt seasonal or annual averaging periods for nutrient criteria instead of the 1-hour, 24-hour, or 4-day average durations typical of aquatic life criteria for toxic pollutants. The ecoregional nutrient criteria documents, technical guidance manuals, and other information on EPA's nutrient criteria recommendations, are available on the Water Quality Criteria for Nitrogen and Phosphorus Pollution Website <www.epa.gov/waterscience/criteria/nutrient/>.

Water quality standards also typically include aquatic life criteria for parameters such as temperature and pH that are not chemical constituents. Criteria for pH generally are expressed as an acceptable pH range in the waterbody. Temperature criteria might be expressed as both *absolute temperature values* (e.g., temperature may not exceed 18 degrees Celsius [°C]) and restrictions on causing *changes in temperature* in the waterbody (e.g., discharges may not warm receiving waters by more than 0.5 °C).

In addition to criteria for individual pollutants or pollutant parameters, many states include in their water quality standards criteria for dissolved oxygen. Often, criteria for dissolved oxygen are addressed by modeling and limiting discharges of oxygen-demanding pollutants such as biochemical oxygen demand (BOD), chemical oxygen demand (COD), and nutrients (phosphorus and nitrogen).

Finally, states could also include in their water quality standards numeric criteria to address the effect of mixtures of pollutants. For example, whole effluent toxicity (WET) criteria protect the waterbody from the aggregate and synergistic toxic effects of a mixture of pollutants. WET is discussed in detail later in this chapter.

Numeric Criteria—Human Health

Human health criteria for toxic pollutants are designed to protect people from exposure resulting from consumption of fish or other aquatic organisms (e.g., mussels, crayfish) or from consumption of both water and aquatic organisms. These criteria express the highest concentrations of a pollutant that are not expected to pose significant long-term risk to human health. Exhibit 6-4 is an example of human health criteria for dichlorobromomethane.

Exhibit 6-4 Human health criteria example: Dichlorobromomethane

For the protection of human health from the potential carcinogenic effects of dichlorobromomethane through ingestion of water and contaminated aquatic organisms, the ambient water criterion is determined to be 0.55 µg/L.

For the protection of human health from the potential carcinogenic effects of dichlorobromomethane through ingestion contaminated aquatic organisms alone, the ambient water criterion is determined to be 17 µg/L.

These values were calculated based on a national default freshwater/estuarine fish consumption rate of 17.5 grams per day.

Other criteria for protection of human health (e.g., bacteria criteria) consider a shorter-term exposure through uses of the waterbody such as contact recreation. EPA's current bacteria criteria recommendations use enterococci and *Escherichia coli* bacteria as indicators and include two components: a geometric mean value and a single sample maximum value. EPA has developed information on implementing those criteria in water quality standards on the Microbial (Pathogen) Water Quality Criteria Website <www.epa.gov/waterscience/criteria/humanhealth/microbial/>.

Other Numeric Criteria

In addition to aquatic life and human health criteria, some state water quality standards include other forms of numeric criteria, such as wildlife, sediment, and biocriteria.

Wildlife criteria are derived to establish ambient concentrations of chemicals that, if not exceeded, will protect mammals and birds from adverse impacts resulting from exposure to those chemicals through consumption of aquatic organisms and water. EPA established four numeric criteria to protect wildlife in the Great Lakes system in its *Final Water Quality Guidance for the Great Lakes System* <www.epa.gov/EPA-WATER/1995/March/Day-23/pr-82.html> (60 FR 15387, March 23, 1995).

In a healthy aquatic community, sediments provide a habitat for many living organisms. Controlling the concentration of pollutants in the sediment helps to protect bottom-dwelling species and prevents harmful toxins from moving up the food chain and accumulating in the tissue of animals at progressively higher levels. For more information on this topic, see EPA's Suspended and Bedded Sediments Website <www.epa.gov/waterscience/criteria/sediment/>.

The presence, condition and numbers of types of fish, insects, algae, plants, and other organisms are data that, together, provide direct, accurate information about the health of specific bodies of water. Biological criteria (biocriteria) are narrative or numeric expressions that describe the reference biological integrity (structure and function) of aquatic communities inhabiting waters of a given designated aquatic life use. Biocriteria are based on the numbers and kinds of organisms present and are regulatory-based biological measurements. They are used as a way of describing the qualities that must be present to support a desired condition in a waterbody, and they serve as the standard against which biological assessment results are compared. EPA's Biocriteria: Uses of Data in NPDES Permits Website <www.epa.gov/waterscience/biocriteria/watershed/npdes.html> provides more information on the use of bioassessment information.

Narrative Criteria

All states have adopted narrative water quality criteria to supplement numeric criteria. Narrative criteria are statements that describe the desired water quality goal for a waterbody. Narrative criteria, for example, might require that discharges be "free from toxics in toxic amounts" or be "free of objectionable color, odor, taste, and turbidity." Narrative criteria can be the basis for limiting specific pollutants for which the state does not have numeric criteria [§ 122.44(d)(1)(vi)] or they can be used as the basis for limiting toxicity using WET requirements where the toxicity has not yet been traced to a specific pollutant or pollutants [§ 122.44(d)(1)(v)]. For toxic pollutants, EPA's Water Quality Standards Regulation at § 131.11(a)(2) requires states to develop implementation procedures for toxics narrative criteria that address how the state intends to regulate point source discharges of toxic pollutants to water quality limited segments.

6.1.1.3 Antidegradation Policy (§ 131.12)

The third part of a state's water quality standards is its antidegradation policy. Each state is required to adopt an antidegradation policy consistent with EPA's antidegradation regulations at § 131.12. A state's antidegradation policy specifies the framework to be used in making decisions about proposed activities that will result in changes in water quality. Antidegradation policies can play a critical role in helping states protect the public resource of water whose quality is better than established criteria levels and ensure that decisions to allow reductions in water quality are made in a public manner and serve the public good. Along with developing an antidegradation policy, each state must identify the method it will use to implement the policy. It is important for permit writers to be familiar with their state's antidegradation policy and how that policy is to be implemented in NPDES permits.

A state's antidegradation policy provides three levels of protection from degradation of existing water quality:

- **Tier 1:** This tier requires that existing uses, and the level of water quality necessary to protect the existing uses, be maintained and protected.
- **Tier 2:** Where the quality of waters exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water (sometimes referred to as *high-quality waters*), Tier 2 requires that this level of water quality be maintained and protected unless the state finds, after full satisfaction of the intergovernmental coordination and public participation provisions of the state's continuing planning process, that allowing lower water quality is necessary to accommodate important economic or social development in the area where the waters are located. In allowing any such degradation or lower water quality, the state must assure water quality adequate to protect existing uses fully and must assure that there will be achieved the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control.
- **Tier 3:** This tier requires that the water quality of *outstanding national resources waters* (ONRWs) be maintained and protected.

States take a variety of approaches to implementing antidegradation policies. Some states designate their waters as Tier 1, Tier 2 (high-quality water) or Tier 3 waters in their antidegradation implementation methods, while others designate a waterbody as a Tier 2 or high-quality water only when activities that would degrade water quality are proposed. In some cases, states may have classified the waterbody as receiving a tier of protection for all pollutant-related parameters, whereas in other cases, tiers of protection have been determined on a parameter-by-parameter basis.

6.1.1.4 General Policies (§ 131.13)

In addition to the three required components of water quality standards, states may, at their discretion, include in their standards policies that generally affect how the standards are applied or implemented. Examples of such policies include mixing zone policies, critical low flows at which criteria must be achieved, and the availability of variances. Some general policies are discussed in more detail later in this chapter. As with the other components of water quality standards, general policies are subject to EPA review and approval if they are deemed to be new or revised water quality standards (i.e., if they constitute a change to designated use(s), water quality criteria, antidegradation requirements, or any combination).

Additional and more detailed information on water quality standards is available in the WQS Handbook.

6.1.2 Water Quality Standards Modifications

Permit writers should be aware of several types of modifications to water quality standards that could permanently or temporarily change the standards and, thus, change the fundamental basis of WQBELs. Those modifications, described below, are as follows:

- Designated use reclassification.
- Site-specific water quality criteria modification.
- Water quality standard variance.

6.1.2.1 Designated Use Reclassification

Once a use has been designated for a particular waterbody or segment, that use may not be removed from the water quality standards except under specific conditions. To remove a designated use, the state demonstrates that attaining that use is not feasible because of any one of the six factors listed in § 131.10(g). The regulations at § 131.10(j) specifically require a state to conduct a UAA if the designated uses for a waterbody do not include the uses in CWA section 101(a)(2) (i.e., fishable/swimmable uses); if the state wishes to remove designated uses included in CWA section 101(a)(2) from its water quality standards; or if the state wishes to adopt subcategories of CWA section 101(a)(2) uses with less stringent criteria. The WQS Handbook discusses UAAs and removing designated uses in detail. Reclassifying a waterbody's designated uses, as supported by a UAA, is a permanent change to both the designated use(s) and the water quality criteria associated with that (those) use(s).

States may conduct a UAA and remove a designated use but not if it is an existing use. Existing uses are defined in § 131.3 as those uses actually attained in the waterbody on or after November 28, 1975 (the date of EPA's initial water quality standards regulation at 40 *Federal Register* 55334, November 28, 1975). At a minimum, uses are deemed attainable if they can be achieved by the implementing effluent limits required under CWA sections 301(b) and 306 and by implementing cost effective and reasonable best management practices (BMPs) for nonpoint source control. EPA's Water Quality Standards: UAA Website <www.epa.gov/waterscience/standards/uses/uaa/index.htm> provides additional information and some example UAAs.

6.1.2.2 Site-Specific Water Quality Criteria Modification

As noted above, CWA sections 303(a)–(c) require states to adopt water quality criteria sufficient to protect applicable designated uses. In some cases, a state might find that the criteria it has adopted to protect a waterbody or segment of a waterbody do not adequately account for site-specific conditions. In such cases, states have the option of modifying water quality criteria on a site-specific basis. Setting site-specific criteria might be appropriate where, for example, a state has adopted EPA's CWA section 304(a) criteria recommendations and finds that physical or chemical properties of the water at a site affect the bioavailability or toxicity of a chemical, or the types of local aquatic organisms differ significantly from those actually tested in developing the EPA-recommended criteria. Site-specific criteria modifications change water quality criteria permanently while continuing to support the current designated uses.

Development of site-specific criteria for aquatic life is discussed in section 3.7 of the WQS Handbook for cases when (1) there might be relevant differences in the toxicity of the chemical in the water at the site and laboratory dilution water (Water-Effect Ratio Procedure) and (2). the species at the site are more or less sensitive than those used in developing the natural criteria (Species Recalculation Procedure). EPA's Office of Science and Technology (OST) has developed the Interim Guidance on Determination and Use of Water-Effect Ratios for Metals <www.epa.gov/waterscience/standards/handbook/handbookappxL.pdf> in Appendix L of the WQS Handbook and the *Streamlined Water-Effect Ratio Procedure for Discharges of Copper*[2] <www.epa.gov/waterscience/criteria/copper/copper.pdf>. In addition, pages 90-97 of Appendix L provide guidance for using the Species Recalculation Procedure. States may also consider establishing aquatic life criteria based on *natural background* conditions. Further information can be found in the memo *Establishing Site Specific Aquatic Life Criteria Equal to Natural Background*[3] <www.epa.gov/waterscience/library/wqcriteria/naturalback.pdf>.

6.1.2.3 Water Quality Standard Variance

Water quality standard variances are changes to water quality standards and have similar substantive and procedural requirements as what are required to remove a designated use. Unlike use removal, variances are time-limited and do not permanently remove the current designated use of a waterbody. Variances are usually discharger- and pollutant-specific, though some states have adopted *general variances*. Where a state has adopted a general variance, the analyses necessary for the variance have been completed on a watershed-wide or statewide basis and, therefore, the process of obtaining a variance is simplified for individual dischargers in that watershed or state.

A variance might be appropriate where the state believes that the existing standards are ultimately attainable and that, by retaining the existing standards rather than changing them, the state would ensure that further progress is made in improving the water quality toward attaining the designated uses while the variance is in effect. State-adopted variances have been approved by EPA where, among other things, the state's standards allow variances and the state demonstrates that meeting the applicable criteria is not feasible on the basis of one or more of the factors outlined in § 131.10(g). A variance typically is granted for a specified period and must be reevaluated at least once every 3 years as reasonable progress is made toward meeting the standards [see section 5.3 of the WQS Handbook and § 131.20(a)].

Modifications of water quality standards could affect effluent limitations in permits in several ways. Specifically, the modifications can change the fundamental basis for WQBELs, potentially affecting an assessment of the need for WQBELs and possibly resulting in either more or less stringent WQBELs than would otherwise be required. It is the permit writer's responsibility to ensure that any EPA-approved modification of water quality standards is properly reflected in an affected NPDES permit.

6.1.3 Water Quality Standards Implementation

As previously noted, CWA section 301(b)(1)(C) requires NPDES permits to establish effluent limitations as necessary to meet water quality standards. Effluent limitations and other conditions in NPDES permits may be based on a parameter-specific approach or a WET testing approach to implementing water quality standards. A third approach to implementing water quality standards, using biocriteria or bioassessment, is not directly accomplished through NPDES permit effluent limitations but can lead to effluent limitations for specific parameters or for WET. Each of those approaches to implementing water quality standards is discussed briefly below.

What procedures should permit writers use to implement water quality standards?

The terminology used and procedures described in this manual when discussing both assessing the need for and calculating WQBELs are based on the procedures in EPA's *Technical Support Document for Water Quality-Based Toxics Control*[4] <www.epa.gov/npdes/pubs/owm0264.pdf> (hereafter *TSD*). Those procedures were developed specifically to address toxic pollutants but have been appropriately used to address a number of conventional and nonconventional pollutants as well. Permit writers should be aware that most permitting authorities have developed their own terminology and procedures for water quality-based permitting, often derived from, but with variations on, EPA's guidance. For example, EPA itself promulgated *Final Water Quality Guidance for the Great Lakes System* (60 FR 15387, March 23, 1995) with minimum water quality criteria, antidegradation policies, and implementation procedures, including permitting procedures based on the TSD. Under the CWA, Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania, and Wisconsin were required to adopt procedures for the Great Lakes system that are consistent with that guidance. Permit writers should always consult the applicable permitting regulations, policy, and guidance for the approved water quality-based permitting procedures in their state.

6.1.3.1 Parameter-Specific Approach

The parameter-specific approach uses parameter-specific criteria for protection of aquatic life, human health, wildlife, and sediments, as well as any other parameter-specific criteria adopted into a state's water quality standards. The criteria are the basis for analyzing an effluent, deciding which parameters need controls, and deriving effluent limitations that will control those parameters to the extent necessary to achieve water quality standards in the receiving water. Parameter-specific WQBELs in NPDES permits involve a site-specific evaluation of the discharge (or proposed discharge) and its potential effect on the receiving water or an evaluation of the effects of multiple sources of a pollutant on the receiving water (e.g., through a total maximum daily load [TMDL] analysis). The parameter-specific approach allows for controlling individual parameters, (e.g., copper, BOD, total phosphorus) before a water quality impact has occurred or for helping return water quality to a level that will meet designated uses.

6.1.3.2 Whole Effluent Toxicity (WET) Approach

WET requirements in NPDES permits protect aquatic life from the aggregate toxic effect of a mixture of pollutants in the effluent. WET tests measure the degree of response of exposed aquatic test organisms to an effluent. The WET approach is useful for complex effluents where it might be infeasible to identify and regulate all toxic pollutants in the effluent or where parameter-specific effluent limitations are set, but the combined effects of multiple pollutants are suspected to be problematic. The WET approach allows a permit writer to implement numeric criteria for toxicity included in a state's water quality standards or to be protective of a narrative "no toxics in toxic amounts" criterion. Like the parameter-specific approach, the WET approach allows permitting authorities to control toxicity in effluents before toxic impacts occur or may be used to help return water quality to a level that will meet designated uses.

6.1.3.3 Bioassessment Approach

The biocriteria approach is used to assess the overall biological integrity of an aquatic community. As discussed in section 6.1.1.2 above, biocriteria are numeric values or narrative statements that describe the biological integrity of aquatic communities inhabiting waters of a given designated aquatic life use. When incorporated into state water quality standards, biocriteria and aquatic life use designations serve as direct endpoints for determining aquatic life use attainment. Once biocriteria are developed, the biological condition of a waterbody can be measured through a biological assessment, or bioassessment.

A bioassessment is an evaluation of the biological condition of a waterbody using biological surveys and other direct measurements of resident biota in surface waters. A biological survey, or biosurvey, consists of collecting, processing, and analyzing representative portions of a resident aquatic community to determine the community structure and function. The results of biosurveys can be compared to the reference waterbody to determine if the biocriteria for the designated use of the waterbody are being met. EPA issued guidance on this approach in *Biological Criteria: National Program Guidance for Surface Waters*[5] <www.epa.gov/bioindicators/html/biolcont.html>. As previously discussed, biocriteria generally are not directly implemented through NPDES permits but could be used in assessing whether a waterbody is attaining water quality standards. Nonattainment of biocriteria could lead to parameter-specific effluent limitations where the permitting authority is able to identify specific pollutant(s) and source(s) contributing to that nonattainment (see EPA's Biocriteria: Uses of Data – Identify Stressors to a Waterbody Website <www.epa.gov/waterscience/biocriteria/uses/stressors.html>) or could lead to WET limitations where the permitting authority identifies sources of toxicity to aquatic life. EPA's Biocriteria: Uses of Data - NPDES <www.epa.gov/waterscience/biocriteria/watershed/npdes.html> provides examples on the use of bioassessment information in the NPDES permitting process.

Sections 6.2–6.4 below discuss, in detail, implementing water quality standards using the parameter-specific approach to assess the need for and develop effluent limitations in NPDES permits. Section 6.5 below provides additional detail on WET requirements in NPDES permits.

6.2 Characterize the Effluent and the Receiving Water

After identifying the most current, approved, water quality standards that apply to a waterbody, a permit writer should characterize both the effluent discharged by the facility being permitted and the receiving water for that discharge. The permit writer uses the information from those characterizations to determine whether WQBELs are required (section 6.3 below) and, if so, to calculate WQBELs (section 6.4 below). Characterizing the effluent and receiving water can be divided into five steps as shown in Exhibit 6-5 and discussed in detail below.

Exhibit 6-5 Steps for characterizing the effluent and receiving water

Step 1.	Identify pollutants of concern in the effluent
Step 2.	Determine whether water quality standards provide for consideration of a dilution allowance or mixing zone
Step 3.	Select an approach to model effluent and receiving water interactions
Step 4.	Identify effluent and receiving water critical conditions
Step 5.	Establish an appropriate dilution allowance or mixing zone

6.2.1 Step 1: Identify Pollutants of Concern in the Effluent

There are several sources of information for and methods of identifying pollutants of concern for WQBEL development. For some pollutants of concern, the permit writer might not need to conduct any further analysis and could, after characterizing the effluent and receiving water, proceed directly to developing WQBELs (section 6.4 below). For other pollutants of concern, the permit writer uses the information from the effluent and receiving water characterization to assess the need for WQBELs (section 6.3 below). The following subsections identify five categories of pollutants of concern for WQBEL development.

6.2.1.1 Pollutants with Applicable TBELs

One category of pollutants of concern includes those pollutants for which the permit writer has developed TBELs based on national or state technology standards or on a case-by-case basis using best professional judgment. By developing TBELs for a pollutant, the permit writer has already determined that there will be some type of final limitations for that pollutant in the permit and must then determine whether more stringent limitations than the applicable TBELs are needed to prevent an excursion above water quality standards in the receiving water (see Exhibit 6-1 above). A permit writer can determine whether the TBELs are sufficiently protective by either proceeding to calculate WQBELs as described in section 6.4 below and comparing them to the TBELs or by assuming that the maximum daily TBEL calculated is the maximum discharge concentration in the water quality assessments described in section 6.3 below.

6.2.1.2 Pollutants with a Wasteload Allocation from a TMDL

Pollutants of concern include those pollutants for which a *wasteload allocation* (WLA) has been assigned to the discharge through a TMDL. Under CWA section 303(d), states are required to develop lists of impaired waters. Impaired waters are those that do not meet the water quality standards set for them, even after point sources of pollution have installed the minimum required levels of pollution control technology. The law requires that those jurisdictions establish priority rankings for waters on their CWA section 303(d) list and develop TMDLs for those waters.

What is a WLA?

The term WLA refers to the portion of a receiving water's loading capacity that is allocated to one of its existing or future point sources of pollution [see § 130.2(h)]. The WLA could be allocated through an EPA-approved TMDL, an EPA or state watershed loading analysis, or a facility-specific water quality modeling analysis.

A TMDL is a calculation of the maximum amount of a single pollutant that a waterbody can receive and still meet water quality standards and an allocation of that amount to the pollutant's sources. The portions of the TMDL assigned to point sources are WLAs, and the portions assigned to nonpoint sources and background concentrations of the pollutant are called *load allocations* (LAs). The calculation must include a margin of safety to ensure that the waterbody can be used for the purposes designated in the water quality standards, to provide for the uncertainty in predicting how well pollutant reduction will result in meeting water quality standards, and to account for seasonal variations. A TMDL might also include a reserve capacity to accommodate expanded or new discharges in the future. Exhibit 6-6 depicts the parts of a TMDL.

Exhibit 6-6 Parts of a TMDL

TMDL = ΣWLA + ΣLA + Margin of Safety + Reserve Capacity

The NPDES regulations at § 122.44(d)(1)(vii)(B) require that NPDES permits include effluent limitations developed consistent with the assumptions and requirements of any WLA that has been assigned to the discharge as part of an approved TMDL. Thus, any pollutant for which a WLA has been assigned to the permitted facility through a TMDL is a pollutant of concern.

Permit writers might also choose to consider any pollutant associated with an impairment of the receiving water a pollutant of concern, regardless of whether an approved TMDL has been developed for that pollutant, a WLA has been assigned to the permitted facility, or the permitted facility has demonstrated that the pollutant is present in its effluent. Permitting authorities might consider monitoring requirements to collect additional data related to the presence or absence of the impairing pollutant in a specific discharge to provide information for further analyses.

6.2.1.3 Pollutants Identified as Needing WQBELs in the Previous Permit

Another category of pollutants of concern includes those pollutants that were identified as needing WQBELs in the discharger's previous permit. Permit writers must determine whether the conditions leading to a decision to include WQBELs for the pollutant in the previous permit continue to apply. Where those conditions no longer apply, the permit writer would need to complete an anti-backsliding analysis to determine whether to remove the WQBELs from the reissued permit. Chapter 7 of this manual provides additional information on anti-backsliding requirements of the CWA and NPDES regulations. In addition, the permit writer might need to conduct an antidegradation analysis if the revised limitation would allow degradation of the quality of the receiving water.

6.2.1.4 Pollutants Identified as Present in the Effluent through Monitoring

Pollutants of concern also include any pollutants identified as present in the effluent through effluent monitoring. Effluent monitoring data are reported in the discharger's NPDES permit application, discharge monitoring reports and special studies. In addition, the permitting authority might collect data itself through compliance inspection monitoring or other special study. Permit writers can match information on which pollutants are present in the effluent to the applicable water quality standards to identify parameters that are candidates for WQBELs.

6.2.1.5 Pollutants Otherwise Expected to be Present in the Discharge

A final category of pollutants of concern includes those pollutants that are not in one of the other categories but are otherwise expected to be present in the discharge. There might be pollutants for which neither the discharger nor the permitting authority have monitoring data but, because of the raw materials stored or used, products or by-products of the facility operation, or available data and information on similar facilities, the permit writer has a strong basis for expecting that the pollutant could be present in the discharge. Because there are no analytical data to verify the concentrations of these pollutants in the effluent, the permit writer must either postpone a quantitative analysis of the need for WQBELs and generate, or require the discharger to generate, effluent monitoring data, or base a determination of the need for WQBELs on other information such as the effluent characteristics of a similar discharge. A discussion on determining the need for WQBELs without effluent monitoring data is provided in section 6.3.3 below.

6.2.2 Step 2: Determine Whether Water Quality Standards Provide for Consideration of a Dilution Allowance or Mixing Zone

Many state water quality standards have general provisions allowing some consideration of mixing of effluent and receiving water when determining the need for and calculating WQBELs. Depending on the state's water quality standards and implementation policy, such a mixing consideration could be expressed in the form of a *dilution allowance* or *regulatory mixing zone*. A dilution allowance typically is expressed as the flow of a river or stream, or a portion thereof. A regulatory mixing zone generally is expressed as a limited area or volume of water in any type of waterbody where initial dilution of a discharge takes place and within which the water quality standards allow certain water quality criteria to be exceeded. Section 6.2.5 below discusses dilution allowances and mixing zones in greater detail.

State water quality standards or implementation policies might indicate specific locations or conditions (e.g., breeding grounds for aquatic species or bathing beaches) or water quality criteria (e.g., pathogens, pH, bioaccumulative pollutants, or narrative criteria) for which consideration of a dilution allowance or mixing zone is not allowed or is otherwise considered inappropriate.

6.2.3 Step 3: Select an Approach to Model Effluent and Receiving Water Interactions

Where consideration of a dilution allowance or mixing zone is not permitted by the water quality standards or is not appropriate, the relevant water quality criterion must be attained at the point of discharge. In such cases, there is no need for a water quality model to characterize the interaction between the effluent and receiving water. In this situation effluent limitations are based on attaining water quality criteria at the "end of the pipe."

Where a dilution allowance or mixing zone is permitted, however, characterizing the interaction between the effluent and receiving water generally requires using a water quality model. In the majority of situations, and in all of the examples provided in this manual, permit writers will use a steady-state water quality model to assess the impact of a discharge on its receiving water. Steady-state means that the model projects the impact of the effluent on the receiving water under a single or *steady* set of design conditions. Because the model is run under a single set of conditions, those conditions generally are set at *critical conditions* for protection of receiving water quality as discussed in section 6.2.4 below. The permit writer would determine the amount of the dilution allowance or the size of the mixing zone that is available under these critical conditions as provided in section 6.2.5 below.

6.2.4 Step 4: Identify Effluent and Receiving Water Critical Conditions

Where steady-state models are used for water quality-based permitting, an important part of characterizing the effluent and receiving water is identifying the critical conditions needed as inputs to the water quality model. Permit writers should discuss selection of critical conditions with water quality modelers or other water quality specialists. Identifying the right critical conditions is important for appropriately applying a water quality model to assess the need for WQBELs and to calculate WQBELs. Some key effluent and receiving water critical conditions are summarized below.

What if I am not a water quality modeler?

Permit writers are not always water quality modelers, nor do they necessarily need to be experts in this field. Many permitting authorities have a team of water quality specialists who model point source discharges to provide data required for permit writers to assess the need for and develop WQBELs. In some cases, this team might even calculate WQBELs directly for the permit writers, who then only need to compare them to TBELs and determine the final effluent limitations for the NPDES permit. Permit writers should, at a minimum, familiarize themselves with water quality modeling concepts presented in this manual, particularly the identification of critical conditions input to a steady-state water quality model, and should consult water quality modelers or other water quality specialists as needed in the process of NPDES permit development.

6.2.4.1 Effluent Critical Conditions

In most any steady-state water quality model there will be at least two basic critical conditions related to the effluent: flow and pollutant concentration.

Effluent Flow

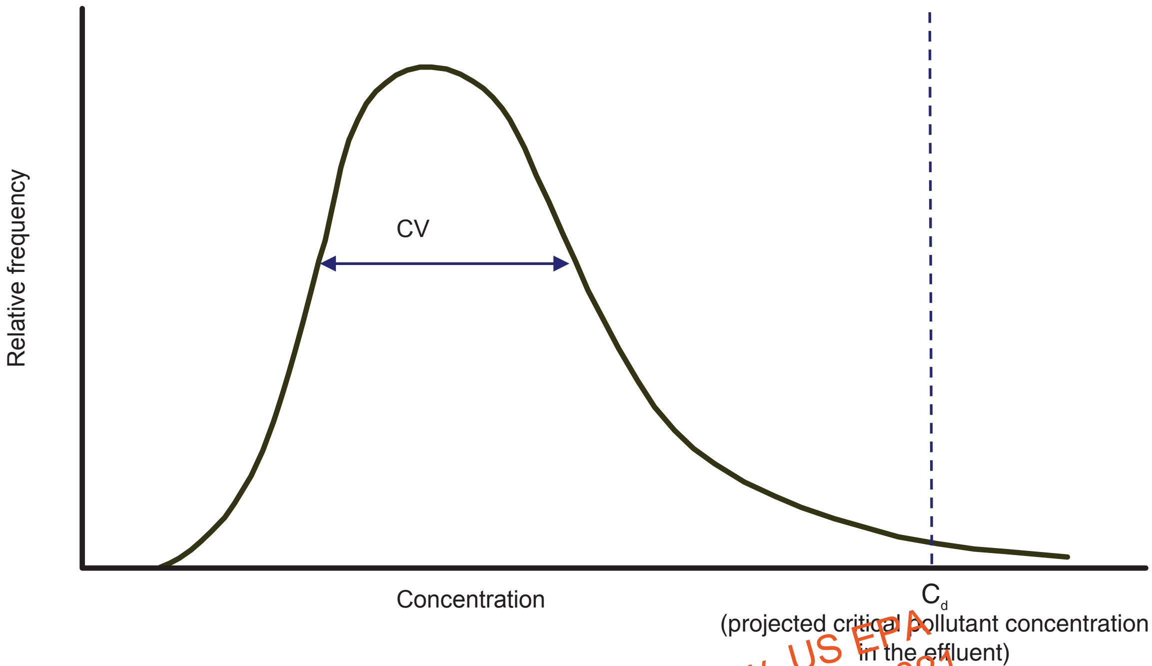
Effluent flow (designated Q_d in the water quality modeling equations used in this manual) is a critical design condition used when modeling the impact of an effluent discharge on its receiving water. A permit writer should be able to obtain effluent flow data from discharge monitoring reports or a permit application. Permitting authority policy or procedures might specify which flow measurement to use as the critical effluent flow value(s) in various water quality-based permitting calculations (e.g., the maximum daily flow reported on the permit application, the maximum of the monthly average flows from discharge monitoring reports for the past three years, the facility design flow). Permit writers should follow existing policy or procedures for determining critical effluent flow or, if the permitting authority does not specify how to determine this value, look at past permitting practices and strive for consistency.

Effluent Pollutant Concentration

Permit writers can determine the critical effluent concentration of the pollutant of concern (designated C_d) by gathering effluent data representative of the discharge. To establish the critical effluent pollutant concentration from the available data, EPA has recommended considering a concentration that represents something close to the maximum concentration of the pollutant that would be expected over time. In most cases, permit writers have a limited effluent data set and, therefore, would not have a high degree of certainty that the limited data would actually include the maximum potential effluent concentration of the pollutant of concern. In addition, the NPDES regulations at § 122.44(d)(1)(ii) require that permit writers consider the variability of the pollutant in the effluent when determining the need for WQBELs. To address those concerns, EPA developed guidance for permit writers on how to characterize effluent concentrations of certain types of pollutants using a limited data set and accounting for variability. This guidance is detailed in EPA's TSD.

By studying effluent data for numerous facilities, EPA determined that daily pollutant measurements of many pollutants follow a *lognormal distribution*. The TSD procedures allow permit writers to project a critical effluent concentration (e.g., the 99th or 95th percentile of a lognormal distribution of effluent concentrations) from a limited data set using statistical procedures based on the characteristics of the lognormal distribution. These procedures use the number of available effluent data points for the measured concentration of the pollutant and the coefficient of variation (or CV) of the data set, which is a measure of the variability of data around the average, to predict the critical pollutant concentration in the effluent. Exhibit 6-7 provides an example of a lognormal distribution of effluent pollutant concentrations and projection of a critical effluent pollutant concentration (C_d). For additional details regarding EPA's guidance, see Chapter 3 of the TSD. Many permitting authorities have developed procedures for estimating a critical effluent pollutant concentration that are based on or derived from those procedures. For pollutants with effluent concentrations that *do not* follow a lognormal distribution, permit writers would rely on alternative procedures developed by their permitting authority for determining the critical effluent pollutant concentration.

Exhibit 6-7 Example of lognormal distribution of effluent pollutant concentrations and projection of critical concentration (C_d)



6.2.4.2 Receiving Water Critical Conditions

As with the effluent, flow (for rivers and streams) and pollutant concentration are receiving water critical conditions used in steady-state water quality models. In addition, depending on the waterbody and pollutant of concern, there could be additional receiving water characteristics that permit writers need to consider in a water quality model.

Receiving Water Upstream Flow

For rivers and streams, an important critical condition is the stream flow upstream of the discharge (designated Q_s). That critical condition generally is specified in the applicable water quality standards and reflects the duration and frequency components of the water quality criterion that is being addressed. For most pollutants and criteria, the critical flow in rivers and streams is some measure of the low flow of that river or stream; however, the critical condition could be different (for example, a high flow, where wet weather sources are a major problem). If a discharge is controlled so that it does not cause water quality criteria to be exceeded in the receiving water at the critical flow condition, the discharge controls should be protective and ensure that water quality criteria, and thus designated uses, are attained under all receiving water flow conditions.

Examples of typical critical hydrologically based low flows found in water quality standards include the 7Q10 (7-day average, once in 10 years) low flow for chronic aquatic life criteria, the 1Q10 low flow for acute aquatic life criteria, and the harmonic mean flow for human health criteria for toxic organic pollutants. The permit writer might examine stream flow data from the state or the U.S. Geological

Survey to determine the critical flow at a point upstream of the discharge. The permit writer might also account for any additional sources of flow or diversions between the point where a critical low flow has been calculated and the point of discharge. EPA also has developed a biologically based flow method that directly uses the durations and frequencies specified in the water quality criteria.

Climate Change Considerations

As noted in this section, the receiving water upstream flow is an important factor in modeling the interaction between the effluent discharge and a river or stream. In most instances, state water quality standards or implementation policies establish the critical low flows that should be used in modeling this interaction. The most common source of upstream flow data for water quality modelers is historical flow gage data available through the U.S. Geological Survey. Modelers should be aware that the effects of climate change could alter historical flow patterns in rivers and streams, making these historical flow records less accurate in predicting current and future critical flows. Where appropriate, water quality modelers should consider alternate approaches to establishing critical low flow conditions that account for these climatic changes.

Receiving Water Background Pollutant Concentration

In addition to determining the critical effluent concentration of the pollutant of concern, the permit writer also should determine the critical background concentration of the pollutant of concern in the receiving water before the discharge (designated C_S) to ensure that any pollutant limitations derived are protective of the designated uses. Permitting authority policies or procedures often address how to determine that critical background concentration value for the pollutant. For example, using ambient data or working with the discharger to obtain reliable ambient data, the permit writer might use the maximum measured background pollutant concentration or, perhaps, an average of measured concentrations as the critical condition. Ambient data will provide the most reliable characterization of receiving water background pollutant concentration. EPA encourages permitting authorities to collect and use actual ambient data, where possible. Where data are not available, however, the state might have other procedures, such as establishing that without valid and representative ambient data, no dilution or mixing will be allowed (i.e., criteria end-of-pipe), or using a percentage of an applicable water quality criterion or a detection, quantitation, or other reporting level. The permit writer should consult the permitting authority's policies and procedures or, if there are no policies or procedures available, look at past permitting practices and maintain consistency with those practices when determining the critical receiving water background concentrations.

Other Receiving Water Characteristics

For waterbodies other than free-flowing rivers and streams, there might be critical environmental conditions that apply rather than flow (e.g., tidal flux, temperature). In addition, depending on the pollutant of concern, the effects of biological activity and reaction chemistry might be important in assessing the impact of a discharge on the receiving water. In such situations, additional critical receiving water conditions that might be used in a steady-state water quality model include conditions such as pH, temperature, hardness, or reaction rates, and the presence or absence of certain fish species or life stages of aquatic organisms, to name a few.

Sections 6.3 and 6.4 below provide further discussion of how critical conditions are applied in a water quality model to determine the need for and calculate WQBELs.

6.2.5 Step 5: Establish an Appropriate Dilution Allowance or Mixing Zone

Following verification of whether the applicable water quality standards allow any consideration of effluent and receiving water mixing and, for a steady-state modeling approach, the critical conditions that apply to the effluent and receiving water, permit writers can determine how the effluent and the receiving water mix under critical conditions. Based on this determination, permit writers can then establish the maximum dilution allowance or mixing zone allowed by the water quality standards for each pollutant of concern.

6.2.5.1 Type of Mixing Under Critical Conditions

On the basis of requirements in the water quality standards, the dilution allowance or mixing zone used in water quality models and calculations are likely to vary depending on whether there is rapid and complete mixing or incomplete mixing of the effluent and receiving water under critical conditions. Thus, the permit writer needs to understand something about *how* the effluent and receiving water mix under critical conditions.

Rapid and complete mixing is mixing that occurs when the lateral variation in the concentration of a pollutant in the direct vicinity of the outfall is small. The applicable water quality standards might specify certain conditions under which a permit writer could *assume* that rapid and complete mixing is occurring, such as the presence of a diffuser. Some standards may also allow a *demonstration* of rapid and complete mixing in cases where the conditions for simply assuming rapid and complete mixing are not met. For example, the applicable water quality standards might specify a distance downstream of a discharge point by which the pollutant concentration across the stream width must vary by less than a certain percentage to assume that there is rapid and complete mixing.

If the permit writer cannot assume rapid and complete mixing and there has been no demonstration of rapid and complete mixing, the permit writer should assume that there is incomplete mixing. Under incomplete mix conditions, mixing occurs more slowly and higher concentrations of pollutants are present in-stream near the discharge as compared to rapid and complete mixing. Thus, an assumption of incomplete mixing is more conservative than an assumption of rapid and complete mixing. For waterbodies other than rivers and streams (e.g., lakes, bays, and the open ocean) the permit writer usually would assume incomplete mixing.

6.2.5.2 Maximum Dilution Allowance or Mixing Zone Size

Once a permit writer determines whether the applicable water quality standards allow consideration of some ambient dilution or mixing and determines the type of mixing taking place (rapid and complete mixing versus incomplete mixing), he or she would again consult the water quality standards to determine the maximum size of the dilution allowance or mixing zone that may be considered in water quality modeling calculations.

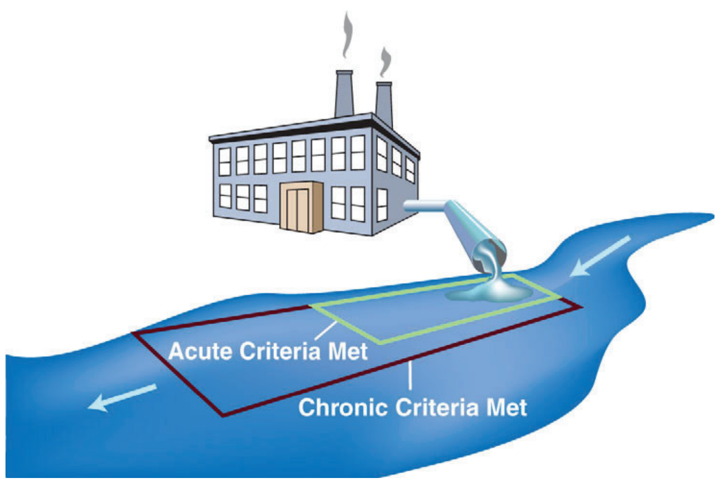
Dilution Allowances in Rapid and Complete Mix Situations

The maximum permissible dilution allowance for rivers and streams under conditions of rapid and complete mixing should be indicated in the water quality standards or standards implementation policy. For example, some water quality standards allow a permit writer to use up to 100 percent of the critical low flow of a river or stream as a dilution allowance in water quality models and calculations when there is rapid and complete mixing. In some cases, water quality standards implement a factor of safety by permitting only a percentage of the critical low flow to be used as a dilution allowance, even when there is rapid and complete mixing under critical conditions. Water quality standards might incorporate such a factor of safety to account for any uncertainty related to other conditions in the waterbody or to ensure that some assimilative capacity is retained downstream of the discharge being permitted. Recall as well that for some pollutants (e.g., pathogens in waters designated for primary contact recreation, bioaccumulative pollutants), the water quality standards or implementing procedures might not authorize any dilution allowance, even where the effluent and receiving water mix rapidly and completely.

Dilution Allowances and Regulatory Mixing Zones in Incomplete Mix Situations

In an incomplete mixing situation, the water quality standards or implementation policies might allow some consideration of ambient dilution. Rather than permitting as much as 100 percent of the critical low flow as a dilution allowance, however, they will likely specify either a limited dilution allowance (such as a percentage of the critical low flow) or the maximum size of a regulatory mixing zone. A regulatory *mixing zone* is a limited area or volume of water where initial dilution of a discharge takes place and within which the water quality standards allow certain water quality criteria to be exceeded. While the criteria may be exceeded within the mixing zone, the use and size of the mixing zone must be limited such that the waterbody as a whole will not be impaired and such that all designated uses are maintained as discussed in section 6.2.5.3 below. Exhibit 6-8 is a diagram illustrating the concept of a regulatory mixing zone. The mixing zone often is a simple geometric shape inside of which a water quality criterion may be exceeded. The geometric shape does not characterize how mixing actually occurs. Actual mixing is described using field studies and a water quality model.

Exhibit 6-8 Regulatory mixing zones for aquatic life criteria



Note that Exhibit 6-8 above illustrates two different mixing zones, one for an acute aquatic life criterion and one for a chronic aquatic life criterion. The water quality standards could specify different maximum mixing zones sizes for different pollutants, different types of criteria, and different waterbody types. Exhibit 6-9 provides examples of different maximum mixing zone sizes and dilution allowances.

Exhibit 6-9 Examples of maximum mixing zone sizes or dilution allowances under incomplete mixing conditions by waterbody type*

For rivers and streams:
- Mixing zones cannot be larger than 1/4 of the stream width and 1/4 mile downstream
- Mixing must be less than 1/2 stream width with a longitudinal limit of 5 times the stream width
- Dilution cannot be greater than 1/3 of the critical low flow

For lakes and the ocean:
- Mixing zones for lakes cannot be larger than 5% of the lake surface
- A maximum of 4:1 dilution is available for lake discharges
- A maximum of 10:1 dilution is available for ocean discharges
- The maximum size mixing zone for the ocean is a 100-foot radius from the point of discharge

* Examples were adapted from state standards and procedures and do not reflect EPA guidance or recommendations.

Permit writers should always check the applicable water quality standards to see if mixing zones are permitted and determine the maximum mixing zone size for the waterbody type, pollutant of concern, and specific criterion being considered.

6.2.5.3 Restrictions on Dilution Allowance or Mixing Zone Size

In addition to specifying the maximum dilution allowance or mixing zone size allowed under both rapid and complete mixing conditions and incomplete mixing conditions, the water quality standards or implementation policies generally include constraints that could further limit the available dilution allowance or mixing zone size to something less than the absolute maximum allowed. For example, one restriction on the size of the acute mixing zone could be that it must be small enough to ensure that the potential time of exposure of aquatic organisms to a pollutant concentration above the acute criterion is very short, and organisms passing through that acute mixing zone will not die from exposure to the pollutant. Such a restriction might lead the permitting authority to give a discharger an acute mixing zone for a specific pollutant that is smaller than the maximum size allowed by the water quality standards or to not allow any acute mixing zone at all. Other possible restrictions on dilution and mixing zone size include preventing impairment of the integrity of the waterbody as a whole and preventing significant risks to human health. For example, a permitting authority might restrict the size of a mixing zone for a human health criterion to prevent the mixing zone from overlapping a drinking water intake.

6.3 Determine the Need for WQBELs

After determining the applicable water quality standards and characterizing the effluent and receiving water, a permit writer determines whether WQBELs are needed. This section provides an overview of that process.

6.3.1 Defining Reasonable Potential

EPA regulations at § 122.44(d)(1)(i) state, "Limitations must control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level that will *cause*, have the *reasonable potential to cause*, or *contribute* to an excursion above any [s]tate water quality standard, including [s]tate narrative criteria for water quality." [emphasis added] Because of that regulation, EPA and many authorized NPDES states refer to the process that a permit writer uses to determine whether a WQBEL is required in an NPDES permit as a *reasonable potential analysis*. Wording the requirements of the regulation another way, a reasonable potential analysis is used to determine whether a discharge, alone or in combination with other sources of pollutants to a waterbody and under a set of conditions arrived at by making a series of reasonable assumptions, could lead to an excursion above an applicable water quality standard. The regulation also specifies that the reasonable potential determination must apply not only to numeric criteria, but also to narrative criteria (e.g., *no toxics in toxic amounts*, *presence of pollutants or pollutant parameters in amounts that would result in nuisance algal blooms*). A permit writer can conduct a reasonable potential analysis using effluent and receiving water data and modeling techniques, as described above, or using a non-quantitative approach. Both approaches are discussed below.

6.3.2 Conducting a Reasonable Potential Analysis Using Data

When determining the need for a WQBEL, a permit writer should use any available effluent and receiving water data as well as other information pertaining to the discharge and receiving water (e.g., type of industry, existing TBELs, compliance history, stream surveys), as the basis for a decision. The permit writer might already have data available from previous monitoring or he or she could decide to work with the permittee to generate data before permit issuance or as a condition of the new permit. EPA recommends that monitoring data be generated before effluent limitation development whenever possible. Monitoring should begin far enough in advance of permit development to allow sufficient time to conduct chemical analyses. Where data are generated as a condition of the permit (for example for a new permittee), it might be appropriate for the permit writer to include a reopener condition in the permit to allow the incorporation of a WQBEL if the monitoring data indicate that a WQBEL is required.

