

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. See 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/BCT 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 (BOD₅).
- 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 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 (BOD₅, 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

