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Effluent Limitations Guidelines and Standards for the Construction and Development Point Source Category; Final Rule

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 450

[EPA–HQ–OW–2008–0465; FRL–9086–4]

RIN 2040–AE91

Effluent Limitations Guidelines and Standards for the Construction and Development Point Source Category

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: The Environmental Protection Agency is publishing final regulations establishing Clean Water Act (CWA) technology-based Effluent Limitations Guidelines and New Source Performance Standards for the Construction and Development (C&D) point source category. EPA expects compliance with this regulation to reduce the amount of sediment and other pollutants discharged from construction and development sites by approximately 4 billion pounds per year.

DATES: This final rule is effective on February 1, 2010, 60 days after publication in the **Federal Register**.

ADDRESSES: EPA has established a docket for this action under Docket ID No. EPA–HQ–OW–2008–0465. All documents in the docket are listed on the *http://www.regulations.gov* Web site. Although listed in the index, some information is not publicly available, e.g., CBI or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, is not placed on the Internet and will be publicly available only in hard copy form. Publicly available docket materials are available either electronically through *http://www.regulations.gov* or in hard copy at the Office of Water Docket, EPA/DC, EPA West, Room 3334, 1301 Constitution Ave., NW., Washington, DC. The Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566–1744, and the telephone number for the Office of Water Docket is (202) 566–1752.

FOR FURTHER INFORMATION CONTACT: For technical information concerning today's rule, contact Mr. Jesse W. Pritts at 202–566–1038 (*pritts.jesse@epa.gov*). For economic information contact Mr. Todd Doley at 202–566–1160 (*doley.todd@epa.gov*). For information regarding environmental benefits, contact Ms. Ashley Allen at 202–566–1012 (*allen.ashley@epa.gov*).

SUPPLEMENTARY INFORMATION:

Regulated Entities

Entities potentially regulated by this action include:

Category	Examples of regulated entities	North American industry classification system (NAICS) code
Industry	Construction activities required to obtain NPDES permit coverage and performing the following activities:	
	Construction of buildings, including building, developing and general contracting	236
	Heavy and civil engineering construction, including land subdivision	237

EPA does not intend the preceding table to be exhaustive, but provides it as a guide for readers regarding entities likely to be regulated by this action. This table lists the types of entities that EPA is now aware could potentially be regulated by this action. Other types of entities not listed in the table could also be regulated. To determine whether your facility is regulated by this action, you should carefully examine the applicability criteria in § 450.10 of today's final rule and the definition of ''storm water discharges associated with industrial activity'' and ''storm water discharges associated with small construction activity'' in existing EPA regulations at 40 CFR 122.26(b)(14)(x) and 122.26(b)(15), respectively. If you have questions regarding the applicability of this action to a particular site, consult one of the persons listed for technical information in the preceding **FOR FURTHER INFORMATION CONTACT** section.

Supporting Documentation

Several key documents support the final regulation:

1. ''Development Document for Final Effluent Guidelines and Standards for the Construction and Development Category,'' EPA–821–R–09–010. (''Development Document'') This document presents EPA's methodology and technical conclusions concerning the C&D category.

2. ''Economic Analysis for Final Effluent Guidelines and Standards for the Construction and Development Category,'' EPA–821–R–09–011. (''Economic Analysis'') This document presents the methodology employed to assess economic impacts of the rule and the results of the analysis.

3. ''Environmental Impact and Benefits Assessment for Final Effluent Guidelines and Standards for the Construction and Development Category,'' EPA–821–R–09–012 (''Environmental Assessment''). This document presents the methodology to assess environmental impacts and benefits of the rule and the results of the analysis.

You can obtain electronic copies of this preamble and final rule as well as the technical and economic support documents for today's rule at EPA's Web site for the C&D rule, *http://www.epa.gov/waterscience/guide/construction*.

Overview

This preamble describes the terms, acronyms, and abbreviations used in this document; the background documents that support these final regulations; the legal authority of this final rule; a summary of the final rule; background information; and the technical and economic methodologies used by the Agency to develop this final regulation.