A reasonable potential analysis conducted with available data can be divided into four steps as shown in Exhibit 6-10 and discussed in detail below.

Exhibit 6-10 Steps of a reasonable potential analysis with available data

Step 1.	Determine the appropriate water quality model
Step 2.	Determine the expected receiving water concentration under critical conditions
Step 3.	Answer the question, "Is there reasonable potential?"
Step 4.	Document the reasonable potential determination in the fact sheet

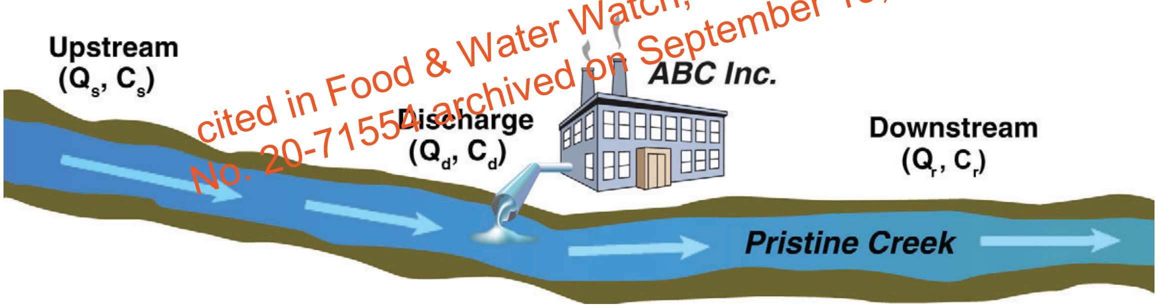
6.3.2.1 Step 1: Determine the Appropriate Water Quality Model

Steady-state or dynamic water quality modeling techniques can be used in NPDES permitting. As discussed in section 6.2.3 above, the examples in this manual consider only steady-state modeling techniques, which consider the impact of a discharge on the receiving water modeled under a single set of critical conditions.

The specific steady-state model used will depend on the pollutant or parameter of concern and whether there is rapid and complete mixing or incomplete mixing of the effluent and the receiving water under critical conditions. For example, to model dissolved oxygen in a river, the permit writer might choose the Streeter-Phelps equation. For modeling heavy metals in an incomplete mix situation, the permit writer might choose the CORMIX model. For pollutants such as BOD, nutrients, or non-conservative parameters, the effects of biological activity and reaction chemistry should be modeled, in addition to the effects of dilution, to assess possible impacts on the receiving water. This manual focuses only on dilution of a pollutant discharged to the receiving water and does not address modeling biological activity or reaction chemistry in receiving waters. For additional information, permit writers should discuss modeling that accounts for biological activity or reaction chemistry with water quality modelers or other water quality specialists as needed and consult EPA's Water Quality Models and Tools Website <www.epa.gov/waterscience/models/>.

For many pollutants such as most toxic (priority) pollutants, conservative pollutants, and pollutants that can be treated as conservative pollutants when near-field effects are of concern, if there is rapid and complete mixing in a river or stream, the permit writer could use a simple mass-balance equation to model the effluent and receiving water. The simple mass-balance equation as applied to a hypothetical facility, ABC, Inc., discharging Pollutant Z to a free-flowing stream called Pristine Creek is presented in Exhibit 6-11 below.

Exhibit 6-11 Simple mass-balance equation



Mass = **Flow** (Q) in million gallons per day (mgd) or cubic feet per second (cfs) X **Pollutant concentration** (C) in milligrams per liter (mg/L)

$$Q_sC_s + Q_dC_d = Q_rC_r$$

where

Q_s = stream flow in mgd or cfs above point of discharge
C_s = background in-stream pollutant concentration in mg/L
Q_d = effluent flow in mgd or cfs
C_d = effluent pollutant concentration in mg/L
Q_r = resultant in-stream flow, after discharge in mgd or cfs
C_r = resultant in-stream pollutant concentration in mg/L (after complete mixing occurs)

6.3.2.2 Step 2: Determine the Expected Receiving Water Concentration under Critical Conditions

When using a steady-state model, the permit writer, or water quality modeler, determines the impact of the effluent discharge on the receiving water under critical conditions. This step examines how this steady-state analysis is conducted in situations where there is incomplete mixing and then provides a detailed discussion of this analysis for situations where there is rapid and complete mixing.

How are *critical conditions* defined?

When using a steady-state water quality model, permit writers generally input values that reflect critical conditions. State permitting procedures should guide permit writers in this task. When characterizing the effluent and receiving water for water quality-based permitting, the permit writer should follow the permitting authority's policies and procedures for selecting the critical conditions to use in a steady-state model. The discussion in section 6.2.4 above provides a discussion of how those values might be selected.

Permit writers generally would input into a steady-state model for a reasonable potential analysis the critical conditions identified in the effluent and receiving water characterization discussed in section 6.2.4 above. Recall that critical conditions include the following:

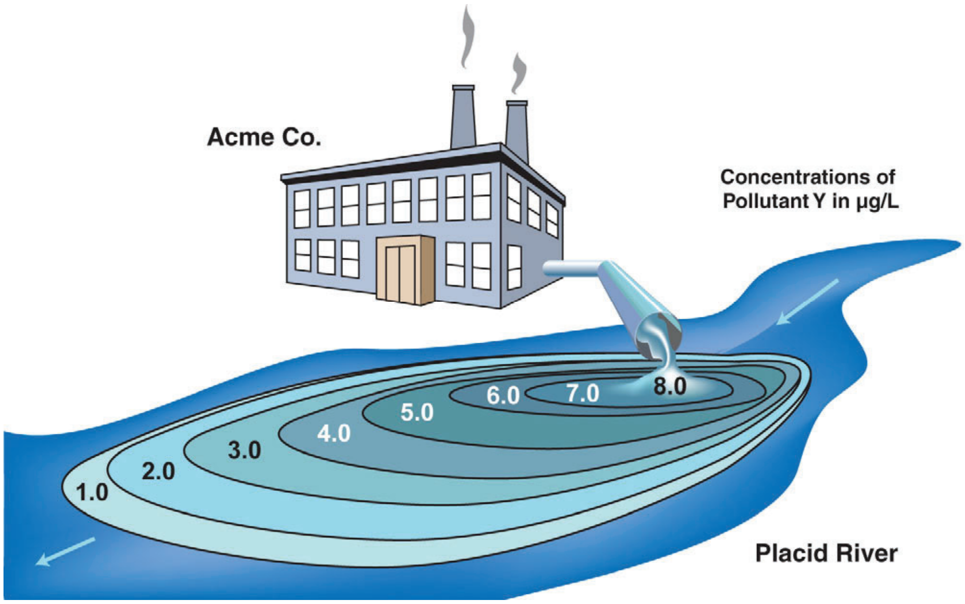
- Effluent critical conditions
  - Flow.
  - Pollutant concentration.
- Receiving water critical conditions
  - Flow (for rivers and streams).
  - Pollutant concentration.
  - Other receiving water characteristics such as tidal flux, temperature, pH, or hardness (depending on the waterbody and pollutant of concern)

As discussed in section 6.2.4.1 above, EPA and other permitting authorities have developed guidance for determining those critical conditions. Permit writers should rely on their permit authority's policies and procedures or past practices to determine values for all other critical conditions.

Expected Receiving Water Concentration in an Incomplete Mixing Situation

Exhibit 6-12 illustrates a situation where there is incomplete mixing of a discharge from a hypothetical facility, Acme Co., with the receiving water, the Placid River. The concentration of the pollutant of concern discharged by Acme Co. (Pollutant Y) is highest nearest the point of discharge and gradually decreases until the pollutant is completely mixed with the receiving water. To determine expected receiving water concentrations resulting from the Acme Co.'s discharge of Pollutant Y to the Placid River, the permit writer, or water quality modeler, would use the appropriate incomplete mixing model, calibrated to actual observations from field studies or dye studies, to simulate mixing under critical conditions. In Step 3 below, the concentrations of the pollutant of concern in the receiving water, as predicted by the water quality model, will be overlaid by a regulatory mixing zone established by the applicable water quality standard to determine whether WQBELs are needed.

Exhibit 6-12 Example of receiving water concentrations in an incomplete mixing situation determined using an incomplete mixing water quality model



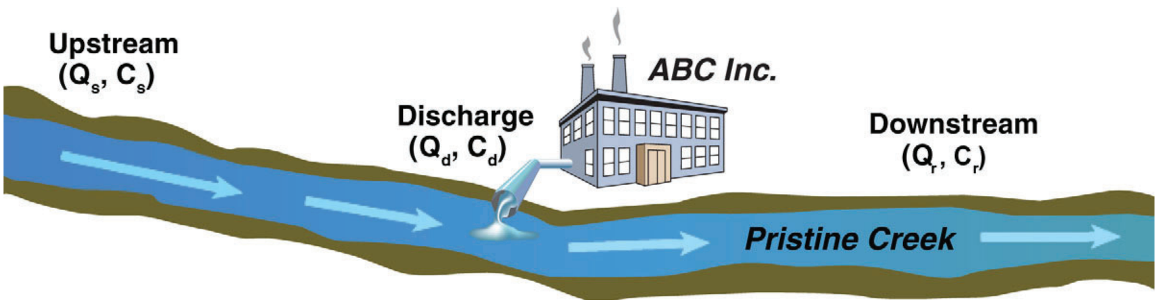
Expected Receiving Water Concentration in Rapid and Complete Mixing Situation

For many pollutants, if there is rapid and complete mixing in a river or stream, the permit writer could use the simple mass-balance equation presented in Exhibit 6-11 above to determine the expected receiving water concentration of the pollutant of concern under critical conditions. As noted previously, the simple mass-balance equation is a very basic steady-state model that can be used for most toxic pollutants, conservative pollutants, and other pollutants for which near-field effects are the primary concern. In Exhibit 6-13, that equation is applied to ABC Inc.'s, discharge of Pollutant Z (a conservative pollutant) to Pristine Creek under conditions of rapid and complete mixing. The mass-balance equation is rearranged to show how it would be used in a reasonable potential analysis.

To use the simple mass-balance equation to predict receiving water impacts for a reasonable potential analysis, the permit writer needs to input one value for each variable and solve the equation for C_r, the downstream concentration of the pollutant. Because this model, like other steady-state models, uses a single value for each variable, the permit writer should be sure that the values selected reflect critical conditions for the discharge and the receiving water. In Exhibit 6-14, those critical conditions have been identified and the equation has been solved for C_r.

It is important for permit writers to remember that, in some situations, the selected steady-state model could be more complex than the simple mass-balance equation shown. For example, there could be other pollutant sources along the stream segment; the pollutant might not be conservative (e.g., BOD); or the parameter to be modeled might be affected by multiple pollutants (e.g., dissolved oxygen affected by BOD and nutrients). For illustrative purposes, this example focuses on a situation where using a simple mass-balance equation is sufficient (i.e., rapid and complete mixing of a conservative pollutant in a river or stream under steady-state conditions).

Exhibit 6-13 Mass-balance equation for reasonable potential analysis for conservative pollutant under conditions of rapid and complete mixing



The mass-balance equation can be used to determine whether the discharge from ABC Inc., would cause, have the reasonable potential to cause, or contribute to an excursion above the water quality standards applicable to Pristine Creek. The equation is used to predict the concentration of Pollutant Z, a conservative pollutant, in Pristine Creek under critical conditions. The predicted concentration can be compared to the applicable water quality criteria for Pollutant Z. Assume the discharge mixes rapidly and completely with Pristine Creek.

Mass	=	**Flow** (Q) in million gallons per day (mgd) or cubic feet per second (cfs)	X	**Pollutant concentration** (C) in milligrams per liter (mg/L)

$$Q_sC_s + Q_dC_d = Q_rC_r$$

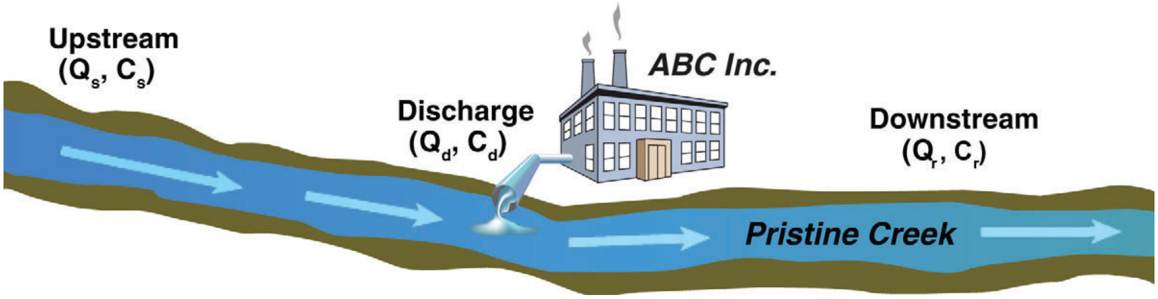
where

Q_s	=	critical stream flow in mgd or cfs above point of discharge
C_s	=	critical background in-stream pollutant concentration in mg/L
Q_d	=	critical effluent flow in mgd or cfs
C_d	=	critical effluent pollutant concentration in mg/L
Q_r	=	resultant in-stream flow, after discharge in mgd or cfs ($Q_r = Q_s + Q_d$)
C_r	=	resultant in-stream pollutant concentration in mg/L (after complete mixing occurs)

Rearrange the equation to determine the concentration of Pollutant Z in the waterbody downstream of a discharge under critical conditions:

$$C_r = \frac{(Q_d)(C_d) + (Q_s)(C_s)}{Q_r}$$

Exhibit 6-14 Example of applying mass-balance equation to conduct reasonable potential analysis for conservative pollutant under conditions of rapid and complete mixing



Mass-Balance Equation: $Q_sC_s + Q_dC_d = Q_rC_r$

Dividing both sides of the mass-balance equation by Q_r gives the following:

$$C_r = \frac{(Q_d)(C_d) + (Q_s)(C_s)}{Q_r}$$

where C_r is the receiving water concentration downstream of the discharge

The following values are known for ABC Inc. and Pristine Creek:

Q_s = critical upstream flow (water quality standards allow a dilution allowance of up to 100% of 1Q10 low flow for rapid and complete mixing)	= 1.20 cfs
C_s = critical upstream concentration of Pollutant Z in Pristine Creek	= 0.75 mg/L
Q_d = critical discharge flow	= 0.55 cfs
C_d = statistically projected critical discharge concentration of Pollutant Z	= 2.20 mg/L
Q_r = downstream flow = Q_d + Q_s	= 0.55 + 1.20 = 1.75 cfs
Acute aquatic life water quality criterion for Pollutant Z in Pristine Creek	= 1.0 mg/L

Find the projected downstream concentration (C_r) by inserting the given values into the equation as follows:

$$C_r = \frac{(0.55\,\text{cfs})(2.20\,\text{mg/L}) + (1.20\,\text{cfs})(0.75\,\text{mg/L})}{(1.75\,\text{cfs})}$$

C_r = 1.2 mg/L of Pollutant Z*

* calculated to 2 significant figures

6.3.2.3 Step 3: Answer the Question, Is There Reasonable Potential?

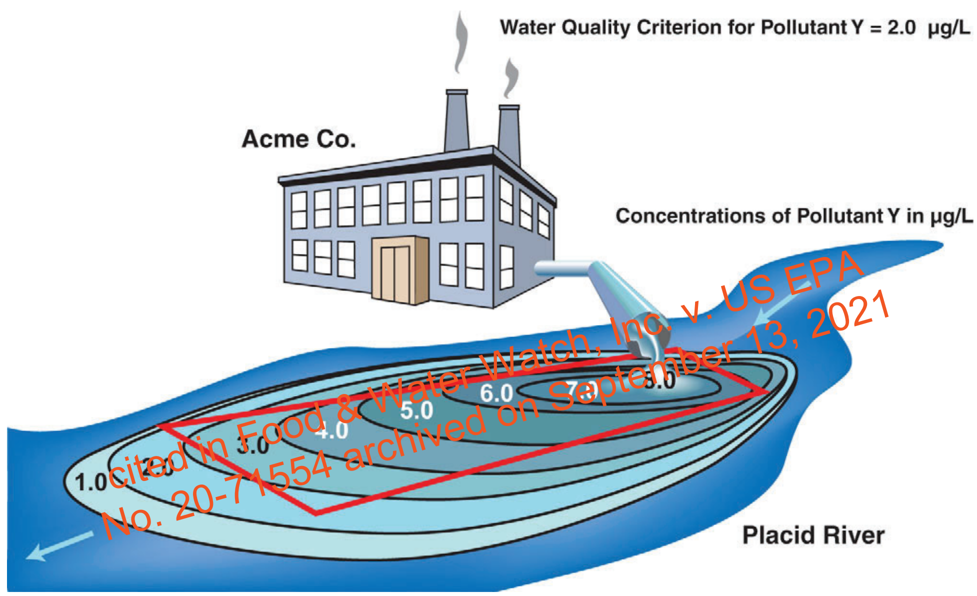
The next step in the reasonable potential analysis is to consider the results of water quality modeling to answer the question, *Is there reasonable potential?*

- For most pollutants, if the receiving water pollutant concentration projected by a steady-state model (e.g., a simple mass-balance equation or a more complex model) exceeds the applicable water quality criterion, there is *reasonable potential*, and the permit writer must calculate WQBELs. (Note that for dissolved oxygen, reasonable potential would occur if the water quality model indicates that the projected effluent concentration of the oxygen-demanding pollutants would result in depletion of dissolved oxygen below acceptable values in the receiving water).
- If the projected concentration is equal to or less than the applicable criterion, there is no reasonable potential and, thus far, there is no demonstrated need to calculate WQBELs.

Reasonable Potential Determination in an Incomplete Mixing Situation

To determine whether there is reasonable potential in an incomplete mixing situation, the permit writer would compare the projected concentration of the pollutant of concern at the edge of the regulatory mixing zone or after accounting for the available dilution allowance, with the applicable water quality criterion. Exhibit 6-15 illustrates the reasonable potential determination for Acme Co. in a situation where the regulatory mixing zone is described by a geometric shape. In the example, the water quality criterion for Pollutant Y being considered is 2.0 micrograms per liter (µg/L). The illustration shows that at many points along the edge of the regulatory mixing zone specified by the water quality standards, which is represented by the rectangle, the concentration of Pollutant Y exceeds 2.0 µg/L. Therefore, there is reasonable potential, and the permit writer must calculate WQBELs for Pollutant Y for Acme Co.

Exhibit 6-15 Reasonable potential determination in an incomplete mixing situation



Reasonable Potential Determination in a Rapid and Complete Mixing Situation

In the rapid and complete mixing example for ABC, Inc., shown in Exhibit 6-14 above, a projected downstream concentration (C_r) of 1.2 mg/L of Pollutant Z was calculated. The permit writer would compare the calculated concentration to the acute aquatic life water quality criterion of 1.0 mg/L for Pollutant Z in Pristine Creek presented in Exhibit 6-14. Because 1.2 mg/L > 1.0 mg/L, the projected downstream concentration exceeds the water quality criterion; therefore, there is a reasonable potential for the water quality criterion to be exceeded, and the permit writer must calculate WQBELs for Pollutant Z.

A permit writer should repeat the reasonable potential analysis for all applicable criteria for the pollutant of concern and must remember that the critical conditions could differ depending on the criterion being evaluated. For example, the critical stream flow used when considering the acute aquatic life criterion might be the 1Q10 low flow, whereas the critical stream flow used when considering the chronic aquatic life criterion might be the 7Q10 low flow. If calculations demonstrate that the discharge of a pollutant of concern would cause, have the reasonable potential to cause, or contribute to an excursion of *any one* of the applicable criteria for that pollutant, the permit writer must develop WQBELs for that pollutant.

In addition, it is important for permit writers to remember that they must repeat the reasonable potential analysis for each pollutant of concern and calculate WQBELs where there is reasonable potential. For each pollutant for which there is no reasonable potential, the permit writer should consider whether there are any existing WQBELs in the previous permit and whether they should be retained. The permit writer would complete an anti-backsliding analysis (see Chapter 7 of this manual) to determine whether it is possible to remove any existing WQBELs from the reissued permit.

6.3.2.4 Step 4: Document the Reasonable Potential Determination in the Fact Sheet

As a final step, permit writers need to document the details of the reasonable potential analysis in the NPDES permit fact sheet. The permit writer should clearly identify the information and procedures used to determine the need for WQBELs. The goal of that documentation is to provide the NPDES permit applicant and the public a transparent, reproducible, and defensible description of how each pollutant was evaluated, including the basis (i.e., reasonable potential analysis) for including or not including a WQBEL for any pollutant of concern.

6.3.3 Conducting a Reasonable Potential Analysis without Data

State implementation procedures might allow, or even require, a permit writer to determine reasonable potential through a qualitative assessment process without using available facility-specific effluent monitoring data or when such data are not available. For example, as noted in section 6.2.1.2 above, where there is a pollutant with a WLA from a TMDL, a permit writer must develop WQBELs or other permit requirements consistent with the assumptions of the TMDL. Even without a TMDL, a permitting authority could, at its own discretion, determine that WQBELs are needed for any pollutant associated with impairment of a waterbody. A permitting authority might also determine that WQBELs are required for specific pollutants for all facilities that exhibit certain operational or discharge characteristics (e.g., WQBELs for pathogens in all permits for POTWs discharging to contact recreational waters).

Types of information that the permit writer might find useful in a qualitative approach to determining reasonable potential include the following:

- Effluent variability information such as history of compliance problems and toxic impacts.
- Point and nonpoint source controls such as existing treatment technology, the type of industry, POTW treatment system, or BMPs in place.
- Species sensitivity data including in-stream data, adopted water quality criteria, or designated uses.
- Dilution information such as critical receiving water flows or mixing zones.

The permit writer should always provide justification for the decision to require WQBELs in the permit fact sheet or statement of basis and *must* do so where required by federal and state regulations. A thorough rationale is particularly important when the decision to include WQBELs is not based on an analysis of effluent data for the pollutant of concern.

After evaluating all available information characterizing the nature of the discharge without effluent monitoring data for the pollutant of concern, if the permit writer is not able to decide whether the discharge causes, has the reasonable potential to cause, or contributes to an excursion above a water quality criterion, he or she may determine that effluent monitoring should be required to gather additional data. The permit writer might work with the permittee to obtain data before permit issuance, if sufficient time exists, or could require the monitoring as a condition of the newly issued or reissued permit. The permit writer might also include a clause in the permit that would allow the permitting authority to reopen the permit and impose an effluent limitation if the required monitoring establishes that there is reasonable potential that the discharge will cause or contribute to an excursion above a water quality criterion.

6.4 Calculate Parameter-specific WQBELs

If a permit writer has determined that a pollutant or pollutant parameter is discharged at a level that will cause, have reasonable potential to cause, or contribute to an excursion above any state water quality standard, the permit writer must develop WQBELs for that pollutant parameter. This manual presents the approach recommended by EPA's TSD for calculating WQBELs for toxic (priority) pollutants. Many permitting authorities apply those or similar procedures to calculate WQBELs for toxic pollutants and for a number of conventional or nonconventional pollutants with effluent concentrations that tend to follow a lognormal distribution. Permit writers should consult permitting authority policies and procedures to determine the methodology specific to their authorized NPDES permitting program, including the approach for pollutants with effluent concentrations that do not follow a lognormal distribution.

6.4.1 Calculating Parameter-specific WQBELs from Aquatic Life Criteria

The TSD process for calculating WQBELs from aquatic life criteria follows five steps as shown in Exhibit 6-16 and discussed in detail below.

Exhibit 6-16 Calculating parameter-specific WQBELs from aquatic life criteria

Step 1.	Determine acute and chronic WLAs
Step 2.	Calculate long-term average (LTA) concentrations for each WLA
Step 3.	Select the lowest LTA as the performance basis for the permitted discharger
Step 4.	Calculate an average monthly limitation (AML) and a maximum daily limitation (MDL)
Step 5.	Document the calculation of WQBELs in the fact sheet.

6.4.1.1 Step 1: Determine Acute and Chronic WLAs

Before calculating a WQBEL, the permit writer will first need to determine the appropriate WLAs for the point source discharge based on both the acute and chronic criteria. A WLA may be determined from a TMDL or calculated for an individual point source directly. Where an EPA-approved TMDL has been developed for a particular pollutant, the WLA for a specific point source discharger is the portion of that TMDL that is allocated to that point source, as discussed in section 6.2.1.2 above. Where no TMDL is available, a water quality model generally is used to calculate a WLA for the specific point source discharger. The WLA is the loading or concentration of pollutant that the specific point source may discharge while still allowing the water quality criterion to be attained downstream of that discharge. Of course, the WLA calculation should take into account any reserve capacity, safety factor, and contributions from other point and nonpoint sources as might be required by the applicable water quality standards regulations or implementation policies.

When a WLA is not given as part of a TMDL or where a separate WLA is needed to address the near-field effects of a discharge on water quality criteria, permit writers will, in many situations, use a steady-state water quality model to determine the appropriate WLA for a discharge. As discussed in section 6.3 above, steady-state models generally are run under a single set of critical conditions for protection of receiving water quality. If a permit writer uses a steady-state model with a specific set of critical conditions to assess reasonable potential, he or she generally may use the same model and critical conditions to calculate a WLA for the same discharge and pollutant of concern.

As with the reasonable potential assessment, the type of steady-state model used to determine a WLA depends on the type of mixing that occurs in the receiving water and the type of pollutant or parameter being modeled. As discussed in section 6.3.2 above, permit writers can use the mass-balance equation as a simple steady-state model for many pollutants, such as most toxic (priority) pollutants or any pollutant that can be treated as a conservative pollutant when considering near-field effects, if there is rapid and complete mixing in the receiving water. For pollutants or discharge situations that do not have those characteristics (e.g., non-conservative pollutants, concern about effects on a downstream waterbody), a water quality model other than the mass-balance equation would likely be more appropriate.

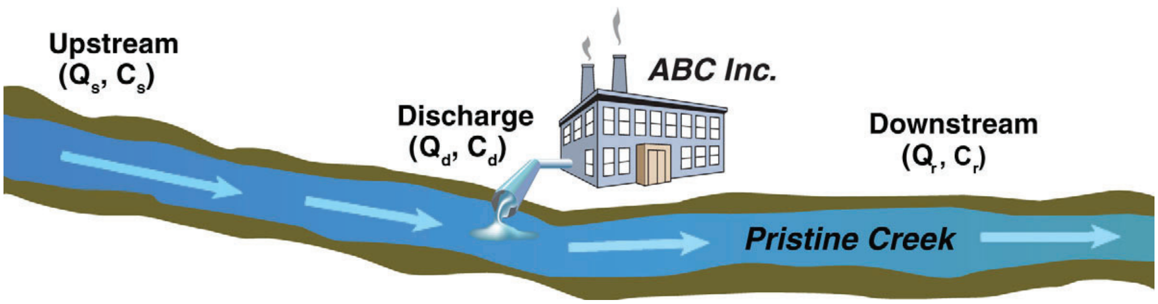
The mass-balance equation is presented again in Exhibit 6-17. In the exhibit, the equation is rearranged to show how it would be used to calculate a WLA for a conservative pollutant discharged to a river or stream under conditions of rapid and complete mixing.

6.4.1.2 Step 2: Calculate LTA Concentrations for Each WLA

The requirements of a WLA generally must be interpreted in some way to be expressed as an effluent limitation. The goal of the permit writer is to derive effluent limitations that are enforceable, adequately account for effluent variability, consider available receiving water dilution, protect against acute and chronic impacts, account for compliance monitoring sampling frequency, and assure attainment of the WLA and water quality standards. In developing WQBELs, the permit writer develops limitations that require a facility to perform in such a way that the concentration of the pollutant of concern in the effluent discharged is nearly always below the WLA.

To accomplish that goal, EPA has developed a statistical permit limitation derivation procedure to translate WLAs into effluent limitations *for pollutants with effluent concentration measurements that tend to follow a lognormal distribution*. EPA believes that this procedure, discussed in Chapter 5 of the TSD, results in defensible, enforceable, and protective WQBELs for such pollutants. In addition, a number of states have adopted procedures based on, but not identical to, EPA's guidance that also provide defensible, enforceable, and protective WQBELs. Permit writers should always use the procedures adopted by their permitting authority. In addition, permit writers should recognize that alternative procedures would be used to calculate effluent limitations for pollutants with effluent concentrations that cannot generally be described using a lognormal distribution.

Exhibit 6-17 Example of applying mass-balance equation to calculate WLAs for conservative pollutant under conditions of rapid and complete mixing



Mass Balance Equation: $Q_sC_s + Q_dC_d = Q_rC_r$

where

Q_s	=	background stream flow in mgd or cfs above point of discharge
C_s	=	background in-stream pollutant concentration in mg/L
Q_d	=	effluent flow in mgd or cfs
C_d	=	effluent pollutant concentration in mg/L **= WLA**
Q_r	=	resultant in-stream flow, after discharge in mgd or cfs
C_r	=	resultant in-stream pollutant concentration in mg/L (after complete mixing occurs)

Rearrange the equation to determine the WLA (C_d) for ABC Inc., necessary to achieve the acute water quality criterion for Pollutant Z in Pristine Creek (C_r) downstream of the discharge:

$$C_d = \frac{Q_rC_r - Q_sC_s}{Q_d}$$

The following values are known for ABC Inc., and Pristine Creek:

Q_s = critical upstream flow (water quality standards allow a dilution allowance of up to 100% of 1Q10 low flow for rapid and complete mixing)	= 1.20 cfs
C_s = upstream concentration of Pollutant Z in Pristine Creek	= 0.75 mg/L
Q_d =discharge flow	= 0.55 cfs
Q_r = downstream flow = Q_d + Q_s	= 0.55 + 1.20 = 1.75 cfs
C_r = acute water quality criterion for Pollutant Z in Pristine Creek	= 1.0 mg/L

Determine the WLA for ABC Inc., by inserting the given values into the equation as follows:

$$\text{WLA for ABC Inc.} = C_d = \frac{(1.75 \text{ cfs})(1.0 \text{ mg/L}) - (1.20 \text{ cfs})(0.75 \text{ mg/L})}{(0.55 \text{ cfs})}$$

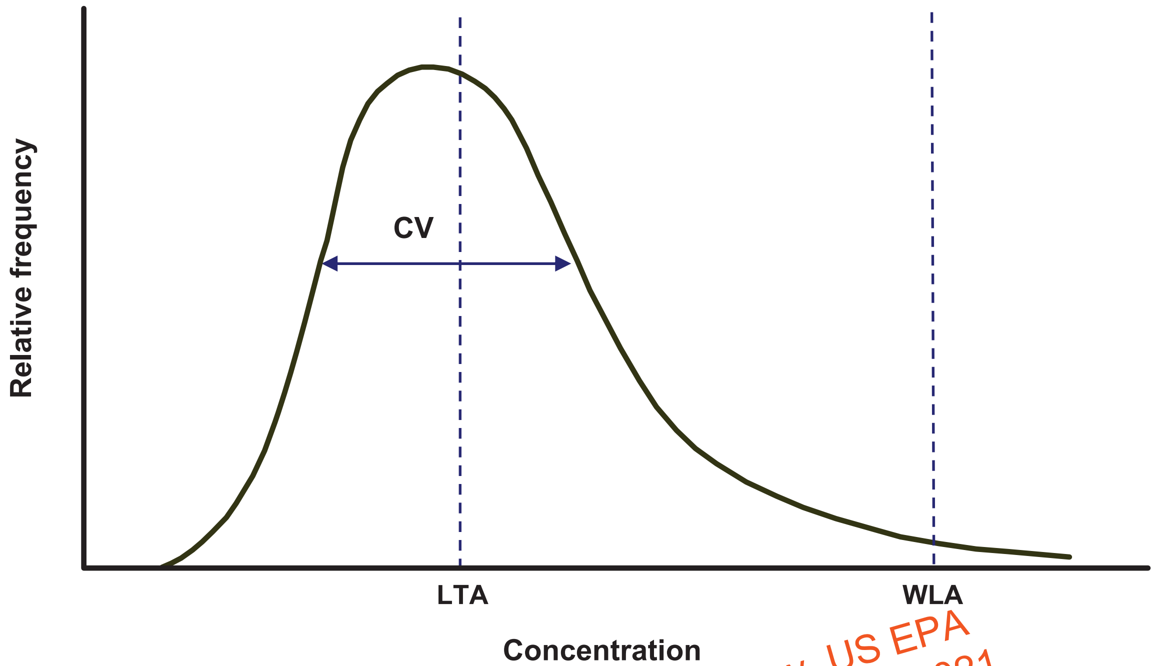
C_d = 1.5 mg/L of Pollutant Z*

* calculated to 2 significant figures

For those pollutants with effluent concentrations that do follow a lognormal distribution, the distribution can be described by determining a long-term average (or LTA) that ensures that the effluent pollutant concentration remains nearly always below the WLA and by the CV, a measure of the variability of data around the LTA. Exhibit 6-18 illustrates a lognormal distribution with the LTA, CV, and WLA highlighted.

When applying aquatic life criteria, a permit writer generally establishes a WLA based on the acute aquatic life criterion and a WLA based on the chronic aquatic life criterion. Thus, the permit writer determines two LTAs—one that would ensure that an effluent concentration is nearly always below the acute WLA and one that would ensure that an effluent concentration nearly always below the chronic WLA. Each LTA, acute and chronic, would represent a different performance expectation for the discharger.

Exhibit 6-18 Example of lognormal distribution of effluent pollutant concentrations and calculation of LTA



6.4.1.3 Step 3: Select the Lowest LTA as the Performance Basis for the Permitted Discharger

EPA recommends that WQBELs be based on a single performance expectation for a facility; therefore, once a permit writer has calculated LTA values for each WLA, he or she would select only one of those LTAs to define the required performance of the facility and serve as the basis for WQBELs. Because WQBELs must assure attainment of all applicable water quality criteria, the permit writer would select the lowest LTA as the basis for calculating effluent limitations. Selecting the lowest LTA would ensure that the facility's effluent pollutant concentration remains below all the calculated WLAs nearly all the time. Further, because WLAs are calculated using critical receiving water conditions, the limiting LTA would also ensure that water quality criteria are fully protected under nearly all conditions.

6.4.1.4 Step 4: Calculate an Average Monthly Limitation (AML) and a Maximum Daily Limitation (MDL)

The NPDES regulations at § 122.45(d) require that all effluent limitations be expressed, unless impracticable, as both AMLs and MDLs for all discharges other than POTWs and as both AMLs and average weekly limitations (AWLs) for POTWs. The AML is the highest allowable value for the average of daily discharges over a calendar month. The MDL is the highest allowable daily discharge measured during a calendar day or 24-hour period representing a calendar day. The AWL is the highest allowable value for the average of daily discharges over a calendar week. For pollutants with limitations expressed in units of mass, the daily discharge is the total mass discharged over the day. For limitations expressed in other units, the daily discharge is the average measurement of the pollutant over the period of a day.

In the TSD, EPA recommends establishing an MDL, rather than an AWL, for discharges of toxic pollutants from POTWs. That approach is appropriate for at least two reasons. First, the basis for the AWL for POTWs is the secondary treatment requirements discussed in section 5.1.1.1 of this manual and is not related to the need for assuring attainment of water quality standards. Second, an AWL, which could be the average of up to seven daily discharges, could average out peak toxic concentrations and, therefore, the discharge's potential for causing acute toxic effects might be missed. An MDL would be more likely to identify potential acutely toxic impacts.

Chapter 5 of the TSD includes statistical tools for calculating MDLs and AMLs from the LTA value selected in Step 3 above. Again, note that those procedures apply to *pollutants with effluent concentration measurements that tend to follow a lognormal distribution*. EPA has not developed guidance on procedures for calculating effluent limitations for pollutants with effluent concentrations that generally cannot be described using a lognormal distribution. For such pollutants, permit writers should use other procedures as recommended by their permitting authority in its policies, procedures, or guidance.

Whether using the TSD procedures or other procedures for calculating WQBELs, the objective is to establish limitations calculated to require treatment plant performance levels that, after considering acceptable effluent variability, would have a very low statistical probability of exceeding the WLA and, therefore, would comply with the applicable water quality standards under most foreseeable conditions.

6.4.1.5 Step 5: Document Calculation of WQBELs in the Fact Sheet

Permit writers should document in the NPDES permit fact sheet the process used to develop WQBELs. The permit writer should clearly identify the data and information used to determine the applicable water quality standards and how that information, or any applicable TMDL, was used to derive WQBELs and explain how the state's antidegradation policy was applied as part of the process. The information in the fact sheet should provide the NPDES permit applicant and the public a transparent, reproducible, and defensible description of how the permit writer properly derived WQBELs for the NPDES permit.

6.4.2 Calculating Chemical-specific WQBELs based on Human Health Criteria for Toxic Pollutants

Developing WQBELs for toxic pollutants affecting human health is somewhat different from calculating WQBELs for other pollutants because (1) the exposure period of concern is generally longer (e.g., often a lifetime exposure) and (2) usually the average exposure, rather than the maximum exposure, is of concern. EPA's recommended approach for setting WQBELs for toxic pollutants for human health protection is to set the AML equal to the WLA calculated from the human health toxic pollutant criterion and calculate the MDL from the AML. Section 5.4.4 of the TSD describes statistical procedures used for such calculations for pollutants with effluent concentrations that follow a lognormal distribution. Once again, for pollutants with effluent concentrations that do not follow a lognormal distribution, permit writers should use other procedures as specified by their permitting authority.

If the permit writer calculates chemical-specific WQBELs from human health criteria, he or she should compare the limitations to any other calculated WQBELs (e.g., WQBELs based on aquatic life criteria) and TBELs and apply antidegradation and anti-backsliding requirements to determine the final limitations that meet all technology and water quality standards. As discussed above, that process should be documented in the fact sheet for the NPDES permit.

6.5 Calculate Reasonable Potential and WQBELs for WET

WET tests measure the degree of response of exposed aquatic test organisms to an effluent mixed in some proportion with control water (e.g., laboratory water or a non-toxic receiving water sample). WET testing is used as a second approach, in addition to the chemical-specific approach, to implementing water quality standards in NPDES permits. This section provides a brief introduction to WET testing and WET limitations.

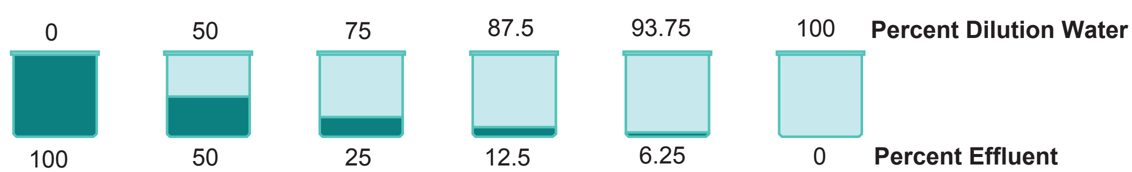
Test of Significant Toxicity (TST)

At the time of the writing of this guidance manual, EPA had recently published a new statistical approach that assesses the whole effluent toxicity (WET) measurement of wastewater effects on specific test organisms' ability to survive, grow, and reproduce. This new approach is called the Test of Significant Toxicity (TST) and is a statistical method that uses hypothesis testing techniques based on research and peer-reviewed publications. The hypothesis test under the TST approach examines whether an effluent, at the critical concentration (e.g., in-stream waste concentration [IWC]), and the control within a WET test differ by an unacceptable amount (the amount that would have a measured detrimental effect on the ability of aquatic organisms to thrive and survive). The TST implementation document and the TST technical document are available at the NPDES WET Website <www.epa.gov/npdes/wet>.

6.5.1 Types of WET Tests

In many WET tests, the effluent and control water are mixed in varying proportions to create a dilution series. Exhibit 6-19 is an example of a typical dilution series used in WET testing.

Exhibit 6-19 Example of typical dilution series



There are two types of WET tests: acute and chronic. An acute toxicity test usually is conducted over a short time, generally 96 hours or less, and the endpoint measured is mortality. The endpoint for an acute test is often expressed as an LC_{50} (i.e., the percent of effluent that is lethal to 50 percent of the exposed test organisms). A chronic toxicity test is usually conducted during a critical life phase of the organism and the endpoints measured are mortality and sub-lethal effects, such as changes in reproduction and growth. A chronic test can occur over a matter of hours or days, depending on the species tested and test endpoint. The endpoint of a chronic toxicity test often is expressed in one of the following ways:

- No observed effect concentration (NOEC), the highest concentration of effluent (i.e., highest percent effluent) at which no adverse effects are observed on the aquatic test organisms.
- Lowest observed effect concentration (LOEC), the lowest concentration of effluent that causes observable adverse effects in exposed test organisms.

- Inhibition concentration (IC), a point estimate of the effluent concentration that would cause a given percent reduction in a biological measurement of the test organisms.
- Effect concentration (EC), a point estimate of the effluent concentration that would cause an observable adverse effect in a given percentage of test organisms.

For additional information on WET monitoring and WET test methods, see section 8.2.4 of this manual.

6.5.2 Expressing WET Limitations or Test Results

There are two options for expressing WET limitations or test results. First, WET limitations or test results can be expressed directly in terms of the WET test endpoints discussed above (e.g., LC_{50}, NOEC, and IC_{25}). Alternatively, the limitations or test results can be expressed in terms of *toxic units* (TUs). A TU is the inverse of the sample fraction, calculated as 100 divided by the percent effluent. Exhibit 6-20 presents example TUs for expressing acute and chronic test results.

Exhibit 6-20 Example of toxic units

If an **acute test** result is a LC_{50} of 60 percent, that result can be expressed as

$$\frac{100}{60} = 1.7 \text{ acute toxic units} = 1.7\ TU_a$$

If a **chronic test** result is an IC_{25} of 40 percent effluent, that result can be expressed as

$$\frac{100}{40} = 2.5 \text{ chronic toxic units} = 2.5\ TU_c$$

It is important to distinguish acute TUs (TU_a) from chronic TUs (TU_c). The difference between TU_a and TU_c can be likened to the difference between miles and kilometers. Both miles and kilometers are used to measure distance, but a distance of 1.0 mile is not the same as a distance of 1.0 kilometer. Likewise, both TU_a and TU_c are expressions of the toxicity of an effluent, but 1.0 TU_a is not the same as 1.0 TU_c. It is possible, however, to determine the relationship between the acute toxicity of an effluent and the chronic toxicity of that same effluent, just as it is possible to determine the relationship between miles and kilometers (i.e., through a conversion factor). Unlike the conversion between miles and kilometers that remains constant, the conversion factor between acute and chronic toxic units varies from effluent to effluent.

For an effluent, the permit writer could develop a conversion factor that would allow conversion of TU_a into equivalent TU_c or vice versa. This conversion factor is known as an acute-to-chronic ratio (ACR) for that effluent. The ACR for an effluent may be calculated where there are at least 10 sets of paired acute and chronic WET test data available. The ACR is determined by calculating the mean of the individual ACRs for each pair of acute and chronic WET tests. Where there are not sufficient data to calculate an ACR for an effluent (i.e., less than 10 paired sets of acute and chronic WET test data), EPA recommends a default value of ACR = 10. Exhibit 6-21 presents examples showing how the ACR converts TU_a into TU_c, how to calculate an ACR from existing data, and how, once an ACR is calculated, a permit writer could estimate the chronic toxicity of an effluent sample from its measured acute toxicity or vice versa.

Exhibit 6-21 Using the ACR

The ACR is expressed

$$ACR = \frac{\text{Acute Endpoint}}{\text{Chronic Endpoint}} = \frac{LC_{50}}{IC_{25}}$$

A TU is the inverse of the sample fraction. Therefore, by definition

$$TU_a = \frac{100}{LC_{50}} \qquad TU_c == \frac{100}{IC_{25}}$$

Consequently, toxicity as percent sample, may be expressed

$$LC_{50} = \frac{100}{TU_a} \qquad IC_{25} = \frac{100}{TU_c}$$

Substituting into the original equation gives

$$ACR = \frac{LC_{50}}{IC_{25}} = \frac{\frac{100}{TU_a}}{\frac{100}{TU_c}} = \frac{TU_c}{TU_a}$$

Example 1
Given: LC_{50} = 28%, IC_{25} = 10%

$$ACR = \frac{LC_{50}}{IC_{25}} = \frac{28\%}{10\%} = 2.8$$

Example 2
Given: TU_a = 3.6, TU_c = 10.0

$$ACR = \frac{TU_c}{TU_a} = \frac{10.0}{3.6} = 2.8$$

Example 3
Given: Toxicity data for a facility's effluent for *C. dubia*. as presented in the table to the right.