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I. Legal Authority

EPA is promulgating these regulations under the authorities of sections 101, 301, 304, 306, 308, 402, 501 and 510 of the Clean Water Act (CWA), 33 U.S.C. 1251, 1311, 1314, 1316, 1318, 1341, 1342, 1361 and 1370 and pursuant to the Pollution Prevention Act of 1990, 42 U.S.C. 13101 *et seq.*

II. Purpose & Summary of the Final Rule

EPA is today promulgating effluent limitations guidelines (ELG) and new source performance standards (NSPS) for the C&D point source category. EPA is promulgating a series of non-numeric effluent limitations, as well as a numeric effluent limitation for the pollutant turbidity. All construction sites will be required to meet the series of non-numeric effluent limitations. Construction sites that disturb 10 or more acres of land at one time will be required to monitor discharges from the site and comply with the numeric effluent limitation. EPA is phasing in the numeric effluent limitation over four years to allow permitting authorities adequate time to develop monitoring requirements and to allow the regulated community time to prepare for compliance with the numeric effluent limitation. Construction sites that disturb 20 or more acres at one time will be required to conduct monitoring of discharges from the site and comply with the numeric effluent limitation beginning 18 months after the effective date of the final rule. Construction sites that disturb 10 or more acres at one time will be required to conduct monitoring of discharges from the site and comply with the numeric effluent limitation beginning four years after the effective date of the final rule.

The total pollutant reductions, once fully implemented, will be approximately 4 billion pounds per year. The final rule will result in an extensive range of benefits. For some of those benefits EPA was able to estimate a monetized value of approximately $369 million per year, once fully implemented. EPA could not monetize the value of some benefit categories, such as increases in property value near water bodies, reduced flood damage, and reduced cost of ditch maintenance. For other benefits categories, such as swimming and fishing, EPA was able to partially monetize the benefits. The costs of the final rule in 2010, which is the first year in which the rule must be incorporated into National Pollutant Discharge Elimination System (NPDES) permits, are estimated to be $8 million. Costs in 2011 are estimated to be $63 million. Since this regulation will be implemented over time due to the schedule by which EPA and states will be issuing new or reissued permits, the annual cost of the rule will be $810 million after all states have incorporated the requirements of the final rule into their NPDES permits in 2014. EPA expects that after the rule is fully incorporated into EPA and state NPDES permits after the industry has returned to normal levels of construction activity, the annual cost of the rule will be $953 million.

The goal of the Clean Water Act is to restore and maintain the chemical, physical and biological integrity of the Nation's waters. CWA section 101, 33 U.S.C. 1251. Despite substantial improvements in the nation's water quality since the inception of the Clean Water Act, many of the nation's surface waters continue to be impaired. EPA's Assessment TMDL Tracking and Implementation System (ATTAINS) provides information on water quality conditions reported by the states to EPA under Sections 305(b) and 303(d) of the Clean Water Act. According to ATTAINS (as of September 17, 2009), 49 percent of assessed river and stream miles, 66 percent of assessed lake area, and 63 percent of assessed bay and estuary area is impaired by a wide range of sources. Improper control of stormwater discharges associated with construction activity is a contributor of sediment, turbidity, nutrients and other pollutants to surface waters in the United States. Sediment (both suspended and deposited) and turbidity are common construction site pollutants and are significant causes of surface water quality impairment. According to ATTAINS (as of September 17, 2009), turbidity contributes to impairment of 26,278 miles of assessed rivers and streams, 1,008,276 acres of assessed lakes, and reservoirs, and 240 square miles of assessed bays and estuaries. These figures probably underestimate the extent of turbidity impairment since many waters have not yet been assessed. EPA's *Wadeable Streams Assessment* (2006) is a statistical survey of the smaller perennial streams and rivers that comprise 90 percent of all perennial stream miles in the coterminous United States. According to the survey, excess streambed sedimentation is one of the most widespread stressors, with 25 percent of streams in ''poor'' streambed sediment condition.

The sediment, turbidity, and other pollutants entrained in stormwater discharges associated with construction activity contribute to aquatic ecosystem degradation, increased drinking water treatment costs, and impairment of the recreational use and aesthetic value of impacted waters. Sediment can also accumulate in rivers, lakes, and reservoirs, leading to the need for dredging or other mitigation in order to prevent reduced water storage or navigation capacity.

Construction activity typically involves site selection and planning, and land-disturbing tasks such as clearing, excavating and grading. Disturbed soil, if not managed properly, can be easily washed off-site during storm events. Stormwater discharges during construction activities containing sediment and turbidity can cause an array of physical, chemical and biological impacts on receiving waters. In addition to sediment and turbidity, a number of other pollutants (e.g., metals, organic compounds and nutrients) are preferentially absorbed or adsorbed onto mineral or organic particles found in fine sediment. These pollutants can cause an array of chemical and biological water quality impairments. The interconnected processes of erosion (i.e., detachment of soil particles by water), sediment transport, and delivery to receiving waters are the primary pathways for the addition of pollutants from construction and development sites (hereinafter C&D sites; construction sites; or sites) into aquatic systems.