The ACR in the third column is calculated using the following equation:

$$ACR = \frac{LC_{50}}{IC_{25}}$$

LC_{50} (% effluent)	IC_{25} (% effluent)	ACR
62	10	6.2
18	10	1.8
68	25	2.7
61	10	6.1
63	25	2.5
70	25	2.8
17	5	3.4
35	10	3.5
35	10	3.5
35	25	1.4
47	10	4.7
Mean		**3.5**

Example 4
Given: TU_a = 1.8, ACR = 3.5

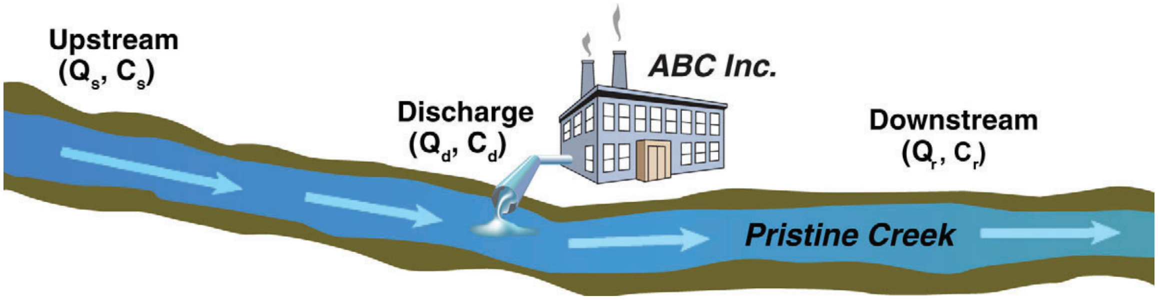
$$ACR = \frac{TU_c}{TU_a} \qquad TU_c = ACR \times TU_a$$

$$\text{Estimated } TU_c = ACR \times TU_a = 3.5\frac{TU_c}{TU_a} \times 1.8\ TU_a = 6.3\ TU_c$$

6.5.3 Determining the Need for WET Limitations

If a state has numeric criteria for WET, a permit writer could use the results of WET tests to project acute or chronic toxicity in the receiving water after accounting for the applicable dilution allowance or mixing zone made available in the water quality standards. The permit writer would compare the projected toxicity of the receiving water to the applicable water quality criterion for WET. If the projected toxicity exceeds the applicable numeric water quality criterion for WET, the discharge would cause, have the reasonable potential to cause, or contribute to an excursion above the applicable water quality standards, and the permit writer must develop a WQBEL for WET [see § 122.44(d)(1)(iv)]. In that way, numeric criteria for WET can be treated similarly to chemical-specific criteria. Exhibit 6-22 provides an example of how the mass-balance equation is used to conduct a reasonable potential analysis for WET.

Exhibit 6-22 Example of mass-balance equation for a WET reasonable potential analysis



The mass-balance equation can be used to determine whether the discharge from ABC Inc. would cause, have the reasonable potential to cause, or contribute to toxicity in Pristine Creek that exceeds the numeric water quality criteria for acute or chronic toxicity. Assume the discharge mixes rapidly and completely with Pristine Creek.

Mass-Balance Equation: $Q_sC_s + Q_dC_d = Q_rC_r$

Dividing both sides of the mass-balance equation by Q_r gives the following:

$$C_r = \frac{(Q_d)(C_d) + (Q_s)(C_s)}{Q_r}$$

The following values are known for ABC Inc. and Pristine Creek:

Q_s = Critical upstream flow	(1Q10 for acute protection)	= 23.6 cfs
	(7Q10 for chronic protection)	= 70.9 cfs
C_s = Upstream toxicity in Pristine Creek	(acute)	= 0 TU_a
	(chronic)	= 0 TU_c
Q_d = Discharge flow		= 7.06 cfs
C_d = Discharge toxicity	(acute)	= 2.50 TU_a
	(chronic)	= 8.00 TU_c
Q_r = Downstream flow		= $Q_d + Q_s$
Acute Water Quality Criterion in Pristine Creek		= 0.3 TU_a
Chronic Water Quality Criterion in Pristine Creek		= 1.0 TU_c

Find the downstream concentration (C_r) by inserting the given values into the equation as follows:

For acute toxicity:

$$C_r = \frac{(7.06\text{ cfs})(2.5\text{ TU}_a) + (23.6\text{ cfs})(0\text{ TU}_a)}{7.06\text{ cfs} + 23.6\text{ cfs}} = 0.58\text{ TU}_a$$

The downstream concentration (C_r) exceeds the water quality criterion for acute toxicity of 0.3 TU_a.

For chronic toxicity:

$$C_r = \frac{(7.06\text{ cfs})(8.00\text{ TU}_c) + (70.9\text{ cfs})(0\text{ TU}_c)}{7.06\text{ cfs} + 70.9\text{ cfs}} = 0.72\text{ TU}_c$$

The downstream concentration (C_r) does not exceed the water quality criterion for chronic toxicity of 1.0 TU_c.

In Exhibit 6-22 above, the downstream concentration under critical conditions for the acute water quality criterion (C_r = 0.58 TU_a) exceeds the water quality criterion for acute toxicity (0.3 TU_a); therefore there is reasonable potential and WET limitations are required. WET limitations would be calculated in much the same way as limitations on specific chemicals. The limitations would be calculated to ensure that WET criteria are not exceeded after any available dilution or at the edge of the applicable mixing zone.

Where state water quality standards do not include numeric criteria for WET, a permit writer could evaluate the need for WQBELs for WET on the basis of narrative criteria; specifically, a narrative criterion stating that waterbodies must be free from *toxics in toxic amounts*. To make it easier for a permit writer to readily establish WET limitations in this situation, the permitting authority should have a policy for implementing the narrative criterion. Following the permitting authority's policy, if the permit writer determines that a discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion above a narrative criterion, the regulations at § 122.44(d)(1)(v) require that the permit include WQBELs for WET unless the permit writer demonstrates that parameter-specific limitations for the effluent are sufficient to attain and maintain applicable numeric and narrative water quality criteria. In other words, the permit must include WET limitations unless the permit writer is able to determine the specific pollutants that are the source of toxicity and include parameter-specific limitations for those pollutants that assure, and will continue to assure, attainment of water quality standards. If there are no criteria in the state water quality standards for the specific parameters causing the toxicity, the permit writer can establish WQBELs using one of three approaches outlined in § 122.44(d)(1)(vi):

- Use EPA's national recommended criteria.
- Calculate a numeric criterion that will attain and maintain the applicable narrative criterion.
- Control the pollutant using an indicator parameter for the pollutant of concern.

A permit also could include a requirement to conduct a toxicity identification evaluation and toxicity reduction evaluation (TIE/TRE) as a special condition in an NPDES permit. (Chapter 9 of this manual presents more information on special conditions.) A TIE/TRE is a site-specific study designed to systematically investigate and identify the causes of effluent toxicity problems, isolate the sources of that toxicity, identify and implement appropriate toxicity control options, and confirm the effectiveness of those control options and the reduction in toxicity. The permit writer might require a TIE/TRE when WET limitations are exceeded or, if there are no WET limitations in the permit, where WET testing demonstrates an unacceptable level of effluent toxicity. Because WET testing indicates the degree of toxicity of an effluent, but does not specifically identify the cause of that toxicity or ways to reduce toxicity, a TIE/TRE is necessary to achieve compliance with effluent limitations or other effluent toxicity requirements in NPDES permits. If a TIE/TRE is not required through the special conditions section of the permit, it could be required via a CWA section 308 letter, a CWA section 309 administrative order, or a consent decree.

6.6 Antidegradation Review

Early in the permit development process, a permit writer should check the state's antidegradation policy and implementation methods to determine what tier(s) of protection, if any, the state has assigned to the proposed receiving water for the parameter(s) of concern. The regulations concerning antidegradation and each of the tiers are described above in section 6.1.1.3. The tier of antidegradation protection is important for determining the required process for developing the water quality-based permit limits and conditions. In some cases, where a waterbody is classified as Tier 3 for antidegradation purposes, the permit writer might find that it is not possible to issue a permit for the proposed activity.

If the state has not specified the tier, the permit writer will need to evaluate, in accordance with the state's implementation procedures, whether the receiving waterbody is of high water quality for the parameters of concern, and thus will require Tier 2 protection. After identifying the tier(s) of protection for the proposed receiving waterbody and parameter(s) of concern, the permit writer should consult the state's antidegradation implementation procedures relevant to the tier(s).

The following sections provide methods permit writers should consider for implementing, through the WQBEL development process, the three levels of protection typically found in a state's antidegradation policy. Implementation of the state's antidegradation policy could have a significant effect on the calculation of WQBELs.

6.6.1 Tier 1 Implementation

All waterbodies receive at least Tier 1 protection. Tier 1 protection means that the permit writer must include limits in the permit sufficient to maintain and protect water quality necessary to protect existing uses. In practice, for a Tier 1 receiving waterbody, the permit writer typically calculates the WQBELs on the basis of the applicable criteria because the state's designated uses and criteria to protect those uses must be sufficient to protect the existing uses. If a Tier 1 waterbody is impaired for a parameter that would be present in the proposed discharge, the permit writer should identify and consult any relevant TMDLs to determine what quantity of pollutant (if any) is appropriate.

6.6.2 Tier 2 Implementation

For new or increased discharges that could potentially lower water quality in high-quality waters, Tier 2 protection provides the state with a framework for making decisions regarding the degree to which it will protect and maintain the high water quality. A new or expanded discharge permit application typically triggers a Tier 2 antidegradation review. Depending on the outcome of the review, the permit could be written to maintain the existing high water quality or could be written to allow some degradation.

Each state's antidegradation policy or implementation procedures should describe the Tier 2 antidegradation review process. Though the process varies among states, EPA's antidegradation regulation at § 131.12 outlines the common elements of the process. To permit a new or increased discharge that would lower water quality, the state is required to make a finding on the basis of the following:

- The state must find that allowing lower water quality is necessary for important social or economic development in the area in which the waters are located.
  - The state would perform an alternatives analysis to evaluate whether the proposed discharge is actually *necessary* (i.e., whether there are less degrading feasible alternatives) and that might include consideration of a wide range of alternatives (e.g. non-discharging options, relocation of discharge, alternative processes, and innovative treatments).
  - The state should provide a justification of important social or economic development (or both) that would occur as a result of permitting the proposed discharge.
- The state's finding must be made after full satisfaction of its own intergovernmental coordination and public participation provisions.
- The state must assure that the highest statutory and regulatory requirements for all new and existing point sources will be achieved.
- The state must assure that all cost-effective and reasonable BMPs for nonpoint source control will be achieved.

- The state must assure that water quality will still protect existing uses.

If, after fulfilling the above conditions of the Tier 2 antidegradation review process, the state makes a determination to allow a new or increased discharge that would lower water quality, the permit writer may include such limitations in the NPDES permit for that discharge provided the limitations meet all other applicable technology and water quality standards.

6.6.3 Tier 3 Implementation

States identify their own ONRWs for Tier 3 protection, which requires that the water quality be maintained and protected. This is the most stringent level of protection. ONRWs often include waters in national or state parks, wildlife refuges, and waters of exceptional recreational or ecological significance. Waterbodies can be given Tier 3 protection regardless of their existing level of water quality. Some states implement Tier 3 by prohibiting any new or increased discharges to ONRWs or their tributaries that would result in lower water quality, with the exception of some limited activities such as those that would result in temporary changes in water quality ultimately resulting in restoration. Some states allow increased discharges as long as they are offset by equivalent or greater reductions elsewhere in the waterbody.

In addition to Tiers 1, 2, and 3, some states have a class of waters considered outstanding to the state and for which the state might have specific antidegradation requirements. Such waterbodies are sometimes referred to as *Tier 2 ½* waters because implementation of the antidegradation policy for them affords a greater degree of protection than Tier 2 but more flexibility than Tier 3.

Chapter 4 of EPA's WQS Handbook and the *Water Quality Standards Regulation Advance Notice of Proposed Rulemaking* (64 FR 36742, July 7, 1998) include additional information on implementing antidegradation policies. The permit writer should clearly explain the antidegradation analysis and how it affects calculation of WQBELs in the fact sheet or statement of basis for the permit.

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[1] U.S. Environmental Protection Agency. 1994. *Water Quality Standards Handbook: Second Edition* (WQS Handbook). EPA 823-B-94-005a. U.S. Environmental Protection Agency, Office of Water, Washington DC. <www.epa.gov/waterscience/standards/handbook/>.

[2] U.S. Environmental Protection Agency. 2001. *Streamlined Water-Effect Ratio Procedure for Discharges of Copper*. EPA-822-R-01-005. U.S. Environmental Protection Agency, Office of Science and Technology, Washington, DC. <www.epa.gov/waterscience/criteria/copper/copper.pdf>.

[3] Davies, Tudor T. 1997. *Establishing Site Specific Aquatic Life Criteria Equal to Natural Background.* U.S. Environmental Protection Agency, Office of Science and Technology, Washington, DC. <www.epa.gov/waterscience/library/wqcriteria/naturalback.pdf>.

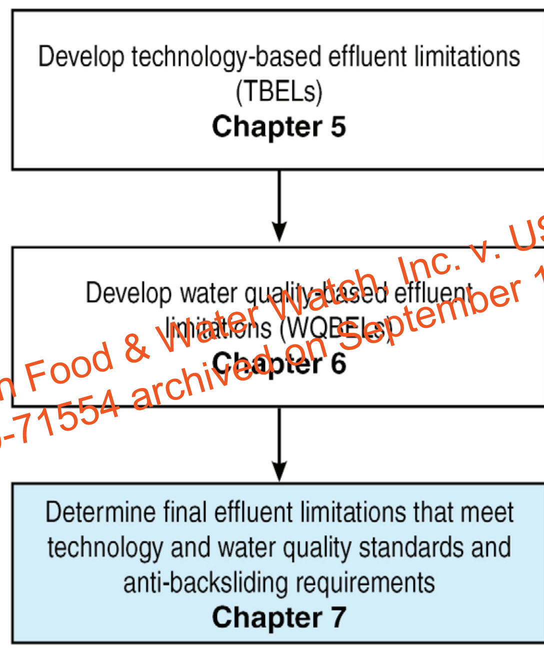
[4] U.S. Environmental Protection Agency. 1991. *Technical Support Document for Water Quality-Based Toxics Control* (TSD). EPA-505/2-90-001. U.S. Environmental Protection Agency, Office of Water, Washington, DC. <www.epa.gov/npdes/pubs/owm0264.pdf>.

[5] U.S. Environmental Protection Agency. 1990. *Biological Criteria: National Program Guidance for Surface Waters*. EPA-440/5-91-004. U.S. Environmental Protection Agency, Office of Science and Technology, Washington, DC. <www.epa.gov/bioindicators/html/biolcont.html>.

CHAPTER 7. Final Effluent Limitations and Anti-backsliding

As illustrated in Exhibit 7.1, after calculating applicable technology-based effluent limitations (TBELs) and water quality-based effluent limitations (WQBELs), the permit writer must determine the final effluent limitations that will be included in the National Pollutant Discharge Elimination System (NPDES) permit for each pollutant or pollutant parameter. For reissued permits, that determination must also include an assessment of whether the revised effluent limitations are consistent with the Clean Water Act (CWA) requirements and NPDES regulations related to anti-backsliding.

Exhibit 7-1 Developing effluent limitations



7.1 Determining Final Effluent Limitations

When determining the final effluent limitations, the permit writer must ensure that all applicable statutory and regulatory requirements, including technology and water quality standards, are fully implemented.

- The permit writer determines the calculated limitations (TBELs, WQBELs, or some combination of the calculated limitations) that will ensure that all applicable CWA standards are met.
- As noted above, for reissued permits, if any of the limitations are less stringent than limitations on the same pollutant in the previous NPDES permit, the permit writer then conducts an anti-backsliding analysis and, if necessary, revises the limitations accordingly. A detailed discussion of the anti-backsliding provisions of the CWA and the NPDES regulations is included below in Section 7.2.

In addition, the permit writer should clearly explain in the fact sheet for the permit how the final limitations in the permit were determined and how those limitations meet both technology and water quality standards (including antidegradation) and, where appropriate, how an anti-backsliding analysis was applied to the final effluent limitations.

7.2 Applying Anti-backsliding Requirements

As noted in Section 7.1, after selecting the calculated effluent limitations for a pollutant that ensure that all CWA standards are met, the permit writer applies anti-backsliding requirements, as necessary, to determine the final effluent limitations. In general, the term anti-backsliding refers to statutory and regulatory provisions that prohibit the renewal, reissuance, or modification of an existing NPDES permit that contains effluent limitations, permit conditions, or standards less stringent than those established in the previous permit. There are, however, exceptions to the prohibition, and determining the applicability and circumstances of the exceptions requires familiarity with both the statutory and regulatory provisions that address anti-backsliding.

7.2.1 Anti-backsliding Statutory Provisions

Clean Water Act (CWA) section 402(o) expressly prohibits backsliding from certain existing effluent limitations. CWA section 402(o) consists of three main parts: (1) a prohibition on specific forms of backsliding, (2) exceptions to the prohibition, and (3) a *safety clause* that provides an absolute limitation on backsliding.

7.2.1.1 Statutory Prohibition Against Backsliding

First, CWA section 402(o)(1) prohibits the relaxation of effluent limitations for two situations:

- To revise an existing TBEL that was developed on a case-by-case basis using best professional judgment (BPJ) to reflect subsequently promulgated effluent limitations guidelines and standards (effluent guidelines) that would result in a less stringent effluent limitation.
- Relaxation of an effluent limitation that is based on state standards, such as water quality standards or treatment standards, unless the change is consistent with CWA section 303(d)(4). Section 303(d)(4) may be applied independently of section 402(o).

The prohibition against relaxation of effluent limitations is subject to the exceptions in CWA section 402(o)(2) and, for limitations based on state standards, the provisions of CWA section 303(d)(4). Those exceptions are outlined further in the following sections.

7.2.1.2 Exceptions for Case-by-Case TBELs

CWA section 402(o)(2) outlines specific exceptions to the general prohibition against revising an existing TBEL that was developed on a case-by-case basis using BPJ to reflect subsequently promulgated, less stringent effluent guidelines in a renewed, reissued, or modified permit. CWA section 402(o)(2) provides that relaxed limitations may be allowed where

- There have been material and substantial alternations or additions to the permitted facility that justify the relaxation.

- New information (other than revised regulations, guidance, or test methods) is available that was not available at the time of permit issuance and that would have justified a less stringent effluent limitation. If the effluent limitation was based on water quality standards, any changes must result in a decrease in pollutants discharged.
- Technical mistakes or mistaken interpretations of the law were made in issuing the permit under CWA section 402(a)(1)(b).
- Good cause exists because of events beyond the permittee's control (e.g., natural disasters) and for which there is no reasonably available remedy.
- The permit has been modified under CWA sections 301(c), 301(g), 301(h), 310(i), 301(k), 301(n), or 316(a).
- The permittee has installed and properly operated and maintained required treatment facilities but still has been unable to meet the effluent limitations (relaxation may be allowed only to the treatment levels actually achieved).

7.2.1.3 Exceptions for Limitations Based on State Standards

EPA has consistently interpreted CWA section 402(o)(1) to allow relaxation of WQBELs and effluent limitations based on state standards if the relaxation is consistent with the provisions of CWA section 303(d)(4) or if one of the exceptions in CWA section 402(o)(2) is met. The two provisions constitute independent exceptions to the prohibition against relaxation of effluent limitations. If either is met, relaxation is permissible.

CWA section 303(d)(4) has two parts: paragraph (A), which applies to *nonattainment waters*, and paragraph (B), which applies to *attainment waters*.

- **Nonattainment water:** CWA section 303(d)(4)(A) allows the establishment of a less stringent effluent limitation when the receiving water has been identified as not meeting applicable water quality standards (i.e., a *nonattainment water*) if the permittee meets two conditions. First, the existing effluent limitation must have been based on a total maximum daily load (TMDL) or other wasteload allocation (WLA) established under CWA section 303. Second, relaxation of the effluent limitation is only allowed if attainment of water quality standards will be ensured or the designated use not being attained is removed in accordance with the water quality standards regulations. This subsection does not provide an exception for establishing less stringent limitations where the original limitation was based on state permitting standards (e.g., state treatment standards) and was not based on a TMDL or WLA.
- **Attainment water:** CWA section 303(d)(4)(B) applies to waters where the water quality equals or exceeds levels necessary to protect the designated use, or to otherwise meet applicable water quality standards (i.e., an *attainment water*). Under CWA section 303(d)(4)(B), a limitation based on a TMDL, WLA, other water quality standard, or any other permitting standard may only be relaxed where the action is consistent with state's antidegradation policy.

Although the statute also identifies six exceptions in section 402(o)(2) where effluent limitations otherwise subject to the prohibition in section 402(o)(1) may be relaxed, the exceptions for technical mistakes or mistaken interpretations and permit modification, which are described above, would not apply to WQBELs.

7.2.1.4 Exception Safety Clause

CWA section 402(o)(3) is a *safety clause* that provides an absolute limitation on backsliding. This section of the CWA prohibits the relaxation of effluent limitations in all cases if the revised effluent limitation would result in a violation of applicable effluent guidelines or water quality standards, including antidegradation requirements. Thus, even if one or more of the backsliding exceptions outlined in the statute is applicable and met, CWA section 402(o)(3) acts as a floor and restricts the extent to which effluent limitations may be relaxed. The requirement affirms existing provisions of the CWA that require effluent limitations, standards, and conditions to ensure compliance with applicable technology and water quality standards.

7.2.2 Anti-backsliding Regulatory Provisions

Anti-backsliding regulations are found at Title 40 of the *Code of Federal Regulations* (CFR) 122.44(l). The regulations do not specifically address backsliding where a permittee seeks relaxation of an effluent limitation that is based on a state treatment standard or water quality standard [i.e., based on CWA section 301(b)(1)(C), 303(d) or 303(e)]. They do, however, address all other forms of backsliding.

First, the regulations at § 122.44(l)(1) restrict the relaxation of *final effluent limitations* and the relaxation of *standards or conditions* contained in existing permits. Thus, this regulation, in effect, addresses all types of backsliding not addressed in the CWA provisions (e.g., backsliding from limitations derived from effluent guidelines, from new source performance standards, from existing case-by-case limitations to new case-by-case limitations, and from conditions such as monitoring requirements that are not effluent limitations). Under the regulation, a permittee must meet one of the causes for modification under § 122.62 for the reissued permit to allow relaxation of such limitations, standards, or conditions.

Second, the regulations at § 122.44(l)(2)(i) directly reflect the specific prohibition imposed by CWA section 402(o) on backsliding where a permittee seeks to revise an existing case-by-case TBEL developed using BPJ to reflect a subsequently promulgated effluent guideline that is less stringent than the case-by-case requirement. The regulations include the same exceptions to this prohibition that are in CWA section 402(o)(2) and the same *safety clause* in CWA section 402(o)(3).

Thus, if the permit condition being considered for relaxation is either a case-by-case effluent limitation developed using BPJ or is any other limitation, standard, or condition other than an effluent limitation based on a state standard, the permit writer can apply the requirements in § 122.44(l). For effluent limitations based on state standards, the permit writer should apply the provisions of CWA sections 402(o) and 303(d)(4) directly. Exhibit 7-2 illustrates the process of applying the statutory and regulatory provisions addressing anti-backsliding.

Exhibit 7-2 Application of anti-backsliding requirements

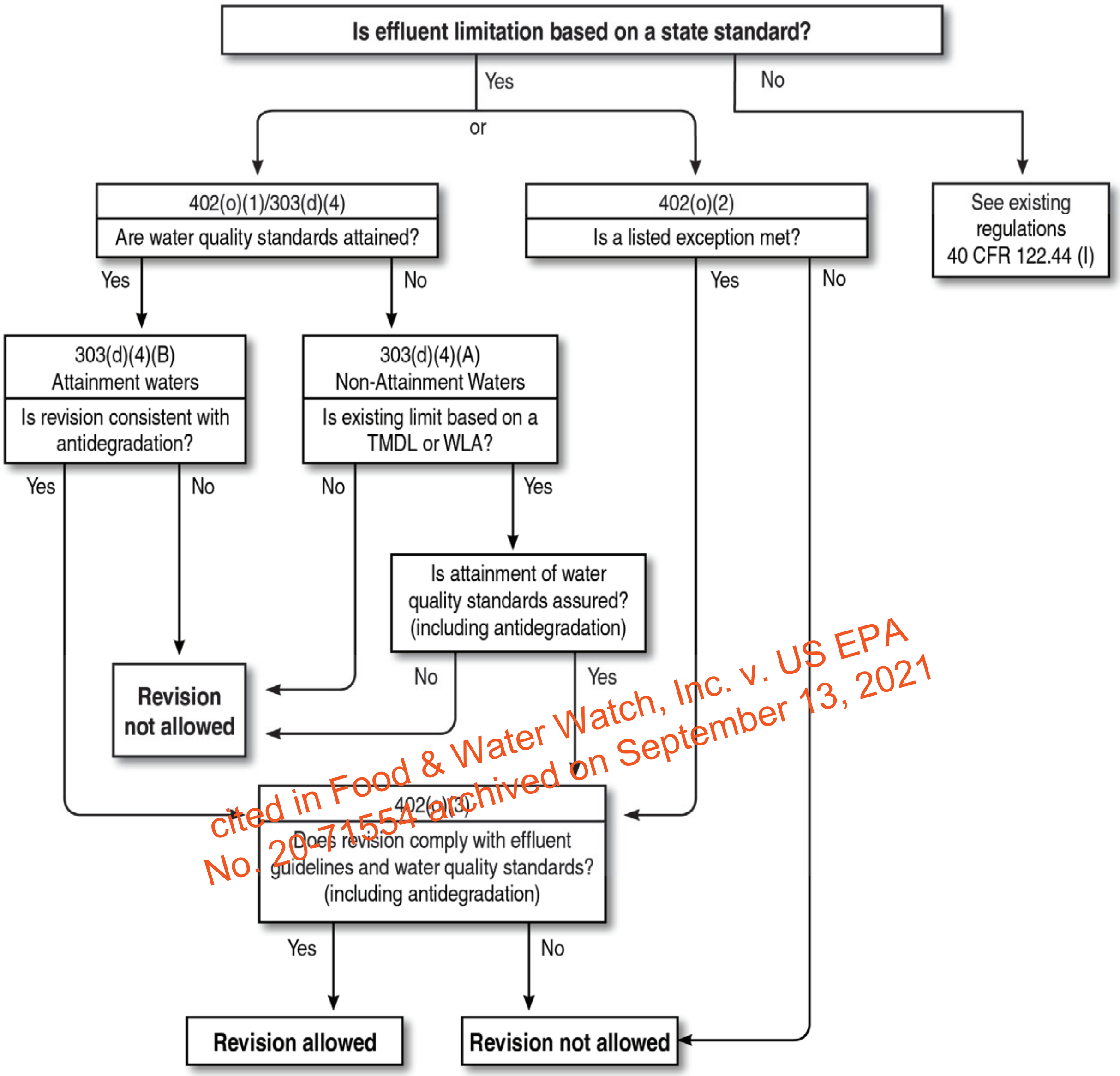


Exhibit 7-3 presents some examples of situations when backsliding might be a factor in effluent limitation development.

Exhibit 7-3 Backsliding examples

Example 1

- A publicly owned treatment works (POTW) seeks to relax its WQBEL for Pollutant X
- The current effluent limitation for Pollutant X is based on a TMDL and WLA for the POTW developed in accordance with § 130.7.
- The POTW is in compliance with its existing effluent limitation, and the applicable water quality standards for Pollutant X are attained.
- The POTW has developed new models with new river flow information. The models indicate that the water quality standards for Pollutant X would be maintained with a relaxed permit limitation.

Question:
May the effluent limitation for Pollutant X be relaxed?

Answer:
Possibly. Under the interpretation discussed above, WQBELs may be relaxed where one of the exceptions in CWA sections 402(o)(1) or (2) are met. In this case, although the new information from the models might meet the exception requirements criteria under CWA section 402(o)(2)(B)(i), CWA section 402(o)(2) will not justify the request unless the state reduces the pollutant loadings from other point sources or nonpoint sources of pollution. That is because, as discussed in Section 7.1 above, CWA section 402(o)(2) restricts the use of new information to cases where there is a decrease in the amount of pollutants being discharged.

The CWA section 402(o)(1) exceptions, on the other hand, might justify the request. In this case, the reference to CWA section 303(d)(4)(B) in CWA section 402(o)(1) is the relevant exception. CWA section 303(d)(4)(B) provides that, for receiving waters that meet water quality standards, permit limitations based on a TMDL or other WLA or other permit standard may be relaxed if the state's antidegradation policy requirements are met.

Example 2

- The state has established a technology-based treatment standard for fecal coliform pursuant to CWA section 301(b)(1)(C).
- The state later relaxes the standard in a revised regulation.
- A POTW, which has been in violation of its effluent limitation for fecal coliform based on the old standard, requests a revision of the limitation to reflect the new standard.
- Water quality standards for fecal coliform are not being attained.
- There was no TMDL or WLA developed. The basis of the effluent limitation was a state technology-based treatment standard.

Question:
May the fecal coliform effluent limitation be relaxed?

Answer:
No. Under CWA section 402(o)(1), the applicable provision is CWA section 303(d)(4)(A). This subsection does not authorize backsliding in this case (i.e., nonattainment waters) because it applies only to permit limitations based on a TMDL or other WLA. Here, the limitation in question is based on a state technology-based treatment standard.

Furthermore, if the permit sought to apply the exceptions in CWA section 402(o)(2), the new information provision would not allow the revision. For purposes of this section of the CWA, new information does not include *revised regulations*.

Exhibit 7-3 Backsliding examples (continued)

Example 3

- The state has a narrative water quality criterion of *no toxics in toxic amounts*.
- On the basis of WET testing data or other information, the state found that the discharge would cause, have the reasonable potential to cause, or contribute to an excursion of the water quality standards in the receiving water—specifically the narrative water quality criterion.
- The permitting authority imposed a WET limitation under § 122.44(d)(1)(v).
- The permittee determines that Pollutant Z is the cause of WET measured in its discharge.
- The permittee can demonstrate through sufficient data (including WET testing data) that an effluent limitation for Pollutant Z will assure compliance with the narrative water quality criterion as well as the state's numeric criteria for Pollutant Z, as required by § 122.44(d)(1)(v).

Question:
May the state modify the permit to delete the WET limitation and to add the effluent limitation for Pollutant Z?

Answer:
Possibly. CWA section 303(d)(4) might justify the action. The applicable provision is CWA section 303(d)(4)(B) because the narrative water quality criterion is currently attained. The permittee is complying with the existing WET limitation to attain and maintain the criterion. Under CWA section 303(d)(4)(B), the existing effluent limitation may be relaxed as long as antidegradation requirements are met and the relaxed limitation will not cause a violation of any effluent guidelines or water quality standards applicable to the discharge. In this case, it appears likely that a relaxation would be permissible because the permittee can demonstrate that the new limitation for Pollutant Z will assure compliance with both the narrative and numeric water quality criteria; however, the permit writer might consider continuing WET monitoring to identify other potential sources of toxicity in the future.

Example 4

- An industrial permittee seeks to revise its WQBEL of 60 mg/L for total suspended solids (TSS) to 100 mg/L, which is its actual discharge level.
- The current effluent limitation is based on a WLA from a TMDL developed in accordance with § 130.7.
- The water quality standards are not being attained. The ambient concentration of TSS exceeds the applicable water quality criteria.
- An effluent limitation of 100 mg/L is consistent with applicable effluent guidelines.
- New modeling information shows that the water quality standards will be attained with an effluent limitation of 75 mg/L TSS.

Question:
May the effluent limitation for TSS be revised from 60 mg/L to 100 mg/L?

Answer:
No; however, the effluent limitation could be relaxed to 75 mg/L under either CWA sections 402(o)(1) or (2) exceptions.

The water quality standards are not being attained because of TSS. Therefore, under CWA section 402(o)(1), the applicable exception is CWA section 303(d)(4)(A). In this case, the permitting authority may allow backsliding to 75 mg/L because the existing effluent limitation is based on a WLA from a TMDL, and the data show that attainment of the water quality standards is assured with an effluent limitation of 75 mg/L (but not with a limitation of 100 mg/L).

CHAPTER 8. Monitoring and Reporting Conditions

This chapter describes the monitoring and reporting conditions that a permit writer establishes in a National Pollutant Discharge Elimination System (NPDES) permit. The monitoring and reporting conditions require the permittee to conduct routine or episodic self-monitoring of permitted discharges and internal operations (where applicable) and report the analytical results to the permitting authority with the information necessary to evaluate discharge characteristics and compliance status. Periodic monitoring and reporting establish an ongoing record of the permittee's compliance status and, where violations are detected, create a basis for any necessary enforcement actions.

The monitoring and reporting conditions section of an NPDES permit generally includes specific requirements for the following items:

- Monitoring locations.
- Monitoring frequencies.
- Sample collection methods.
- Analytical methods.
- Reporting and recordkeeping requirements.

The following sections provide an overview of the considerations involved in determining appropriate monitoring, reporting, and recordkeeping requirements, and how to properly incorporate the appropriate requirements in an NPDES permit.

8.1 Establishing Monitoring Conditions

The NPDES regulations require facilities discharging pollutants to waters of the United States to periodically evaluate compliance with the effluent limitations established in their permits and provide the results to the permitting authority. A permit writer should consider several factors when determining the specific requirements to be included in the NPDES permit. Inappropriate or incomplete monitoring requirements can lead to inaccurate compliance determinations. Factors that could affect sampling location, sampling method, and sampling frequency include the following:

- Applicability of effluent limitations guidelines and standards (effluent guidelines).
- Wastestream and process variability.
- Access to sample locations.
- Pollutants discharged.
- Effluent limitations.
- Discharge frequencies (e.g., continuous versus intermittent).
- Effect of flow or pollutant load or both on the receiving water.
- Characteristics of the pollutants discharged.
- Permittee's compliance history.

8.1.1 Purposes of Monitoring

Monitoring is performed to determine compliance with effluent limitations established in NPDES permits, establish a basis for enforcement actions, assess treatment efficiency, characterize effluents and characterize receiving water.

Regulations requiring the establishment of monitoring and reporting conditions in NPDES permits are at Title 40 of the *Code of Federal Regulations* (CFR) 122.44(i) and 122.48. Regulations at § 122.44(i) require permittees to monitor pollutant mass (or other applicable unit of measure) and effluent volume and to provide other measurements (as appropriate) using the test methods established at Part 136. That subpart also establishes that NPDES permits (with certain specific exceptions as discussed in section 8.1.3 below) must require permittees to monitor for all limited pollutants and report data at least once per year.

Regulations at § 122.48 stipulate that all permits must specify requirements concerning the proper use, maintenance, and installation of monitoring equipment or methods (including biological monitoring methods when appropriate). NPDES permits must also specify the monitoring type, intervals, and frequency sufficient to yield data that are representative of the activity. The following sections focus on developing permit monitoring conditions that properly address these regulatory requirements.

8.1.2 Monitoring Location

The permit writer should specify the appropriate monitoring location in an NPDES permit to ensure compliance with the permit limitations and provide the necessary data to determine the effects of an effluent on the receiving water. The NPDES regulations do not prescribe exact monitoring locations; rather, the permit writer is responsible for determining the most appropriate monitoring location(s) and indicating the location(s) in the permit. Ultimately, the permittee is responsible for providing a safe and accessible sampling point that is representative of the discharge [§ 122.41(j)(1)].

The permit writer should consider the following questions when selecting a monitoring location:

- Is the monitoring location on the facility's property?
- Is the monitoring location accessible to the permittee and the permitting authority?
- Will the results be representative of the targeted wastestream?
- Is monitoring at internal points needed?

Permit writers should establish monitoring locations where the wastewater is well mixed, such as near a Parshall flume or at a location in a sewer with hydraulic turbulence. Weirs tend to enhance the settling of solids immediately upstream and the accumulation of floating oil or grease immediately downstream. Such locations should be avoided for sampling.

The permit writer can specify monitoring locations with either a narrative description or a diagram of the permittee's facility. Exhibit 8-1 provides examples of how to specify monitoring locations in a permit either by narrative or by diagram.

Exhibit 8-1 Examples of specifying monitoring locations in permits

Narrative

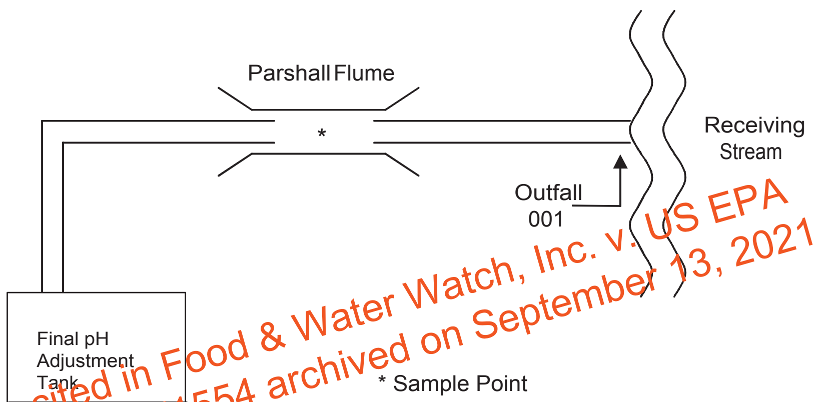
A. Monitoring Locations

1. Discharge from the Chemistry-Fine Arts Building must be sampled at the Parshall flume before the discharge point for Outfall 001.
2. Discharge from the Physics Building must be sampled at the Parshall flume before the discharge point for Outfall 002.
3. Discharge from the Research Lab No. 1 must be sampled at the Parshall flume before the discharge point for Outfall 003.

Diagram

A. Monitoring Locations

Outfall	Description
001	Discharge Pipe: Discharge of wastewater generated by all regulated metal finishing processes at the facility. Samples must be collected at the point indicated on the diagram below.



The monitoring location will vary depending on the type of monitoring required. The following sections discuss monitoring location considerations for each monitoring type.

8.1.2.1 Influent and source water monitoring locations

Influent monitoring is monitoring of a wastestream before that wastestream receives treatment. The permit writer should require influent monitoring when a characterization of the influent is needed to determine compliance with a permit condition, such as the 5-day biochemical oxygen demand (BOD_5) and total suspended solids (TSS) percent removal limitations required by the secondary treatment standards for publicly owned treatment works (POTWs).

Source water monitoring is the monitoring of source water before use as process water (e.g., river water used as contact cooling water). The permit writer should require source water monitoring if intake credits are established as specified in § 122.45(g).

Influent and source water monitoring locations should ensure a representative sample of raw intake water before any processes or treatment that could alter the properties of the intake water.

8.1.2.2 Internal monitoring locations

Internal monitoring is the monitoring of wastestreams at a location within the facility before discharge to waters of the United States. The NPDES regulations at § 122.45(h) allow internal monitoring points to be established when needed to determine compliance with a standard and in cases where setting an external monitoring location is not feasible. The permit writer may require internal monitoring to determine compliance with technology-based effluent limitations (TBELs) for a wastestream before commingling with other process or non-process wastestreams. Internal monitoring is generally not appropriate for determining compliance with water quality-based effluent limitations (WQBELs) unless final effluent monitoring is impractical (e.g., the final discharge point is submerged or inaccessible).

Examples of reasons for requiring designation of internal monitoring locations include the following:

- **Ensuring compliance with effluent guidelines (at non-POTW facilities):** When non-process wastewaters dilute process wastewaters subject to effluent guidelines, monitoring the combined discharge might not accurately allow determination of whether the facility is complying with the effluent guidelines. Under such circumstances, the permit writer might consider requiring monitoring for compliance with TBELs before the process wastewater is combined with non-process wastewater.
- **Ensuring compliance with secondary treatment standards (for POTWs only):** Some POTWs include treatment processes that do not address pollutants regulated by secondary treatment standards and that could interfere with the ability to accurately monitor for compliance with secondary treatment standards. Under such circumstances, the permit writer could consider requiring monitoring for compliance with limitations derived from secondary treatment standards before such processes. For example, the permit could require effluent monitoring for compliance with limitations derived from secondary treatment standards after secondary clarification but before disinfection.
- **Allowing detection of a pollutant:** Instances could arise where the combination of process and non-process wastewaters result in dilution of a pollutant of concern such that it would not be detectable using approved analytical methods. Internal monitoring would enable characterization of the pollutant before dilution with other wastewaters.

Where the permit writer determines that internal monitoring is necessary, § 122.45(h)(2) states that limitations on internal wastestreams may be imposed only where the permit fact sheet sets forth the exceptional circumstances requiring application of limitations at those locations.

8.1.2.3 Effluent monitoring locations

Effluent monitoring is monitoring of the final effluent after all treatment processes. The permit writer should require effluent monitoring to determine compliance with final effluent limitations established in the permit. Effluent monitoring also can be used to provide data to assess the possible impact of the discharge on the receiving water.

Effluent monitoring locations should provide a representative sample of the effluent being discharged into the receiving water. Effluent monitoring locations should be established after all industrial uses and treatment processes. Most importantly, the point where a final effluent limitation applies and the point where monitoring is required must be the same. A logical effluent monitoring point is just before discharge to the receiving water. This is particularly true for ensuring compliance with WQBELs.

8.1.3 Monitoring Frequency

The permit writer should establish monitoring frequencies sufficient to characterize the effluent quality and to detect events of noncompliance, considering the need for data and, as appropriate, the potential cost to the permittee. Monitoring frequency should be determined on a case-by-case basis, and decisions for setting monitoring frequency should be described in the fact sheet. Some states have their own monitoring guidelines that can help a permit writer determine an appropriate monitoring frequency.

To establish a monitoring frequency, the permit writer should consider the variability of the concentration of various parameters by reviewing effluent data for the facility (e.g., from discharge monitoring reports [DMRs]) or, without actual data, information from similar dischargers. A highly variable discharge should require more frequent monitoring than a discharge that is relatively consistent over time (particularly in terms of flow and pollutant concentration). Other factors that should be considered when establishing appropriate monitoring frequencies include the following:

- **Design capacity of the treatment facility.** The monitoring frequency might need to be increased at facilities where the treatment facility is nearing design capacity. For example, at equivalent average flow rates, a large lagoon system that is not susceptible to bypasses would require less frequent monitoring than an overloaded treatment facility that experiences fluctuating flow rates from infiltration or large batch discharges from an industrial user system. The lagoon should have a relatively low variability compared to the facility receiving batch discharges.
- **Treatment method used.** The monitoring frequency will be similar for similar treatment processes. The type of wastewater treatment used by the facility might affect the frequency of effluent monitoring. An industrial facility employing biological treatment would have a similar monitoring frequency as a secondary treatment plant with the same units used for wastewater treatment. If the treatment method is appropriate and achieving high pollutant removals on a consistent basis, monitoring could be less frequent than for a plant with little or insufficient treatment.
- **Compliance history.** The monitoring frequency might need to be adjusted to reflect the compliance history of the facility. A facility with problems achieving compliance generally should be required to perform more frequent monitoring to characterize the source or cause of the problems or to detect noncompliance.
- **Cost of monitoring relative to permittee's capabilities.** The monitoring frequency should not be excessive and should be what is necessary to provide sufficient information about the discharge.
- **Location of the discharge.** The monitoring frequency could be increased if the discharge is to sensitive waters or is near a public water supply.
- **Nature of the pollutants.** To accurately characterize the discharge, the monitoring frequency might be increased for wastewaters with highly toxic pollutants or where the nature of the pollutants varies.

- **Frequency of the discharge.** The monitoring frequency for a wastewater discharged in batches infrequently should differ from that for a continuous discharge of highly concentrated wastewater or a wastewater containing a pollutant that is found infrequently and at very low concentrations. The production schedule of the facility (e.g., seasonal, daily), the plant washdown schedule, and other similar factors should be considered.
- **Number of monthly samples used in developing effluent limitations.** When establishing monitoring frequency, the permit writer should consider the number of monthly samples used in developing average monthly WQBELs. If the discharger monitors less frequently than the monthly monitoring frequency assumed when developing applicable effluent guidelines or in calculating a WQBEL, it could be more difficult for the discharger to comply with its average monthly effluent limitations. For example, if an average monthly limitation is established assuming a monitoring frequency of four times per month (i.e., the limit is the expected average of four samples taken during a month), a discharger taking only one sample per month would statistically have a greater chance of exceeding its average monthly limit than if it sampled at least four times per month.
- **Tiered limitations.** The monitoring frequency requirements should correspond to the applicable tiers in cases where the permit writer has included tiered limitations. If a facility has seasonal discharge limitations, it might be appropriate to increase the monitoring frequency during the higher production season, and reduce the frequency during the off-season.
- **Other Considerations.** To ensure representative monitoring, permit conditions could be included to require monitoring on the same day, week, or month for parameters that might be correlated in some way. For example, coordinating the monitoring requirements for parameters such as pathogens and chlorine or metals and pH can provide information for both compliance assessment and determination of treatment efficacy.

A permit writer could also establish a tiered monitoring schedule that reduces or increases the monitoring frequency during a permit cycle. Tiered monitoring might be appropriate for discharges where the initial sampling shows compliance with effluent limitations, justifying a reduction in monitoring frequency over time. Conversely, if problems are found during the initial sampling, more frequent sampling and more comprehensive monitoring can be applied. This step-wise approach could lead to lower monitoring costs for permittees while still providing the data needed to demonstrate compliance with effluent limitations.

In 1996 EPA issued *Interim Guidance for Performance-Based Reductions of NPDES Permit Monitoring Frequencies* <www.epa.gov/npdes/pubs/perf-red.pdf>. Under the guidance, NPDES reporting and monitoring requirements may be reduced on the basis of a demonstration of excellent historical performance. Facilities can demonstrate that historical performance by meeting a set of compliance and enforcement criteria and by demonstrating their ability to consistently discharge pollutants below the levels necessary to meet their existing NPDES permit limitations. Reductions are determined parameter-by-parameter, on the basis of the existing monitoring frequency and the percentage below the limitation at which the parameter is being discharged. The reductions are incorporated when the permit is reissued. To remain eligible for the reductions, permittees are expected to maintain the parameter performance levels and good compliance on which the reductions were based.

8.1.4 Sample Collection

The permit writer must specify the sample collection method for all parameters required to be monitored in the permit. The permit writer should determine the sample collection method on the basis of the characteristics of each specific discharge. Certain sample collection and storage requirements are identified as part of the analytical methods specified in Part 136. (Section 8.3 below presents more on analytical methods.) The two most frequently used sampling methods are grab and composite. For more detailed information on sample collection methods, permit writers should refer to Chapter 5 (Sampling) of the NPDES Compliance Inspection Manual[1] <www.epa.gov/compliance/resources/publications/monitoring/cwa/inspections/npdesinspect/npdesmanual.html>.

8.1.4.1 Grab Samples

Grab samples are individual samples collected over a period not exceeding 15 minutes and that are representative of conditions at the time the sample is collected. Grab samples are appropriate when the flow and characteristics of the wastestream being sampled are relatively constant. The sample volume depends on the type and number of analyses to be performed. A grab sample is appropriate when a sample is needed to

- Monitor an effluent that does not discharge on a continuous basis.
- Provide information about instantaneous concentrations of pollutants at a specific time.
- Allow collection of a variable sample volume.
- Corroborate composite samples.
- Monitor parameters not amenable to compositing (e.g., temperature).

Grab samples can also be used to determine the spatial variability of a parameter or information on variability over a short period. They also are useful for monitoring intermittent wastewater flows from well-mixed batch process tanks.

8.1.4.2 Composite Samples

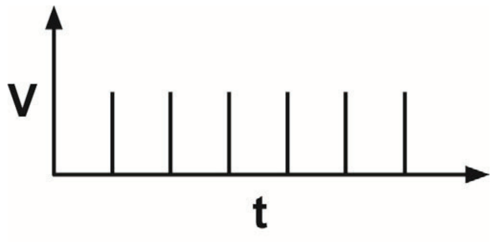
Composite samples are collected over time, either by continuous sampling or by mixing discrete samples, and represent the average characteristics of the wastestream during the sample period. Composite samples might provide a more representative measure of the discharge of pollutants over a given period than grab samples, and are used when any of the following is true:

- A measure of the average pollutant concentration during the compositing period is needed.
- A measure of mass loadings per unit of time is needed.
- Wastewater characteristics are highly variable.

Composite samples can be discrete samples (see discussion of sequential sampling in section 8.1.4.3 below) or a single combined sample and are collected either manually or with automatic samplers. There are two general types of composite sampling: time-proportional and flow-proportional. The permit writer should clearly express which type is required in the permit.

Time-proportional composite sample: This method collects a fixed volume (V) of discrete sample aliquots in one container at constant time intervals (t) as shown in Exhibit 8-2.

Exhibit 8-2 Visual interpretation of time-proportional composite monitoring



Time-proportional composite monitoring is appropriate when the flow of the sampled stream is constant (flow rate does not vary more than ±10 percent of the average flow rate) or when flow-monitoring equipment is not available. Automatically timed composited samples are usually preferred over manually collected composites. Composite samples collected by hand are appropriate for infrequent analyses and screening or if the subsamples have a fixed volume at equal time intervals.

Flow-proportional composite sample: There are two methods used for this type of sample: constant-volume when the interval time varies between samples, or constant-time when the interval volume collected varies between samples as shown in Exhibit 8-3.

Exhibit 8-3 Visual interpretation of flow-proportional composite monitoring

The constant-volume, flow-proportional, composite monitoring method collects a constant sample volume at varying time intervals proportional to stream flow (e.g., 200 milliliters sample collected for every 5,000 gallons of flow). The constant-time, flow-proportional, composite monitoring method collects the sample by adjusting the volume of each aliquot as the flow varies, while maintaining a constant time interval between the aliquots.

Flow-proportional composite sampling is usually preferred over time-proportional composite sampling when the effluent flow volume varies appreciably over time. If there is no flow-measuring device, effluent samples can be manually composited using the influent flow measurement without any correction for time lag. The error in the influent and effluent flow measurement is insignificant except in those cases where large volumes of water are impounded, as in equalization basins.

If a sampling protocol is not specified in the regulations, the permit writer should establish the duration of the compositing period and frequency of aliquot collection. The permit writer should also establish the time frame within which the sample is to be collected and the number of individual aliquots in the composite.

There are instances where composite samples are inappropriate. For example, the permit application regulations at § 122.21(g)(7) indicate that grab samples must be used for sampling several parameters that may change during the time it takes to composite the sample. Composite samples can be used for whole effluent toxicity (WET) testing; however, if there is concern that there are toxicity spikes or that the toxicant is a parameter for which composite sampling is not appropriate, grab samples for WET testing could be specified in the permit.

8.1.4.3 Sequential and Continuous Monitoring

Sequential monitoring refers to collecting discrete samples in individual containers in regular succession, such as timed intervals or discharge increments. Sequential grab samples provide a characteristic of the wastestream over a given time. Automatic sequential monitoring may be done with a special type of automatic sampling device that collects relatively small amounts of a sampled wastestream with the interval between sampling proportioned based on either time or effluent flow. Unlike a combined composite sampler, the sequential sampling device automatically retrieves a sample and holds it in a bottle separate from other automatically retrieved samples. Many individual samples can be stored separately in the unit rather than combining aliquots in a common bottle.

Continuous monitoring is another option for a limited number of parameters such as flow, total organic carbon (TOC), temperature, pH, conductivity, residual chlorine, fluoride, and dissolved oxygen. When establishing continuous monitoring requirements, the permit writer should be aware that the NPDES regulations concerning pH limitations allow for a period of excursion when the effluent is being continuously monitored (§ 401.17). The reliability, accuracy, and cost of continuous monitoring vary with the parameter monitored. The permit writer should consider the environmental significance of the variation of any of these parameters in the effluent and the cost of continuous monitoring before establishing continuous monitoring requirements in the permit.

8.2 Additional Monitoring Requirements and WET Testing

A variety of discharges other than traditional POTW or industrial wastewater discharges, including biosolids (sewage sludge), combined sewer and sanitary sewer overflows, and stormwater, are regulated under the NPDES permit program. In addition, many permits include requirements for WET testing. As discussed in this section, a permit writer should account for such unique discharges and testing requirements in establishing monitoring requirements.

8.2.1 Biosolids (Sewage Sludge)

The purpose of monitoring sewage sludge is to ensure safe use or disposal of the sludge. Sewage sludge regulations specified in Part 503 require monitoring of sewage sludge that is applied to land, placed on a surface disposal site, or incinerated. The frequency of monitoring is based on the annual amount of sewage sludge that is used or disposed of by those methods. POTWs that provide the sewage sludge to another party for further treatment (such as composting) must provide that party with the information necessary to comply with regulations at Part 503. Sewage sludge disposed of in a municipal solid waste landfill unit must meet the criteria for municipal solid waste landfills in the regulations at Part 258.

Exhibit 8-4 shows the minimum monitoring requirements established in Part 503 for sewage sludge before use and disposal. More frequent monitoring for any of the required or recommended parameters is appropriate when the POTW has any of the following:

- A highly variable influent load of toxics or organic solids.
- A significant industrial load.
- A history of process upsets due to toxics, or of adverse environmental impacts due to sludge use or disposal activities.

Exhibit 8-4 Minimum requirements for sewage sludge monitoring, based on method of sludge use or disposal

Method	Monitoring requirements	Frequency	Citation (40 CFR)
Land application	• Sludge weight and percent total solids • Metals: As, Cd, Cu, Pb, Hg, Mo, Ni, Se, and Zn • Pathogen Density • Vector Attraction Reduction	Based on dry weight of sludge in metric tons per year: • > zero but < 290: annually • = or > 290 but < 1,500: quarterly • = or > 1,500 but < 15,000: bimonthly • = or > 15,000: monthly	§ 503.16
Co-disposal in municipal solid waste landfill	• Sludge weight and percent total solids • Passes Paint-Filter Liquid Test • Suitability of sludge used as cover • Characterize in accordance with hazardous waste rules	Monitoring requirements or frequency not specified by Part 503. Determined by local health authority or landfill owner/operator.	Part 258
Surface disposal: lined sites with leachate collection and unlined sites	• Sludge weight and percent total solids • Metals: As, Cr, Ni (Unlined sites only) • Pathogen Density • Vector Attraction Reduction	Based on dry weight of sludge in metric tons per year: • > zero but < 290: annually • = or > 290 but < 1,500: quarterly • = or > 1,500 but < 15,000: bimonthly • = or > 15,000: monthly	§ 503.26
	• Methane gas	• Continuously	
Incineration	• Sludge weight and percent total solids • Metals: As, Cd, Cr, Pb, and Ni	Based on dry weight of sludge in metric tons per year: • > zero but < 290: annually • = or > 290 but < 1,500: quarterly • = or > 1,500 but < 15,000: bimonthly • = or > 15,000: monthly	§ 503.46
	• Be and Hg (National Emissions Standards)	• As required by permitting authority (local air authority)	
	• THC or O_2, moisture, combustion temperatures	• Continuously	
	• Air pollution control device operating parameters	• As required by permitting authority	

Notes:
Monitoring frequencies required by Part 503 may be reduced after 2 years of monitoring, but in no case may be less than once per year.
A successful land application program could necessitate sampling for other constituents of concern (such as nitrogen) in determining appropriate agronomic rates. The permit writer will determine additional monitoring requirements.

The sampling and analysis methods specified in § 503.8 and Part 136 should be followed for monitoring the required parameters. Without any specific methods in Part 503, guidance on appropriate methods is in the following documents:

- *Part 503 Implementation Guidance*[2] <www.epa.gov/npdes/pubs/owm0237.pdf>.
- *POTW Sludge Sampling and Analysis Guidance Document*[3] <www.epa.gov/npdes/pubs/owm012.pdf>.
- *Control of Pathogens and Vector Attraction in Sewage Sludge*[4] <www.epa.gov/ORD/NRMRL/pubs/625r92013/625r92013.htm>.

8.2.2 Combined Sewer Overflows (CSOs) and Sanitary Sewer Overflows (SSOs)

EPA's Combined Sewer Overflow (CSO) Control Policy (59 FR 18688, April 19, 1994) requires monitoring to characterize the combined sewer system, assist in developing a Long-Term Control Plan (LTCP), and show compliance with permit requirements. The permit writer should ensure the following:

- Monitoring is done to develop an initial system characterization as part of the nine minimum controls to reduce CSOs and their effect on receiving water quality. Such monitoring includes analyzing existing data on precipitation events, on the combined sewer system and CSOs, on water quality, and conducting field inspections.
- As part of the LTCP, a permittee is required to develop a more complete characterization of the sewer system through monitoring and modeling.
- To show compliance with the permit requirements and ultimately the attainment of water quality standards, the permittee is required to conduct a post-construction compliance monitoring program. Specific monitoring requirements of the post-construction compliance monitoring program will be unique to each permittee's LTCP and should be established as specific monitoring conditions in the individual NPDES permit.

These monitoring conditions should require monitoring of certain key parameters during a representative number of CSOs from a representative number of wet-weather events along with ambient water quality monitoring to ascertain attainment of water quality standards. EPA has prepared a guidance manual on monitoring entitled *Combined Sewer Overflows: Guidance for Monitoring and Modeling*[5] <www.epa.gov/npdes/pubs/sewer.pdf>.

A facility's permit might also contain monitoring requirements for sanitary sewer overflows (SSOs). SSO monitoring requirements would be developed on a case-by-case basis.

8.2.3 Stormwater Monitoring Considerations

Stormwater monitoring requirements vary according to the type of permit regulating the stormwater discharge and the activity. Municipal separate storm sewer systems (MS4s) serving more than 100,000 people (and some serving less than 100,000) are typically issued individual NPDES permits with monitoring requirements that are specific to the MS4. Smaller MS4s regulated under the stormwater Phase II rule are typically not required to conduct water quality monitoring as a condition in their NPDES general permit, though evaluation of measurable goals may include monitoring. EPA's multi-sector general permit (MSGP) for stormwater discharges from industrial facilities includes analytical monitoring requirements based on the type of industrial activity. Finally, operators of construction activity regulated under the construction general permit are typically not required to conduct water quality monitoring; however, some states and EPA Regions do require monitoring if the construction activity will discharge to a water impaired by sediment.

Specific monitoring conditions for the federal general stormwater permits are detailed in the most recent Construction General Permit or MSGP issued by EPA (available on the EPA Stormwater Program Website <www.epa.gov/npdes/stormwater>). Additional documents on stormwater monitoring are:

- *Urban Stormwater BMP Performance: A Guidance Manual for Meeting the National Stormwater BMP Database Requirements*[6] <www.epa.gov/npdes/pubs/montcomplete.pdf>.
- *Guidance Manual for the Monitoring and Reporting Requirements of the NPDES Stormwater Multi-Sector General Permit (MSGP)*[7] <www.epa.gov/npdes/pubs/dmr-fin.pdf>.

8.2.4 WET Monitoring

The use of WET testing to evaluate the toxicity in a receiving stream is discussed in section 6.4 of this manual and on the NPDES WET Website <www.epa.gov/npdes/wet>. The WET (or biomonitoring) test procedures were promulgated in § 136.3 (60 FR 53529, October 16, 1995). EPA revised the WET methods in 67 FR 69951, November 19, 2002. WET monitoring conditions included in permits should specify the particular biomonitoring test to be used, the test species, required test endpoints, and quality assurance/quality control procedures.

To support permitting agencies in implementing WET methods, EPA has revised and published manuals for toxicity test protocols:

- *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*. 5th ed.[8] <www.epa.gov/waterscience/WET/disk2/atx.pdf>.
- *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms*. 4th ed.[9] <www.epa.gov/waterscience/WET/disk3/ctf.pdf>.
- *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms*. 3rd ed.[10] <www.epa.gov/waterscience/WET/disk1/ctm.pdf>.
- *NPDES Compliance Monitoring Inspector Training: Biomonitoring*[11] (No Link).

WET testing samples could be composite or grab samples. Twenty-four hour composite samples are suggested except when any of the following are true:

- The effluent is expected to be more toxic at a certain time of day.
- Toxicity may be diluted during compositing.
- The size of the sample needed exceeds the composite sampler volume.

WET tests are relatively expensive compared to single parameter tests. Therefore, a permit writer should carefully consider the appropriate frequency for WET testing. A discharge with highly variable flow or observed toxicity should have more frequent monitoring than a discharge that is relatively consistent over time. As with other parameters, factors that a permit writer should consider when establishing appropriate WET monitoring frequencies include the following:

- Type of treatment process.

- Environmental significance and nature of the toxicity.
- Past compliance record or history.
- Cost of monitoring relative to financial capabilities.
- Number of monthly samples used in developing the permit limitation.
- The frequency of intermittent discharges.

Samples should be evenly spaced throughout the year so that seasonal variability can be ascertained.

8.3 Analytical Methods

The permit writer must specify the analytical methods to be used for monitoring. EPA's Office of Science and Technology's Clean Water Act Analytical Methods Website <www.epa.gov/waterscience/methods/> contains information about analytical methods.

The standard conditions of the permit [§§ 122.41(j)(4) and 122.44(i)] require that, when available, permittees use test procedures specified in Part 136 <www.epa.gov/waterscience/methods/basic.htm>. The analytical methods contained in Part 136 are established for conventional, toxic (priority), and some nonconventional pollutants. Without analytical methods for a parameter, the permit writer should specify the analytical method to be used. There are also procedures to apply for approval of alternative test methods in accordance with § 136.4.

While Part 136 identifies the analytical methods approved for use in the NPDES program, additional methods information is available through the National Environmental Methods Index (NEMI) <www.nemi.gov/>. NEMI is a Web-based, searchable clearinghouse of methods supported by the U.S. Geological Survey and EPA's Office of Water. NEMI contains summaries of more than 1,100 methods and describes them by their performance characteristics and their regulatory status, relative cost, detection level, detection level type, accuracy, precision, spiking level, instrumentation, lab equipment, and the *greenness* of analytic methods. Permit writers might find that information useful in comparing the features of Part 136 methods that will be used for assessing compliance with the calculated effluent limitations.

When establishing effluent limitations for a specific parameter (based on technology or water quality regulatory requirements), it is possible for the value of the calculated limit to fall below the method detection limit (MDL) and the minimum level (ML) established by the approved analytical method(s). Regardless of whether current analytical methods are available to detect and quantify the parameter at the concentration of the calculated limitation, the limitation must be included in the permit as calculated.

In some instances, there might be two or more approved Part 136 analytical methods available for the analysis of a parameter. In such cases, the permit should determine whether there is a need to select one of the approved methods and to include a requirement in the permit mandating the use of only the selected method. That approach might be necessary where an effluent limit is established at a level that is quantifiable by one approved method but is below the ML of another approved method.

Such a situation often occurs where a permit contains a WQBEL for mercury. To clarify the EPA's position with respect to effluent monitoring for mercury, EPA developed a memo *Analytical Methods for Mercury in National Pollutant Discharge Elimination System (NPDES) Permits*[12] <www.epa.gov/npdes/pubs/mercurymemo_analyticalmethods.pdf>.

Sufficiently Sensitive Methods

At the time of the writing of this manual, EPA had proposed regulations at §§ 122.21(e), 122.44(i), and Part 136, to require the use of sufficiently sensitive methods for analyses conducted for NPDES permit applications and for compliance monitoring (75 FR 35712, June 23, 2010). To ensure that appropriate analytical methods are required and performed, see the most current version of these federal regulations and applicable state analytical method regulations and policy.

8.4 Reporting Monitoring Results

The NPDES regulations require the permittee to maintain records and periodically report on monitoring activities. The regulations at § 122.41(l)(4)(i) require that monitoring results must be reported on a DMR <www.epa.gov/npdes/pubs/dmr.pdf>. Data reported include both data required by the permit and any additional data the permittee has collected consistent with permit requirements. All facilities must submit reports (on discharges and sludge use or disposal) at least annually, as required by § 122.44(i)(2). POTWs with pretreatment programs must submit a pretreatment report at least annually as required by § 403.12(i). However, the NPDES regulation states that monitoring frequency and reporting should be dependent on the nature and effect of the discharge or sludge use or disposal. Thus, the permit writer can require reporting more frequent than annually.

8.5 Recordkeeping Requirements

Generally, the permit writer is required by § 122.41(j) to include in the permit the requirement to retain records for at least three years, subject to extension by the State Director. Recordkeeping requirements for sewage sludge [§ 122.41(j)] and the CAFO program [§ 122.42(e)(2)] require records be kept five years or longer if required by the State Director. The permit writer should designate in the permit where records should be kept.

Monitoring records must include the following:

- Date, place, time of sampling.
- Name of sampler.
- Date of analysis.
- Name of analyst.
- Analytical methods used.
- Analytical results.

According to § 122.41(j), monitoring records must be representative of the discharge. Monitoring records, which must be retained, include continuous strip chart recordings, calibration data, copies of all reports for the permit, and copies of all data used to compile reports and applications.

Sewage sludge regulations under §§ 503.17, 503.27, and 503.47 establish recordkeeping requirements that vary depending on the use and disposal method for the sewage sludge. The same recordkeeping requirements should be applied to other sludge monitoring parameters not regulated by the Part 503 rule.

[1] U.S. Environmental Protection Agency. 2004. *NPDES Compliance Inspection Manual*. EPA-305-X-03-001. U.S. Environmental Protection Agency, Office of Enforcement and Compliance Assurance, Washington, DC. <www.epa.gov/compliance/resources/publications/monitoring/cwa/inspections/npdesinspect/npdesinspect.pdf>.

[2] U.S. Environmental Protection Agency. 1995. *Part 503 Implementation Guidance*. EPA 833-R-95-001. U.S. Environmental Protection Agency, Office of Water, Washington, DC. <www.epa.gov/npdes/pubs/owm0237.pdf>.

[3] U.S. Environmental Protection Agency. 1989. *POTW Sludge Sampling and Analysis Guidance Document*. EPA-833-B-89-100. U.S. Environmental Protection Agency, Office of Water, Washington, DC. <www.epa.gov/npdes/pubs/owm012.pdf>.

[4] U.S. Environmental Protection Agency. 1992. *Control of Pathogens and Vector Attraction in Sewage Sludge*. EPA-625/R-92-013. U.S. Environmental Protection Agency, Office of Research and Development, Washington, DC. <www.epa.gov/ORD/NRMRL/pubs/625r92013/625r92013.htm>.

[5] U.S. Environmental Protection Agency. 1999. *Combined Sewer Overflows–Guidance for Monitoring and Modeling*. EPA-832-B-99-002. U.S. Environmental Protection Agency, Office of Water, Washington, DC. <www.epa.gov/npdes/pubs/sewer.pdf>.

[6] U.S. Environmental Protection Agency. 2002. *Urban Stormwater BMP Performance: A Guidance Manual for Meeting the National Stormwater BMP Database Requirements*. EPA-821-B-02-001. U.S. Environmental Protection Agency, Office of Water, Washington, DC. <www.epa.gov/npdes/pubs/montcomplete.pdf>.

[7] U.S. Environmental Protection Agency. 1999. *Guidance Manual for the Monitoring and Reporting Requirements of the NPDES Stormwater Multi-Sector General Permit (MSGP)*. U.S. Environmental Protection Agency, Office of Water, NPDES Program Branch, Washington, DC. <www.epa.gov/npdes/pubs/dmr-fin.pdf>.

[8] U.S. Environmental Protection Agency. 2002. *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fifth Edition.* EPA-821-R-02-012. U.S. Environmental Protection Agency, Office of Water, Washington, DC <www.epa.gov/waterscience/WET/disk2/atx.pdf>.

[9] U.S. Environmental Protection Agency. 2002. *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition*. EPA-821-R-02-013. U.S. Environmental Protection Agency, Office of Water, Washington, DC. <www.epa.gov/waterscience/WET/disk3/ctf.pdf>.

[10] U.S. Environmental Protection Agency. 1994. *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms, Third Edition*. EPA-821-R-02-014. U.S. Environmental Protection Agency, Office of Water, Washington, DC. <www.epa.gov/waterscience/WET/disk1/ctm.pdf>.

[11] U.S. Environmental Protection Agency. 1990. *NPDES Compliance Monitoring Inspector Training: Biomonitoring*. U.S. Environmental Protection Agency, Office of Water Enforcement and Permits, Washington, DC. NTIS # PB91-145854. (No Link)

[12] Hanlon, James A. 2007. *Analytical Methods for Mercury in National Pollutant Discharge Elimination System (NPDES) Permits.* U.S. Environmental Protection Agency, Office of Wastewater Management. Memorandum, August 23, 2007. <www.epa.gov/npdes/pubs/mercurymemo_analyticalmethods.pdf>.

CHAPTER 9. Special Conditions

Special conditions in National Pollutant Discharge Elimination System (NPDES) permits supplement numeric effluent limitations and require the permittee to undertake activities designed to reduce the overall quantity of pollutants being discharged to waters of the United States, to reduce the potential for discharges of pollutants, or to collect information that could be used in determining future permit requirements.

There are many different reasons to incorporate special conditions into a permit including:

- To address unique situations, such as facilities discharging pollutants for which data are absent or limited, making development of technology- or water quality-based effluent limitations (TBELs or WQBELs) more difficult or impossible.
- To incorporate preventive requirements, such as requirements to install process control alarms, containment structures, good housekeeping practices, and the like.
- To address foreseeable changes to discharges, such as planned changes to process, products, or raw materials that could affect discharge characteristics.
- To incorporate compliance schedules to provide the time necessary to comply with permit conditions.
- To incorporate other NPDES programmatic requirements (e.g., pretreatment, sewage sludge).
- To impose additional monitoring requirements that provide the permit writer with data to evaluate the need for changes in permit limitations.
- To increase or decrease monitoring requirements, depending on monitoring results or changes in processes or products.
- To impose requirements for special studies such as ambient stream surveys, toxicity identification evaluations (TIEs) and toxicity reduction evaluations (TREs), bioaccumulation studies, sediment studies, mixing or mixing zone studies, pollutant reduction evaluations, or other such information-gathering studies.

Section 9.1 below addresses several types of special conditions that apply to both municipal and non-municipal facilities. Section 9.2 addresses special conditions unique to municipal facilities.

9.1 Special Conditions Potentially Applicable to Any Type of Discharger

This section discusses several types of special conditions that could be included in any NPDES permit (i.e., municipal or non-municipal). Those special conditions can be thought of as the *ABCs* of special conditions and include the following:

- **A**dditional monitoring and special studies.
- **B**est management practices (BMPs).
- **C**ompliance schedules.

A summary of the use of those special conditions follows.

9.1.1 Additional Monitoring and Special Studies

Additional monitoring requirements, beyond those required under the effluent limitations section of the permit, and special studies are useful for collecting data that were not available to the permit writer for consideration during permit development. Additional monitoring requirements and special studies generally are used to supplement numeric effluent limitations or support future permit development activities. Examples of the types of special studies that could be required in an NPDES permit include the following:

- **Treatability studies:** Might be required in a permit when insufficient treatability information for a pollutant or pollutants would hinder a permit writer from developing defensible TBELs. Treatability studies can also be required when the permit writer suspects that a facility might not be able to comply with an effluent limitation.

- **Toxicity identification evaluation/toxicity reduction evaluation (TIE/TRE):** Could be required in a permit when wastewater discharges are found to be toxic using whole effluent toxicity (WET) tests. The purpose of those evaluations is to identify and control the sources of toxicity in an effluent. Further guidance related to U.S. Environmental Protection Agency (EPA) recommended TIE/TRE procedures and requirements is found in the following guidance manuals:
  - *Toxicity Reduction Evaluation Guidance for Municipal Wastewater Treatment Plants*[1] <www.epa.gov/npdes/pubs/tre.pdf>.
  - *Clarifications Regarding Toxicity Reduction and Identification Evaluations in the National Pollutant Discharge Elimination System Program*[2] <www.epa.gov/npdes/pubs/owmfinaltretie.pdf>.
  - *Generalized Methodology for Conducting Industrial Toxicity Reduction Evaluations*[3] (No link—see the endnote for ordering instructions).
  - *Methods for Aquatic Toxicity Identification Evaluations: Phase I Toxicity Characterization Procedures*. 2nd ed[4] <www.epa.gov/npdes/pubs/owm0330.pdf>.
  - *Toxicity Identification Evaluation: Characterization of Chronically Toxic Effluents, Phase I*[5] <www.epa.gov/npdes/pubs/owm0255.pdf>.
  - *Methods for Aquatic Toxicity Identification Evaluations: Phase II Toxicity Identification Procedures for Samples Exhibiting Acute and Chronic Toxicity*[6] <www.epa.gov/npdes/pubs/owm0343.pdf>.
  - *Methods for Aquatic Toxicity Identification Evaluations: Phase III Confirmation Procedures for Samples Exhibiting Acute and Chronic Toxicity*[7] <www.epa.gov/npdes/pubs/owm0341.pdf>.

- **Mixing or mixing zone studies:** Might be required in a permit to assist in determining how effluent and receiving water mix and in establishing a regulatory mixing zone that can be applied when developing WQBELs.

- **Sediment monitoring:** Could be included in a permit if a permit writer suspects that pollutants contained in wastewater discharges accumulate in the sediments of the receiving water.

- **Bioaccumulation studies:** Might be required in a permit to determine whether pollutants contained in wastewater discharges bioaccumulate in aquatic organisms (e.g., fish, invertebrates). Such studies could be required when water quality criteria are expressed in terms of fish tissue levels. Additional guidance related to evaluating the bioaccumulation potential of a pollutant can be found in the *EPA Great Lakes Water Quality Initiative Technical Support Document for the Procedure to Determine Bioaccumulation Factors*[8] (No link—see the endnote for ordering instructions).

When establishing additional monitoring or special studies, permit writers must ensure that any requirements related to the study (e.g., special sampling or analytical procedures) are specified in the appropriate permit condition. In addition, permit writers should establish a reasonable schedule for completion and submission of the study or monitoring program. If the anticipated timeline is longer than one year, an interim progress report during the study is advisable.

9.1.2 Best Management Practices (BMPs)

In general, BMPs are actions or procedures to prevent or reduce the discharge of pollution to waters of the United States. Title 40 of the *Code of Federal Regulations* (CFR) section 122.2 includes the following in the definition of BMPs:

- Schedules of activities.
- Prohibitions of practices.
- Maintenance procedures.
- Treatment requirements.
- Operating procedures and practices to control
  - Plant site runoff.
  - Spillage or leaks.
  - Sludge or waste disposal.
  - Drainage from raw material storage areas.

9.1.2.1 When to Use BMPs

Clean Water Act (CWA) section 304(e) authorizes EPA to require BMPs as part of effluent limitations guidelines and standards (effluent guidelines) to control plant site runoff, spillage or leaks, sludge or waste disposal, and drainage from raw material storage that it determines are associated with or ancillary to the industrial manufacturing or treatment process and can contribute significant amounts of pollutants to navigable waters. Where effluent guidelines require specific control measures, including BMPs or development of a BMP plan, permit writers must include such requirements in permits. In addition, CWA section 402(p)(3)(B)(iii) states that permits for discharges from municipal storm sewers must require controls, including management practices, to reduce the discharge of pollutants. Finally, CWA sections 402(a)(1) and (2) give the permitting authority the ability to include BMPs in permits on a case-by-case basis to carry out the provisions of the CWA.

The NPDES regulations at § 122.44(k) track the statutory provisions cited above. This section of the regulations provides that permits must contain BMPs (when applicable) to control or abate the discharge of pollutants when any of the following are true:

- They are authorized under CWA section 304(e).
- They are authorized under CWA section 402(p) for the control of stormwater discharges.
- Numeric effluent limitations are infeasible.
- The practices are necessary to achieve effluent limitations and standards or carry out the purpose and intent of the CWA.

Circumstances under which numeric effluent limitations might be infeasible include the following:

- Regulating a pollutant for which limited treatability or aquatic impact data are available to allow development of numeric TBELs or WQBELs.
- Regulating discharges when the types of pollutants vary greatly over time.

In addition, a permit writer should consider using BMPs under any of the following circumstances:

- When chemical analyses are inappropriate or impossible.
- When there is a history of leaks and spills or when housekeeping is sloppy.
- When a complex facility lacks data for a pollutant or pollutants.

9.1.2.2 BMPs in NPDES Permits

Permit writers include BMP requirements in permits using two approaches: (1) site-, process-, or pollutant-specific BMPs, or (2) a requirement to develop a BMP plan. Site-, process-, or pollutant-specific BMPs might be appropriate in the case of an individual permit where a permit writer has the opportunity to review the circumstances at the facility. On the other hand, it might not be appropriate to include site-, process-, or pollutant-specific BMPs as conditions in a general permit, a permit for a particularly complex facility, or a permit for a facility with operations not familiar to the permit writer. Instead, complicated facilities and discharges covered under a general permit could be required to develop a BMP plan that requires the permittee to determine appropriate BMPs on the basis of circumstances at its facility.

Specific BMPs

Specific BMPs are designed to address conditions particular to a type of facility or to a specific site, process, or pollutant. Specific BMPs might be used in a permit when

- They are needed to address ancillary activities that could result in the discharge of pollutants to waters of the United States.
- Numeric effluent limitations for a specific process are otherwise infeasible and BMPs serve as effluent limitations for that process.
- They are required to supplement and ensure compliance with effluent limitations in the permit.

To select a specific BMP, the permit writer could

- Review the industry profiles or the specific facility to determine the applicable and appropriate management practices.
- Evaluate whether the BMP would help to achieve effluent limitations or other environmental objectives for that facility.
- Use information from other permits, pollution prevention sources, and EPA guidance documents to identify applicable and appropriate BMPs.

Specific BMPs frequently are required for certain types of dischargers such as concentrated animal feeding operations (CAFOs), combined sewer overflows (CSOs), and stormwater discharges.

BMP Plans

The *Guidance Manual for Developing Best Management Practices*[9] <www.epa.gov/npdes/pubs/owm0274.pdf> describes the activities and materials at an industrial or municipal facility that are best addressed by BMPs. The manual also describes how BMPs work and gives examples of types of BMPs.

If a permit writer requires a BMP plan, it is the facility's responsibility to develop, implement, and evaluate the success or shortfalls of its own plan. Often, a BMP committee (i.e., a group of individuals within the plant organization) is responsible for developing the BMP plan and assisting the plant management in implementing and updating the BMP plan.

EPA has identified several recommended components of effective BMP plans and detailed each component in the *Guidance Manual for Developing Best Management Practices*. The minimum suggested components of a general BMP plan are presented below:

- General Provisions
  - Name and location of facility.
  - Statement of BMP policy and objective.
  - Review by plant manager.
- Specific Provisions
  - BMP committee.
  - Risk identification and assessment.
  - Reporting of BMP incidents.
  - Materials compatibility.
  - Good housekeeping.
  - Preventive maintenance.
  - Inspections and records.
  - Security.
  - Employee training.

BMP plans used to supplement effluent limitations or to describe how the discharger plans to meet effluent limitations can be submitted to the regulatory agency or be kept on-site and made available to the permitting authority upon request. A general schedule for BMP plan development can be included in the permit (e.g., complete and submit the plan within six months of permit issuance and begin implementing the plan within nine months of permit issuance).

Exhibit 9-1 presents example permit text for a requirement to develop and implement a BMP plan and should be adapted as necessary to reflect conditions at the individual facility.

Exhibit 9-1 Example BMP plan requirement

The following is example text for requiring development and implementation of a BMP plan through an NPDES permit. The text should be crafted and changed as necessary to meet the individual facility's needs and the permitting authority's goals. The bracketed text should be updated to be specific to the permit.

1. Implementation.

[IF A BMP PLAN DOES NOT EXIST:]
The permittee, must develop and implement a best management practices (BMP) plan that achieves the objectives and the specific requirements listed below. A copy of the plan must be submitted to the U.S. Environmental Protection Agency (EPA) **[AND/OR STATE AGENCY]** within six months of the effective date of this permit. The plan must be implemented as soon as possible but no later than nine months from the effective date of the permit. The permittee must update and amend the plan as needed.

[IF A BMP PLAN ALREADY EXISTS:]
The permittee must during the term of this permit operate the facility in accordance with the BMP plan **[CITE EXISTING PLAN]** and in accordance with subsequent amendments to the plan. The permittee must amend the plan to incorporate practices to achieve the objectives and specific requirements listed below, and a copy of the amended plan must be submitted to the U.S. Environmental Protection Agency (EPA) **[AND/OR STATE AGENCY]** within three months of the effective date of this permit. The amended plan must be implemented as soon as possible but not later than six months from the effective date of the permit.

2. Purpose

Through implementation of the BMP plan the permittee must prevent or minimize the generation and the potential for the release of pollutants from the facility to the waters of the United States through normal operations and ancillary activities.

3. Objectives

The permittee must develop and amend the BMP plan consistent with the following objectives for the control of pollutants.

a. The number and quantity of pollutants and the toxicity of effluent generated, discharged, or potentially discharged at the facility must be minimized by the permittee to the extent feasible by managing each influent waste stream in the most appropriate manner.
b. Under the BMP plan, and any Standard Operating Procedures (SOPs) included in the plan, the permittee must ensure proper operation and maintenance of the treatment facility as required by § 122.41(e).
c. The permittee must establish specific objectives for the control of pollutants by conducting the following evaluations.
    1. Each facility component or system must be examined for its waste minimization opportunities and its potential for causing a release of significant amounts of pollutants to waters of the United States because of equipment failure, improper operation, and natural phenomena such as rain or snowfall, etc. The examination must include all normal operations and ancillary activities including material storage areas, plant site runoff, in-plant transfer, process and material handling areas, loading or unloading operations, spillage or leaks, sludge and waste disposal, or drainage from raw material storage. **[NOTE THAT ONLY THE APPLICABLE AREAS SHOULD BE INCLUDED IN THE PREVIOUS LIST.]**
    2. Where experience indicates a reasonable potential for equipment failure (e.g., a tank overflow or leakage), natural condition (e.g., precipitation), or other circumstances that may result in significant amounts of pollutants reaching surface waters, the program should include a prediction of the direction, rate of flow and total quantity of pollutants that could be discharged from the facility as a result of each condition or circumstance.

4. Requirements

The BMP Plan must be consistent with the objectives in the Objectives section above and the general guidance contained in the publication entitled *Guidance Manual for Developing Best Management Practices (BMPs)*, EPA 833-B-93-004, <www.epa.gov/npdes/pubs/owm0274.pdf> or any subsequent revisions to the guidance document. The BMP plan must

a. Be documented in narrative form, must include any necessary plot plans, drawings or maps, and must be developed in accordance with good engineering practices. The BMP plan must be organized and written with the following structure:
    1. Name and location of the facility.
    2. Statement of BMP policy.
    3. Structure, functions, and procedures of the BMP Committee.
    4. Specific management practices and standard operating procedures to achieve the above objectives, including the following:

Exhibit 9-1 Example BMP plan requirement (continued)

a. Modification of equipment, facilities, technology, processes, and procedures.
b. Reformulation or redesign of products.
c. Substitution of materials.
d. Improvement in management, inventory control, materials handling or general operational phases of the facility.

5. Risk identification and assessment.
6. Reporting of BMP incidents.
7. Materials compatibility.
8. Good housekeeping.
9. Preventative maintenance.
10. Inspections and records.
11. Security.
12. Employee training.

b. Include the following provisions concerning BMP plan review:
1. Review by plant engineering staff and the plant manager.
2. Review and endorsement by the permittee's BMP Committee.
3. A statement that the above reviews have been completed and that the BMP plan fulfills the requirements set forth in this permit. The statement must include the dated signatures of each BMP Committee member as certification of the reviews.

c. Establish specific BMPs to meet the objectives identified in the Objectives section above, addressing each component or system capable of generating or causing a release of significant amounts of pollutants, and identifying specific preventive or remedial measures to be implemented.

d. Establish specific BMPs or other measures that ensure that the following specific requirements are met:
1. Ensure proper management of solid and hazardous waste in accordance with regulations promulgated under the Resource Conservation and Recovery Act (RCRA). Management practices required under RCRA regulations must be referenced in the BMP plan.
2. Reflect requirements for Spill Prevention, Control, and Countermeasure (SPCC) plans under Clean Water Act (CWA) section 311 and 40 CFR Part 112 and may incorporate any part of such plans into the BMP plan by reference.
3. Reflect requirements for stormwater control under CWA section 402(p) and the regulations at 40 CFR 122.26 and 122.44, and otherwise eliminate to the extent practicable, contamination of stormwater runoff.

etc.

[NOTE: SECTION d ABOVE COULD BE TAILORED TO EACH FACILITY BY THE PERMIT WRITER AND MAY INCLUDE PROCESSES OR AREAS OF THE FACILITY WITH HOUSEKEEPING PROBLEMS, NONCOMPLIANCE, SPILLS/LEAKS, OR OTHER PROBLEMS THAT COULD BE REMEDIED THROUGH A BMP. IF THERE IS A KNOWN SOLUTION TO THE PROBLEM (E.G., MORE FREQUENT INSPECTIONS, PREVENTIVE MAINTENANCE, ETC.), THIS REMEDY COULD ALSO BE INCLUDED AS A PART OF THE BMP PLAN REQUIREMENTS. TO GATHER IDEAS FOR SUCH REQUIREMENTS, THE PERMIT WRITER MAY WANT TO CONTACT THE PERMITTEE, COMPLIANCE PERSONNEL, FACILITY INSPECTORS, OPERATIONS OFFICE PERSONNEL, AND STATE AGENCY COUNTERPARTS. THE PERMIT WRITER MIGHT ALSO WANT TO CHECK REQUIREMENTS IN OTHER PERMITS AND BMP PLANS FOR SIMILAR FACILITIES.]

5. Documentation

The permittee must maintain a copy of the BMP plan at the facility and must make the plan available to EPA **[AND/OR STATE AGENCY]** upon request. All offices of the permittee, which are required to maintain a copy of the NPDES permit, must also maintain a copy of the BMP plan.

6. BMP Plan Modification

The permittee must amend the BMP plan whenever there is a change in the facility, or in the operation of the facility, that materially increases the generation of pollutants or their release or potential release to the receiving waters. The permittee must also amend the plan, as appropriate, when plant operations covered by the BMP plan change. Any such changes to the BMP plan must be consistent with the objectives and specific requirements listed above. All changes in the BMP plan must be reported to EPA **[AND/OR STATE AGENCY]** in writing.

7. Modification for Ineffectiveness

If at any time the BMP plan proves to be ineffective in achieving the general objective of preventing and minimizing the generation of pollutants and their release and potential release to the receiving waters and/or the specific requirements above, the permit and/or the BMP plan must be subject to modification to incorporate revised BMP requirements.

9.1.2.3 Pollution Prevention in BMPs

BMPs are, by their nature, pollution prevention practices. Traditionally, BMPs have focused on good housekeeping measures and good management techniques that attempt to avoid contact between pollutants and water as a result of leaks, spills, and improper waste disposal. However, on the basis of the authority granted under the regulations, BMPs may include a range of pollution prevention options, including production modifications, operational changes, materials substitution, and materials and water conservation.

When developing BMPs, permit writers should be familiar with the fundamental principles of pollution prevention:

- Pollution should be prevented or reduced at the source, whenever feasible (*Reduce*).
- Pollution that cannot be prevented should be reused or recycled in an environmentally safe manner, whenever feasible (*Reuse-Recycle*).
- Pollution that cannot be prevented or recycled should be treated in an environmentally safe manner, whenever feasible (*Treat*).
- Disposal or other release into the environment should be employed only as a last resort and should be conducted in an environmentally safe manner (*Dispose of*).

When writing an NPDES permit, a permit writer who has familiarity with a certain type of processes might identify pollution prevention practices that are not used at a facility and that would help that facility achieve its pollution prevention goals. Where the pollution prevention practices are necessary to carry out the purposes and intent of the CWA, the permit writer may develop BMPs to implement those practices.

9.1.3 Compliance Schedules

The NPDES regulations at § 122.47 allow permit writers to establish schedules of compliance to give permittees additional time to achieve compliance with the CWA and applicable regulations. Schedules developed under this provision must require compliance by the permittee *as soon as possible*, but may not extend the date for final compliance beyond compliance dates established by the CWA. Thus, compliance schedules in permits are not appropriate for every type of permit requirement. Specifically, a permit writer may not establish a compliance schedule in a permit for TBELs because the statutory deadlines for meeting technology standards (i.e., secondary treatment standards and effluent guidelines) have passed. This restriction applies to both existing and new dischargers. Permit writers should note, however, that § 122.29(d)(4) allows a new source or new discharger up to 90 days to *start-up* its pollution control equipment and achieve compliance with its permit conditions (i.e., provides for up to a 90-day period to achieve compliance).

Examples of requirements for which a compliance schedule in an NPDES permit might be appropriate include:

- Pretreatment program development.
- Sludge use and disposal program development and implementation.
- BMP plan development and implementation.
- Effluent limitations derived from new or revised water quality standards.

An EPA Administrator's decision specifically addresses compliance schedules for effluent limitations derived from new or revised water quality standards. In the decision *In the Matter of Star-Kist Caribe, Inc*., documented in the memorandum *Order Denying Modification Request With Respect to the Administrator's 1990 Decision in Star-Kist Caribe, Inc. (NPDES Appeal No. 88-5)*[10] <www.epa.gov/npdes/pubs/owm0121.pdf>, the EPA Administrator interpreted CWA section 301(b)(1)(C) to mean that 1) after July 1, 1977, permits may not contain compliance schedules for effluent limitations based on water quality standards adopted before July 1, 1977, and 2) compliance schedules are allowed for effluent limitations based on standards adopted after that date *only* if the state has clearly indicated in its water quality standards or implementing regulations that it intends to allow them.

In May 2007, the Director of EPA's Office of Wastewater Management issued a memorandum to EPA Region 9 that clarified the requirements of § 122.47 as they relate to WQBELs [see *Compliance Schedules for Water Quality-Based Effluent Limitations in NPDES Permits*[11] <www.epa.gov/npdes/pubs/memo_complianceschedules_may07.pdf>. Permit writers should consider the principles outlined in this memo when assessing whether a compliance schedule for achieving a WQBEL is consistent with the CWA and its implementing regulations and when documenting the basis for a compliance schedule in a permit. Considerations outlined in the memo include the following:

- Demonstrate that the permittee cannot immediately comply with the new effluent limitation on the effective date of the permit.
- Include an enforceable *final* effluent limitation and a date for achievement in the permit.
- Justify and document the *appropriateness* of the compliance schedule; factors relevant to a determination that a compliance schedule is appropriate include how much time the discharger had to meet the WQBEL under prior permit(s), whether there is any need for modifications to treatment facilities, operations, or other measures and, if so, how long it would take to implement such modifications.
- Justify and demonstrate that compliance with the final WQBEL is required *as soon as possible*; factors relevant to a determination that a compliance is required as soon as possible include the steps needed to modify or install treatment facilities, operations, or other measures and the time those steps would take.
- Include an enforceable sequence of events leading to compliance with interim milestones for schedules longer than one year.
- Recognize that a schedule solely to provide time to develop a total maximum daily load (TMDL) or to conduct a use attainability analysis (UAA) is not appropriate.

Many of the principles outlined in the memo could be more generally applied to compliance schedules for requirements other than WQBELs.

9.2 Special Conditions for Municipal Facilities

This section explains several common special conditions that are applicable only to municipal facilities. These conditions reflect requirements for publicly owned treatment works (POTWs) to implement and enforce local pretreatment programs for their industrial users; biosolids (sewage sludge) disposal requirements; CSO requirements; SSO requirements; and municipal separate storm sewer system (MS4) requirements.

9.2.1 The National Pretreatment Program

CWA section 402(b)(8) requires that certain POTWs receiving pollutants from significant industrial sources (subject to CWA section 307(b) standards) establish a pretreatment program to ensure compliance with these standards. The implementing regulations at § 403.8(a) state that:

> Any POTW (or combination of POTWs operated by the same authority) with a total design flow greater than 5 million gallons per day (mgd) and receiving from industrial users pollutants which pass through or interfere with the operation of the POTW or are otherwise subject to pretreatment standards will be required to establish a POTW pretreatment program unless the NPDES state exercises its option to assume local responsibilities as provided in § 403.10(e).