A primary concern at most C&D sites is the erosion and transport process related to fine sediment because rain splash, rills (small channels typically less than one foot deep) and sheetwash (thin sheets of water flowing across a surface) encourage the detachment and transport of sediment to water bodies. Although streams and rivers naturally carry sediment loads, discharges associated with construction activity can elevate these loads to levels above those in undisturbed watersheds. In addition, discharges from C&D sites can increase the proportion of silt, clay and colloidal particles in receiving streams because these fine-grained particles may not be effectively managed by conventional erosion and sediment controls utilized at C&D sites that rely on simple settling.

Existing national stormwater regulations at 40 CFR 122.26 require dischargers engaged in construction activity to obtain NPDES permit coverage and to implement control measures to manage discharges associated with construction activity. This category is the largest category of dischargers in the NPDES program. However, there are currently no national performance standards or monitoring requirements for this category of dischargers. Today's regulation establishes a technology-based ''floor'' or minimum requirements on a national basis. This rule constitutes the nationally applicable, technology-based ELG and NSPS applicable to all dischargers currently required to obtain a NPDES permit pursuant to 40 CFR 122.26(b)(14)(x) and 122.26(b)(15). This rule focuses on discharges composed of stormwater but the ELGs and NSPSs also apply to other discharges of pollutants from C&D sites, such as discharges from dewatering activities. CWA section 301(a). The ELGs and NSPSs would require stormwater discharges from most C&D sites to meet effluent limitations designed to reduce the amount of sediment, turbidity, Total Suspended Solids (TSS) and other pollutants in stormwater discharges from the site.

EPA acknowledges that many state and local governments have existing programs for controlling stormwater and wastewater discharges from construction sites. Today's ELGs and NSPS are intended to work in concert with these existing state and local programs and in no way does EPA intend for this regulation to interfere with existing state and local requirements that are more stringent than this rule or with the ability of state and local governments to promulgate new and more stringent requirements. Today's regulation requires all permittees to implement a range of erosion and sediment controls and pollution prevention measures at regulated construction sites. Today's regulation also establishes a numeric effluent limitation for turbidity in discharges from C&D sites that disturb ten or more acres of land at one time. Permittees would be required to sample stormwater discharges from the site and report the levels of turbidity present in the discharges to the permitting authority. These effluent limitations would, for many sites, require an additional layer of management practices and/or treatment above what most state and local programs are currently requiring. Permitting authorities are required to incorporate these turbidity limitations into their permits and permittees are required to implement control measures to meet a numeric turbidity limitation in discharges of stormwater from their C&D sites. EPA is not dictating that specific technologies be used to meet the numeric limitation, but is specifying the maximum daily turbidity level that can be present in discharges from C&D sites. EPA's limitations are based on its assessment of what specific technologies can reliably achieve. Permittees have the flexibility to select management practices or technologies that are best suited to site-specific conditions present on each individual C&D site if they are able to consistently meet the limitations and if they are consistent with requirements established by the permitting authority.

Permittees also have the ability to phase their construction activities to limit applicability of the monitoring requirements and turbidity limitation.

EPA expects that today's regulation will result in reductions in pollutant discharges and substantial improvements in receiving water quality nationally in areas where construction activities are occurring and downstream of areas where construction activities are occurring. In addition, the monitoring requirements contained in today's rule will significantly increase transparency and accountability for the largest category of NPDES dischargers and provide permittees, permitting authorities and the public with an important mechanism for gauging compliance with the regulations and standards.

III. Background on Existing Regulatory Program

A. Clean Water Act

Congress passed the Federal Water Pollution Control Act of 1972 (Pub. L. 92–500, October 18, 1972) (hereinafter the Clean Water Act or CWA), 33 U.S.C. 1251 *et seq.,* with the stated objectives to ''restore and maintain the chemical, physical, and biological integrity of the Nation's waters.'' Section 101(a), 33 U.S.C. 1251(a). To achieve this goal, the CWA provides that ''the discharge of any pollutant by any person shall be unlawful'' except in compliance with other provisions of the statute. CWA section 301(a). 33 U.S.C. 1311. The CWA defines ''discharge of a pollutant'' broadly to include ''any addition of any pollutant to navigable waters from any point source.'' CWA section 502(12). 33 U.S.C. 1362(12). EPA is authorized under CWA section 402(a) to issue a NPDES permit for the discharge of any pollutant from a point source. These NPDES permits are issued by EPA regional offices or NPDES authorized state or tribal agencies. Since 1972, EPA and the states have issued NPDES permits to thousands of dischargers, both industrial (e.g., manufacturing, energy and mining facilities) and municipal (e.g., sewage treatment plants). As required under Title III of the CWA, EPA has promulgated ELGs and standards for many industrial point source categories, and these requirements are incorporated into the permits. The Water Quality Act (WQA) of 1987 (Pub. L. 100–4, February 4, 1987) amended the CWA, adding CWA section 402(p), requiring implementation of a comprehensive program for addressing stormwater discharges. 33 U.S.C. 1342(p).

B. Clean Water Act Stormwater Program

Prior to the WQA of 1987, there were numerous questions regarding the appropriate means of regulating stormwater discharges within the NPDES program due to the serious water quality impacts of stormwater, the variable nature of stormwater, the large number of stormwater point sources and permitting agency resources. EPA undertook numerous regulatory actions, which resulted in extensive litigation, in an attempt to address these unique discharges. Congress, with the addition of section 402(p), established a structured and phased approach to address stormwater discharges and fundamentally altered the way stormwater is addressed under the CWA as compared with process wastewater or other discharges of pollutants. Section 402(p)(1) created a temporary moratorium on NPDES permits for point source stormwater discharges, except for those listed in section 402(p)(2), including dischargers already required to have a permit and discharges associated with industrial activity. In 1990, pursuant to section 402(p)(4), EPA promulgated the Phase I stormwater regulations for those stormwater discharges listed in 402(p)(2). 55 FR 47990 (November 16, 1990). The Phase I regulations required NPDES permit coverage for discharges associated with industrial activity and from ''large'' and ''medium'' municipal separate storm sewer systems (MS4s). CWA section 402(p)(2). As part of that rulemaking, the Agency interpreted stormwater ''discharges associated with industrial activity'' to include stormwater discharges associated with ''construction activity'' as defined at 40 CFR 122.26(b)(14)(x). As described in the Phase I regulations, dischargers must apply for and obtain authorization to discharge (or ''permit coverage''), and a permit is required for discharges associated with construction activity, including clearing, grading, and excavation, if the construction activity:

- Will result in the disturbance of five acres or greater; or
- Will result in the disturbance of less than five acres of total land area that is a part of a larger common plan of development or sale if the larger common plan will ultimately disturb five acres or greater.

See 40 CFR 122.26(b)(14)(x) and (c)(1). These discharges associated with ''large'' construction activity are one of the categories of stormwater dischargers EPA defined as associated with industrial activity. See 40 CFR 122.26(b)(14).

Section 402(p)(6) established a process for EPA to evaluate potential sources of stormwater discharges not included in the Phase I regulations and designation of those discharges for regulation in order to protect water quality. Section 402(p)(6) instructs EPA to ''issue regulations * * * which designate stormwater discharges, other than those discharges described in [section 402(p)(2)], to be regulated to protect water quality and shall establish a comprehensive program to regulate such designated sources.'' In 1999, pursuant to the broad discretion granted to the Agency under section 402(p)(6), EPA promulgated the Phase II stormwater regulations which designated discharges associated with ''small'' construction activity and ''small'' MS4s. 64 FR 68722 (December 8, 1999). An NPDES permit is required for discharges associated with small construction activity, including clearing, grading, and excavation, if the construction activity:

- Will result in land disturbance of equal to or greater than one acre and less than five acres; or
- Will result in 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.

See 40 CFR 122.26(b)(15).

EPA continues to have the authority to use section 402(p)(6) to designate additional stormwater discharges for regulation under the CWA in order to protect water quality. See 40 CFR 122.26(a)(9)(i)(C)–(D); see also *Envt Defense Ctr.* v. *EPA,* 344 F.3d 832, 873–76 (9th Cir. 2003).

In addition, as stated above, the Phase I and Phase II regulations require NPDES permits for ''large,'' ''medium,'' and ''small'' MS4s. Operators of these MS4s, typically local governments, must develop and implement a stormwater management program, including a requirement to address stormwater discharges associated with construction activity and discharges after construction activity. More details on the requirements of MS4 programs are described in section III.B.2.