As specified in § 403.8(a), the Regional Administrator or Director of an authorized state may require a POTW with a design flow of 5 mgd or less to develop a POTW pretreatment program. Program development could be determined to be necessary to prevent interference with or pass through of the POTW based on the nature, or volume, of the industrial influent, a history of treatment process upsets and violations of POTW effluent limitation(s), and contamination of municipal sludge.

Since 1978, approximately 1,500 POTWs have been required to develop and implement pretreatment programs through special conditions of NPDES permits. The pretreatment program was developed to control industrial discharges to POTWs and to meet the following objectives:

- To prevent pass through of pollutants.
- To prevent interference with POTW processes, including interference with the use or disposal of municipal sludge.
- To improve opportunities to recycle and reclaim municipal and industrial wastewater and sludges.

The pretreatment program also helps ensure POTW personnel health and safety.

As authorized by the pretreatment regulations at §§ 403.8(c), 403.8(d) and 403.8(e) and the NPDES regulations at § 122.44(j)(2), the requirements to develop and implement a POTW pretreatment program are included as enforceable conditions in the POTW's NPDES permit. NPDES permits drive the development and implementation of pretreatment programs by requiring the following:

- Adequate legal authority.
- Maintenance of an industrial user inventory.
- Development and implementation of local limits.
- Control mechanisms issued to significant industrial users (SIUs).
- Compliance monitoring activities.
- Swift and effective enforcement.
- Data management and recordkeeping.
- Reporting to the approval authority (EPA or state).
- Public participation.

Through the NPDES permit, the POTW is required to develop and implement a pretreatment program. The POTW is required to submit an approvable program that meets the requirements in § 403.9(b). A more detailed description of these required program elements is in § 403.8(f). The POTW must have the legal authority enabling it to do the following:

- Deny or condition new or increased contributions of pollutants, or changes in nature of pollutants, to the POTW by industrial users.
- Require compliance with applicable pretreatment standards and requirements by industrial users.
- Control through a permit, order, or similar means the contribution to the POTW by each industrial user to ensure compliance with applicable pretreatment standards and requirements. These control mechanisms must have certain conditions as laid out in § 403.8(f)(1)(iii) and be enforceable.
- Require the development of compliance schedules where necessary by each industrial user for the installation of technology required to meet applicable pretreatment standards and requirements, and submission of all notices and self-monitoring reports to assess and ensure compliance.
- Carry out all inspection, surveillance, and monitoring procedures necessary to determine compliance with applicable pretreatment standards and requirements independent of information submitted by the industrial user (including the authority to enter the premises of the industrial user).
- Obtain remedies for noncompliance (e.g., injunctive relief, penalties).
- Comply with confidentiality requirements.

Further, at a minimum, the POTW must have procedures to do the following:

- Identify and locate all possible industrial users that might be subject to the POTW pretreatment program.
- Identify the character and volume of pollutants contributed to the POTW by the industrial users.
- Notify industrial users of applicable pretreatment standards and applicable requirements under CWA sections 204(b) and 405 and RCRA Subtitles C and D.
- Receive and analyze self-monitoring reports.
- Conduct sampling, inspections and other surveillance activities to determine compliance with applicable pretreatment standards and requirements independent of information supplied by the industrial user.
- Investigate instances of noncompliance.
- Comply with public participation requirements, including annual public notice of industrial users determined to be in significant noncompliance during the previous 12-month period.

Also, as part of the POTW pretreatment program, POTWs must have adequate resources and funding to implement the program, evaluate the need for and, as necessary, develop local limits and develop an enforcement response plan.

The NPDES permit should include the conditions specified in § 403.9, including that the POTW be required to submit the program documentation, detailing the authority and procedures to be implemented, along with other information about the program. The permit will allow the POTW up to one year, from the time when written notification from the approval authority determined the need for a pretreatment program, to develop and submit a program for approval as stated in § 403.8(b). Once the permitting authority reviews and approves the program, the requirement to implement the approved program is then incorporated into the permit.

The permit writer generally incorporates the requirement to develop a pretreatment program at the time of permit reissuance. The requirement, however, may also be incorporated through a modification of the permit if there is *cause*, as defined in detail in § 403.8(e), to make such a modification. The permit writer must follow procedures outlined by § 122.62 related to modifications when including the requirement to develop a pretreatment program in an NPDES permit

During the life of the permit, it might be necessary for the POTW to modify its approved pretreatment program (changes to local limits, changes to the ordinance, and such). The changes can be brought about by the POTW's desire to change the way the program operates, or they can be the result of changes that are necessary to address deficiencies in the program found during inspections or audits done by the permitting authority. Whatever the reason for the modification, the permitting authority must review and approve any modification to the approved program that is considered substantial, as required by § 403.18. All substantial program modifications to the POTW's approved pretreatment program require minor modifications to the NPDES permit and are subject to the procedural requirements in §§ 122.63(g) and 403.18. In addition, incorporating the requirement for a previously approved pretreatment program for the purpose of making the implementation of the program an enforceable part of the permit is also considered a minor modification to the NPDES permit.

The majority of POTWs that need pretreatment program requirements in their permits currently have them in place. In addition, an NPDES state or an EPA region will often designate a pretreatment coordinator to serve as the pretreatment expert to review the annual report from the POTW and recommend any action to be taken. The state or EPA regional pretreatment coordinator is a key resource on pretreatment issues, particularly at the time of NPDES permit reissuance. EPA regions and approved states have developed standard pretreatment development or implementation conditions (with minor modifications made to tailor the conditions to the specific discharger) that are placed in all applicable NPDES permits in that region or state. The permit writer can usually obtain examples of these NPDES pretreatment conditions from the EPA or state pretreatment coordinators. The permit writer might need to update or modify pretreatment implementation language or initiate corrective action related to the pretreatment program.

EPA has developed the Pretreatment Program Website <www.epa.gov/npdes/pretreatment> and prepared a number of guidance manuals for POTWs on how to implement their local pretreatment programs that are accessible through this website. In addition, EPA prepared the *Introduction to the National Pretreatment Program*[12] <www.epa.gov/npdes/pubs/final99.pdf> as a reference for anyone interested in understanding the basics of pretreatment program requirements and to provide a roadmap to additional and more detailed guidance materials for those trying to implement specific elements of the pretreatment program.

Pretreatment program information and monitoring data obtained through the POTW's pretreatment program are useful to the permit writer in identifying possible modifications to the pretreatment program's local limits or procedures, or the need for water quality-based controls. The permit writer should obtain such data with the aid of the pretreatment coordinator. Permits must include conditions requiring a POTW to provide a written technical evaluation of the need to revise local limits under § 403.5(c)(1) following permit issuance or reissuance [§ 122.44(j)(2)(ii)]. In addition, POTWs with a design flow greater than or equal to one mgd and with an approved pretreatment program or required to develop a pretreatment program must sample and analyze their effluent for priority (toxic) pollutants listed in Part 122, Appendix J, Table 2 as part of the permit application process [see § 122.21(j)(4)(iv)]. Those data and information also are useful for determining the need for WQBELs.

9.2.2 Biosolids (Sewage Sludge)

CWA section 405(d) requires that EPA regulate the use and disposal of sewage sludge to protect public health and the environment from any reasonably anticipated adverse effects of these practices. In the CWA, Congress directed EPA to develop technical standards for municipal sludge use and disposal options and enacted strict deadlines for compliance with these standards. Within one year of promulgation of the standards, compliance was required unless construction of new pollution control facilities was necessary, in which case compliance was required within two years.

EPA promulgated Part 503, Standards for the Use or Disposal of Sewage Sludge in 58 *Federal Register* (FR) 9248, February 19, 1993, with amendments in 59 FR 9095, February 19, 1994 and 60 FR 54764, October 25, 1995. These regulations address four sludge use and disposal practices: land application, surface disposal, incineration, and disposal in a municipal solid waste landfill. The standards for each end use and disposal method consist of general requirements, numeric effluent limitations, operational standards, and management practices, as well as monitoring, recordkeeping, and reporting requirements. Unlike technology standards, which are based on the ability of treatment technologies to reduce the level of pollutants, EPA's sewage sludge standards are based on health and environmental risks. Part 503 imposes requirements on four groups:

- Persons who prepare sewage sludge or material derived from sewage sludge.
- Land appliers of sewage sludge.
- Owners/operators of sewage sludge surface disposal sites.
- Owners/operators of sewage sludge incinerators.

Details of that rule are described in *A Plain English Guide to the EPA Part 503 Biosolids Rule*[13] <www.epa.gov/owm/mtb/biosolids/503pe/>.

The risk assessment for the Part 503 rule that governs the land application of biosolids took nearly 10 years to complete and had extensive rigorous review and comment. The risk assessment evaluated and established limitations for a number of pollutants. These limitations are in chapter 4 of *A Guide to the Biosolids Risk Assessments for the EPA Part 503 Rule*[14] <www.epa.gov/owm/mtb/biosolids/503rule/>.

The regulation is largely self-implementing, and anyone who engages in activities covered by the regulation must comply with the appropriate requirements on or before the compliance deadlines. A person who violates Part 503 requirements is subject to administrative, civil, and criminal enforcement actions.

CWA section 405(f) requires the inclusion of sewage sludge use or disposal requirements in any NPDES permit issued to a Treatment Works Treating Domestic Sewage (TWTDS) and authorizes the issuance of sewage sludge-only permits to non-discharging TWTDS. In response, EPA promulgated revisions to the NPDES permit regulations at Parts 122 and 124 in 54 FR 18716, May 2, 1989, to address inclusion of sewage sludge use and disposal standards in NPDES permits and NPDES permit issuance to treatment works that do not have an effluent discharge to waters of the United States, but are involved in sewage sludge use or disposal as preparers, appliers, or owners/operators. TWTDS includes all sewage sludge generators and facilities, such as blenders, that change the quality of sewage sludge.

EPA recognizes that implementation of Part 503 requirements is a source of confusion for permit writers and permittees who might already have NPDES permits with special conditions addressing sewage sludge requirements. EPA has provided several guidance documents to help clarify NPDES permitting expectations, and explain the requirements of Part 503:

- *Part 503 Implementation Guidance*[15] <www.epa.gov/npdes/pubs/owm0237.pdf>.
- *Land Application of Sewage Sludge—A Guide for Land Appliers on the Requirements of the Federal Standards for the Use or Disposal of Sewage Sludge Management in 40 CFR Part 503*[16] <www.epa.gov/npdes/pubs/sludge.pdf>.
- *Surface Disposal of Sewage Sludge—A Guide for Owners/Operators of Surface Disposal Facilities on the Monitoring, Recordkeeping, and Reporting Requirements of the Federal Standards for the Use or Disposal of Sewage Sludge in 40 CFR Part 503*[17] <No Link–see the endnote for ordering instructions>.
- *Preparing Sewage Sludge for Land Application or Surface Disposal—A Guide for Preparers of Sewage Sludge on the Monitoring, Record Keeping, and Reporting Requirements of the Federal Standards for the Use or Disposal of Sewage Sludge in 40 CFR Part 503*[18] <No Link–see the endnote for ordering instructions>.
- *Domestic Septage Regulatory Guidance, A Guide to the EPA 503 Rule*[19] <www.epa.gov/npdes/pubs/owm0026.pdf>.
- *Control of Pathogens and Vector Attraction in Sewage Sludge*[20] <www.epa.gov/nrmrl/pubs/625r92013/625R92013.pdf>.

The permit writer should refer to the *Part 503 Implementation Guidance* and EPA Region and state guidelines or policies for instructions on how to implement the applicable Part 503 standards into the permit. The permit writer will need to determine the type of sewage sludge use or disposal practice(s) used by the discharger and apply the appropriate Part 503 standards. In general, conditions will need to be established to address the following:

- Pollutant concentrations or loading rates.
- Operational standards (such as pathogen and vector attraction reduction requirements for land application and surface disposal and total hydrocarbons (THC) concentrations for incinerators).
- Management practices (e.g., siting restrictions, design requirements, operating practices).
- Monitoring requirements (e.g., pollutants to be monitored, sampling locations, frequency, and sample collection and analytical methods).

- Recordkeeping requirements.
- Reporting requirements (e.g., contents of reports and frequency or due dates for submission of reports).
- General requirements (e.g., specific notification requirements before land application, submission of closure and post closure plan for surface disposal sites).

In addition to any specific applicable Part 503 standards, three boilerplate conditions must be written in the NPDES permit where applicable. These consist of the following:

- Text requiring the POTW/TWTDS to comply with all existing requirements for sewage sludge use and disposal, including the Part 503 standards [see § 122.44(b)(2)].
- A reopener clause, which authorizes reopening a permit to include technical standards if the technical standards are more stringent or more comprehensive than the conditions in the permit [see § 122.44(c)].
- A notification provision requiring the permittee to give notice to the permitting authority when a significant change in the sewage sludge use or disposal practice occurs (or is planned) [see standard conditions in § 122.41(l)(1)(iii)].

If permit conditions based on existing regulations are insufficient to protect public health and the environment from adverse effects that could occur from toxic pollutants in sewage sludge, permit conditions should be developed on a case-by-case basis using best professional judgment (BPJ) to fulfill the statutory requirement. The *Part 503 Implementation Guidance* contains information to assist permit writers in developing effluent limitations and management practice requirements on a case-by-case basis to protect public health and the environment from adverse effects that could occur from toxic pollutants in sewage sludge. For more information on biosolids, see section 2.3.1.3 of this manual and the Biosolids Website <www.epa.gov/owm/mtb/biosolids/index.htm>

9.2.3 Combined Sewer Overflows (CSOs)

Combined sewer systems were designed and built in the 19th and early 20th centuries to collect sanitary and industrial wastewater and stormwater runoff. During dry weather, combined sewers carry sanitary wastes and industrial wastewater to a treatment plant. In periods of heavy rainfall, however, stormwater is combined with untreated wastewater, which can overflow and discharge directly to a waterbody without being treated. These overflows are called combined sewer overflows (CSOs).

EPA published a CSO Control Policy in 59 FR 18688, April 19, 1994. That policy represents a comprehensive national strategy to ensure that municipalities, permitting authorities, water quality standards authorities, and the public engage in a comprehensive and coordinated planning effort to achieve cost-effective CSO controls that ultimately meet appropriate health and environmental objectives.

The CSO Control Policy includes expectations for NPDES permitting authorities. In general, EPA envisioned a phased permit approach, including initial requirements to implement Nine Minimum CSO Controls (NMC) and develop a Long-Term CSO Control Plan (LTCP), followed by requirements to implement the controls in the approved LTCP. The Wet Weather Water Quality Act of 2000 amended the CWA to add section 402(q), which required that CSO permits be issued in conformance with the CSO Control Policy.

CSOs are point source discharges subject to both the technology-based requirements of the CWA and applicable state water quality standards. Under the CWA, CSOs must comply with Best Available Technology Economically Achievable (BAT) for nonconventional and toxic pollutants and Best Conventional Technology (BCT) for conventional pollutants. However, there are no promulgated BAT or BCT limitations in effluent guidelines for CSOs. As a result, permit writers must use BPJ in developing technology-based permit requirements for controlling CSOs. Permit conditions also must achieve compliance with applicable water quality standards.

The 1994 CSO Control Policy contains the recommended approach for developing and issuing NPDES permits to control CSOs. In addition, EPA has developed the following CSO guidance documents to help permit writers and permittees implement the CSO Control Policy:

- *Combined Sewer Overflows–Guidance for Long-Term Control Plan*[21] <www.epa.gov/npdes/pubs/owm0272.pdf>.
- *Combined Sewer Overflows–Guidance for Nine Minimum Controls*[22] <www.epa.gov/npdes/pubs/owm0030.pdf>.
- *Combined Sewer Overflows–Guidance for Screening and Ranking*[23] <www.epa.gov/npdes/cso>.
- *Combined Sewer Overflows–Guidance for Monitoring and Modeling*[24] <www.epa.gov/npdes/pubs/sewer.pdf>.
- *Combined Sewer Overflows–Guidance for Financial Capability Assessment and Schedule Development*[25] <www.epa.gov/npdes/pubs/csofc.pdf>.
- *Combined Sewer Overflows–Guidance for Funding Options*[26] <www.epa.gov/npdes/pubs/owm0249.pdf>.
- *Combined Sewer Overflows–Guidance for Permit Writers*[27] <www.epa.gov/npdes/cso>.
- *Combined Sewer Overflows–Guidance: Coordinating Combined Sewer Overflow Long-Term Planning with Water Quality Standards Reviews*[28] <www.epa.gov/npdes/pubs/wqs_guide_final.pdf>.

Combined Sewer Overflows–Guidance for Permit Writers[24] contains guidance and example permit language that permit writers can use. Controlling CSOs typically requires substantial long-term planning, construction, financing and continuous reassessment; therefore, the implementation of CSO controls will probably occur over several permit cycles. The guidance explains a phased permitting approach to CSOs. Exhibit 9-2 depicts this phased permitting approach and the types of permit conditions that should be developed for each phase.

Exhibit 9-2 Categories of CSO permitting conditions

NPDES permit	Phase I	Phase II	Post phase II
A. Technology-based	• NMC, at a minimum	• NMC, at a minimum	• NMC, at a minimum
B. Water Quality-based	• Narrative	• Narrative + performance-based standards	• Narrative + performance-based standards + numeric WQBELs (as appropriate)
C. Monitoring	• Characterization, monitoring, and modeling of CSS	• Monitoring to evaluate water quality impacts • Monitoring to determine effectiveness of CSO controls	• Post-construction compliance monitoring
D. Reporting	• Documentation of NMC implementation • Interim LTCP deliverables	• Implementation of CSO controls (both NMC and long-term controls)	• Report results of post-construction compliance monitoring
E. Special conditions	• Prohibition of dry weather overflows (DWO) • Development of LTCP	• Prohibition of DWO • Implementation of LTCP • Reopener clause for water quality standards violations • Sensitive area reassessment	• Prohibition of DWO • Reopener clause for water quality standards violations

Depending on the permittee's situation, a permit may contain both Phase I and Phase II elements. Phase I permits require demonstration of implementation of the NMC, shown in Exhibit 9-3.

Exhibit 9-3 Nine minimum CSO controls

1. Proper operation and regular maintenance programs for the sewer system and the CSOs
2. Maximum use of the collection system for storage
3. Review and modification of pretreatment requirements to ensure that CSO impacts are minimized
4. Maximization of flow to the POTW for treatment
5. Prohibition of CSOs during dry weather
6. Control of solid and floatable materials in CSOs
7. Establishment of pollution prevention programs
8. Public notification to ensure that the public receives adequate notification of CSO occurrences and CSO impacts
9. Monitoring to effectively characterize CSO impacts and the efficacy of CSO controls

In the Phase I permit issued/modified to reflect the CSO Control Policy, the NPDES authority should at least require permittees to

- Immediately implement BAT/BCT, which at a minimum includes the NMC, as determined on a BPJ basis by the permitting authority.
- Develop and submit a report documenting the implementation of the NMC within 2 years of permit issuance/modification.

- Comply with applicable water quality standards, no later than the date allowed under the state's water quality standards expressed in the form of a narrative limitation.
- Develop and submit, consistent with the CSO Control Policy and based on a schedule in an appropriate enforceable mechanism, an LTCP, as soon as practicable, but generally within 2 years after the effective date of the permit issuance/modification. Permitting authorities may establish a longer timetable for completion of the long-term CSO control plan on a case-by-case basis to account for site-specific factors that could influence the complexity of the planning process. Exhibit 9-4 shows the minimum elements of the LTCP.

Exhibit 9-4 Elements of the long-term CSO control plan

1. Characterization, monitoring, and modeling of the combined sewer system
2. Public participation
3. Consideration of sensitive areas
4. Evaluation of alternatives
5. Cost/performance considerations
6. Operational plan
7. Maximizing treatment at the existing POTW treatment plant
8. Implementation schedule
9. Post-construction compliance monitoring program

Phase II permits require the implementation of an LTCP. The Phase II permit should contain the following:

- Requirements to implement the technology-based controls including the NMC determined on a BPJ basis.
- Narrative requirements that ensure that the selected CSO controls are implemented, operated and maintained as described in the LTCP.
- Water quality-based effluent limits under §§ 122.44(d)(1) and 122.44(k), requiring, at a minimum, compliance with, no later than the date allowed under the state's water quality standards, the numeric performance standards for the selected CSO controls, based on average design conditions specifying at least one of the following:
  - A maximum number of overflow events per year for specified design conditions consistent with II.C.4.a.i of the CSO Control Policy.
  - A minimum percentage capture of combined sewage by volume for treatment under specified design conditions consistent with II.C.4.a.ii of the CSO Control Policy.
  - A minimum removal of the mass of pollutants discharged for specified design conditions consistent with II.C.4.a.iii of CSO Control Policy.
  - Performance standards and requirements that are consistent with II.C.4.b of the CSO Control Policy.
- A requirement to implement, with an established schedule, the approved post-construction water quality assessment program including requirements to monitor and collect sufficient information to demonstrate compliance with water quality standards and protection of designated uses as well as to determine the effectiveness of CSO controls.

- A requirement to reassess overflows to sensitive areas in those cases where elimination or relocation of the overflow is not physically possible and economically achievable.
- Conditions establishing requirements for maximizing the treatment of wet-weather flows at the POTW, as appropriate, consistent with section II.C.7. of the CSO Policy.
- A reopener clause authorizing the NPDES authority to reopen and modify the permit upon determination that the CSO controls fail to meet water quality standards or protect designated uses.

Reviewing the permittee's LTCP and consultations with other staff involved in the CSO control process and the permittee are important steps in the process of determining the appropriate Phase II permit conditions. Water quality-based controls in Phase II generally are expressed as narrative requirements and performance standards for the combined sewer system. Finally, post Phase II permit conditions would address continued implementation of the NMC, long-term CSO controls, and post-construction compliance monitoring. There may also be numeric WQBELs when there are sufficient data to support their development.

LTCP implementation schedules were expected to include project milestones and a financing plan for design and construction of necessary controls as soon as practicable. The CSO Control Policy expected permitting authorities to undertake the following:

- Review and revise, as appropriate, state CSO permitting strategies developed in response to the National CSO Control Strategy.
- Develop and issue permits requiring CSO communities to immediately implement the NMC and document their implementation and develop and implement an LTCP.
- Promote coordination among the CSO community, the water quality standards authority, and the general public through LTCP development and implementation.
- Evaluate water pollution control needs on a watershed basis and coordinate CSO control with the control of other point and nonpoint sources of pollution.
- Recognize that it might be difficult for some small communities to meet all the formal elements of LTCP development, and that compliance with the NMC and a reduced scope LTCP might be sufficient.
- Consider sensitive areas, use impairment, and a CSO community's financial capability in the review and approval of implementation schedules.

Communities must develop and implement LTCPs to meet water quality standards, including the designated uses and criteria to protect those uses for waterbodies that receive CSO discharges. The CSO Control Policy recognized that substantial coordination and agreement among the permitting authority, the water quality standards authority, the public, and the CSO community would be required to accomplish this objective. The CSO Control Policy also recognized that the development of the LTCP should be coordinated with the review and appropriate revision of water quality standards and their implementation procedures.

In developing permit requirements to meet technology-based requirements and applicable state water quality standards, the permit writer, in conjunction with staff involved in water quality standards and the permittee, should identify the appropriate site-specific considerations that will determine the CSO conditions to be established in the permit. EPA believes that the following information will be particularly relevant in developing the appropriate conditions:

- CSO Discharge
  - Flow, frequency, and duration of the CSO discharge.
  - Available effluent characterization data on the CSO discharge.
  - Available information and data on the impacts of the CSO discharge(s) (e.g., CWA section 305(b) reports, ambient survey data, fish kills, CWA section 303(d) lists of impaired waters).
  - Compliance history of the CSO owner, including performance and reliability of any existing CSO controls.
  - Current NPDES permit and NPDES permit application.
  - Facility planning information from the permittee that addresses CSOs.
- Technologies
  - Performance data (either from the manufacturer or from other applications) for various CSO technologies that may be employed, including equipment efficiency and reliability.
  - Cost information associated with the installation, operation and maintenance of CSO technologies.
  - Reference materials on various types of CSO.

For more information on CSOs, see section 2.3.1.4 of this manual and the Combined Sewer Overflows Website <www.epa.gov/npdes/cso>.

9.2.4 Sanitary Sewer Overflows (SSOs)

EPA's *Report to Congress on the Impacts and Control of CSOs and SSOs*[29] <www.epa.gov/npdes/csossoreport2004> shows that NPDES permit requirements establishing clear reporting, recordkeeping and third party notification of overflows from municipal sewage collection systems, as well as clear requirements to properly operate and maintain the collection system, are critical to effective program implementation. NPDES authorities should be improving NPDES permit requirements for SSOs and sanitary sewer collection systems, which could lead to improved performance of municipal sanitary sewer collection systems and improved public notice for SSO events.

The NPDES regulations provide standard conditions that are to be in NPDES permits for POTWs as discussed in Chapter 10 of this manual. Standard conditions in a permit for a POTW apply to portions of the collection system for which the permittee has ownership or has operational control. When reissued, permits for POTW discharges should clarify how key standard permit conditions apply to SSOs and sanitary sewer collection systems. On August 20, 2007, EPA circulated a draft fact sheet, NPDES Permit Requirements for Municipal Sanitary Sewer Collection Systems and SSOs <www.epa.gov/npdes/pubs/sso_fact_sheet_model_permit_cond.pdf>, which explains the ways NPDES permitting authorities should be improving implementation of NPDES permit requirements to address SSOs and sanitary sewer collection systems.

The draft fact sheet indicates that clarifications should address the particular application of standard permit conditions to SSOs and municipal sanitary sewer collection systems as discussed below.

- **Immediate reporting.** Permits should clarify that the permittee is required to notify the NPDES authority of an overflow that could endanger health or the environment from portions of the collection system over which the permittee has ownership or operational control as soon as practicable but within 24 hours of the time the permittee becomes aware of the overflow. [See § 122.41(l)(6)].
- **Written reports**. Permits should clarify that the permittee is required to provide the NPDES authority a written report within 5 days of the time it became aware of any overflow that is subject to the immediate reporting provision. [See § 122.41(l)(6)(i).] In addition, permits should clarify that any overflow that is not immediately reported as indicated above, should be reported in the discharge monitoring report. [See § 122.41(l)(7)].
- **Third party notice.** Permits should establish a process for requiring the permittee or the NPDES authority to notify specified third parties of overflows that could endanger health because of a likelihood of human exposure; or unanticipated bypass and upset that exceeds any effluent limitation in the permit or that could endanger health because of a likelihood of human exposure. Permits should clarify that the permittee is required to develop, in consultation with appropriate authorities at the local, county, or state level (or any combination), a plan that describes how, under various overflow (and unanticipated bypass and upset) scenarios, the public, and other entities, would be notified of overflows that may endanger health. The plan should identify all overflows that would be reported, to whom they should be reported, the specific information that would be reported, a description of lines of communication, and the identities of responsible officials. [See § 122.41(l)(6)].
- **Recordkeeping.** Permits should clarify that the permittee is required to keep records of overflows. Clarified permit language for recordkeeping should require the permittee to retain the reports submitted to the NPDES authority and other appropriate reports that could include work orders associated with investigation of system problems related to an overflow, that describes the steps taken or planned to reduce, eliminate, and prevent reoccurrence of the overflow. [See § 122.41(j)].
- **Capacity, management, operation and maintenance programs.** Permits should clarify requirements for proper operation and maintenance of the collection system. [See §§ 122.41(d) and 122.41(e)]. This may include requiring the development and implementation of capacity, management, operation and maintenance (CMOM) programs. EPA's Region 4 has developed materials and guidance that can help a municipality with its CMOM program on the Management, Operation and Maintenance (MOM) Programs Project Website <www.epa.gov/region4/water/wpeb/momproject/>. The CMOM program may use a process for self-assessment and information management techniques for ongoing program improvement and may develop and implement emergency response procedures to overflows. In addition, the CMOM permit condition may specify appropriate documentation requirements, including the following:
  - CMOM program summary. Permittees may be required to develop a written summary of their CMOM programs, which would be available to the NPDES authority and public on request. The program summary would give an overview of the management program and summarize major implementation activities.

- Program audit report. Permittees may be required to conduct comprehensive audits of their programs during the permit cycle, and submit a copy of the audit report to the NPDES authority with the application for permit renewal. EPA's Sanitary Sewer Overflow Toolbox Website <www.epa.gov/npdes/sso/ssotoolbox> provides information on CMOM.
- System evaluation and capacity assurance plan. Capacity assurance refers to a process to identify, characterize and address hydraulic deficiencies in a sanitary sewer collection system. The permit may require the permittee to implement a program to assess the current capacity of the collection system and treatment facilities that they own or over which they have operational control to ensure that discharges from unauthorized locations do not occur. Where peak flow conditions contribute to an SSO discharge or to noncompliance at a treatment plant, the permittee may be required to prepare and implement a system evaluation and capacity assurance plan. In some instances, the permittee may already be under an enforceable obligation and schedule, in which case this permit provision would be redundant and, thus, unnecessary.

Section 2.3.1.5 of this manual and EPA's Sanitary Sewer Overflows Website <www.epa.gov/npdes/sso> provide more information on SSOs.

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CHAPTER 10. Standard Conditions of NPDES Permits

This chapter describes standard conditions, sometimes called *boilerplate* conditions, that must be incorporated in National Pollutant Discharge Elimination System (NPDES) permits. Standard conditions, specified in Title 40 of the *Code of Federal Regulations* (CFR) 122.41 and 122.42, play an important supporting role to effluent limitations, monitoring and reporting requirements, and special conditions because they delineate various legal, administrative, and procedural requirements of the permit. Standard conditions cover various topics, including definitions, testing procedures, records retention, notification requirements, penalties for noncompliance, and other permittee responsibilities. The conditions provided in § 122.41 apply to all types and categories of NPDES permits and must be included in all permits (see § 123.25 for applicability to state NPDES permits). The conditions provided in § 122.42 apply only to certain categories of NPDES facilities. Any permit issued to a facility in one of the categories listed in § 122.42 must contain the additional conditions, as applicable.

The use of standard conditions helps ensure uniformity and consistency of all NPDES permits issued by authorized states or the U.S. Environmental Protection Agency (EPA) Regional Offices. Permit writers need to be aware of the contents of the standard conditions because it might be necessary to explain portions of the conditions to a discharger. The permit writer should keep abreast of any changes in EPA's standard conditions set out in §§ 122.41 and 122.42. According to § 122.41, standard conditions may be incorporated into a permit either expressly (verbatim from the regulations) or by reference to the regulations. It generally is preferable for permit writers to attach the standard conditions expressly because permittees might not have easy access to the regulations. Some states have developed an attachment for NPDES permits that includes the federal standard conditions.

10.1 Types of Standard Conditions

A brief summary of the § 122.41 standard conditions that must be included in all types of NPDES permits follows:

- **Duty to Comply** § 122.41(a): The permittee must comply with all conditions of the permit. Noncompliance is a violation of the Clean Water Act (CWA) and is grounds for enforcement action, changes to or termination of the permit, or denial of a permit renewal application.
- **Duty to Reapply** § 122.41(b): A permittee wishing to continue permitted activities after the permit expiration date must reapply for and obtain a new permit.
- **Need to Halt or Reduce Activity not a Defense** § 122.41(c): The permittee may not use as a defense in an enforcement action the reasoning that halting or reducing the permitted activity is the only way to maintain compliance.
- **Duty to Mitigate** § 122.41(d): The permittee is required to take all reasonable steps to prevent any discharge or sludge use or disposal in violation of the permit that has a reasonable likelihood of adversely affecting human health or the environment.
- **Proper Operation and Maintenance** § 122.41(e): The permittee must properly operate and maintain all equipment and treatment systems used for compliance with the terms of the permit.

The permittee must provide appropriate laboratory controls and quality assurance procedures. Operation of backup systems is required only when needed to ensure compliance.

- **Permit Actions** § 122.41(f): The permit may be modified, revoked and reissued, or terminated for cause. A request by the permittee for a permit modification, revocation or reissuance, termination, or a notification of planned changes or anticipated noncompliance does not suspend the permittee's obligation to comply with all permit conditions.
- **Property Rights** § 122.41(g): The permit does not convey any property rights of any sort, or any exclusive privilege.
- **Duty to Provide Information** § 122.41(h): The permittee must furnish, within a reasonable time, any information needed to determine compliance with the permit or to determine whether there is cause to modify, revoke and reissue, or terminate the permit. The permittee also must furnish, on request, copies of records that must be kept as required by the permit.
- **Inspection and Entry** § 122.41(i): The permittee must, upon presentation of valid credentials by the Director or his or her representative, allow entry into the premises where the regulated activity or records are present. The Director must have access to and be able to make copies of any required records; inspect facilities, practices, operations, and equipment; and sample or monitor at reasonable times.
- **Monitoring and Records** § 122.41(j): Samples must be representative of the monitored activity. The permittee must retain records for 3 years (5 years for sewage sludge activities) subject to extension by the Director. Monitoring records must identify the sampling dates and personnel, the sample location and time, and the analytical techniques used and corresponding results. Wastewater and sludge measurements must be conducted in accordance with Parts 136 or 503 or other specified procedures. Falsification of results is a violation under the CWA.
- **Signatory Requirement** § 122.41(k): The permittee must sign and certify applications, reports, or information submitted to the Director in accordance with the requirements in § 122.22. Knowingly making false statements, representations, or certifications is punishable by fines or imprisonment.
- **Planned Changes** § 122.41(l)(1): Notice must be given to the Director as soon as possible of planned physical alterations or additions to the facility (or both) that could meet the criteria for determining whether the facility is a new source under § 122.29(b); result in changes in the nature or quantity of pollutants discharged; or significantly change sludge use or disposal practices.
- **Anticipated Noncompliance** § 122.41(l)(2): The permittee must give advance notice of any planned changes that could result in noncompliance.
- **Permit Transfers** § 122.41(l)(3): The permit is not transferable except after written notice to the Director. The Director may require modification or revocation and reissuance, as necessary.
- **Monitoring Reports** § 122.41(l)(4): Monitoring results must be reported at the frequency specified in the permit and be reported on a discharge monitoring report (DMR) or forms provided or specified by the Director for reporting results of monitoring sludge use or disposal practices. Monitoring for any pollutant that occurs more frequently than is required by the permit and uses approved test procedures or test procedures specified in the permit must also be reported. Calculations requiring averaging must use an arithmetic mean unless otherwise specified in the permit.

- **Compliance Schedules** § 122.41(l)(5): Reports of compliance or noncompliance or any progress report must be submitted no later than 14 days following the interim or final compliance date specified in a compliance schedule.
- **Twenty-Four Hour Reporting** § 122.41(l)(6): The permittee must orally report any noncompliance that might endanger human health or the environment within 24 hours after becoming aware of the circumstances. Within 5 days of becoming aware of the circumstances, the permittee must provide a written submission including a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times; the anticipated time the noncompliance is expected to continue (if not already corrected); and steps taken to reduce, eliminate, or prevent reoccurrence unless the Director waives the requirement. In addition, 24-hour reporting is required for an unanticipated bypass exceeding effluent limits; an upset exceeding effluent limits; and a violation of a maximum daily effluent limitation for pollutants listed in the permit for 24-hour reporting.
- **Other Noncompliance** § 122.41(l)(7): The permittee must report all instances of noncompliance not reported under other specific reporting requirements at the time monitoring reports are submitted.
- **Other Information** § 122.41(l)(8): If the permittee becomes aware that it failed to submit any relevant facts in its application, or submitted incorrect information in its application or other reports, it must promptly submit such facts or information.
- **Bypass** § 122.41(m): The intentional diversion of wastestreams from any portion of a treatment facility. Bypass is prohibited unless the bypass does not cause the effluent to exceed limits and is for essential maintenance to assure efficient operation (no notice or 24-hour reporting is required in such a case). All other bypasses are prohibited, and the Director of the NPDES program may take enforcement action against a permittee for a bypass, unless the bypass was unavoidable to prevent loss of life, personal injury, or severe property damage, there was no feasible alternative, and the proper notification was submitted.
- **Upset** § 122.41(n): An upset (i.e., an exceptional incident in which there is unintentional and temporary noncompliance with technology-based effluent limits because of factors beyond the permittee's control) can be used as an affirmative defense in actions brought against the permittee for noncompliance. An upset does not include noncompliance to the extent caused by operational error, improperly designed or inadequate treatment facilities, lack of preventative maintenance, or careless or improper operation. The permittee (who has the burden of proof to demonstrate that an upset has occurred) must have operational logs or other evidence that shows
  - When the upset occurred and its causes.
  - The facility was being operated properly.
  - Proper notification was made.
  - Remedial measures were taken.

10.2 Other Standard Conditions

In addition to standard conditions specified in § 122.41 that are applicable to all permittees, § 122.42 includes additional conditions applicable to certain categories of NPDES permits. Below are summaries of these additional standard conditions applicable to various types of NPDES permits.

Non-Municipal (Industrial) Permits: Additional standard conditions applicable to non-municipal permits are found in § 122.42(a) and specify that the permittee must notify the Director as soon as it knows or has reason to believe that the discharge has or will exceed certain notification levels specified in §§ 122.42(a)(1) and (2). In addition, § 122.44(f) allows the Director to establish alternate notification levels upon petition by the permittee or by his or her own initiative.

Publicly Owned Treatment Work (POTW) Permits: Additional standard conditions applicable to POTWs are found in § 122.42(b). The standard conditions specify that the permittee must provide adequate notice to the Director of the new introduction of certain pollutants into the POTW from an indirect discharger and of substantial changes in the volume or character of pollutants introduced into the POTW. That notice must include information on the quality and quantity of effluent introduced to the POTW and information on the impact to the quality and quantity of the POTW's effluent.

Municipal Separate Storm Sewer Systems: Additional standard conditions applicable to large, medium or EPA-designated municipal separate storm sewer systems are in § 122.42(c). Those standard conditions require that the permittee submit an annual report addressing the status, and changes to, the stormwater management program, water quality data and other information specified in §§ 122.42(c)(1)-(6).

Individual Stormwater Permits: Initial permits for discharges composed entirely of stormwater and permitted under § 122.26(e)(7) must require compliance no later than 3 years after permit issuance.

Concentrated Animal Feeding Operations (CAFO) Permits: The regulations at § 122.42(e) specify conditions that must be included in all permits for CAFOs.

CHAPTER 11. NPDES Permit Administration

Previous discussions in this manual focused on the process of developing National Pollutant Discharge Elimination System (NPDES) permit conditions and effluent limitations. This chapter describes the administrative process associated with the issuance of an NPDES permit including a discussion of the other federal laws that might affect the development or issuance of NPDES permits.

11.1 Other Federal Laws Applicable to NPDES Permits

This section addresses other federal laws, besides the Clean Water Act (CWA), that permit writers should consider when drafting an NPDES permit. The requirements imposed under these statutes only apply to federal actions (i.e., U.S. Environmental Protection Agency [EPA] issuance of permits). Permits issued by states authorized to administer the NPDES program are not subject to the requirements of these statutes. However, many states may have enacted state legislation that is modeled on federal law and, therefore, it is prudent to review state law in these areas before preparing an NPDES permit.

The following sections briefly discuss the other federal laws and contain links to other websites for more information. Because these laws are implemented by other federal agencies, many of the links provided below are to websites outside EPA, and EPA is not responsible for the information provided on those websites. The NPDES regulations at Title 40 of the *Code of Federal Regulations* (CFR) 122.49 also include a discussion of how some of the laws relate to the federal NPDES program. Exhibit 11-1 presents the other federal laws that are applicable to NPDES permits and includes the legislative citations from the *United States Code* (U.S.C.) and the implementing regulations in the CFR.

Exhibit 11-1 Other federal laws applicable to NPDES permits

Federal law	Year	Federal agency	Legislative citations	Implementing regulations
Endangered Species Act (ESA)	1973	FWS, NMFS	16 U.S.C. 1531 et seq.	50 CFR Part 402
National Environmental Policy Act (NEPA)	1969	CEQ	42 U.S.C. 4321 et seq.	40 CFR Part 6
National Historic Preservation Act (NHPA)	1992	ACHP	16 U.S.C. 470 et seq.	36 CFR Part 800
Coastal Zone Management Act (CZMA)	1972	NOAA	16 U.S.C. 1451 et seq.	15 CFR Part 930
Wild and Scenic Rivers Act	1968	Various	16 U.S.C. 1271 et seq.	36 CFR Part 297
Fish and Wildlife Coordination Act (FWCA)	1934	FWS	16 U.S.C. 661 et seq.	--
Essential Fish Habitat Provisions (EFH)	1996	NOAA	16 U.S.C. 1855(b)(2)	50 CFR Part 600

11.1.1 *Endangered Species Act*

This section discusses procedures intended to protect endangered species that apply only to permits issued by EPA. The 1973 Endangered Species Act (ESA) <www.fws.gov/endangered/esa-library/pdf/ESAall.pdf>, 16 U.S.C. 1531 *et seq.*, was enacted to protect and conserve endangered and threatened species and critical habitat. The Fish and Wildlife Service (FWS) <www.fws.gov/endangered/> of the Department of the Interior and the National Marine Fisheries Service (NMFS) <www.nmfs.noaa.gov/pr/> of the National

Oceanic and Atmospheric Administration (NOAA) within the Department of Commerce (collectively *the Services*) share primary responsibility for administration of the ESA.

ESA section 7 requires that federal agencies consult with the Services to ensure that any action authorized, funded, or carried out by the agencies that could affect a listed species or critical habitat and to ensure that their actions are not likely to jeopardize the continued existence of any endangered species or threatened species, or result in the destruction or adverse modification of critical habitat of such species. The ESA section 7 regulations are in 50 CFR Part 402. FWS/NMFS published the ESA Section 7 Consultation Handbook <www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF> to address the major consultation processes pursuant to ESA section 7.

Consultation may be either informal or formal. An informal consultation determines if an action is or is not likely to adversely affect the species. A formal consultation is required if the findings from the informal consultation show that there is a likelihood for adverse impacts and evaluates whether the proposed action is likely to jeopardize the continued existence of the species. It is EPA's responsibility to ensure that consultation occurs; however, a nonfederal representative (i.e., the discharger) may be designated for the informal consultation.

On February 22, 2001, EPA entered into a National Memorandum of Agreement (*National MOA*) <www.epa.gov/fedrgstr/EPA-SPECIES/2001/February/Day-22/e2170.pdf> with the Services that outlines the process for consulting on federally issued NPDES permits. In addition, because consultation is not required for state-issued permits, the National MOA includes a process for coordinating with the Services on state-issued permits. EPA permit writers should review the ESA consultation regulations and the ESA section 7 Consultation Handbook, and coordinate with the Region's ESA coordinator (if such a position has been established in a Region) and the Service office(s) nearest to the site.

11.1.2 National Environmental Policy Act

This section discusses environmental review procedures that apply only when EPA issues permits to *new sources* (dischargers subject to New Source Performance Standards). The 1969 National Environmental Policy Act (NEPA) <www.epa.gov/compliance/basics/nepa.html>, 42 U.S.C. 4321 *et seq*., requires that agencies perform environmental impact reviews and prepare an *Environmental Impact Statement* (EIS) for major federal actions significantly affecting the quality of the human environment [see section 102(2)(C)]. The President's Council on Environmental Quality (CEQ) <www.whitehouse.gov/ceq/> coordinates federal environmental efforts to comply with NEPA.

Within EPA, the Office of Federal Activities under the Office of Enforcement and Compliance Assurance (OECA) is responsible for EPA's implementation of NEPA <www.epa.gov/compliance/nepa/>. EPA's NEPA regulations are at 40 CFR Part 6. With respect to NPDES permits, CWA section 511 establishes that only EPA-issued permits to new sources are subject to NEPA's environmental review procedures before permit issuance. States may have their own state law versions of NEPA. Federal permit writers should coordinate efforts with the Office of Federal Activities and document all NEPA activities in the permit file and fact sheet.

11.1.3 National Historic Preservation Act Amendments

Section 106 of the 1992 National Historic Preservation Act (NHPA) <www.achp.gov/nhpa.html>, 16 U.S.C. 470 *et seq.*, as amended, and implementing regulations 36 CFR Part 800 require the Regional Administrator, before issuing a license (permit), to identify the area of potential effect of a permitted discharge and, if historic or cultural resources within that area would be adversely affected by the discharge, to adopt measures when feasible to mitigate potential adverse effects of the licensed activity and properties listed or eligible for listing in the National Register of Historic Places.

The Act's requirements are to be implemented in cooperation with State Historic Preservation Officers <www.achp.gov/shpo.html>, and upon notice to, and when appropriate, in consultation with the Advisory Council on Historic Preservation <www.achp.gov/>, which provides national oversight for the NHPA. A decision by the D.C. Circuit in 2003 concluded that NHPA consultation is not required for state-issued permits (*National Mining Ass'n v. Fowler*, 324 F.3d 752 (D.C. Cir. 2003) <caselaw.findlaw.com/us-dc-circuit/1169695.html>).

Federal permit writers should evaluate potential effects of NHPA and submit written documentation of the evaluation to the State Historic Preservation Office and to the permit file.