1. NPDES Permits for Stormwater Discharges Associated With Construction Activity

The NPDES regulations provide two options for obtaining authorization to discharge or ''permit coverage'': General permits and individual permits. A brief description of these types of permits as they apply to C&D sites follows.

a. General NPDES Permits

The vast majority of discharges associated with construction activity are covered under NPDES general permits. EPA, states and tribes use general permits to cover a group of similar dischargers under one permit. See 40 CFR 122.28. General permits simplify the process for dischargers to obtain authorization to discharge, provide permit requirements for any discharger that files a notice of intent to be covered, and reduce the administrative workload for NPDES permitting authorities. General permits, including a fact sheet describing the rationale for permit conditions, are issued by NPDES permitting authorities after an opportunity for public review of the proposed general permit. Typically, to obtain authorization to discharge under a construction general permit, a discharger (the owner or operator of the C&D sites; typically, a developer, builder, or contractor) submits to the permitting authority a Notice of Intent (NOI) to be covered under the general permit. A NOI is not a permit or a permit application, see *Texas Independent Producers and Royalty Owners Ass'n* v. *EPA,* 410 F.3d 964, 977–78 (7th Cir. 2005), but by submitting the NOI, the discharger acknowledges that it is eligible for coverage under the general permit and agrees to the conditions in the published general permit. Discharges associated with the construction activity are authorized consistent with the terms and conditions established in the general permit.

EPA regulations allow NPDES permitting authorities to regulate discharges from small C&D sites under a general permit without the discharger submitting an NOI if the permitting authority determines an NOI is inappropriate and the general permit includes language acknowledging that an NOI is unnecessary (40 CFR 122.28(b)(2)(v)). To implement such a requirement, the permitting authority must specify in the public notice of the general permit any reasons why an NOI is not required. In these instances, any stormwater discharges associated with small construction activity are automatically covered under an applicable general permit and the discharger is required to comply with the terms, conditions and effluent limitations of such permit.

Similarly, EPA, states and tribes have the authority to notify a C&D site operator that it is covered by a general permit, even if that operator has not submitted an NOI (40 CFR 122.28(b)(2)(vi)). In these instances, the operator is given the opportunity to request coverage under an individual permit. Individual permits are discussed in section III.B.1.d.

b. EPA Construction General Permit

Since 1992, EPA has issued a series of ''national'' Construction General Permits (CGP) that cover areas where EPA is the NPDES permitting authority. At present, EPA is the permitting authority in four states (Idaho, Massachusetts, New Hampshire, and New Mexico), the District of Columbia, Puerto Rico, all other U.S. territories with the exception of the Virgin Islands, federal facilities in four states (Colorado, Delaware, Vermont, and Washington), most Indian lands and a couple of other specifically designated activities in specific states (e.g., oil and gas activities in Texas and Oklahoma). EPA's current CGP became effective on June 30, 2008 (see 74 FR 40338). EPA has proposed to modify the expiration date of the current 2008 CGP for one year, to June 30, 2011, in order to allow EPA adequate time to incorporate the ELGs and NSPS in this final rule and provide any necessary guidance to the regulated industry (see 74 FR 53494). At that time, EPA will issue a new CGP that includes the requirements of this final rule.

The key components of EPA's current CGP are non-numeric effluent limitations and ''best management practices'' (BMP) that require the permittee to minimize discharges of pollutants in stormwater discharges using control measures that reflect best engineering practices based on EPA's best professional judgment. Dischargers must minimize their discharge of pollutants in stormwater using appropriate erosion and sediment controls and control measures for other pollutants such as litter, construction debris, and construction chemicals that could be exposed to stormwater and other wastewater. The 2008 EPA CGP requires dischargers to develop and implement a stormwater pollution prevention plan (SWPPP) to document the steps they will take to comply with the terms, conditions and effluent limitations of the permit. EPA's guidance manual, ''Developing Your Stormwater Pollution Prevention Plan: A Guide for Construction Sites,'' (EPA 833/R–060–04, May 2007; available on EPA's Web site at *http://www.epa.gov/npdes/stormwater*) describes the SWPPP process in detail. As detailed in EPA's CGP, the SWPPP must include a description of the C&D site with maps showing drainage patterns, discharge points, and locations of discharge controls; a description of the control measures used; and inspection procedures. A copy of the SWPPP must be kept on the construction site from the date of project initiation to the date of final stabilization. The CGP does not require permittees to submit a SWPPP to the permitting authority; however, a copy must be readily available to authorized inspectors during normal business hours. Other requirements in the CGP include conducting regular inspections and reporting releases of reportable quantities of hazardous substances.

c. State Construction General Permits

Whether EPA, a state or a tribe issues the general permit, the CWA and EPA regulations require that NPDES permits must include technology-based effluent limitations. 40 CFR 122.44. In addition, where technology-based effluent limitations are insufficient for the discharge to meet applicable water quality standards, the permit must contain water quality-based effluent limitations as necessary to meet those standards. See sections 301, 304, 303, 306, and 402 of the CWA. *PUD No. 1 of Jefferson County* v. *Washington Department of Ecology,* 511 U.S. 700, 704–705 (1994).

For the most part, state-issued general permits for stormwater discharges associated with construction activity have followed EPA's CGP format and content, starting with EPA's first CGP issued in 1992 (57 FR 41176; September 9, 1992). Over time, some states have changed components of their permits to better address the specific conditions encountered at construction sites within their jurisdiction (e.g., soil types, topographic or climatic characteristics, or other relevant factors). For example, the States of Washington, Oregon, Georgia and Vermont's CGPs include discharge monitoring requirements for C&D sites applicable to all or a subset of construction sites. In addition, the State of California's current CGP contains monitoring requirements as well as numeric effluent limitations for a subset of construction sites within the state.

d. Individual NPDES Permits

A permitting authority may require any C&D site to apply for an individual permit rather than using the general permit. Likewise, any discharger may request to be covered under an individual permit rather than seek coverage under an otherwise applicable general permit (40 CFR 122.28(b)(3)). Unlike a general permit, an individual permit is intended to be issued to one permittee, or a few co-permittees. Individual permits for stormwater discharges from construction sites are rarely used, but when done so, are most often used for very large projects or projects located in sensitive watersheds. EPA estimates that fewer than one half of one percent (< 0.5%) of all construction sites are covered under individual permits.

2. Municipal Stormwater Permits and Local Government Regulation of Stormwater Discharges Associated With Construction Activity

Many local governments, as MS4 permittees, have a role to play in the regulation of construction activities. This section provides an overview of MS4 responsibilities associated with controlling stormwater discharges associated with construction activity.

a. NPDES Requirements

A municipal separate storm sewer system (MS4) is generally a conveyance or system of conveyances owned or operated by a public body that discharges to waters of the United States and is designed or used for collecting or conveying stormwater. These systems are not combined sewers and not part of a Publicly Owned Treatment Works (POTW). See 40 CFR 122.26(b)(8) for an exact definition. An MS4 is all large, medium, and small municipal storm sewers or those designated as such under EPA regulations. See 40 CFR 122.26(b)(18). The NPDES stormwater regulations require many MS4s to apply for permits. In general, the 1990 Phase I rule requires MS4s serving populations of 100,000 or more to obtain coverage under an MS4 individual permit. See 40 CFR 122.26(a)(3). The 1999 Phase II rule requires most small MS4s located in urbanized areas also to obtain coverage. See 40 CFR 122.33. Regardless of the type of permit, MS4s are required to develop stormwater management programs that detail the procedures they will use to control discharges of pollutants in stormwater from the MS4.

The Phase II regulations also provide permitting authorities or the EPA Regional Administrator with the authority to designate any additional stormwater discharges for permit coverage where he or she determines that stormwater controls are needed for the discharge based on wasteload allocations that are part of total maximum daily loads (TMDL) that address pollutants of concern or that the discharge, or category of discharges within a geographic area, contributes to a violation of a water quality standard or is a significant contributor of pollutants to waters of the United States. 40 CFR 122.26(9)(a)(i)(C) and (D).

Both the Phase I and II rules require regulated municipalities to develop stormwater management programs which include, among other elements, the control of discharges from construction sites. The Phase I regulations require medium and large MS4s to implement and maintain a program to reduce pollutants in stormwater discharges associated with construction activities, including procedures for site planning, requirements for structural and non-structural BMPs, procedures for identifying priorities for inspecting sites and enforcing control measures, and development and dissemination of appropriate educational and training materials. In general, the Phase II regulations require small MS4s to develop, implement, and enforce a program to control pollutants in stormwater discharges associated with construction activities which includes developing an ordinance to require implementation of erosion and sediment control practices, to control waste and to have procedures for site plan review and site inspections. Thus, as described above, both the Phase I and Phase II regulations specifically anticipate a local program for controlling stormwater discharges associated with construction activity. See 40 CFR 122.26(d)(2)(iv)(D) for Phase I MS4s and 40 CFR 122.34(b)(4) for Phase II MS4s. EPA has provided guidance materials to the NPDES permitting authorities and MS4s that recommend components and activities for a well-operated local stormwater management program.