11.1.4 Coastal Zone Management Act

The 1972 Coastal Zone Management Act (CZMA) <www.coastalmanagement.noaa.gov/czm/czm_act.html>, 16 U.S.C. 1451 *et seq.*, was enacted to manage the nation's coastal zone and is implemented through a state-federal partnership. Section 307 of the CZMA (16 U.S.C. 1456 and 15 CFR Part 930) prohibits the issuance of federal NPDES permits for activities affecting land or water use in coastal zones unless the permit applicant certifies that the proposed activity complies with the state Coastal Zone Management Program and the relevant state either concurs with the applicant's certification or the state's concurrence is conclusively presumed as a result of the state's failure to concur or non-concur. *Coastal States*, according to the CZMA, include those states and territories adjacent to the Atlantic, Pacific, or Arctic oceans; the Gulf of Mexico; or one or more of the Great Lakes. Any of those states that have completed the development of its management program is required, as a condition of receipt of federal grant money under the CZMA, to adopt coastal management plans, which designate boundaries, identify areas of particular concern, and establish inventories of permitted uses and enforcement policies. Beach access, emergency planning, and erosion control also must be addressed in such plans.

The Office of Ocean and Coastal Resource Management <www.coastalmanagement.noaa.gov/>, which is part of NOAA within the Department of Commerce, oversees the CZMA. The CZMA implementing regulations are at 15 CFR Part 930. EPA and other federal agencies must coordinate their activities on coastal lands with state CZMA plans. Federal permit writers should document all activities relating to CZMA in the permit file.

11.1.5 Wild and Scenic Rivers Act

The 1968 Wild and Scenic Rivers Act (WSRA) <www.rivers.gov/publications/wsr-act.pdf>, 16 U.S.C. 1271 *et seq.*, established a National Wild and Scenic Rivers System (System) and prescribed the process by which additional rivers may be added to this System. Rivers may be added by act of Congress [WSRA section 2(a)(i)] or by the Secretary of the Interior at the initiative of a state governor [WSRA section 2(a)(ii)]. Under WSRA section 7(a), EPA is prohibited from assisting, by license or otherwise, in the construction of any water resources project that would have a direct and adverse effect on the values for which a national wild and scenic river was established. The WSRA regulations are codified at 36 CFR Part 297.

Federal permit writers should verify whether the receiving water is part of the System and document all activities related to the Act in the permit file and fact sheet. For detailed explanation of WSRA section 7, refer to Wild and Scenic Rivers Act: Section 7 <www.rivers.gov/publications/section-7.pdf>, a technical report of the Interagency Wild and Scenic Rivers Coordinating Council. Permit writers may also refer to Water Quantity and Quality as Related to the Management of Wild and Scenic Rivers <www.rivers.gov/publications/water.pdf>, a technical report of the Interagency Wild and Scenic Rivers Coordinating Council.

11.1.6 Fish and Wildlife Coordination Act

The 1934 Fish and Wildlife Coordination Act (FWCA) <www.fws.gov/habitatconservation/fwca.html>, 16 U.S.C. 661 *et seq.*, requires mitigation for the loss of wildlife habitat due to the construction of federal water resources projects. The FWCA requires designers of federal dams, reservoirs, and irrigation works to include the costs and benefits to fish and wildlife when determining the benefit/cost ratio of a project and requires that EPA and other federal agencies consult with state and federal wildlife and fisheries agencies to minimize the impacts of the activity on fish and wildlife. The FWCA specifically calls for ongoing studies by the U.S. Department of the Interior on the effects of domestic sewage and industrial wastes on fish and wildlife (16 U.S.C. 665).

No implementing regulations directly related to the FWCA and NPDES permits exist. However, the FWCA describes actions taken or compelled by the affected federal agencies. The Water Resources Development under the Fish and Wildlife Coordination Act manual <www.fws.gov/habitatconservation/fwca.pdf> provides the FWS guidance on implementing the FWCA. Federal permit writers should note any FWCA consultation activities in the permit file.

11.1.7 Essential Fish Habitat Provisions

The 1996 Essential Fish Habitat (EFH) provisions of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act or MSA) promote the protection of essential fish habitat in any federal action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken, by such agency that might adversely affect such habitat identified under the MSA [16 U.S.C. 1855(b)(2)]. The MSA requires that federal agencies, such as EPA, consult with the NMFS for any EPA-issued permits that might adversely affect essential fish habitat identified under the MSA. The regulations applicable to federal agencies' coordination and consultation under the MSA are codified at 50 CFR 600.905 through 600.930, and other EFH information can be found on the NMFS EFH Website <www.habitat.noaa.gov/protection/efh/index.html>. Federal permit writers should note any EFH determinations and consultation activities in the permit file.

11.2 Documentation for Development of the Draft Permit

EPA regulations at 40 CFR 124.2 define a draft permit as a document that indicates the Director's tentative decision to issue or deny, modify, revoke and reissue, terminate, or reissue a permit. After the permit is issued, the fact sheet and supporting documentation (administrative record) are the primary support for defending the permit in the administrative appeals process. Documenting the permit requires the permit writer to be organized and logical throughout the permit development process. Some of the content of the fact sheet and administrative record is specified by federal and state regulation, and the remainder is dictated by good project management. Permit writers should recognize the importance of

- Developing a thorough permit in a logical fashion.
- Meeting legal requirements for preparation of an administrative record, fact sheet, and statement of basis.
- Substantiating permit decisions and providing a sound basis for the derivation of permit terms, conditions, and limitations if challenges are made.
- Establishing a permanent record of the basis of the permit for use in future permit actions.

Exhibit 11-2 presents reasons for good documentation in the permit file and fact sheet.

Exhibit 11-2 Reasons for good documentation

- Streamlines the permit reissuance/ compliance monitoring process
- Establishes a permanent record of the basis for the permit
- Explains the legal and technical basis of the permit
- Provides a sound basis for future modifications and permits
- Requires the permit writer to be organized and logical throughout permit development process

Exhibits 11-3 and 11-4 provide flow diagrams of the NPDES permit administrative process. In general, the administrative process includes the following:

- Documenting all permit decisions.
- Coordinating EPA and state review of the draft (or proposed) permit.
- Providing public notice, conducting hearings (if appropriate), and responding to public comments.
- Defending the permit and modifying it (if necessary) after issuance.

Note that Exhibit 11-3 provides the general framework for the administrative process where EPA is the NPDES permitting authority and Exhibit 11-4 provides a typical framework for the administrative process where a state is the permitting authority. State requirements need not be identical to federal regulatory requirements, provided they are at least as stringent. Some authorized states have slightly different processes for developing and issuing NPDES permits. The same holds true for the appeal process. This manual presents EPA's procedure; state procedures for NPDES permit hearings and appeals vary according to state law.

Exhibit 11-3 Administrative process for EPA-issued NPDES permits

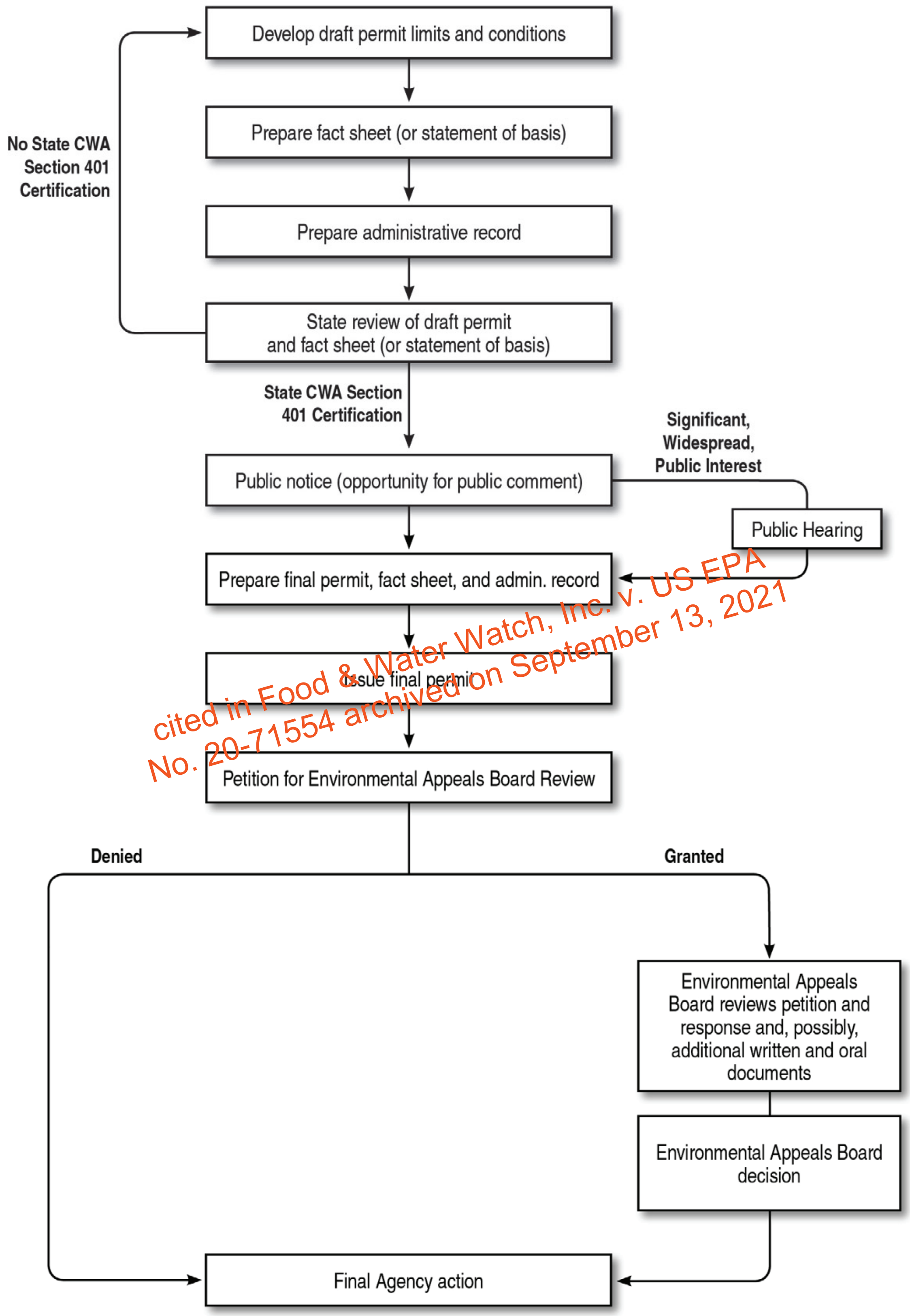
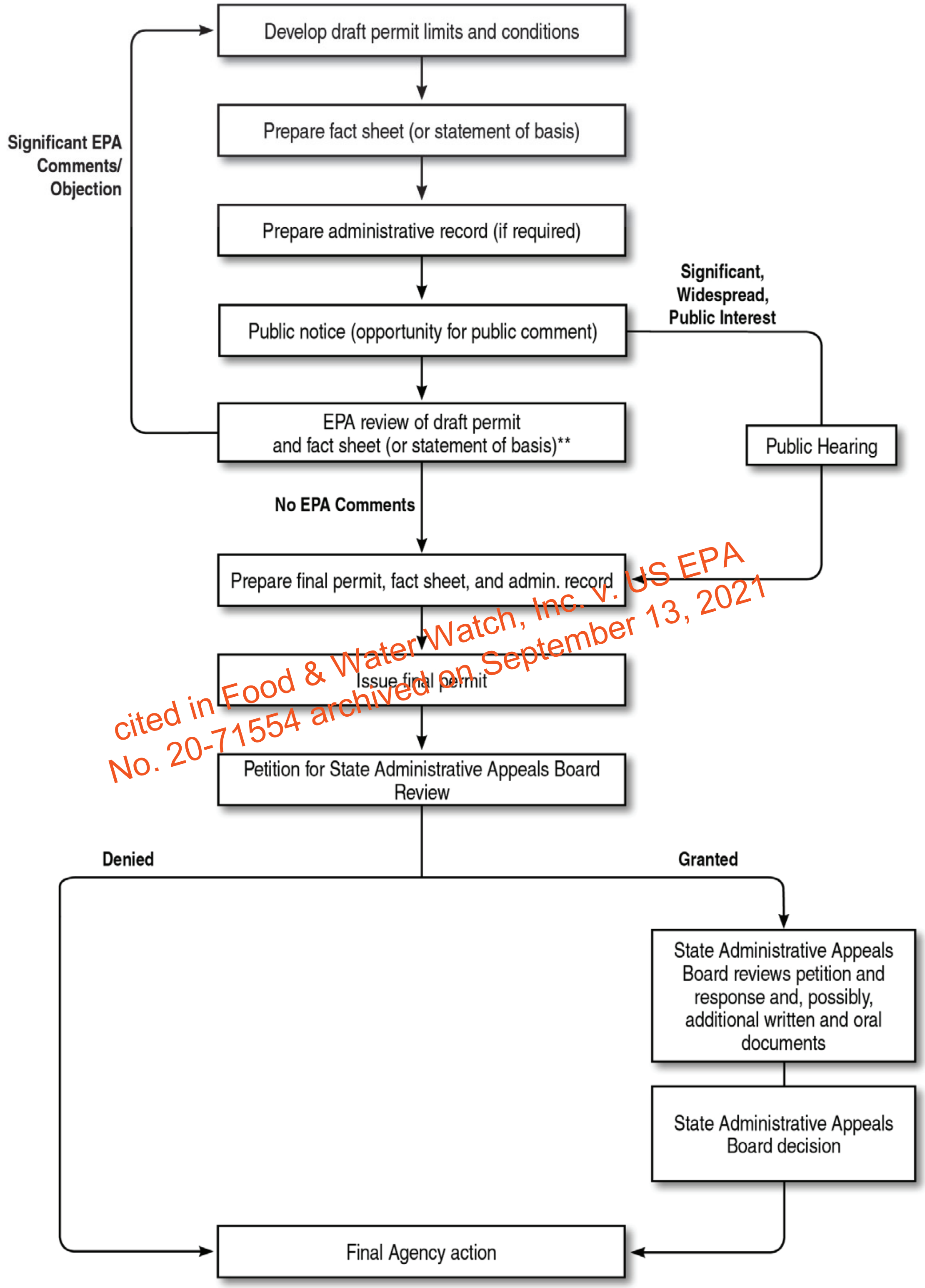


Exhibit 11-4 Typical administrative process for state-issued NPDES permits*



* State statutes and regulations govern the specific steps of the state administrative process, which may differ from the process outlined in this exhibit.
** Under State/EPA MOA, EPA may review draft or proposed permit.

11.2.1 Administrative Record

The administrative record should be considered the foundation that supports the NPDES permit. If EPA issues the permit, the contents of the administrative record are prescribed by regulation, with § 124.9 identifying the required content of the administrative record for a draft permit and § 124.18 describing the requirements for final permits. Regardless of whether a state or EPA issues the permit, all supporting materials must be made available to the public at any time and may be examined during the public comment period and any subsequent public hearing. The importance of maintaining the permit records in a neat, orderly, complete, and retrievable form cannot be over emphasized. The record allows personnel from the permitting agency to reconstruct the justification for a given permit and defend the permit during any legal proceedings regarding the permit.

The administrative record for a draft permit consists, at a minimum, of the specific documents shown in Exhibit 11-5. Materials that are readily available in the permit issuing office or published material that is generally available do not need to be physically included with the record as long as they are specifically referred to in the fact sheet or statement of basis. If EPA issues a draft permit for a new source, the administrative record should include any EISs or *Environmental Assessments* (EAs) performed in accordance with § 122.29(c).

Exhibit 11-5 Elements of the administrative records for a draft permit

- Permit application and supporting data
- Draft permit
- Statement of basis or fact sheet
- All items cited in the statement of basis or fact sheet, including calculations used to derive the permit limitations
- Meeting reports
- Correspondence with the applicant and regulatory personnel
- All other items in the supporting file
- For new sources, any EA, draft/final EIS, or other such background information, such as a Finding of No Significant Impact (only applies if EPA issues the permit)

The administrative record should include all meeting reports and correspondence with the applicant and other regulatory agency personnel, trip reports, and records of telephone conversations. All correspondence, notes, and calculations should be dated and indicate the name of the writer and all other persons involved. Because correspondence is subject to public scrutiny, references or comments that do not serve an objective purpose should be avoided. Finally, the presentation of calculations and documentation of decisions should be organized in such a way that they can be reconstructed and the logic supporting the calculation or decisions can easily be found.

11.2.2 Fact Sheets and Statements of Basis

A fact sheet is a document that briefly sets forth the principal facts and the significant factual, legal, methodological, and policy questions considered in preparing the draft permit. When the permit is in the draft stage, the fact sheet and supporting documentation serve to explain the rationale and assumptions used in deriving the limitations to the discharger, the public, and other interested parties.

The NPDES regulations at § 124.8(a) stipulate that every EPA and state-issued permit must be accompanied by a fact sheet if the permit

- Involves a major facility or activity.
- Incorporates a variance or requires an explanation under § 124.56(b) (toxic pollutants, internal waste stream, and indicator pollutants and for privately owned waste treatment facilities).
- Is an NPDES general permit.
- Is subject to widespread public interest.
- Is a Class I sludge management facility.
- Includes a sewage sludge land application plan.

A well-documented rationale for all permit decisions reduces the work necessary to reissue a permit by eliminating conjecture concerning the development of those permit conditions that are being carried forward to the next permit. That is also true if a modification is initiated during the life of the permit. The required contents of a fact sheet, as specified in §§ 124.8 and 124.56, are listed in Exhibit 11-6.

Exhibit 11-6 Required elements of a fact sheet

Required element	Regulatory citation (40 CFR)
General facility information	
• Description of the facility or activity	§ 124.8
• Sketches or a detailed description of the discharge location	§ 124.56
• Type and quantity of waste/pollutants discharged	§ 124.8
Summary rationale of permit conditions • Summary of the basis for the draft permit conditions • References to the applicable statutory or regulatory provisions • References to the administrative record	§ 124.8
Detailed rationale of permit conditions • Explanation and calculation of effluent limitations and conditions • Specific explanations of – Toxic pollutant limitations – Limitations on internal wastestreams – Limitations on indicator pollutants – Case-by-case requirements – Decisions to regulate non-publicly owned treatment works (POTWs) under a separate permit • For EPA-issued permits, the requirements of any state certification • For permits with a sewage sludge land application plan, a description of how all required elements of the land application plan are addressed in the permit	§ 124.56
• Reasons why any requested variances do not appear justified, if applicable	§ 124.8
Administrative Requirements • A description of the procedures for reaching a final decision on the draft permit, including – Public comment period beginning and ending dates – Procedures for requesting a hearing – Other procedures for public participation • Name and telephone number of the person to contact for additional information	§ 124.8

The fact sheet should include detailed discussions of the development of permit limitations for each pollutant, including the following:

- Calculations and assumptions related to production and flow.
- Type of limitations (i.e., limitations based on secondary treatment standards, effluent limitations guidelines and standards (effluent guidelines), case-by-case determinations, or water quality standards).
- Whether the effluent guidelines used were Best Practicable Control Technology Currently Available (BPT), Best Available Technology Economically Achievable (BAT), Best Conventional Pollutant Control Technology (BCT), or New Source Performance Standards (NSPS).
- The water quality standards or criteria used.
- Whether any parameters were used as indicators for other pollutants.
- Citations to appropriate wasteload allocation or total maximum daily load studies, guidance documents, other references.

Often, decisions to include certain requirements lead to a decision to exclude other requirements. It is just as important to keep a thorough record of items that were not included in the draft permit as it is to keep a record of included items. Such records might include the following:

- Why were secondary treatment standards, case-by-case determinations, or effluent guidelines used as the basis for final effluent limitations rather than water quality standards (i.e., demonstrate that the limitations checked to see that water quality standards would be attained)?
- Why was biomonitoring not included?
- Why were pollutants that were reported as present in the permit application not specifically limited in the permit?
- Why is a previously limited pollutant no longer limited in the draft permit?

Finally, the fact sheet should address the logistics of the permit issuance process, including the beginning and ending dates of the public comment period, procedures for requesting a hearing, and other means of public involvement in the final decision.

A statement of basis, as described in § 124.7, is required for EPA-issued permits that are not required to have a fact sheet. A statement of basis describes the derivation of the effluent limitations and the reasons for special conditions. However, a prudent permit writer will develop the detailed rationale required in a fact sheet for any permit that includes complex calculations or special conditions (e.g., case-by-case effluent limitations based on best professional judgment [BPJ]) even if a fact sheet is not required by regulation.

11.3 Items to Address before Issuing a Final Permit

This section describes the public participation activities that must be conducted in the permit issuance process. These include providing public notices, collecting and responding to public comments, and holding public hearings as necessary.

11.3.1 Public Notice

The public notice is the vehicle for informing all interested parties and members of the general public of the contents of a draft NPDES permit or other significant actions with respect to an NPDES permit or permit application. The basic intent of this requirement is to ensure that all interested parties have an opportunity to comment on significant actions of the permitting agency with respect to NPDES permits. The exact scope, required contents, and methods for effecting public notices are found in § 124.10. The NPDES permit-related actions for which public notice is required are shown in Exhibit 11-7.

Exhibit 11-7 Actions for which public notice is required

- Tentative denial of an NPDES permit application (not necessarily applicable to state programs)
- Preparation of a draft NPDES permit, including a proposal to terminate a permit
- Scheduling of a public hearing
- An appeal has been granted by the Environmental Appeals Board
- Major permit modifications (after permit issuance)
- New Source determinations (EPA only)

The permit writer should be particularly concerned with the first three items in Exhibit 11-7. It is important to note that no public notice is required when a request for a permit modification, revocation, reissuance, or termination is denied.

Public notice of NPDES permit-related activities should be provided using the following methods:

- For major permits, publication of a notice in daily or weekly newspaper within the area affected by the facility or activity.
- For general permits issued by EPA, publication in the FR.
- For all permits, direct mailing to various interested parties. This mailing list should include the following:
  - The applicant.
  - Any interested parties on the mailing list.
  - Any other agency that has issued or is required to issue a Resource Conservation and Recovery Act (RCRA), Underground Injection Control (UIC), Prevention of Significant Deterioration (PSD) (or other permit under the Clean Air Act), NPDES, CWA section 404, sludge management, or ocean dumping permit under the Marine Research Protection and Sanctuaries Act for the same facility or activity.
  - Federal and state agencies with jurisdiction over fish, shellfish, and wildlife resources and over coastal zone management plans, the Advisory Council on Historic Preservation, State Historic Preservation Officers, including any affected states and tribes.
  - State agencies conducting area-wide and continuing planning under CWA sections 208(b)(2), 208(b)(4) or 303(e) and the FWS, NMFS, and the U.S. Army Corps of Engineers.
  - Users identified in the permit application of a privately owned treatment work.
  - Persons on any mailing lists developed by including those who request inclusion in writing and persons solicited for *area lists* from participants in past permit proceedings in the area.
  - Any local government having jurisdiction over the locality of the facility.

A public notice must contain the information shown in Exhibit 11-8.

Exhibit 11-8 Contents of the public notice

- Name and address of the office processing the permit action
- Name and address of the permittee or applicant and, if different, of the facility or activity regulated by the permit
- A brief description of the business conducted at the facility or activity described in the permit
- Name, address, and telephone number of a contact from whom interested persons can obtain additional information
- A brief description of the comment procedures required, the time and place of any hearing to be held including procedures to request a hearing
- For EPA-issued permits, the location and availability of the administrative record and the times at which the record will be open for public inspection and a statement that all data submitted by the applicant is available as part of the administrative record
- A description of the location of each existing or proposed discharge point and the name of the receiving water and the sludge use and disposal practice(s) and the location of each sludge treatment works treating domestic sewage and use or disposal sites known at the time of permit application
- Requirements applicable to a thermal variance under CWA section 316(a)
- Requirements applicable to cooling water intake structures under CWA section 316(b)
- Any additional information considered necessary

The regulatory agency preparing the permit must provide public notice of the draft permit (including a notice of intent to deny a permit application), and it must provide at least 30 days for public comment. The draft permit is usually submitted for public notice after it has undergone internal review by the regulatory agency that is issuing the permit. State-issued permits typically undergo public notice after EPA has reviewed and commented on the draft permit. In the special case of those EPA-issued permits that require an EIS, public notice is not given until after a draft EIS is issued.

11.3.2 Public Comments

Public notice of a draft permit might elicit comments from concerned individuals or agencies. Frequently, such comments are simply requests for additional information. However, some comments are of a substantive nature and suggest modifications to the draft permit or indicate that the draft permit is inappropriate for various reasons. In such cases, commenters must submit all reasonable arguments and factual material in support of their positions and comments by the close of the public comment period, and the permitting authority must consider those comments in making final decisions. If the approach is technically correct and clearly stated in the fact sheet, it will be difficult for commenters to find fault with the permit. Commenters can always suggest alternatives, however. In addition, an interested party may also request a public hearing.

To the extent possible, it is desirable to respond to all public comments as quickly as possible. In some cases, it might be possible to diffuse a potentially controversial situation by providing further explanation of permit terms and conditions. Additionally, permit writers should also consider notifying commenters that their comments have been received and are being considered.

The permitting agency must respond to all significant comments, in accordance with § 124.17, at the time a final permit decision is reached (in the case of EPA-issued permits) or at the same time a final permit is actually issued (in the case of state-issued permits). The response should incorporate the following elements:

- Changes in any of the provisions of the draft permit and the reasons for the changes.
- Description and response to all significant comments on the draft permit or the permit application raised during the public comment period or during any hearing.

If any information is submitted during the public comment period raises substantial new questions about the draft permit, one of the following actions can occur:

- A new draft permit with a revised fact sheet or statement of basis is prepared.
- A revised statement of basis, a fact sheet, or revised fact sheet is prepared, and the comment period is reopened.
- The comment period is reopened but is limited to new findings only.

If any of those actions is taken, a new public notice, as described earlier, must be given.

For EPA-issued permits, any documents cited in the response to comments must be included in the administrative record. If new points are raised or new material is supplied during the public comment period, EPA may document its response to these new materials by adding new materials to the administrative record.

11.3.3 Public Hearings

Any interested party may request a public hearing. The request should be in writing and should state the nature of the issues proposed to be raised during the hearing. However, a request for a hearing does not automatically necessitate that a hearing be held. A public hearing should be held when there is a significant amount of interest expressed during the public comment period or when it is necessary to clarify the issues involved in the permit decision.

Thus, the decision of whether to hold a public hearing is actually a judgment call. Such decisions are usually made by someone other than the permit writer. However, the permit writer will be responsible for ensuring that all the factual information in support of the draft permit is well documented.

Public notice of a public hearing must be given at least 30 days before the public meeting. Public notice of the hearing may be given at the same time as public notice of the draft permit, and the two notices may be combined. The public notice of the hearing should contain the following information:

- Brief description of the nature and purpose of the hearing, including the applicable rules and procedures.
- Reference to the dates of any other public notices relating to the permit.
- Date, time, and place of the hearing.

Scheduling a hearing automatically extends the comment period until at least the close of the hearing [§ 124.12(c)] and the public comment period may be extended by request during the hearing. Anyone may submit written or oral comments concerning the draft permit at the hearing. A presiding officer is responsible for scheduling the hearing and maintaining orderly conduct, including setting reasonable time limitations for oral statements. Note that a transcript or recording of the hearing must be available to interested persons.

11.3.4 Environmental Justice Considerations

Environmental justice (EJ) is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. EPA has this goal for all communities and persons across U.S. It will be achieved when everyone enjoys the same degree of protection from environmental and health hazards and equal access to the decision-making process to have a healthy environment in which to live, learn, and work.

In NPDES permits, the public participation process provides opportunities to address EJ concerns by providing appropriate avenues for public participation, seeking out and facilitating involvement of those potentially affected, and including public notices in more than one language where appropriate.

11.3.5 EPA and State/Tribal Roles in Reviewing Draft Permits

The CWA and the NPDES regulations include review roles for EPA and for states, tribes, and territories (states) depending on whether EPA or a state is issuing an NPDES permit.

11.3.5.1 State-issued Permits

Each authorized state administering an NPDES program must transmit to the EPA Region copies of permit applications received and copies of draft or proposed permits [§ 123.43(a)]. The state and the EPA Region execute a Memorandum of Agreement (MOA) under § 123.24 that addresses administration and enforcement of the state's regulatory program. The MOA may specify that EPA will review draft permits rather than proposed permits [§ 123.44(j)] and specify the classes or categories of permit applications and draft or proposed permits that the state will send to the EPA Region for review, comment, and, where applicable, objection. In addition, the MOA specifies classes or categories of permits for which EPA will waive its right to review the draft or proposed permit. EPA cannot waive its right to review classes or categories of permits for the following:

- Discharges into the territorial seas.
- Discharges that could affect waters of a state other than the one in which the discharge originates.
- Discharges proposed to be regulated by general permits.
- Discharges from a POTW with a daily average discharge exceeding 1 million gallons per day.
- Discharges of uncontaminated cooling water with a daily average discharge exceeding 500 million gallons per day.
- Discharges from any major discharger or from any NPDES primary industry category.
- Discharges from other sources with a daily average discharge exceeding 500,000 gallons per day (however, EPA may waive review for non-process wastewater).

The MOA provides a period up to 90 days from receipt of a permit during which the EPA Region can make general comments on, objections to, or recommendations with respect to the permit. If the EPA

Region objects to a permit, within 90 days of receiving the permit it must transmit to the state a statement of the reasons for the objection and the actions that the state must take to eliminate the objection [§ 123.44(a)-(b)]. Specific causes for objection are outlined in the regulations at § 123.44(c). Any interested party can request a public hearing on an objection by the EPA Region. After such a hearing, the Region can affirm the objection, modify the terms of the objection, or withdraw the objection and notify the state of that decision. If the EPA Region does not withdraw the objection, the state then has 30 days to resubmit a permit revised to meet the objection. If the state does not do so, exclusive authority to issue the permit passes to the EPA Region. If no public hearing on the objection is held, the time frame for the state to resubmit a revised permit is 90 days from receipt of the objection.

11.3.5.2 EPA-issued Permits

Permits issued by EPA require an opportunity for state review and certification under CWA section 401. The state in which a discharge originates or will originate is provided the opportunity to review an application or a draft permit and certify that the discharge will comply with the applicable water quality standards. This process also has the benefits of ensuring that state initiatives or policies are addressed in EPA-issued NPDES permits and promoting consistency between state-issued and EPA-issued permits where not all permits within the state are issued by the same agency.

Regulations at §§ 124.53 (State Certification) and 124.54 (Special provisions for state certification and concurrence on applications for CWA section 301(h) variances) describe procedures an EPA permit writer should follow to obtain state certification. Under CWA section 401(a)(1), EPA may not issue a permit until a certification is granted or waived. If EPA is preparing the draft permit, state certification can be accomplished by allowing states to review and certify the application before draft permit preparation. Under § 124.53, if EPA has not received a state certification by the time the draft permit is prepared, EPA must send the state a copy of the draft permit along with a notice requesting state certification.

If the state does not respond within a specified reasonable time, which cannot exceed 60 days, it is deemed to have waived its right to certify. If the state chooses to certify the draft permit, it may include any conditions more stringent than those in the draft permit necessary to ensure compliance with the applicable provisions of the CWA or state law, and must cite the CWA or state law references that support the changes. In addition, the state is required to include a statement of the extent to which each condition of the draft permit can be made less stringent without violating the requirements of state law, including water quality standards. Failure to provide this statement for any condition waives the right to certify or object to any less stringent condition that might be established during the EPA permit issuance process. When a permit applicant requests a CWA section 301(h) variance (§ 124.54), the state certification process is very similar to the process described above. For more on CWA section 301(h) variances, see section 5.1.3.5 of this manual.

11.3.6 Schedule for Final Permit Issuance

The final permit may be issued after the close of the public notice period and after state certification has been received (for permits issued by EPA). The public notice period consists of the following:

- A 30-day period that gives notice of intent to issue or deny the permit.
- A 30-day period advertising a public hearing (if applicable).
- Any extensions or reopening of the comment period.

Final EPA permit decisions are effective immediately upon issuance unless comment were received on the draft permit, in which case, the effective date of the permit is 30 days after issuance (or a later date if specified in the permit). In addition, permit decisions will not be immediately effective if review is requested on the permit under § 124.19. As discussed earlier, any comments that are received must be answered at the time of final permit issuance (in the case of NPDES states or tribes) or after a final decision is reached (in the case of EPA). The administrative record for the final permit consists of the items in Exhibit 11-9.

Exhibit 11-9 Elements of the administrative records for a final permit

- All elements for the draft permit administrative record (see Exhibit 11-5)
- All comments received during the comment period
- The tape or transcript of any public hearing
- Any materials submitted at a hearing
- Responses to comments
- For NPDES new source permits, the draft or final EIS
- The final permit

11.4 Administrative Actions after Final Permit Issuance

Once the final permit has been issued, the issuing authority should enter the permit limitations and any special conditions into the Integrated Compliance Information System for the NPDES program (ICIS-NPDES) (for more on ICIS-NPDES, see the introduction to this manual and section 11.5.1.1 below). Entering permit information into ICIS-NPDES will ensure that the facility's performance will be tracked and the permitting agency will be alerted to the need for corrective action if violations of permit limitations, terms, or conditions occur.

After final permit issuance, interested parties have opportunities to change the permit through permit appeals, major/minor permit modifications, termination and revocation, or transfer. Those administrative procedures are described below.

11.4.1 Permit Appeals

Throughout the process of developing a permit and during the public notice period, the permit writer should carefully consider all legitimate concerns of the applicant/permittee and any other interested party. Nevertheless, there will inevitably be situations in which a permit is issued in spite of the objections of the permittee or a third party. In such instances, the permittee or interested party can choose to legally contest or appeal the NPDES permit, as provided in § 124.19. Permit appeals are the process by which any person that filed comments on the draft permit may contest the final limitations and conditions in a permit.

Appeals of EPA-issued permits consist of petitioning the Environmental Appeals Board (EAB) for review. Such review must be requested within 30 days of issuance of the final permit, and challenges must be limited to issues raised during the draft permit's public comment or hearing processes, although persons not participating in these processes may seek review of changes in the permit from draft to final permit. During the appeals process, only those conditions of an existing permit that are being contested are stayed. Within a reasonable time following the filing of the petition for review, the EAB must grant or deny the petition. Only individual permits may be appealed to the EAB; general permits may be challenged in court or an individual permit may be sought and appealed.

Many states have similar administrative appeal procedures designed to resolve challenges to the conditions of a permit. For the sake of convenience, such procedures, which could be known by different names (e.g., evidentiary hearing, administrative appeal), are hereafter *permit appeals*. Permit writers will, from time to time, be involved in permit appeals and will need to address the types of issues discussed below.

Aside from preparing the administrative record and notices, the permit writer might not be involved in the procedural matters relating to permit appeals. All requests for permit appeals are coordinated through the office of the EPA Regional Counsel or the appropriate state legal counsel. The permit writer's first involvement with the appeals process will likely come as a result of designation of the appeals staff, and his or her role will be limited to that of a technical advisor to legal counsel and, where a state uses an evidentiary hearing procedure, possibly a witness.

11.4.1.1 Deposition and Testimony

In a state hearing procedure, a permit writer might be required to give a deposition during which the appellant attorney conducts the questioning that would otherwise occur in the hearing. The deposition is transcribed and presented as evidence. The appellant attorney may ask some of the same questions at the hearing.

To prepare for a deposition and testimony, the permit writer should first consult with his or her general counsel to become familiar with laws, regulations, and policies that could affect the permit. The permit writer should also be thoroughly familiar with the technical basis for the permit conditions. For example, if final effluent limitations are based on water quality standards, the permit writer should thoroughly study the applicable water quality standards, water quality models, and procedures used to develop the effluent limitations and be prepared to defend all assumptions and decisions made in the effluent limitation calculations. For case-by-case limitations based on BPJ, the permit writer should carefully review all applicable data and procedures used to calculate the effluent limitations and should be sure that the information on which case-by-case limitations are based is unimpeachable, the limitations were derived from the data in a logical manner in accordance with established procedures, and the limitations are technically sound and meet applicable standards for economic reasonableness.

A permit appeal before the EAB relies on the information presented in the petitions and briefs, and possibly includes oral argument, but typically does not use depositions and direct testimony.

11.4.1.2 The Permit Writer's Role in the Appeals Process

As technical advisor to legal counsel, the permit writer's most important function is to develop support for contested permit conditions. A permit writer should not attempt to support technically indefensible conditions. Contested permit conditions that are not technically defensible and are not based on any legal requirement should be brought to counsel's attention, with advice that EPA or the state withdraw those conditions.

The second most important advisory function of the permit writer is assisting counsel in identifying weaknesses in the appellant's arguments. That process could include developing questions for cross-examination of opposing witnesses in a state permit appeal that involves a hearing. Questions should be restricted to the subject material covered by the witness' direct testimony and should be designed to elicit an affirmative or negative response, rather than an essay-type response.

Finally, the permit writer should remember that when a person petitions for EAB review or requests a hearing for a state-issued permit, the permit writer should refrain from any discussion about the case without first consulting with legal counsel.

In the role of technical advisor or witness, the permit writer should do the following:

- Cultivate credibility.
- Never imply or admit weakness in his or her area of expertise.
- Never attempt to testify about subjects outside his or her area of expertise.
- Always maintain good communication with counsel.

The EAB generally will attempt to resolve permit appeals in the initial stage of granting review. If that is not possible, the EAB conducts formal review of the contested conditions and publishes a written opinion (an Environmental Administrative Decision). The result of an EAB or state permit appeal might be relief from certain permit conditions, validation or strengthening of contested permit conditions, or a combination of these two outcomes. Under certain circumstances, decisions of the EAB can be appealed in federal court. Authorized state's permit appeal procedures typically provide for further appeal of administrative decisions regarding contested permit conditions in state court when all administrative steps have been fulfilled.

11.4.2 Modification or Revocation and Reissuance of Permits

In most cases, a permit will not need to be modified (or revoked and reissued) during the term of the permit if the facility can fully comply with permit conditions. However, under certain circumstances, it might be necessary to modify the permit before its expiration date. A permit modification could be triggered in several ways. For example, a representative of the regulatory agency might inspect the facility and identify a need for the modification (i.e., the improper classification of an industry), or information submitted by the permittee might suggest the need for a change. Of course, any interested person may make a request for a permit modification.

Modifications differ from revocations and reissuance. In a permit modification, only the conditions subject to change are reconsidered while all other permit conditions remain in effect. Conversely, the entire permit could be reconsidered when it is revoked and reissued.

Except where the permittee requests or agrees, permit modifications are limited to specific *causes* identified in §§ 122.62(a) and 122.62(b) and summarized in Exhibit 11-10. Most NPDES permit modifications require EPA or the state to conduct the public notice and participation activities of Part 124, similar to the issuance or reissuance of the permit; however, only those specific conditions being modified are open to review and comment. The permitting authority may revoke and reissue a permit during its term for the causes identified in § 122.62(b) (i.e., the final two bulleted items in Exhibit 11-10).

Exhibit 11-10 Causes for permit modification

- **Alterations**: When there are material and substantial alterations or changes to the permitted facility or activity occur that justify new conditions that are different from the existing permit.
- **New information**: When information is received that was not available at the time of permit issuance.
- **New regulations**: Under limited circumstances, when standards or regulations on which the permit was based have been changed by the modification, withdrawal or promulgation of amended standards or regulations or by judicial decision.
- **Compliance schedules**: To modify the compliance schedule when good cause exists, such as an act of God, strike, or flood.
- **Variance requests**: When requests for variances or fundamentally different factors are filed within the specified time but not granted until after permit issuance.
- **Toxics**: To insert CWA section 307(a) toxic effluent standard or prohibition.
- **Reopener**: Conditions in the permit that require it to be reopened under certain circumstances.
- **Net limits**: Upon request of a permittee who qualifies for effluent limitations on a net basis under § 122.45(g) or when a permittee is no longer eligible for net limitations, as provided in § 122.45(g)(1)(ii).
- **Pretreatment**: As necessary under § 403.8 (e) to put a compliance schedule in place for the development of a pretreatment program or to change the schedule for program development.
- **Failure to notify**: Upon failure of an approved state to notify another state whose waters may be affected by a discharge from the approved state.
- **Non-limited pollutants**: When the level of any pollutant that is not limited in the permit exceeds the level that can be achieved by the technology-based treatment requirements appropriate to the permit.
- **Notification levels**: To establish notification levels for toxic pollutants as provided in § 122.44(f).
- **Compliance schedules for innovative or alternative facilities**: To modify the compliance schedule in light of the additional time that might be required to construct such a facility.
- **Small municipal separate storm sewer system (MS4) minimum control measures**: For a small MS4 to include required minimum control measures when the permit does not include such measure(s) based on the determination that another entity was responsible for implementation and the other entity fails to fulfill its responsibility to implement such measure(s).
- **Technical mistakes**: To correct technical mistakes or mistaken interpretations of law made in developing the permit conditions.
- **Failed BPJ compliance**: When BPJ technology is installed and properly operated and maintained but the permittee is unable to meet its limitations, the limitations may be reduced to reflect actual removal; however, they may not be less than the limitations in the effluent guidelines. If BPJ operation and maintenance costs are extremely disproportionate to the costs considered in a subsequent effluent guideline, the permittee may be allowed to backslide to the limitations in the effluent guideline.
- **Land application plans**: When required by a permit condition to incorporate a land application plan for beneficial reuse of sewage sludge, to revise an existing land application plan, or to add a land application plan.
- **Cause exists for termination**: Cause exists under § 122.64, and the Director determines that modification is appropriate.
- **Notification of proposed transfer**: Director may modify the permit upon receipt of ownership transfer notification.

There are certain minor modifications that, upon consent of the permittee, may be processed by the permitting authority without following the procedures for public notice in Part 124. Minor modifications are generally non-substantive changes (e.g., typographical errors) and are exempt from the administrative procedures; that is, a draft permit and public review are not required. The specific permit changes that can be processed as minor modifications, described in § 122.63, are to

- Correct typographical errors.
- Incorporate more frequent monitoring or reporting.
- Revise an interim compliance date in the schedule of compliance, provided the new date is not more than 120 days after the date specified in the permit and does not interfere with attainment of the final compliance date requirement.
- Allow for a change of ownership, provided no other change is necessary (see section 11.4.4 below).
- Change the construction schedule for a new source discharger.
- Delete a point source outfall when that outfall is terminated and does not result in discharge of pollutants from other outfalls except in accordance with permit limits.
- Incorporate an approved local pretreatment program.

11.4.3 Permit Termination

Situations could arise during the life of the permit that are causes for termination of the permit. Such circumstances, described in § 122.64(a), include the following:

- Noncompliance by the permittee with any condition of the permit.
- Misrepresentation or omission of relevant facts by the permittee.
- Determination that the permitted activity endangers human health or the environment, and can be regulated to acceptable levels only by permit modification or termination.
- A change in any condition that requires either a temporary or permanent reduction or elimination of a discharge (e.g., plant closure).

Terminations are used to retract a permittee's privileges to discharge during the permit term. A notice of intent to terminate a permit is a type of draft permit that follows the same procedures as any draft permit prepared under § 124.6. Administrative procedures, such as public notice, must be followed in permit termination proceedings. If a facility with a terminated permit wishes to obtain permit coverage, it would have to submit an application and apply for a new permit.

The regulations at § 122.64(b) do provide one exception to the more formal permit termination process described above. Where the entire discharge is permanently terminated by elimination of the flow or by connection to a POTW (but not by land application or disposal into a well) the permit can be terminated by notice to the permittee, and the Part 124 administrative process is not required. However, if the permittee objects to such an expedited termination, the Permitting Authority must then proceed in accordance with the administrative procedures described above.

11.4.4 Permit Transfer

Regulatory agencies occasionally receive notification of a change in ownership of a facility covered by an NPDES permit. Such changes require that a permit be transferred by one of two provisions:

- **Transfer by modification or revocation**: The transfer may be made during the process of a major or minor permit modification. It may also be addressed by revoking and subsequently reissuing the permit.
- **Automatic transfer**: A permit may automatically be transferred to a new permittee if three conditions are met:
  - The current permittee notifies the Director 30 days in advance of the transfer date.
  - The notice includes a written agreement between the old and new owner that contains the specific date for transfer of permit responsibility, coverage, and liability between them.
  - The Director of the regulatory agency does not notify the old permittee and the proposed new permittee that the subject permit will be modified or revoked and reissued.

11.5 Permit Compliance and Enforcement

EPA's OECA is responsible for nationally managing EPA's compliance and enforcement programs for all media including the CWA and NPDES. EPA uses a mix of tools including compliance assistance, incentives, and monitoring and enforcement. EPA and state environmental agencies authorized to administer the NPDES program seek to achieve and maintain a high level of compliance with environmental laws and regulations. Enforcement provides a powerful incentive for NPDES permittees to comply, and the way in which an NPDES permit is written directly affects its enforceability. Each permit must be written clearly and unambiguously so that compliance can be tracked effectively and the permit can be enforced if violations occur.

The permit writer could become actively involved with the compliance monitoring and enforcement of the terms and conditions of the NPDES permits that he or she has written. The extent of the permit writer's involvement will usually depend on the organizational structure of the regulatory agency. Larger, centrally organized agencies typically have separate personnel responsible for enforcing the terms of NPDES permits. In other organizations, the individual who writes the permit will also be responsible for such enforcement activities as discharge monitoring report (DMR) tracking, facility inspections, and enforcement recommendations. If a civil judicial enforcement action occurs, the permit writer might be called on to testify regarding the specific requirements of the permit or its basis.