EPA promulgated two provisions intended to minimize potential duplication of requirements or inconsistencies between requirements. First, 40 CFR 122.35 provides that a small MS4 is allowed to rely on another entity's program to satisfy its NPDES permit obligations, including construction site control, provided the other entity implements a program that is at least as stringent as the corresponding NPDES permit requirements and the other entity agrees to implement the control measures on the small MS4's behalf. Thus, for example, where a county implements a construction site stormwater control program already, and that program is at least as stringent as the controls required by a small MS4's NPDES permit, the MS4 may reference that program in the Notice of Intent to be covered by a general permit, or in its permit application, rather than developing and implementing a new program to require control of construction site stormwater within its jurisdiction.

Similarly, EPA or the state permitting authority may substitute certain aspects of the requirements of the EPA or state permit by incorporating by reference the requirements of a ''qualifying local program'' in the EPA or state CGP. A ''qualifying local program'' is an existing sediment and erosion control program that meets the minimum requirements as established in 40 CFR 122.44(s). By incorporating a qualifying local, state or tribal program into the EPA or state CGP, construction sites covered by the qualifying program in that jurisdiction would simply follow the incorporated local requirements in order to meet the corresponding requirements of the EPA or state CGP.

b. EPA Guidance to Municipalities

EPA developed several guidance documents for municipalities to implement the NPDES Phase II rule.

• National Menu of BMPs (*http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm*). This document provides guidance to regulated MS4s as to the types of practices they could use to develop and implement their stormwater management programs. The menu includes descriptions of practices that local programs can implement to reduce impacts of stormwater discharges from construction activities.

• Measurable Goals Guidance for Phase II MS4s (*http://cfpub.epa.gov/npdes/stormwater/measurablegoals/index.cfm*). This document assists small MS4s in defining performance targets and includes examples of goals for practices to control stormwater discharges from construction activities.

• Stormwater Phase II Compliance Assistance Guide (EPA 833–R–00–002, March 2000). The guide provides an overview of compliance responsibilities for MS4s, small construction sites, and certain other industrial stormwater discharges affected by the Phase II rule.

• Fact Sheets on various stormwater control technologies, including hydrodynamic separators (EPA 832–F–99–017), infiltrative practices (EPA 832–F–99–018 and EPA 832–F–99–019), modular treatment systems (EPA 832–F–99–044), porous pavement (EPA 832–F–99–023), sand filters (EPA 832–F–99–007), turf reinforcement mats (EPA 832–F–99–002), vegetative covers (EPA 832–F–99–027), swales (EPA 832–F–99–006) and wet detention ponds (EPA 832–F–99–048). (Available at *http://www.epa.gov/npdes/stormwater/;* click on ''Publications.'')

C. Other State and Local Stormwater Requirements

States and municipalities may have other requirements for flood control, erosion and sediment control, and in many cases, stormwater management. Many of these provisions were enacted before the promulgation of the EPA Phase I stormwater rule although many have been updated since. EPA found that all states have laws for erosion and sediment control measures, with these laws implemented by state, county, or local governments. A summary of existing state requirements is provided in the Development Document.

D. Technology-Based Effluent Limitations Guidelines and Standards

Effluent limitations guidelines and new source performance standards are technology-based effluent limitations required by CWA sections 301 and 306 for categories of point source discharges. These effluent limitations, which can be either numeric or non-numeric, along with water quality-based effluent limitations, if necessary, are incorporated into NPDES permits. ELGs and NSPSs are based on the degree of control that can be achieved using various levels of pollutant control technology as defined in Title III of the CWA and outlined below.