Regardless of a regulatory agency's organizational structure, the permit writer should have an appreciation for the various aspects of a meaningful NPDES compliance enforcement program. The following sections address compliance monitoring reviews and inspections and data in the national ICIS-NPDES (formerly the Permit Compliance System or PCS) database, which provides the basis for evaluating compliance. This section concludes with a brief description of the enforcement actions available to facilitate permit compliance. For more information about CWA enforcement, see OECA's Clean Water Act Enforcement Website <www.epa.gov/compliance/civil/cwa/index.html>.

11.5.1 Compliance Monitoring

Compliance monitoring is a broad term that includes all activities that federal or state regulatory agencies take to ascertain a permittee's compliance with the conditions specified in an NPDES permit. Compliance monitoring data collected as part of the NPDES program are used to evaluate compliance and support enforcement actions. The process includes receiving, reviewing, and entering data into the ICIS-NPDES database, conducting on-site inspections, identifying violators, and determining an appropriate response.

A primary function of the compliance monitoring program is to verify compliance with permit conditions, including effluent limitations and compliance schedules. Compliance verification is achieved through

- **Compliance review**: A review of all written reports and other material relating to the status of a permittee's compliance.
- **Compliance inspections**: Field-related regulatory activities (i.e., facility inspections, effluent sampling) to determine compliance.

11.5.1.1 Compliance Review

Compliance and enforcement personnel use two primary sources of information to carry out compliance reviews:

- Permit/compliance files.
- The ICIS-NPDES database.

Permit/compliance files include the permit, application, fact sheet, compliance schedule reports, compliance inspection reports, DMRs, enforcement actions, and correspondence (e.g., summaries of telephone calls, copies of warning letters). Compliance personnel periodically review that information and use it to determine if enforcement is necessary and, if so, what level of enforcement is appropriate.

The ICIS-NPDES database <https://icis.epa.gov/icis> is the national database for tracking compliance with NPDES requirements and is discussed further in this manual's introduction. Information in ICIS-NPDES includes facility and discharge characteristics, self-monitoring data, compliance schedules, permit conditions, inspections, and enforcement actions. Permittees are required to submit effluent monitoring data, and compliance and status information, via Compliance Schedule Reports and DMRs. EPA Regions and NPDES states enter such information into ICIS-NPDES and evaluate permittees on compliance with NPDES permit requirements. Inspection and enforcement information is collected and entered by Regions or authorized states or both. Quarterly, EPA reviews the ICIS-NPDES system data and generates a *quarterly noncompliance report* (QNCR) for all major facilities following the requirements of § 123.45.

ICIS-NPDES supports compliance and enforcement actions and assists EPA staff in evaluation and oversight of the NPDES program. The database also promotes national consistency and uniformity in permit and compliance evaluations. NPDES permits must be written so that compliance can be tracked using ICIS-NPDES. Situations might arise in which permit limitations and monitoring conditions are not initially compatible with ICIS-NPDES entry and tracking. In such cases, the permit writer should alert the state or EPA Regional staff responsible for entering ICIS-NPDES codes and work with them to resolve any coding issues. To assist ICIS-NPDES coders in accurately interpreting and entering the permit into ICIS-NPDES and to assist enforcement personnel in reviewing permittee's self-monitoring data and reports in a timely manner, permit writers should follow the compliance inspection procedures discussed in the next section.

11.5.1.2 Compliance Inspections

Compliance inspections refer to all field-related regulatory activities conducted to determine permit compliance. Such field activities can include compliance evaluation inspections (non-sampling), sampling inspections, other specialized inspections, and remote sensing. Certain inspections, such as diagnostic inspections and performance audit inspections, aid the regulatory agency in evaluating the facility's problems in addition to providing information to support enforcement action. Biomonitoring inspections are specifically targeted at facilities with effluent suspected or identified as causing toxicity problems that threaten the ecological balance of the receiving waters.

Compliance inspections are undertaken to fulfill one or more of the following purposes:

- Establish a regulatory presence to deter noncompliance.
- Ensure that permit requirements are being met or determine if permit conditions are adequate.
- Check the completeness and accuracy of a permittee's performance and compliance records.
- Assess the adequacy of the permittee's self-monitoring and reporting program including on-site laboratory functions.
- Determine the progress or completion of corrective action.
- Obtain independent compliance data on a facility's discharge.
- Evaluate the permittee's operation and maintenance activities.
- Observe the status of construction required by the permit.

11.5.2 Quarterly Noncompliance Reports

EPA Regional offices and NPDES states are required by the regulations at § 123.45 to report quarterly on major facilities that are not in compliance with the terms and conditions of their permit or enforcement order (i.e., that meet the criteria for *reportable noncompliance* [RNC] for effluent limitation, schedules, and reporting violations).

The regulations in § 123.45 establish requirements for listing facility violations and resulting regulatory enforcement action on QNCRs. The regulation establishes reporting requirements for violations that meet specific, quantifiable reporting criteria, as well as for violations that are more difficult to quantify but are of sufficient concern to be considered reportable. The regulation also specifies the format that the reports must follow and the schedule for their submission.

Only major facilities that meet RNC criteria must be reported on the QNCR. RNC consists of several general types of violations as established in § 123.45:

- Effluent limitations
  - Monthly average effluent limitations (see below for more).
  - Other effluent limitations with water quality or health impacts.

- Schedule: Violations of compliance schedule milestones by 90 days or more.
- Reporting: Reports late by 30 days or more.

A violation of any monthly average limitation should be evaluated for magnitude by comparing the measured amount in the DMR to the product of the monthly average limitation times the Technical Review Criteria (TRC) for that pollutant or parameter. The TRC is 1.4 for Group I (conventional) pollutants and 1.2 for Group II (generally toxic) pollutants. Appendix A to Part 123 contains a list of pollutants in each Group. RNC includes violations of a given Group I or Group II pollutant or parameter that equals or exceeds the product of the TRC times the monthly average limitation for any 2 or more months during a 6-month reporting period. RNC also includes violations of a Group I or Group II parameter by any amount (not necessarily TRC times the limitation or greater) for 4 months during the 6-month reporting period.

A subset of instances of RNC that appear on the QNCR could be noted as *significant noncompliance* (SNC). This distinction is used solely for management accountability purposes as a means of tracking trends in compliance and evaluating the relative timeliness of enforcement response toward priority violations.

The definition of SNC is not regulatory and can change as the NPDES program evolves to encompass new enforcement priorities. For example, in September 1995, EPA revised the definition of SNC to include violations of non-monthly average permit limitations by major facilities. Many permits for NPDES major facilities lacked required monthly average limitations and, thus, were not evaluated for SNC violations and follow-up formal enforcement action. The new definition became effective as of October 1, 1996. EPA's SNC policy is described in the memorandum Revision of NPDES Significant Noncompliance (SNC) Criteria to Address Violations of Non-Monthly Average Limits[1] <www.epa.gov/compliance/resources/policies/civil/cwa/revisedsncmemo.pdf>.

Generally, the designation of SNC indicates a violation is of sufficient magnitude or duration or both to be considered among EPA's priorities for regulatory review or response. The categories of SNC are

- Effluent limitations: The effluent limitation SNC criteria are the same as for QNCR discussed above.
- Schedule: The schedule SNC criteria are the same as for QNCR discussed above.
- Reporting: The reporting SNC criteria are the same as for QNCR discussed above.
- Order requirements: Violation of requirements in administrative or judicial orders.

The instance of SNC is considered resolved when the SNC criteria are no longer met during the review period, or when the permittee formerly in SNC exhibits compliance for all 3 months of the most recent 3-month reporting period. A permittee with SNC violations under a compliance schedule that is meeting its deadlines for corrective actions is in *resolved pending* status.

Any major permittee that is listed on the QNCR for two consecutive 3-month reporting periods for the same instance of SNC (e.g., same outfall point, same parameter, same category of violation) is expected to return to compliance or to be addressed with an appropriate enforcement action before the reporting deadline for the second QNCR. If the facility is in SNC after the second QNCR, and no enforcement action has been taken, the facility is placed on the Watch List. The Watch List is a management tool that identifies and tracks facilities with serious violations and no apparent formal enforcement response.

11.5.3 Enforcement

EPA's NPDES compliance and enforcement principles and recommendations are described in the NPDES Enforcement Management System (EMS)[2] <www.epa.gov/compliance/resources/policies/civil/cwa/emscwa-jensen-rpt.pdf>. By choosing an appropriate enforcement response to CWA violations, EPA tries to achieve several goals:

- Correction of the violation as soon as possible.
- Deterrence of future violations by the same permittee or other permittees.
- Equal treatment of the regulated community through use of a uniform approach to selecting enforcement responses (i.e., similar violations are treated similarly).
- Assessment of an appropriate penalty.
- Protection of human health and the environment.

Once a facility has been identified as having potential CWA violations, EPA or the NPDES state reviews the facility's compliance history. The review includes an assessment of the magnitude, frequency, and duration of violations. The permitting authority identifies significant violations and makes a determination of the appropriate enforcement response. CWA section 309 authorizes the Agency to bring civil or criminal action against facilities that discharge pollutants without a permit or discharge in violation of NPDES permit conditions and judicial penalties up to $32,500 per day per violation.

EPA Regions and authorized states have specific procedures for reviewing self-monitoring and inspection data and for deciding what type of enforcement action is warranted. EPA recommends an escalating response to continuing noncompliance. The range of enforcement responses includes the following:

- Informal action (e.g., *notice of violation* [NOV]).
- Formal action.
- Administrative compliance order.
- Administrative order with or without an administrative penalty order (up to $157,500).
- Civil judicial action that imposes injunctive relief seeking compliance or penalty or both.
- Criminal prosecution.

Considerations when making determinations on the level of the enforcement response include the following:

- The duration of the violation.
- The severity of the violation.
- The degree of economic benefit obtained through the violation.
- Compliance history and previous enforcement actions taken against the violator.
- The degree of culpability.
- The deterrent effect of the response on similarly situated permittees.

Equally important considerations may include fairness and equity, national consistency, and the integrity of the NPDES program.

Citizens can participate in the enforcement process in a number of ways. Under the Freedom of Information Act, citizens have the right to request certain facility-specific compliance information from EPA's ICIS-NPDES database. In addition, under NPDES regulations, interested citizens can intervene in any federal civil judicial action to enjoin any threatened or continuing violation of program requirements or permit conditions, and to recover civil penalties in court. Citizens also have the opportunity to review and comment on any proposed consent decree to resolve a state or federal civil judicial enforcement action.

CWA section 505 allows any citizen to begin a civil judicial enforcement action on his or her own behalf. In certain circumstances, citizens may not begin suit if EPA or the state is diligently prosecuting a civil or criminal judicial action or an administrative action to obtain a penalty under CWA section 309(g) or a comparable provision of state law. Citizens must also give EPA, the state, and the alleged violator 60 days' notice of the alleged violation before beginning a citizen suit.

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[1] Herman, S.A. 1995. *Revision of NPDES Significant Noncompliance (SNC) Criteria to Address Violations of Non-Monthly Average Limits*. U.S. Environmental Protection Agency, Office of Enforcement and Compliance Assurance. Memorandum, September 21, 1995. <www.epa.gov/compliance/resources/policies/civil/cwa/revisedsncmemo.pdf>.

[2] U.S. Environmental Protection Agency. 1989. *The Enforcement Management System: National Pollutant Discharge Elimination System (Clean Water Act)*. EC-G-1998-11b. U.S. Environmental Protection Agency, Office of Water, Washington, DC. <www.epa.gov/compliance/resources/policies/civil/cwa/emscwa-jensen-rpt.pdf>.

Appendix A. Acronyms, Abbreviations and Glossary

This appendix contains two tables for permit writers to more easily navigate through the acronyms and the terms that are mentioned throughout this manual. The first table, *Acronyms and Abbreviations*, provides the full text of the acronyms and abbreviations used throughout and indicates whether they are defined in the *Glossary* (the second table), which provides definitions of terms used in the Clean Water Act and NPDES permit program. It provides a reference to the source of the definitions, where available.

A.1 Acronyms and Abbreviations

Exhibit A-1 presents the abbreviations used in the *NPDES Permit Writers' Manual*.

Exhibit A-1 Acronyms and abbreviations

Acronym or abbreviation	Full phrase	Glossary
1Q10	1-day, 10-year Low Flow	
7Q10	7-day, 10-year Low Flow	
4AAP	4-Aminoantipyrine (used for detecting phenolic compounds colorimetrically)	
ACHP	Advisory Council on Historic Preservation	
ACR	Acute-to-Chronic Ratio	
AFO	Animal Feeding Operation	x
AML	Average Monthly Limitation	x
ASR	Alternative State Requirement	
AWL	Average Weekly Limitation	x
BA	Biological Assessment	
BAT	Best Available Technology Economically Achievable	x
BCT	Best Conventional Pollutant Control Technology	x
BE	Biological Evaluation	
BMP	Best Management Practice	x
BOD	Biochemical Oxygen Demand	x
BOD_5	5-day Biochemical Oxygen Demand	
BPJ	Best Professional Judgment	x
BPT	Best Practicable Control Technology Currently Available	x
CAAP	Concentrated Aquatic Animal Production	
CAFO	Concentrated Animal Feeding Operation	x
CBOD	Carbonaceous Biochemical Oxygen Demand	x
$CBOD_5$	5-day Carbonaceous Biochemical Oxygen Demand	
CEQ	Council on Environmental Quality	
CERCLA	Comprehensive Environmental Response, Compensation and Liabilities Act	
CFR	*Code of Federal Regulations*	x
cfs	Cubic Feet per Second	
CGP	Construction General Permit	
CMOM	Capacity, Management, Operation and Maintenance	

Exhibit A-1 Acronyms and abbreviations (continued)

Acronym or abbreviation	Full phrase	Glossary
COD	Chemical Oxygen Demand	x
CSO	Combined Sewer Overflow	x
CSS	Combined Sewer System	x
CV	Coefficient of Variation	
CWA	Clean Water Act	x
CWIS	Cooling Water Intake Structure	
CZMA	Coastal Zone Management Act	
DMR	Discharge Monitoring Report	x
DWO	Dry Weather Overflow	
EA	Environmental Assessment	
EAB	Environmental Appeals Board	
EC	Effect Concentration	
EFH	Essential Fish Habitat	
EIS	Environmental Impact Statement	
ELG	Effluent Limitations Guidelines or Effluent Guidelines	x
EMS	Enforcement Management System	
eNOI	Electronic Notice of Intent	
EPA	U.S. Environmental Protection Agency	
ESA	Endangered Species Act	
FDF	Fundamentally Different Factors	x
FR	*Federal Register*	
FWCA	Fish and Wildlife Coordination Act	
FWPCA	Federal Water Pollution Control Act	
FWS	U.S. Fish and Wildlife Service	
GC/MS	Gas Chromatography/Mass Spectroscopy	
gpd	Gallons per Day	
HEM	Hexane Extractable Material	
IC	Inhibition Concentration	
ICIS	Integrated Compliance Information System	
I/I	Infiltration/Inflow	
LA	Load Allocation	
lbs/day	Pounds per Day	
LC_{50}	Lethal Concentration to 50% of test organisms	
LOEC	Lowest Observed Effect Concentration	
LTA	Long-Term Average	
LTCP	Long-Term Control Plan	
MDL	Method Detection Limit	x
MDL	Maximum Daily Effluent Limitation	x
MEP	Maximum Extent Practicable	
µg/L	Micrograms per Liter	
mg/L	Milligrams per Liter	
mgd	Million Gallons per Day	x
ML	Minimum Level	x

Exhibit A-1 Acronyms and abbreviations (continued)

Acronym or abbreviation	Full phrase	Glossary
MOA	Memorandum of Agreement	
MS4	Municipal Separate Storm Sewer System	x
MSA	Magnuson-Stevens Act	
MSGP	Multi-Sector General Permit	
N/A	Not Applicable	
NAICS	North American Industrial Classification System	x
NEMI	National Environmental Methods Index	
NEPA	National Environmental Policy Act	
NHPA	National Historic Preservation Act	
NMC	Nine Minimum CSO Controls	
NMFS	National Marine Fisheries Service	
NMP	Nutrient Management Plan	
NOAA	National Oceanic and Atmospheric Administration	
NOEC	No Observable Effect Concentration	
NOI	Notice of Intent	
NOV	Notice of Violation	
NPDES	National Pollutant Discharge Elimination System	x
NRDC	Natural Resources Defense Council	
NSCEP	National Service Center for Environmental Publications	
NSPS	New Source Performance Standards	
NTIS	National Technical Information Service	
O&G	Oil and Grease	
OCPSF	Organic Chemicals, Plastics, and Synthetic Fibers Point Source Category	
OECA	EPA Office of Enforcement and Compliance Assurance	
ONRW	Outstanding National Resources Waters	
OTIS	Online Tracking Information System	
OW	Office of Water	
OWRC	Office of Water Resource Center	
PCS	Permit Compliance System	
POTW	Publicly Owned Treatment Works	x
PSD	Prevention of Significant Deterioration	
PSES	Pretreatment Standards for Existing Sources	
PSNS	Pretreatment Standards for New Sources	
QNCR	Quarterly Noncompliance Report	
RAPP	Refuse Act Permit Program	
RCRA	Resource Conservation and Recovery Act	
RNC	Reportable Noncompliance	
SIC	Standard Industrial Classification	x
SIU	Significant Industrial User	x
SNC	Significant Noncompliance	
SOP	Standard Operating Procedure	
SPCC	Spill Prevention Control and Countermeasure	x
SS	Suspended Solids	x

Exhibit A-1 Acronyms and abbreviations (continued)

Acronym or abbreviation	Full phrase	Glossary
SSO	Sanitary Sewer Overflow	x
STORET	EPA Storage and Retrieval Database	x
SWPPP	Stormwater Pollution Prevention Plan	
TBEL	Technology-Based Effluent Limit(s)	x
TCDF	Tetrachlorodibenzofuran	
TEC	Transportation Equipment Cleaning Point Source Category	
THC	Total Hydrocarbons	
TIE	Toxicity Identification Evaluation	
TMDL	Total Maximum Daily Load	x
TOC	Total Organic Carbon	x
TRC	Technical Review Criteria	
TRE	Toxicity Reduction Evaluation	x
TRI	Toxic Release Inventory	
TSD	Technical Support Document [for Water Quality-based Toxics Control]	
TSS	Total Suspended Solids	x
TTO	Total Toxic Organics	
TU	Toxic Units	
TUa	Toxic Units – Acute	
TUc	Toxic Units – Chronic	
TWTDS	Treatment Works Treating Domestic Sewage	x
UAA	Use Attainability Analysis	
UIC	Underground Injection Control	
U.S.C.	*United States Code*	
WET	Whole Effluent Toxicity	x
VGP	Vessel General Permit	
WLA	Waste Load Allocation	x
WPD	EPA Water Permits Division	
WQA	Water Quality Act of 1987	
WQBEL	Water Quality-Based Effluent Limit(s)	x
WQS	Water Quality Standard(s)	x
WSRA	Wild and Scenic Rivers Act	

A.2 Glossary

Exhibit A-2 includes definitions of terms used in the *NPDES Permit Writers' Manual*. For terms that have a definition in the federal regulations, that definition is included with an appropriate citation. The citations also indicate where this guidance manual has paraphrased or modified the regulatory definitions for consistency with the format of the glossary. For terms that do not have a regulatory definition, but that are defined in another published EPA document, the citation to the relevant EPA document is provided.

Note that the definitions provided in the Glossary do not constitute EPA's official use of terms and phrases for regulatory purposes, and nothing in this document should be construed to alter or supplant any other federal document. Official terminology is in the laws and related regulations as published in such sources as the Congressional Record, *Federal Register*, and elsewhere.

Exhibit A-2 Glossary

Term	Definition	Citation
401(a) Certification	A requirement of CWA section 401(a) that all federally issued permits be certified by the state in which the discharge occurs. The state certifies that the proposed permit will comply with state water quality standards and other state requirements.	1996 U.S. EPA NPDES Permit Writers' Manual (1996 PWM) <www.epa.gov/npdes/pubs/owm0243.pdf>
Acute Effect	The effect of a stimulus severe enough to rapidly induce an effect; in aquatic toxicity tests, an effect generally observed in 96 hours or less is typically considered acute. When referring to aquatic toxicology or human health, an acute effect is not always measured in terms of lethality.	1996 PWM
Animal Feeding Operation (AFO)	Lot or facility (other than an aquatic animal production facility) where the following conditions are met: • Animals (other than aquatic animals) have been, are, or will be stabled or confined and fed or maintained for a total of 45 days or more in any 12-month period. • Crops, vegetation, forage growth, or post-harvest residues are not sustained in the normal growing season over any portion of the lot or facility.	§ 122.23(b)(1)
Anti-backsliding	In general, a statutory provision that prohibits the renewal, reissuance, or modification of an existing NPDES permit that contains effluent limitations, permit conditions, or standards that are less stringent than those established in the previous permit. For more information on anti-backsliding, see Chapter 7 of this manual.	CWA section 402(o)
Antidegradation	A policy developed and adopted as part of a state's water quality standards that ensures protection of existing uses and maintains the existing level of water quality where that water quality exceeds levels necessary to protect fish and wildlife propagation and recreation on and in the water. This policy also includes special protection of water designated as Outstanding National Resource Waters.	Adapted from 1996 PWM
Authorized Program or Authorized State	A state, territorial, tribal, or interstate NPDES program that has been approved or authorized by EPA under Part 123.	1996 PWM
Average Monthly Discharge Limitation	The highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during that month divided by the number of daily discharges measured during that month.	§ 122.2
Average Weekly Discharge Limitation	The highest allowable average of daily discharges over a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week.	§ 122.2
Best Available Technology Economically Achievable (BAT)	Technology standard established by the CWA as the most appropriate means available on a national basis for controlling the direct discharge of toxic and nonconventional pollutants to navigable waters. BAT limitations in effluent guidelines, in general, represent the best existing performance of treatment technologies that are economically achievable within an industrial point source category or subcategory.	Adapted from 1996 PWM

Exhibit A-2 Glossary (continued)

Term	Definition	Citation
Best Conventional Pollutant Control Technology (BCT)	Technology-based standard for the discharge from existing industrial point sources of conventional pollutants including BOD, TSS, fecal coliform, pH, oil and grease. The BCT is established in light of a two-part cost reasonableness test, which compares the cost for an industry to reduce its pollutant discharge with the cost to a POTW for similar levels of reduction of a pollutant loading. The second test examines the cost-effectiveness of additional industrial treatment beyond BPT. EPA must find limits which are reasonable under both tests before establishing them as BCT.	1996 PWM
Best Management Practice (BMP)	Schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of *waters of the United States*. BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.	§ 122.2
Best Practicable Control Technology Currently Available (BPT)	The first level of technology standards established by the CWA to control pollutants discharged to waters of the U.S. BPT limitations in effluent guidelines are generally based on the average of the best existing performance by plants within an industrial category or subcategory.	Adapted from 1996 PWM
Best Professional Judgment (BPJ)	The method used by permit writers to develop technology-based NPDES permit conditions on a case-by-case basis using all reasonably available and relevant data.	1996 PWM
Bioassay	A test used to evaluate the relative potency of a chemical or a mixture of chemicals by comparing its effect on a living organism with the effect of a standard preparation on the same type of organism.	1996 PWM
Biochemical Oxygen Demand (BOD)	A measurement of the amount of oxygen used by the decomposition of organic material, over a specified time (usually 5 days) in a wastewater sample; it is used as a measurement of the readily decomposable organic content of a wastewater.	1996 PWM
Biosolids	See *Sewage Sludge*.	--
Bypass	The intentional diversion of waste streams from any portion of a treatment facility. This definition applies to both direct and indirect discharges.	§ 122.41(m)(1)(i) and § 403.17
Carbonaceous Biochemical Oxygen Demand (CBOD)	The biochemical oxygen demand of carbonaceous sources. This differs from BOD in that BOD measures both nitrogenous and carbonaceous sources, whereas CBOD excludes nitrogenous sources (e.g., nitrifying bacteria) from determination through the addition of a nitrification inhibitor.	--
Categorical Industrial User (CIU)	An industrial user subject to national categorical pretreatment standards.	1996 PWM
Categorical Pretreatment Standards	National pretreatment standards , expressed as Pretreatment Standards for Existing Sources (PSES) or Pretreatment Standards for New Sources (PSNS), specifying quantities or concentrations of pollutants or pollutant properties that may be discharged to a POTW by existing or new industrial users in specific industrial subcategories established as separate regulations under the appropriate subpart of 40 CFR chapter I, subchapter N.	Adapted from § 403.6

Exhibit A-2 Glossary (continued)

Term	Definition	Citation
Chemical Oxygen Demand (COD)	A measure of the oxygen-consuming capacity of inorganic and organic matter present in wastewater. COD is expressed as the amount of oxygen consumed in mg/L. Results do not necessarily correlate to the biochemical oxygen demand (BOD) because the chemical oxidant can react with substances that bacteria do not stabilize.	Adapted from 1996 PWM
Chronic Effect	The effect of a stimulus that lingers or continues for a relatively long period, often one-tenth of the life span or more. The measurement of a chronic effect can be reduced growth, reduced reproduction, and such, in addition to lethality.	1996 PWM
Clean Water Act (CWA)	The Clean Water Act is a statute passed by the U.S. Congress to control water pollution. It was formerly referred to as the Federal Water Pollution Control Act of 1972 or Federal Water Pollution Control Act Amendments of 1972 (Public Law 92-500), 33 U.S.C. 1251 *et seq.*, as amended by: Public Law 96-483; Public Law 97-117; Public Laws 95-217, 97-117, 97-440, and 100-04.	1996 PWM
Code of Federal Regulations (CFR)	A codification of the final rules published daily in the *Federal Register*. Title 40 of the CFR contains regulations for the protection of the environment.	1996 PWM
Combined Sewer Overflow (CSO)	A discharge of untreated wastewater from a combined sewer system at a point before the headworks of a publicly owned treatment works. CSOs generally occur during wet weather (rainfall or snowmelt). During periods of wet weather, these systems become overloaded, bypass treatment works, and discharge directly to receiving waters at designed overflow points.	1996 PWM
Combined Sewer System (CSS)	A wastewater collection system that conveys sanitary wastewaters (domestic, commercial and industrial wastewaters) and stormwater through a single pipe to a publicly owned treatment works for treatment before discharge to surface waters.	1996 PWM
Compliance Schedule (or Schedule of Compliance)	A schedule of remedial measures included in a permit, including an enforceable sequence of interim requirements (for example, actions, operations, or milestone events) leading to compliance with the CWA and regulations.	§ 122.2
Composite Sample	Sample composed of two or more discrete aliquots (samples). The aggregate sample will reflect the average water quality of the compositing or sample period.	--
Conventional Pollutants	Pollutants typical of municipal sewage, and for which publicly owned treatment works typically are designed to remove; defined by Federal Regulation (§ 401.16) as BOD, TSS, fecal coliform bacteria, oil and grease, and pH.	1996 PWM
Daily Discharge	The *discharge of a pollutant* measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the daily discharge is calculated as the average measurement of the pollutant over the day.	§ 122.2

Exhibit A-2 Glossary (continued)

Term	Definition	Citation
Designated Uses	Those uses specified in water quality standards for each waterbody or segment whether they are being attained (§ 131.3). Examples of designated uses include cold and warm water fisheries, public water supply, and irrigation.	Adapted from EPA. Terms of Environment: Glossary, Abbreviations, Acronyms. <www.epa.gov/OCEPAterms/dterms.html>
Development Document	A report prepared during development of an effluent guideline by EPA that provides the data and methodology used to develop effluent guidelines and categorical pretreatment standards for an industrial category.	Adapted from 1996 PWM
Director	The Regional Administrator or the State Director, as the context requires, or an authorized representative. When there is no *approved state program*, and there is an EPA-administered program, *Director* means the Regional Administrator. When there is an approved state program, Director normally means the State Director. In some circumstances, however, EPA retains the authority to take certain actions even when there is an approved state program. (For example, when EPA has issued an NPDES permit before the approval of a state program, EPA may retain jurisdiction over that permit after program approval, see § 123.1.) In such cases, Director means the Regional Administrator and not the State Director.	§ 122.2
Discharge Monitoring Report (DMR)	The EPA uniform national form, including any subsequent additions, revisions, or modifications for the reporting of self-monitoring results by permittees. DMRs must be used by *approved states* as well as by EPA. EPA will supply DMRs to any approved state upon request. The EPA national forms may be modified to substitute the state agency name, address, logo, and other similar information, as appropriate, in place of EPA's.	§ 122.2
Draft Permit	A document prepared under § 124.6 indicating the Director's tentative decision to issue, deny, modify, revoke and reissue, terminate, or reissue a *permit*. A notice of intent to terminate a permit, and a notice of intent to deny a permit, as discussed in § 124.5, are types of *draft permits*. A denial of a request for modification, revocation and reissuance, or termination, as discussed in § 124.5, is not a draft permit. A *proposed permit* is not a draft permit.	§ 122.2
Effluent Limitation	Any restriction imposed by the Director on quantities, discharge rates, and concentrations of *pollutants* which are *discharged* from *point sources* into waters of the United States, the waters of the *contiguous zone*, or the ocean.	§ 122.2
Effluent Limitations Guidelines (Effluent Guidelines or ELG)	A regulation published by the Administrator under CWA section 304(b) to adopt or revise *effluent limitations*.	§ 122.2
Existing Uses	Those uses actually attained in the waterbody on or after November 28, 1975, whether they are included in the water quality standards.	§ 131.3

Exhibit A-2 Glossary (continued)

Term	Definition	Citation
Fact Sheet	A document that must be prepared for all draft individual permits for NPDES major dischargers, NPDES general permits, NPDES permits that contain variances, NPDES permits that contain sewage sludge land application plans and several other classes of dischargers. The document summarizes the principal facts and the significant factual, legal, methodological and policy questions considered in preparing the draft permit and explains how the public may comment (§§ 124.8 and 124.56). Where a fact sheet is not required, a statement of basis must be prepared (§ 124.7).	1996 PWM
Fundamentally Different Factors (FDF)	Those components of a petitioner's facility that are determined to be so unlike those components considered by EPA during the effluent guidelines and pretreatment standards rulemaking that the facility is worthy of a variance from the effluent guidelines or categorical pretreatment standards that would otherwise apply.	Adapted from 1996 PWM
General Permit	An NPDES permit issued under § 122.28 that authorizes a category of discharges under the CWA within a geographical area. A general permit is not specifically tailored for an individual discharger.	1996 PWM
Grab Sample	A sample taken from a wastestream on a one-time basis without consideration of the flow rate of the wastestream and without consideration of time.	Adapted from 1996 PWM
Hazardous Substance	Any substance—as designated under Part 116 pursuant to CWA section 311—that presents an imminent and substantial danger to the public health or welfare, including fish, shellfish, wildlife, shorelines, and beaches, upon discharge to navigable waters of the United States.	Adapted from § 122.2 and CWA section 311(b)(2)(A)
Indirect Discharger	A nondomestic discharger introducing *pollutants* to a publicly owned treatment works.	40 CFR 122.2
Instantaneous Maximum Limit	The maximum allowable concentration or other measure of a pollutant determined from the analysis of any discrete or composite sample collected, independent of the flow rate and the duration of the sampling event.	1996 PWM
Instantaneous Minimum Limit	The minimum allowable concentration or other measure of a pollutant determined from the analysis of any discrete or composite sample collected, independent of the flow rate and the duration of the sampling event.	--
Load Allocation	The portion of a receiving water's loading capacity that is attributed either to one of its existing or future nonpoint sources of pollution or to natural background sources. Load allocations are best estimates of the loading, which may range from reasonably accurate estimates to gross allotments, depending on the availability of data and appropriate techniques for predicting the loading. Wherever possible, natural and nonpoint source loads should be distinguished.	§ 130.2
Local Limits	Where specific prohibitions or limits on pollutants or pollutant parameters are developed by a POTW in accordance with § 403.4(c), such limits must be deemed Pretreatment Standards for the purposes of CWA section 307(d).	Adapted from § 403.4(d)

Exhibit A-2 Glossary (continued)

Term	Definition	Citation
Major Facility	Any NPDES facility or activity classified as such by the Regional Administrator, or in the case of approved state programs, the Regional Administrator in conjunction with the State Director (§ 122.2). Major municipal dischargers include all facilities with design flows of greater than one million gallons per day and facilities with EPA/state approved industrial pretreatment programs. Major industrial facilities are determined based on specific ratings criteria developed by EPA or are classified as such by EPA in conjunction with the state.	1996 PWM
Method Detection Limit (MDL)	The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix containing the analyte.	§ 136 - Appendix B
Maximum Daily Effluent Limitation (MDL)	The highest allowable daily discharge of a pollutant. (Chapter 6)	--
Million Gallons per Day (or mgd)	A unit of flow commonly used for wastewater discharges. One million gallon per day is equivalent to 1.547 cubic feet per second.	1996 PWM
Minimum Level (ML)	The level at which the entire analytical system must give a recognizable signal and acceptable calibration point. It is equivalent to the concentration of the lowest calibration standard, assuming that all method-specified sample weights, volumes, and cleanup procedures have been employed.	§ 136 - Appendix A
Mixing Zone	An area where an effluent discharge undergoes initial dilution and is extended to cover the secondary mixing in the ambient waterbody. A mixing zone is an allocated impact zone where water quality criteria can be exceeded as long as acutely toxic conditions are prevented.	Technical Support Document for Water Quality-based Toxics Control <www.epa.gov/npdes/pubs/owm0264.pdf>
Municipal Separate Storm Sewer System (MS4)	A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): a. Owned or operated by a state, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to state law) having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under state law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under CWA section 208 that discharges to waters of the United States. b. Designed or used for collecting or conveying stormwater. c. [That] is not a combined sewer. d. [That] is not part of a Publicly Owned Treatment Works (POTW) as defined at § 122.2.	§ 122.26(b)(8)
Municipal Sludge	See *Sewage Sludge*.	--

Exhibit A-2 Glossary (continued)

Term	Definition	Citation
National Pollutant Discharge Elimination System (NPDES)	The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under CWA sections 307, 318, 402, and 405. The term includes *approved program*. NPDES permits regulate discharges of pollutants from point sources to waters of the United States. Such discharges are illegal unless authorized by an NPDES permit.	Adapted from § 122.2
National Pretreatment Standard or Pretreatment Standard	Any regulation promulgated by EPA in accordance with CWA sections 307(b) and 307(c) that applies to a specific category of industrial users and provides limitations on the introduction of pollutants into publicly owned treatment works. The term includes the prohibited discharge standards under § 403.5.	Adapted from § 403.3(l)
New Discharger	Any building, structure, facility, or installation: a. From which there is or may be a discharge of pollutants. b. That did not begin the discharge of pollutants at that site before August 13, 1979. c. That is not a new source. d. That has never received a finally effective NPDES permit for discharges at that site. This definition includes an *indirect discharger* that begins discharging into waters of the United States after August 13, 1979. It also includes any existing mobile point source (other than an offshore or coastal oil and gas exploratory drilling rig or a coastal oil and gas developmental drilling rig) such as a seafood processing rig, seafood processing vessel, or aggregate plant, that begins discharging at a *site* for which it does not have a permit; and any offshore or coastal mobile oil and gas exploratory drilling rig or coastal mobile oil and gas developmental drilling rig that commences the discharge of pollutants after August 13, 1979, at a site under EPA's permitting jurisdiction for which it is not covered by an individual or general permit and which is in an area determined by the Regional Administrator in the issuance of a final permit to be an area or biological concern. In determining whether an area is an area of biological concern, the Regional Administrator must consider the factors specified in §§ 125.122(a)(1) - 125.122(a)(10). An offshore or coastal mobile exploratory drilling rig or coastal mobile developmental drilling rig will be considered a *new discharger* only for the duration of its discharge in an area of biological concern.	Adapted from § 122.2

Exhibit A-2 Glossary (continued)

Term	Definition	Citation
New Source	Any building, structure, facility, or installation from which there is or could be a discharge of pollutants, the construction of which commenced: a. After promulgation of standards of performance under CWA section 306, which are applicable to such source; or b. After proposal of standards of performance in accordance with CWA section 306, which are applicable to such source but only if the standards are promulgated in accordance with CWA section 306 within 120 days of their proposal. Additional Criteria: Except as otherwise provided in an applicable new source performance standard, a source is a *new source* if it meets the definition in § 122.2; and i. It is constructed at a site at which no other source is located; or ii. It totally replaces the process or production equipment that causes the discharge of pollutants at an existing source; or iii. Its processes are substantially independent of an existing source at the same site. In determining whether these processes are substantially independent, the Director shall consider such factors as the extent to which the new facility is integrated with the existing plant; and the extent to which the new facility is engaged in the same general type of activity as the existing source.	Adapted from § 122.2 and § 122.29(b)(1)
New Source Performance Standards (NSPS)	Technology standards for facilities that qualify as new sources under § 122.2 and § 122.29. Standards consider that the new source facility has an opportunity to design operations to more effectively control pollutant discharges.	1996 PWM
Nonconventional Pollutants	All pollutants that are not included in the list of conventional or toxic pollutants in Part 401. Includes pollutants such as chemical oxygen demand (COD), total organic carbon (TOC), nitrogen, and phosphorus.	1996 PWM
Nonpoint Source	Diffuse pollution sources (i.e., without a single point of origin or not introduced into a receiving stream from a specific outlet). The pollutants are generally carried off the land by stormwater. Atmospheric deposition and hydromodification are also sources of nonpoint source pollution.	--
North American Industrial Classification System (NAICS)	The North American Industry Classification System (NAICS) is the standard used by federal statistical agencies in classifying business establishments for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. business economy.	Retrieved from <www.census.gov/epcd/www/naics.html>
Nutrients	Chemical elements and compounds found in the environment that plants and animals need to grow and survive. Nutrients include compounds of nitrogen (nitrate, nitrite, ammonia, organic nitrogen) and phosphorus (orthophosphate and others), both natural and man-made.	--
Permitting Authority	The agency authorized to issue and enforce specific requirements of the NPDES permit program. The permitting authority may be EPA, or a state, territorial, or tribal agency that has been authorized under CWA section 402(b) to administer the NPDES program within its jurisdiction.	--

Exhibit A-2 Glossary (continued)

Term	Definition	Citation
pH	A measure of the hydrogen ion concentration of water or wastewater; expressed as the negative log of the hydrogen ion concentration in mg/L. A pH of 7 is neutral. A pH less than 7 is acidic, and a pH greater than 7 is basic.	1996 PWM
Point Source	Any discernible, confined, and discrete conveyance, including any pipe, ditch, channel, tunnel, conduit, well, discrete fixture, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. The term does not include return flows from irrigated agriculture or agricultural stormwater runoff.	Adapted from § 122.2
Pollutant	Dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials (except those regulated under the Atomic Energy Act of 1954, as amended [42 U.S.C. 2011 *et seq.*)], heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water. It does not mean a. Sewage from vessels. b. Water, gas, or other material that is injected into a well to facilitate production of oil or gas, or water derived in association with oil and gas production and disposed of in a well, if the well used either to facilitate production or for disposal purposes is approved by authority of the state in which the well is located, and if the state determines that the injection or disposal will not result in the degradation of ground or surface water resources.	§ 122.2
Pollutant, Conservative	Pollutants that do not readily degrade in the environment and that are mitigated primarily by dilution after entering receiving waters (e.g., metals, total suspended solids).	Adapted from 1996 PWM
Pollutant, Non-Conservative	Pollutants that are mitigated by natural biodegradation or other environmental decay or removal processes in the receiving water after mixing and dilution have occurred (e.g., biochemical oxygen demand, pH, volatile organic compounds).	Adapted from 1996 PWM
Pretreatment	The reduction of the amount of pollutants, the elimination of pollutants, or the alteration of the nature of pollutant properties in wastewater prior to or in lieu of discharging or otherwise introducing such pollutants into a POTW.	§ 403.3(s)
Primary Industry Category	Any industry category listed in the NRDC settlement agreement (*Natural Resources Defense Council et al. v. Train,* 8 E.R.C. 2120 [D.D.C. 1976], modified 12 E.R.C. 1833 [D.D.C. 1979]); also listed in Appendix A of Part 122.	§ 122.2
Primary Treatment	The practice of removing some portion of the suspended solids and organic matter in wastewater through sedimentation. Common usage of this term also includes preliminary treatment to remove wastewater constituents that may cause maintenance or operational problems in the system (i.e., grit removal, screening for rags and debris, oil and grease removal, etc.).	1996 PWM
Priority Pollutants	Those pollutants considered to be of principal importance for control under the CWA based on the NRDC Consent Decree (*NRDC et al. v. Train,* 8 E.R.C. 2120 [D.D.C. 1976], modified 12 E.R.C. 1833 [D.D.C. 1979]); a list of the pollutants is provided as Appendix A to 40 CFR Part 423.	1996 PWM

Exhibit A-2 Glossary (continued)

Term	Definition	Citation
Process Wastewater	Any water [that], during manufacturing or processing, comes into direct contact with, or results from the production or use of any raw material, intermediate product, finished product, by-product, or waste product.	§ 122.2
Production-Based Standard	A discharge standard expressed in terms of pollutant mass allowed per unit of product manufactured or some other measure of production.	1996 PWM
Proposed Permit	A state NPDES *permit* prepared after the close of the public comment period (and when applicable, any public hearing and administrative appeals) [that] is sent to EPA for review before final issuance by the state. A *proposed permit* is not a *draft permit*.	§ 122.2
Publicly Owned Treatment Works (POTW)	A treatment works as defined by CWA section 212, which is owned by a state or municipality [as defined by CWA section 502(4)]. This definition includes any devices and systems used in the storage, treatment, recycling, and reclamation of municipal sewage or industrial wastes of a liquid nature. It also includes sewers, pipes, and other conveyances only if they convey wastewater to a POTW. The term also means the municipality as defined in CWA section 502(4), which has jurisdiction over the indirect discharges to and the discharges from such a treatment works.	§ 403.3(q)
Sanitary Sewer	A pipe or conduit (sewer) intended to carry wastewater or water-borne wastes from homes, businesses, and industries to the POTW.	1996 PWM
Sanitary Sewer Overflows (SSO)	Untreated or partially treated sewage overflows from a sanitary sewer collection system.	1996 PWM
Secondary Industry Category	Any industry category, which is not a *primary industry category*.	§ 122.2
Secondary Treatment	Technology-based requirements for direct discharging POTWs. Standard is based on the expected performance of a combination of physical and biological processes typical for the treatment of pollutants in municipal sewage. Standards are expressed as a minimum level of effluent quality in terms of: BOD_5, total suspended solids (TSS), and pH (except as provided by treatment equivalent to secondary treatment and other special considerations).	Adapted from 1996 PWM
Section 304(a) Criteria	Developed by EPA under authority of CWA section 304(a) based on the latest scientific information on the relationship that the effect of a constituent concentration has on particular aquatic species and/or human health. This information is issued periodically to the states as guidance for use in developing criteria.	§ 131.3(c)
Self-Monitoring	Sampling and analyses performed by a facility to determine compliance with effluent limitations or other regulatory requirements.	1996 PWM

Exhibit A-2 Glossary (continued)

Term	Definition	Citation
Sewage Sludge	Any solid, semi-solid, or liquid residue removed during the treatment of municipal waste water or domestic sewage. Sewage sludge includes solids removed during primary, secondary, or advanced wastewater treatment, scum, septage, portable toilet pumpings, type III marine sanitation device pumpings (33 CFR Part 159), and sewage sludge products. Sewage sludge does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator or grit and screenings generated during preliminary treatment of domestic sewage in a treatment works.	Adapted from § 122.2 and Part 503
Significant Industrial User (SIU)	An indirect discharger that is the focus of control efforts under the National Pretreatment Program. SIUs include [with exceptions provided under § 403.3(v)]: i. All Industrial Users subject to Categorical Pretreatment Standards under § 403.6 and Chapter 1, Subchapter N. ii. Any other Industrial User that: discharges an average of 25,000 gallons per day or more of process wastewater to the POTW (excluding sanitary, noncontact cooling and boiler blowdown wastewater); contributes a process wastestream that makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the POTW; or is designated as such by the Control Authority on the basis that the Industrial User has a reasonable potential for adversely affecting the POTW's operation or for violating any Pretreatment Standard or requirement [in accordance with § 403.8(f)(6)].	Adapted from § 403.3(v)
Spill Prevention Control and Countermeasure Plan (SPCC)	A plan prepared by a facility to minimize the likelihood of a spill and to expedite control and cleanup activities if a spill occurs. Such plans are required for certain facilities under the Oil Pollution Prevention Regulations at 40 CFR Part 112.	Adapted from 1996 PWM
Standard Industrial Classification (SIC) Code	A code number system used to identify various types of industries. A particular industry may have more than one SIC code if it conducts several types of commercial or manufacturing activities onsite. An online version of the 1987 SIC Manual <www.osha.gov/pls/imis/sic_manual.html> is available courtesy of the Occupational Safety & Health Administration (OSHA).	Adapted from 1996 PWM
Statement of Basis	A document prepared for every draft NPDES permit for which a fact sheet is not required. A statement of basis briefly describes how permit conditions were derived and the reasons the conditions are necessary for the permit.	1996 PWM
STORET	EPA's computerized STOrage and RETrieval water quality data base that includes physical, chemical, and biological data measured in waterbodies throughout the United States.	1996 PWM
Storm Water (or Stormwater)	Stormwater runoff, snow melt runoff, and surface runoff and drainage.	§ 122.26(b)(13)
Technology-Based Effluent Limitation (TBEL)	An effluent limit for a pollutant that is based on the capability of a treatment method to reduce the pollutant to a certain concentration or mass loading level. TBELs for POTWs are derived from the secondary treatment regulations in Part 133 or state treatment standards. TBELs for non-POTWs are derived from effluent guidelines, state treatment standards, or by the permit writer on a case-by-case basis using best professional judgment.	Adapted from 1996 PWM

Exhibit A-2 Glossary (continued)

Term	Definition	Citation
Tiered Permit Limits	Permit limits that apply to the discharge only when a certain threshold (e.g., production level), specific circumstance (e.g., batch discharge), or time frame (e.g., after 6 months, during the months of May through October) triggers their use.	Adapted from 1996 PWM
Total Maximum Daily Load (TMDL)	The sum of the individual wasteload allocations (WLAs) for point sources and load allocations (LAs) for nonpoint sources and natural background. If a receiving water has only one point source discharger, the TMDL is the sum of that point source WLA plus the LAs for any nonpoint sources of pollution and natural background sources, tributaries, or adjacent segments. TMDLs can be expressed in terms of either mass per time, toxicity, or other appropriate measure. If best management practices (BMPs) or other nonpoint source pollution controls make more stringent load allocations practicable, then wasteload allocations can be made less stringent. Thus, the TMDL process provides for nonpoint source control tradeoffs.	40 CFR § 130.2(i)
Total Suspended Solids (TSS)	A measure of the filterable solids present in a sample, as determined by the method specified in Part 136.	1996 PWM
Toxic Pollutant	Any pollutant listed as toxic under CWA section 307(a)(1) or, in the case of *sludge use or disposal practices*, any pollutant identified in regulations implementing CWA section 405(d).	§ 122.2
Toxicity Reduction Evaluation (TRE)	A site-specific study conducted in a step-wise process designed to identify the causative agent(s) of effluent toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in effluent toxicity.	1996 PWM
Toxicity Test	A procedure to determine the toxicity of a chemical or an effluent using living organisms. A toxicity test measures the degree of effect on exposed test organisms of a specific chemical or effluent.	1996 PWM
Trading (or Water Quality Trading)	An innovative approach to achieve water quality goals more efficiently. Trading is based on the fact that sources in a watershed can face very different costs to control the same pollutant. Trading programs allow facilities facing higher pollution control costs to meet their regulatory obligations by purchasing environmentally equivalent (or superior) pollution reductions from another source at lower cost, thus achieving the same water quality improvement at lower overall cost.	Water Quality Trading Fact Sheet: <www.epa.gov/owow/watershed/trading/handbook/factsheet.html>
Treatability Manual	Five-set library of EPA guidance manuals that contain information related to the treatability of many pollutants. The manual may be used in developing effluent limitations for facilities and pollutants, which, at the time of permit issuance, are not subject to industry-specific effluent guidelines. The five volumes that comprise this series consist of Vol. I – Treatability Data (EPA-600/8-80-042a); Vol. II – Industrial Descriptions (EPA-600/8-80-042b); Vol. III – Technologies (EPA-600/8-80-042c); Vol. IV – Cost Estimating (EPA-600/8-80-042d); and Vol. V – Summary (EPA-600/8-80-042e).	1996 PWM
Treatment Works Treating Domestic Sewage (TWTDS)	A POTW or any other sewage sludge or waste water treatment devices or systems, regardless of ownership (including federal facilities), used in the storage, treatment, recycling, and reclamation of municipal or domestic sewage, including land dedicated for the disposal of sewage sludge. This definition does not include septic tanks or similar devices. For purposes of this definition, *domestic sewage* includes waste and waste water from humans or household operations that are discharged to or otherwise enter a treatment works.	Adapted from § 122.2

Exhibit A-2 Glossary (continued)

Term	Definition	Citation
Upset	An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.	§ 122.41(n)
Use Attainability Analysis	A structured scientific assessment of the factors affecting the attainment of the use that [can] include physical, chemical, biological, and economic factors as described in § 131.10(g).	§ 131.3
Variance	Any mechanism or provision under CWA sections 301 or 316 or under 40 CFR Part 125, or in the applicable *effluent limitations guidelines*, which allows modification to or waiver of the generally applicable effluent limitation requirements or time deadlines of the CWA. This includes provisions, [that] allow the establishment of alternative limitations based on fundamentally different factors or on CWA sections 301(c), 301(g), 301(h), 301(i), or 316(a).	§ 122.2
Wasteload Allocation (WLA)	The portion of a receiving water's loading capacity that is allocated to one of its existing or future point sources of pollution.	Adapted from § 130.2(h)
Water Quality Criteria	Elements of state water quality standards, expressed as constituent concentrations, levels, or narrative statements, representing a quality of water that supports a particular use. When criteria are met, water quality will generally protect the designated use.	§ 131.3(b)
Water Quality Limited Segment	Any segment where it is known that water quality does not meet applicable water quality standards, and/or is not expected to meet applicable water quality standards, even after the application of the technology-based effluent limitations required by CWA sections 301(b) and 306.	§ 131.3
Water Quality Standards (WQS)	Provisions of state or federal law that consist of a designated use or uses for the waters of the United States and water quality criteria for such waters based on such uses. Water quality standards are to protect the public health or welfare, enhance the quality of water, and serve the purposes of the CWA.	Adapted from §131.3
Water Quality-Based Effluent Limitation (WQBEL)	An effluent limitation determined by selecting the most stringent of the effluent limits calculated using all applicable water quality criteria (e.g., aquatic life, human health, wildlife, translation of narrative criteria) for a specific point source to a specific receiving water.	Adapted from 1996 PWM

Exhibit A-2 Glossary (continued)

Term	Definition	Citation
Waters of the United States	Means a. All waters [that] are currently used, were used in the past, or [could] be susceptible to use in interstate or foreign commerce, including all waters [that] are subject to the ebb and flow of the tide. b. All interstate waters, including interstate *wetlands*. c. All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, *wetlands*, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters 1. [That] are or could be used by interstate or foreign travelers for recreational or other purposes. 2. From which fish or shellfish are or could be taken and sold in interstate or foreign commerce or 3. [That] are used or could be used for industrial purposes by industries in interstate commerce. d. All impoundments of waters otherwise defined as waters of the United States under this definition. e. Tributaries of waters identified in paragraphs (a) through (d) of this definition. f. The territorial sea and g. Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. [see additional notes in § 122.2]	§ 122.2
Whole Effluent Toxicity (WET)	The aggregate toxic effect of an effluent measured directly by a toxicity test.	§ 122.2

Appendix B. Index to the CWA and NPDES Regulations

This appendix provides two tables to help permit writers navigate Clean Water Act (CWA) legislation and National Pollutant Discharge Elimination System (NPDES) regulations. The first table provides key sections of the CWA and the second table provides an index to NPDES regulations.

B.1 Index to Sections of the CWA

Title 33 of the *United States Code* (U.S.C.) includes the statutes and amendments to the CWA. Exhibit B-1 matches key sections of the CWA to the appropriate reference in the U.S.C. This latest version, dated December 20, 2004, was provided by the New England Interstate Water Pollution Control Commission.

Exhibit B-1 Index to sections of the CWA

33 U.S.C. section	Section title	CWA section
	Subchapter I Research and Related Programs	
1251	Congressional declaration of goals and policy	**101**
1252	Comprehensive programs for water pollution control	**102**
1253	Interstate cooperation and uniform laws	**103**
1254	Research, investigations, training and information	**104**
1255	Grants for research and development	**105**
1256	Grants for pollution control programs	**106**
1257	Mine water pollution demonstrations	**107**
1258	Pollution control in the Great Lakes	**108**
1259	Training grants and contracts	**109**
1260	Applications for training grants and contracts; allocations	**110**
1261	Scholarships	**111**
1262	Definitions and authorization	**112**
1263	Alaska village demonstration project	**113**
1265	In-place toxic pollutants	**115**
1266	Hudson River reclamation demonstration project	**116**
1267	Chesapeake Bay	**117**
1268	Great Lakes	**118**
1269	Long Island Sound	**119**
1270	Lake Champlain management conference	**120**
1273	Lake Pontchartrain Basin	**121**
1274	Wet weather watershed pilot projects	**121**
	Subchapter II Grants for Construction of Treatment Works	
1281	Congressional declaration of purpose	**201**
1282	Federal share	**202**
1283	Plans, specifications, estimates, and payments	**203**
1284	Limitations and conditions	**204**
1285	Allotment of grant funds	**205**
1286	Reimbursement and advanced construction	**206**
1287	Authorization of appropriations	**207**
1288	Area wide waste treatment management	**208**
1289	Basin planning	**209**

Exhibit B-1 Index to sections of the CWA (continued)

33 U.S.C. section	Section title	CWA section
1290	Annual survey	210
1291	Sewage collection system	211
1292	Definitions	212
1293	Loan guarantees	213
1294	Wastewater recycling and reuse information and education	214
1295	Requirements for American materials	215
1296	Determination of priority	216
1297	Guidelines for cost-effective analysis	217
1298	Cost effectiveness	218
1299	State certification of projects	219
1300	Pilot program for alternative water source projects	220
1301	Sewer overflow control grants	221
Subchapter III Standards and Enforcement		
1311	Effluent Limitations	301
1312	Water quality-related effluent limitations	302
1313	Water quality standards and implementation plans	303
1314	Information and guidelines	304
1315	Water quality inventory	305
1316	National standards of performance	306
1317	Toxic and pretreatment effluent standards	307
1318	Records and reports, inspections	308
1319	Enforcement	309
1320	International pollution abatement	310
1321	Oil and hazardous substance liability	311
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1323	Federal facility pollution control	313
1324	Clean lakes	314
1325	National study commission	315
1326	Thermal discharges	316
1328	Aquaculture	318
1329	Nonpoint source management program	319
1330	National estuary study	320
Subchapter IV Permits and Licenses		
1341	Certification	401
1342	National pollutant discharge elimination system	402
1343	Ocean discharge criteria	403
1344	Permits for dredge and fill materials	404
1345	Disposal or use of sewage sludge	405
1346	Coastal recreation water quality monitoring and notification	406
Subchapter V General Provisions		
1361	Administration	501
1362	Definitions	502
1363	Water pollution control advisory board	503
1364	Emergency powers	504
1365	Citizen suits	505
1366	Appearance	506
1367	Employee protection	507
1368	Federal procurement	508
1369	Administrative procedure and judicial review	509
1370	State authority	510

Exhibit B-1 Index to sections of the CWA (continued)

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1251 Note	Separability	**512**
1372	Labor standards	**513**
1373	Public health agency coordination	**514**
1374	Effluent standards and water quality information advisory committee	**515**
1375	Reports to Congress	**516**
1376	Authorization of appropriations	**517**
1377	Indian tribes	**518**
1251 Note	Short Title	**519**
	Subchapter VI State Water Pollution Control Revolving Funds	
1381	Grants to States for establishment of revolving funds	**601**
1382	Capitalization grant agreements	**602**
1383	Water pollution control revolving loan funds	**603**
1384	Allotment of funds	**604**
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1387	Authorization of appropriations	**607**

B.2 Index to NPDES Regulations

The index to NPDES regulations table presented in Exhibit B-2 was created by Sylvia Kawabata of EPA Region 10 on February 1, 1986, and is maintained by Doug Corb of EPA Region 1.

Exhibit B-2 Index to NPDES regulations

Subject	40 CFR section number
	Selected CWA sections
CWA section 301(c) – Modification of Timetable	§ 122.21(m)(2) Part 125, Subpart E (reserved)
CWA section 301(g) – Modifications for Certain Nonconventional Pollutants	§ 122.21(m)(2) Part 125, Subpart F (reserved) *Technical Guidance Manual for the Regulations Promulgated Pursuant to section 301(g) of the Clean Water Act of 1977 and 40 CFR Part 125 (Subpart F); August 22, 1984.* <www.epa.gov/npdes/pubs/owm0008.pdf>
CWA section 301(h) – Secondary Treatment Waiver	§ 122.21(n)(1) Part 125, Subpart G
CWA section 301(n) – Timetable for Achievement of Objectives	See Fundamentally Different Factors
CWA section 316(a) – Thermal Discharges	§ 122.21(m)(6) Part 125, Subpart H § 124.57 § 124.62(a)(2) § 124.66
	NPDES permit subjects
Administrative Procedures Act Permit Continuance	§ 122.6
Administrative Record	§ 124.9 § 124.18

Exhibit B-2 Index to NPDES regulations (continued)

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Alternate Test Procedures • Application • Approval	 • § 136.4 • § 136.5
Ambient Monitoring (for Indicator Parameters)	§ 122.44(d)(1)(vi)(C)(3)
Anti-backsliding	See Backsliding
Antidegradation Policy	§ 131.12
Applicability to State NPDES Programs	See General Conditions for All Permits (State Programs)
Application • Submittal Deadline (Time to Apply) • Permit May Not Be Issued Without Complete Application • Completeness	§ 122.21 • § 122.21(c) • § 122.21(e) • §§ 124.3(c) – 124.3(g)
Aquaculture	§ 122.25 Part 125, Subpart B
Aquatic Animal Production Facilities • Application • Definition Criteria for Determination • General Permit	§ 122.24 • § 122.21(i)(2) • § 122.24 Part 122, Appendix C • § 122.28
Average Monthly (Definition) • Requirements for use in Non-POTWs • Requirements for use in POTWs	§ 122.2 • § 122.45(d)(1) • § 122.45(d)(2)
Average Weekly (Definition) • Requirements for use in POTWs	§ 122.2 • § 122.45(d)(2)
Biochemical Oxygen Demand (BOD_5)	§ 133.101(d)
Backsliding • From Water Quality and Technology Based Limits • From Water Quality	§ 122.44(l) § 122.62(a)(15) § 122.62(a)(17) • CWA section 402(o) • CWA section 303(d)(4)
Best Management Practices • Definition • In Effluent Limitation Guidelines • Case-by-Case Authority	• § 122.2 § 122.44(k) § 130.2(m) • CWA section 304(e) • CWA section 402(a)(1)
Best Professional Judgment (BPJ) • Case-by-Case Authority • Appropriate Factors	 • §125.3(a)(1) • §§125.3(c) and 125.3(d)
BMP	See Best Management Practices
Boilerplate Permit Conditions	§§ 122.41 - 122.42
BPJ	See Best Professional Judgment
Bypasses	§ 122.41(m)
CAFO	See Concentrated Animal Feeding Operations
Calculating NPDES Permit Conditions	§ 122.45
Carbonaceous Biochemical Oxygen Demand ($CBOD_5$)	§ 133.101(e)
Case-by-Case Limitations	See also BPJ § 122.44(a) § 125.3
Case-by-Case Permits	See also BPJ § 124.52

Exhibit B-2 Index to NPDES regulations (continued)

Subject	40 CFR section number
Clean Water Act (CWA)	(Public Law 92-500), 33 U.S.C. 1251 *et seq.*, as amended by Public Laws 96-483; 97-117; 95-217, 97-117, 97-440, and 100-04
Coast Guard (Discharges from Transportation Over Water)	§ 122.44(p)
Coastal Zone Management Act	§ 122.49(d)
Combined Sewer Overflow Policy	59 FR 18688, April 19, 1994 <www.epa.gov/npdes/pubs/owm0111.pdf>
Comments Received During Public Notice Period	§ 124.13
Compliance Schedules (in permits) • Allowance by State Water Quality Standards	§ 122.41(l)(5) § 122.47 §§ 122.62(a)(4), (a)(9), (a)(13) • Star-kist Caribe, Inc., NPDES Appeal No. 88-5 <www.epa.gov/npdes/pubs/owm0121.pdf> (EAB, May 25, 1992)
Computation of Time	§ 124.20
Concentrated Animal Feeding Operations	§ 122.23
Concentrated Aquatic Animal Production	See Aquatic Animal Production
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Confidentiality of Information	§ 122.7 Part 2
Consolidation of Permit Processing	§ 124.4
Continuation of Expired Permits	§ 122.6
Continuous Discharge	§ 122.45(d)
Conventional Pollutants	§ 401.16
Cooling Water Intake Structures [CWA section 316(b)]	Part 125, Subparts I, J and N § 122.21(r) § 401.14
DMR	See Discharge Monitoring Report
Daily Average	See Average Monthly
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Denial of Permit • Public Notice of Denial	§ 124.6(b) • § 124.10(a)(1)(i)
Design Flow (POTWs)	§ 122.45(b)(1)
Dilution, Not A Substitute For Treatment	§ 122.45(f)(1)(iii) § 125.3(f)
Discharge Monitoring Report (DMR)	§ 122.41(l)(4)
Discharge of a Pollutant (Definition)	§ 122.2
Disposal into Wells, into POTWs, or by Land Application	§ 122.50 § 122.45(i)
Draft Permit	§ 124.6
Dredged Materials (Discharge to Waters of the United States)	CWA section 404
Duration of Permits • Computation of time	§ 122.46 • § 124.20
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Duty to Mitigate	§ 122.41(d)
Duty to Provide Information	§ 122.41(h)
Duty to Reapply	§ 122.41(b)
Effect of a Permit	§ 122.5

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Endangered Species Act	§ 122.49(c)
Enforcement Authority	§ 123.27
Environmental Impact Statement (EIS) • EIS Public Notice of a New Source • Final EIS • New Source • NEPA	 • § 124.10(b)(1) • § 124.61 • § 122.29(c) • Part 6
Equivalent To Secondary Treatment (for POTWs)	§ 133.105
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Establishing Permit Conditions	§ 122.43
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Expiration Dates	See Duration of Permits
Extension of Public Notice Comment Period	§ 124.12(c)
FDF	See Fundamentally Different Factors
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Filter Backwash	§ 125.3(g)
Fish and Wildlife Coordination Act	§ 122.49(e)
Fish Farms	See Aquatic Animal Production Facilities
Flow Augmentation	§ 125.3(f)
Flow Limits (POTW - Design Flow)	§ 122.45(b)
Flow Monitoring Requirement	§ 122.44(i)(1)(ii)
Fundamentally Different Factors (FDF)	§ 122.21(m)(1) § 122.44(d)(8) Part 125, Subpart D
Frequency of Sampling (Not less than once per year)	§ 122.44(i)(2)
General Conditions Applicable to All Permits	§ 122.41
General Conditions for All Permits (State Programs)	§ 123.25
General Permits • Public Notice • Individual Permit Required	§ 122.28 • § 124.10(c)(2)(i) • § 122.28(b)(3)
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Indian Tribe (Definition)	§ 124.2
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Inspection and Entry	§ 122.41(i)
Internal Waste Streams	§ 122.45(h)
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Introduction of New Pollutants (POTW)	§ 122.42(b)
Issuance and Effective Date	§ 124.15 § 124.60
Mass Limitations	§ 122.45(f) § 122.44(i)(1)(i)
Maximum Daily (Definition) • Requirements for Non-POTWs	§ 122.2 • § 122.45(d)(1)
Metals (To Be Expressed as Total Recoverable)	§ 122.45(c)

Exhibit B-2 Index to NPDES regulations (continued)

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Monitoring and Records • Monitoring Reports • Requirements • Recordkeeping	§ 122.41(j) • § 122.41(l)(4) • § 122.44(h) • § 122.21(p)
Municipal Separate Storm Sewer Systems (MS4) • When Permit Required • Definitions	 • §§ 122.26(a)(3), (4), and (5) • § 122.26(b)
• Large and Medium MS4s Application Requirements • Small MS4 Requirements	• § 122.26(d) • §§ 122.30 and 122.32 - 122.37
• Tribes	• § 122.31
NPDES (Definition)	§ 122.2
National Environmental Policy Act (NEPA)	§ 122.49(g)
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Navigable Waters (Definition)	§ 110.1
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Need to Halt or Reduce Activity, Not a Defense	§ 122.41(c)
Net/Gross - Intake Credits	§ 122.45(g)
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Non-Attainment Waters	§ 130.10(d)
Non-Continuous Discharges	§ 122.45(e)
Noncompliance • Anticipated • Other	 • § 122.41(l)(2) • § 122.41(l)(7)
Notification Levels • General • For Existing Manufacturing, Commercial, Mining, and Silvicultural Dischargers	 • § 122.62(a)(12) • § 122.42(a) • § 122.44(f)
Ocean Discharge Criteria	Part 125, Subpart M
Offshore Oil and Gas Facilities • Requirements Applicable to Cooling Water Intake Structures for New Offshore Oil and Gas Extraction Facilities under CWA section 316(b) • General Permit Requirements & Application Effluent Guidelines and Standards	 • Part 125, Subpart N • § 122.28(c) Part 435, Subpart A
Stormwater Exemption	§ 122.26(a)(2)
Oil Pollution Prevention	Part 112

Exhibit B-2 Index to NPDES regulations (continued)

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Transfer of Permit	§ 122.61
Treatment Works Treating Domestic Sewage Sludge (TWTDS) (Definition)	§ 122.2
Twenty-four Hour Reporting	§ 122.41(l)(6)
Upset	§ 122.41(n)
Variances for • Non-POTWs • POTWs • Appeals of variances • Decisions on variances • Expedited variance procedures and time extensions • Procedures for variances when EPA is the permitting authority	 • § 122.21(m) • § 122.21(n) • § 124.64 • § 124.62 • § 122.21(o) • § 124.63

Exhibit B-2 Index to NPDES regulations (continued)

Subject	40 CFR section number
Vessel (Definition)	§ 112.2
Waste Stabilization Ponds (POTW)	§ 133.103(c)
Water Quality Report – CWA section 305(b)	§ 130.8
Water Quality Standards (WQS) • Scope • Purpose • Definitions • State Authority • EPA Authority • Submission, Minimum Requirements • Dispute Resolution • Establishment of Standards • Criteria • Antidegradation Policy • General Policies on Establishing WQS • State Review and Revision of WQS • EPA Review and Approval of WQS • EPA Promulgation of WQS • Federally Promulgated Standards (State-By-State List)	Part 131 • § 131.1 • § 131.2 • § 131.3 • § 131.4 • § 131.5 • § 131.6 • § 131.7 • § 131.10 • § 131.11 • § 131.12 • § 131.13 • § 131.20 • § 131.21 • § 131.22 • Part 131, Subpart D
Waters of the United States (Definition)	§ 122.2
Wetlands	See Waters of the U.S. § 122.2
Whole Effluent Toxicity (WET) Limits	§ 122.44(d)(1)(iv) § 125.3(c)(4)
WET Testing With Permit Application (POTWs)	§ 122.21(j)
Wild and Scenic Rivers Act	§ 122.49(a)
Withdrawal Of State Program	§§ 123.63 - 123.64

Appendix C. Priority Pollutants

Exhibit C-1 presents the list of 126 priority (toxic) pollutants from 40 CFR Part 423 Appendix A, which are further discussed in sections 1.2 and 6.1.1.2 of this manual. Note that the list goes up to 129 because numbers 017, 049, and 050 were deleted.

Exhibit C-1 Priority pollutants from 40 CFR Part 423, Appendix A

#	Pollutant name	#	Pollutant name
001	Acenaphthene	067	Butyl benzyl phthalate
002	Acrolein	068	Di-N-Butyl Phthalate
003	Acrylonitrile	069	Di-n-octyl phthalate
004	Benzene	070	Diethyl Phthalate
005	Benzidine	071	Dimethyl phthalate
006	Carbon tetrachloride (tetrachloromethane)	072	1,2-benzanthracene (benzo(a) anthracene
007	Chlorobenzene	073	Benzo(a)pyrene (3,4-benzo-pyrene)
008	1,2,4-trichlorobenzene	074	3,4-Benzofluoranthene (benzo(b) fluoranthene)
009	Hexachlorobenzene	075	11,12-benzofluoranthene (benzo(b) fluoranthene)
010	1,2-dichloroethane	076	Chrysene
011	1,1,1-trichloreothane	077	Acenaphthylene
012	Hexachloroethane	078	Anthracene
013	1,1-dichloroethane	079	1,12-benzoperylene (benzo(ghi) perylene)
014	1,1,2-trichloroethane	080	Fluorene
015	1,1,2,2-tetrachloroethane	081	Phenanthrene
016	Chloroethane	082	1,2,5,6-dibenzanthracene (dibenzo(,h) anthracene)
018	Bis(2-chloroethyl) ether	083	Indeno (,1,2,3-cd) pyrene (2,3-o-pheynylene pyrene)
019	2-chloroethyl vinyl ether (mixed)	084	Pyrene
020	2-chloronaphthalene	085	Tetrachloroethylene
021	2,4, 6-trichlorophenol	086	Toluene
022	Parachlorometa cresol	087	Trichloroethylene
023	Chloroform (trichloromethane)	088	Vinyl chloride (chloroethylene)
024	2-chlorophenol	089	Aldrin
025	1,2-dichlorobenzene	090	Dieldrin
026	1,3-dichlorobenzene	091	Chlordane (technical mixture and metabolites)
027	1,4-dichlorobenzene	092	4,4-DDT
028	3,3-dichlorobenzidine	093	4,4-DDE (p,p-DDX)
029	1,1-dichloroethylene	094	4,4-DDD (p,p-TDE)
030	1,2-trans-dichloroethylene	095	Alpha-endosulfan
031	2,4-dichlorophenol	096	Beta-endosulfan
032	1,2-dichloropropane	097	Endosulfan sulfate
033	1,2-dichloropropylene (1,3-dichloropropene)	098	Endrin
034	2,4-dimethylphenol	099	Endrin aldehyde
035	2,4-dinitrotoluene	100	Heptachlor
036	2,6-dinitrotoluene	101	Heptachlor epoxide (BHC-hexachlorocyclohexane)
037	1,2-diphenylhydrazine	102	Alpha-BHC
038	Ethylbenzene	103	Beta-BHC
039	Fluoranthene	104	Gamma-BHC (lindane)
040	4-chlorophenyl phenyl ether	105	Delta-BHC (PCB-polychlorinated biphenyls)

Exhibit C-1 Priority pollutants from 40 CFR Part 423, Appendix A (continued)

#	Pollutant name	#	Pollutant name
041	4-bromophenyl phenyl ether	106	PCB-1242 (Arochlor 1242)
042	Bis(2-chloroisopropyl) ether	107	PCB-1254 (Arochlor 1254)
043	Bis(2-chloroethoxy) methane	108	PCB-1221 (Arochlor 1221)
044	Methylene chloride (dichloromethane)	109	PCB-1232 (Arochlor 1232)
045	Methyl chloride (dichloromethane)	110	PCB-1248 (Arochlor 1248)
046	Methyl bromide (bromomethane)	111	PCB-1260 (Arochlor 1260)
047	Bromoform (tribromomethane)	112	PCB-1016 (Arochlor 1016)
048	Dichlorobromomethane	113	Toxaphene
051	Chlorodibromomethane	114	Antimony
052	Hexachlorobutadiene	115	Arsenic
053	Hexachloromyclopentadiene	116	Asbestos
054	Isophorone	117	Beryllium
055	Naphthalene	118	Cadmium
056	Nitrobenzene	119	Chromium
057	2-nitrophenol	120	Copper
058	4-nitrophenol	121	Cyanide, Total
059	2,4-dinitrophenol	122	Lead
060	4,6-dinitro-o-cresol	123	Mercury
061	N-nitrosodimethylamine	124	Nickel
062	N-nitrosodiphenylamine	125	Selenium
063	N-nitrosodi-n-propylamin	126	Silver
064	Pentachlorophenol	127	Thallium
065	Phenol	128	Zinc
066	Bis(2-ethylhexyl) phthalate	129	2,3,7,8-tetrachloro-dibenzo-p-dioxin (TCDD)

Appendix D. New Source Dates by Effluent Guideline Category

This appendix provides the applicable new source dates used in making new source determinations by effluent guideline category as provided in Appendix B of the U.S. Environmental Protection Agency (EPA) memorandum New Source Dates for Direct and Indirect Dischargers[1] <www.epa.gov/npdes/pubs/newsource_dates.pdf> sent by the directors of EPA's Water Permits Division and the Engineering and Analysis Division to the Regional Water Division Directors on September 28, 2006. Section 5.2.2.4 of this manual discusses the determination of whether existing or new source standards apply.

EPA has promulgated regulations under the Clean Water Act (CWA) that establish effluent limitations guidelines for existing sources, standards of performance for new sources and pretreatment standards for new and existing sources. EPA has codified these regulations at Title 40 of the *Code of Federal Regulations* (CFR) Subchapter N. As discussed in section 5.2.1 of this manual, EPA has published effluent guidelines for 56 major industrial categories (over 450 subcategories) since the passage of the 1972 CWA. Those regulations limit the discharge of pollutants to surface waters by point source dischargers (*direct dischargers*). The regulations also limit the introduction of pollutants into publicly owned treatment works (POTWs) by industrial users (*indirect dischargers*). The CWA and EPA regulations define when a source is a *new source*. A discharger is defined as a new source in CWA sections 306(a)(2) and 307(c) and §§ 122.2 (for direct dischargers) and 403.3(m) (for indirect dischargers). In general, a facility is a new source if it begins construction after either the date of promulgation of new source performance standards applicable to the direct dischargers or the date of publication of a proposed new source performance standard applicable to an indirect discharger.

Exhibit D-1 lists new source dates for direct or indirect dischargers based on regulatory definitions. In some cases, effluent guidelines in 40 CFR Chapter I, Subchapter N, specify New Source Dates, and these dates are reported in the table below. If dates are not specified in the rule language, EPA based the date on the regulatory definitions of new source, which are cited above. EPA's General Pretreatment Regulations provide that an indirect source is a new source if construction of the source began after the publication of proposed pretreatment standards for new sources if the proposed standard is later finalized [§ 403.3(m)]. For direct dischargers, § 122.2 states that the New Source date is the proposal date if the standard is finalized within 120 days after its proposal; otherwise, the New Source date is the *promulgation date*. EPA's regulations establish the time and date of EPA's actions for purposes of determining when the action is subject to judicial review. The regulations, in the case of the CWA, define the date of an EPA promulgation action as two weeks after the rule appears in the *Federal Register* (see § 23.2). Before February 1985, the date on which the final rule was published was considered the promulgation date.

This document is not a regulation itself, nor does it substitute for any requirements under the CWA or EPA's regulations. Thus, it does not impose legally binding requirements on EPA, states or the regulated community. While EPA has made every effort to ensure the accuracy of this table, dischargers' obligations are determined, in the case of direct dischargers, by the terms of their NPDES permit and the CWA and EPA's regulations, and, in the case of indirect dischargers, by permits or equivalent control mechanisms issued to POTW industrial users and the CWA and EPA regulations. Nothing in this document changes any statutory or regulatory requirement. If the discussion in this memorandum conflicts with any permit or regulation, this document would not be controlling.

Exhibit D-1 New source dates by effluent category

40 CFR Part	Category	New source date for direct dischargers	New source date for indirect dischargers
467	Aluminum Forming	Subparts A-F: 10/24/83	Subparts A-F: 11/22/82
427	Asbestos Manufacturing	Subparts A-K: 10/30/73[2]	Not Applicable
461	Battery Manufacturing	Subparts A-G: 03/09/84	Subparts A-G 11/10/82
407	Canned and Preserved Fruits and Vegetables Processing	Subparts A-H: 03/21/74	Not Applicable
408	Canned and Preserved Seafood Processing	Subparts A-J, N: 06/26/74 Subparts O-AG: 12/01/75	Not Applicable
458	Carbon Black Manufacturing	Subparts A-D: 01/09/78	Subparts A-D: 05/18/76
411	Cement Manufacturing	Subparts A-C: 02/20/74	Not Applicable
437	Centralized Waste Treatment (CWT)	Subparts A-D: 01/05/01	Subparts A-D: 01/13/99
434	Coal Mining	Subparts B-E, H: 05/04/84[3] Subpart G: 02/22/02[4]	Not Applicable
465	Coil Coating	Subparts A-C: 12/01/82 Subpart D: 11/17/83	Subparts A-C: 01/12/81 Subpart D: 02/10/83
412	Concentrated Animal Feeding Operations (CAFO)	Subparts A-B: 02/14/74 Subparts C-D: 04/14/03[5]	Subpart B: 09/07/73
451	Concentrated Aquatic Animal Production	Subparts A-B: 09/07/04	Not Applicable
468	Copper Forming	Subpart A: 08/15/83	Subpart A: 11/12/82
405	Dairy Products Processing	Subparts A-L: 05/28/74	Not Applicable
469	Electrical and Electronic Components	Subparts A-B: 04/08/83 Subparts C-D: 12/14/83	Subparts A-B: 08/24/82 Subparts C-D: 03/09/83
413	Electroplating	Not Applicable[6]	See Metal Finishing[7]
457	Explosives Manufacturing	Not Applicable	Not Applicable
424	Ferroalloy Manufacturing	Subparts A-C: 02/22/74	Not Applicable
418	Fertilizer Manufacturing	Subparts A-D: 04/08/74 Subpart E: 01/16/76 Subparts F-G: 10/07/74[8]	Subparts A-D[9]: 12/07/73 Subpart E: 01/16/76 Subparts F-G: 10/07/74
426	Glass Manufacturing	Subpart A: 01/22/74 Subparts B-D: 02/14/74 Subparts E-G: 02/14/74 Subparts H, J-M: 01/16/75	Subparts H, K-M: 08/21/74
406	Grain Mills	Subparts A-J: 12/04/73[10]	Subpart A: 12/04/73
454	Gum and Wood Chemicals	Not Applicable	Not Applicable
460	Hospitals	Not Applicable	Not Applicable
447	Ink Formulating	Subpart A: 07/28/75	Subpart A: 02/26/75

Exhibit D-1 New source dates by effluent category (continued)

40 CFR Part	Category	New source date for direct dischargers	New source date for indirect dischargers
415	Inorganic Chemicals	Subparts B-F, H, K-N, P, Q, T, V, W, AJ [$CuSO_4$ manufacturing], AH, AP, AU [$NiSO_4$ manufacturing], BB: 06/29/82 Subparts AJ [except $CuSO_4$ manufacturing], AU [except $NiSO_4$ manufacturing], BL - BO: 08/22/84	Subparts B-F, H, K-N, P, Q, V, AH, AJ [$CuSO_4$ manufacturing], AP, AU [$NiSO_4$ manufacturing], BB: 07/24/80 Subparts T, AA, AC, AE, AI, AJ [except $CuSO_4$ manufacturing], AL, AN, AQ, AR, AU [except $NiSO_4$ manufacturing], AX, BC, BH, BK-BO: 10/25/83
420	Iron and Steel Manufacturing	Subparts A-B: 11/18/02[11] Subpart C: 05/27/82 Subpart D, Semi-Wet: 10/31/02 Subpart D, Other: 05/27/82 Subparts E-L: 05/27/82 Subpart M: 10/31/02	Subparts A-B: 11/18/02[12] Subpart C: 01/07/81 Subpart D, Semi-Wet: 12/27/00 Subpart D, Other: 01/07/81 Subparts E-F, H-J,L: 01/07/81 Subpart M: 12/27/00
445	Landfills	Subparts A-B: 02/02/00	Not Applicable
425	Leather Tanning and Finishing	Subparts A, B, D-I: 11/23/82 Subpart C: 04/04/88	Subpart A, B, D-I: 07/02/79 Subpart C: 01/21/87
432	Meat and Poultry Products	Subparts A-D, Small Facilities: 02/28/74[13] Subparts A-D, Other: 09/22/04 Subparts E-I, Small Facilities: 01/03/75[14] Subparts E-I, Other: 09/22/04 Subpart J-L: 09/22/04	Not Applicable
433	Metal Finishing	Subpart A: 07/15/83	Subpart A: 08/31/82
464	Metal Molding and Casting	Subparts A-D: 11/13/85	Subparts A-D: 11/15/82
438	Metal Products and Machinery	Subpart A: 06/12/03[15]	Not Applicable
436	Mineral Mining and Processing	Not Applicable	Not Applicable
471	Nonferrous Metals Forming and Metal Powders	Subparts A-J: 09/06/85	Subparts A-J: 03/05/84
421	Nonferrous Metal Manufacturing	Subparts B-I (except molybdenum acid plants), K-M: 03/08/84 Subparts N-AE, molybdenum acid plants in subpart I: 10/04/85 Subpart J: 02/04/88	Subparts B-I (except molybdenum acid plants), K-M: 02/17/83 Subparts N-AE, molybdenum acid plants in subpart I: 06/27/84 Subpart J: 01/22/87
435	Oil and Gas Extraction[16]	Subparts C (Onshore), D (Coastal), and E (Agriculture & Wildlife): 03/04/93 Subparts A and D (Synthetic-Based Drilling Fluids): 02/05/01	Subpart D: 02/17/95
440	Ore Mining and Dressing	Subparts A-F, J, M: 12/03/82	Not Applicable

Exhibit D-1 New source dates by effluent category (continued)

40 CFR Part	Category	New source date for direct dischargers		New source date for indirect dischargers	
414	Organic Chemicals, Plastics, and Synthetic Fibers	Subparts B-H:	11/19/87	Subparts B-H:	03/21/83
446	Paint Formulating	Subpart A:	07/28/75	Subpart A:	02/26/75
443	Paving and Roofing Materials (Tars and Asphalt)	Subparts A-D:	07/28/75	Subparts A-D:	01/10/75
455	Pesticide Chemicals	Subparts A-B: Subparts C, E:	10/12/93 11/20/96	Subparts A-B: Subparts C, E:	04/10/92 04/14/94
419	Petroleum Refining	Subparts A-E:	10/18/82	Subparts A-E:	12/21/79
439	Pharmaceutical Manufacturing	Subparts A-D:	11/20/98[17]	Subparts A-D:	05/02/95
422	Phosphate Manufacturing	Subparts D-F:	06/23/76	Not Applicable	
459	Photographic	Not Applicable		Not Applicable	
463	Plastics Molding and Forming	Subparts A-C:	12/17/84	Not Applicable	
466	Porcelain Enameling	Subparts A-D:	11/24/82	Subparts A-D:	01/27/81
430	Pulp, Paper, and Paperboard	Subparts B, E: Subparts A, C, D, F, G, I-L:	06/15/98[18] 11/18/82	Subparts B, E: Subparts A, C, D, F, G, I-L:	12/17/93 01/06/81
428	Rubber Manufacturing	Subparts A-D: Subparts E-J:	02/21/74 01/10/75	Subparts E-K:	08/23/74
417	Soap and Detergents Manufacturing	Subparts A-S:	4/12/74	Subpart Q: Subparts O, P, R:	12/26/73 02/20/75
423	Steam Electric Power Generation		11/19/82[19]		10/14/80
409	Sugar Processing	Subpart A: Subparts B, C:	1/31/74 12/07/73[20]	Not Applicable	

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[1] Boornazian, Linda and Mary Smith. 2006. *New Source Dates for Direct and Indirect Dischargers*. U.S. Environmental Protection Agency, Office of Water Memorandum. September 28, 2006. <www.epa.gov/npdes/pubs/newsource_dates.pdf>.

[2] The rule was finalized within 120 days of its October 30, 1973, proposal (38 FR 22606).

[3] The New Source date is specified in 40 CFR 434.11(j)(1).

[4] The New Source date is specified in 40 CFR 434.11(j)(1).

[5] New Source date derived from the 10-year protection period [see 40 CFR 412.35(d) and 412.43(d)].

[6] Direct dischargers formerly regulated under Part 413 are now regulated under Part 433 (metal finishing).

[7] Pretreatment categorical standards in Part 413 currently apply only to job shop electroplaters and independent printed circuit board manufacturers that were in existence before the New Source date for Part 433 (metal finishing). Job shop electroplaters and independent printed circuit board manufacturers that are "New Sources" must comply with PSNS in Part 433. Except for these "existing" job shop electroplaters and independent printed circuit board manufacturers, all other operations formerly subject to Part 413 are now subject to Part 433.

[8] The rule was finalized within 120 days of its October 7, 1974, proposal.

[9] Section 41 8.46 (the PSNS under Subpart D) was suspended until further notice, at 40 FR 26275, June 23, 1975, effective July 20, 1975.

[10] The rule was finalized within 120 days of its December 4, 1973, proposal (38 FR 33438).

Endnotes for this chapter continued on the next page.

[11] Date specified in 40 CFR 420.14(a)(2), 420.16(a)(2), 420.24(b), and 420.26(a)(2).

[12] See previous footnote.

[13] The 2004 Amendment did not revise NSPSs for small meat products facilities in Subparts A-I, so the 2004 New Source date does not affect these facilities.

[14] See previous footnote.

[15] Date specified in 40 CFR 438.15.

[16] See promulgated standards at 40 CFR 58 FR 12505 and 66 FR 6850 for complete information on the applicability of New Source standards.

[17] New Source date derived from the 10-year protection period [see 40 CFR 439.15(c), 439.35(c), and 439.45(b)].

[18] Date specified in 40 CFR 430.25(b) and 430.55(b). Refer to these sections for additional information regarding the applicability of NSPSs.

[19] NSPS promulgated were not removed via the 1982 regulation; therefore wastewaters generated by Part 423-applicable sources that were New Sources under the 1974 regulations are subject to the 1974 NSPS. The New Source date for the 1974 regulations was 10/8/1974.

[20] The rule was finalized within 120 days of its December 7, 1973, proposal (38 FR 33846).

United States Court of Appeals for the Ninth Circuit

Office of the Clerk
95 Seventh Street
San Francisco, CA 94103

Information Regarding Judgment and Post-Judgment Proceedings

Judgment

- This Court has filed and entered the attached judgment in your case. Fed. R. App. P. 36. Please note the filed date on the attached decision because all of the dates described below run from that date, not from the date you receive this notice.

Mandate (Fed. R. App. P. 41; 9th Cir. R. 41-1 & -2)

- The mandate will issue 7 days after the expiration of the time for filing a petition for rehearing or 7 days from the denial of a petition for rehearing, unless the Court directs otherwise. To file a motion to stay the mandate, file it electronically via the appellate ECF system or, if you are a pro se litigant or an attorney with an exemption from using appellate ECF, file one original motion on paper.

Petition for Panel Rehearing (Fed. R. App. P. 40; 9th Cir. R. 40-1)
Petition for Rehearing En Banc (Fed. R. App. P. 35; 9th Cir. R. 35-1 to -3)

(1) A. Purpose (Panel Rehearing):

- A party should seek panel rehearing only if one or more of the following grounds exist:
  - ► A material point of fact or law was overlooked in the decision;
  - ► A change in the law occurred after the case was submitted which appears to have been overlooked by the panel; or
  - ► An apparent conflict with another decision of the Court was not addressed in the opinion.
- Do not file a petition for panel rehearing merely to reargue the case.

B. Purpose (Rehearing En Banc)

- A party should seek en banc rehearing only if one or more of the following grounds exist:

- Consideration by the full Court is necessary to secure or maintain uniformity of the Court's decisions; or
- The proceeding involves a question of exceptional importance; or
- The opinion directly conflicts with an existing opinion by another court of appeals or the Supreme Court and substantially affects a rule of national application in which there is an overriding need for national uniformity.

(2) Deadlines for Filing:

- A petition for rehearing may be filed within 14 days after entry of judgment. Fed. R. App. P. 40(a)(1).
- If the United States or an agency or officer thereof is a party in a civil case, the time for filing a petition for rehearing is 45 days after entry of judgment. Fed. R. App. P. 40(a)(1).
- If the mandate has issued, the petition for rehearing should be accompanied by a motion to recall the mandate.
- *See* Advisory Note to 9th Cir. R. 40-1 (petitions must be received on the due date).
- An order to publish a previously unpublished memorandum disposition extends the time to file a petition for rehearing to 14 days after the date of the order of publication or, in all civil cases in which the United States or an agency or officer thereof is a party, 45 days after the date of the order of publication. 9th Cir. R. 40-2.

(3) Statement of Counsel

- A petition should contain an introduction stating that, in counsel's judgment, one or more of the situations described in the "purpose" section above exist. The points to be raised must be stated clearly.

(4) Form & Number of Copies (9th Cir. R. 40-1; Fed. R. App. P. 32(c)(2))

- The petition shall not exceed 15 pages unless it complies with the alternative length limitations of 4,200 words or 390 lines of text.
- The petition must be accompanied by a copy of the panel's decision being challenged.
- An answer, when ordered by the Court, shall comply with the same length limitations as the petition.
- If a pro se litigant elects to file a form brief pursuant to Circuit Rule 28-1, a petition for panel rehearing or for rehearing en banc need not comply with Fed. R. App. P. 32.

- The petition or answer must be accompanied by a Certificate of Compliance found at Form 11, available on our website at www.ca9.uscourts.gov under *Forms*.
- You may file a petition electronically via the appellate ECF system. No paper copies are required unless the Court orders otherwise. If you are a pro se litigant or an attorney exempted from using the appellate ECF system, file one original petition on paper. No additional paper copies are required unless the Court orders otherwise.

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- The Bill of Costs must be filed within 14 days after entry of judgment.
- See Form 10 for additional information, available on our website at www.ca9.uscourts.gov under *Forms*.

Attorneys Fees

- Ninth Circuit Rule 39-1 describes the content and due dates for attorneys fees applications.
- All relevant forms are available on our website at www.ca9.uscourts.gov under *Forms* or by telephoning (415) 355-7806.

Petition for a Writ of Certiorari

- Please refer to the Rules of the United States Supreme Court at www.supremecourt.gov

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  - ► Thomson Reuters; 610 Opperman Drive; PO Box 64526; Eagan, MN 55123 (Attn: Jean Green, Senior Publications Coordinator);
  - ► and electronically file a copy of the letter via the appellate ECF system by using “File Correspondence to Court,” or if you are an attorney exempted from using the appellate ECF system, mail the Court one copy of the letter.

UNITED STATES COURT OF APPEALS
FOR THE NINTH CIRCUIT

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