1. Best Practicable Control Technology Currently Available (BPT)

In establishing effluent limitations guidelines for a point source category, the CWA requires EPA to specify BPT effluent limitations for conventional, toxic, and nonconventional pollutants. In doing so, EPA is required to determine what level of control is technologically available and economically practicable. CWA section 301(b)(1)(A). In specifying BPT, the CWA requires EPA to look at a number of factors. EPA considers the total cost of application of technology in relation to the effluent reduction benefits to be achieved from such application. The Agency also considers the age of the equipment and facilities, the process employed and any required process changes, engineering aspects of the application of the control technologies, non-water quality environmental impacts (including energy requirements), and such other factors as the Administrator deems appropriate. CWA section 304(b)(1)(B). Traditionally, EPA establishes BPT effluent limitations based on the average of the best performance of facilities within the category of various ages, sizes, processes or other common characteristics. Where existing performance is uniformly inadequate, EPA may require higher levels of control than currently in place in a category if the Agency determines that the technology can be practicably applied. See e.g., *American Frozen Foods Inst.* v. *Train,* 539 F.2d 107, 117 (D.C. Cir. 1976).

EPA assesses the cost-reasonableness of BPT limitations by considering the cost of treatment technologies in relation to the effluent reduction benefits achieved. This inquiry does not limit EPA's broad discretion to adopt BPT limitations that are achievable with available technology. This ''limited cost-benefit analysis'' is intended to ''limit the application of technology only where the additional degree of effluent reduction is wholly out of proportion to the costs of achieving such marginal level of reduction.'' See *EPA* v. *National Crushed Stone Ass'n,* 449 U.S. 64 71 (1980). Moreover, the inquiry does not require the Agency to quantify benefits in monetary terms. See, e.g., *American Iron and Steel Institute* v. *EPA,* 526 F.2d 1027, 1051 (3rd Cir. 1975).

In balancing costs against the effluent reduction, EPA considers the volume and nature of the expected discharges after application of BPT and the cost and economic impacts of the required level of pollution control. In past effluent limitation guidelines, BPT cost-reasonableness comparisons ranged from $0.26 to $41.44 per pound removed (in 2008 dollars). This range is not inclusive of all categories regulated by BPT, but nonetheless represents a very broad range of cost-reasonableness values. About half of the cost-reasonableness values represented by this range are less than $2.99 per pound (in 2008 dollars).

2. Best Available Technology Economically Achievable (BAT)

BAT effluent guidelines are applicable to toxic (priority) and nonconventional pollutants. EPA has identified 65 pollutants and classes of pollutants as toxic pollutants, of which 126 specific substances have been designated priority toxic pollutants. 40 CFR 401.15 and 40 CFR part 423, Appendix A. In general, BAT represents the best available performance of facilities through application of the best control measures and practices achievable including treatment techniques, process and procedure innovations, operating methods, and other alternatives within the point source category. CWA section 304(b)(2)(A). The factors EPA considers in assessing BAT include the cost of achieving BAT effluent reductions, the age of equipment and facilities involved, the processes employed, the engineering aspects of the control technology, potential process changes, non-water quality environmental impacts (including energy requirements), and such factors as the Administrator deems appropriate. CWA section 304(b)(2)(B). The Agency retains considerable discretion in assigning the weight to be accorded to these factors. *Weyerhaeuser Company* v. *Costle,* 590 F.2d 1011, (D.C. Cir. 1978). An additional factor, derived from the statutory phrase best available technology economically achievable, is ''economic achievability.'' CWA section 301(b)(2)(A). EPA may determine the economic achievability of an option on the basis of the overall effect of the rule on the industry's financial health. See *E.I. du Pont de Nemours & Co.* v. *Train,* 430 U.S. 112, 129 (1977); *American Frozen Food Inst.* v. *Train,* 539 F.2d 107, 131 (D.C. Cir. 1976). The Agency may base BAT limitations upon effluent reductions attainable through changes in a facility's processes and operations. *See Texas Oil & Gas Ass'n* v. *EPA,* 161 F.3d 923, 928 (5th Cir. 1998) (citing ''process changes'' as one factor EPA considers in determining BAT); see also, *American Meat Institute* v. *EPA,* 526 F.2d 442, 464 (7th Cir. 1975). As with BPT, where existing performance is uniformly inadequate, EPA may base BAT upon technology transferred from a different subcategory or from another category. See *CPC International Inc.* v. *Train,* 515 F.2d 1032, 1048 (8th Cir. 1975) (established criteria EPA must consider in determining whether technology from one industry can be applied to another); see also, *Tanners' Council of America, Inc.* v. *Train,* 540 F.2d 1188 (4th Cir. 1976). In addition, the Agency may base BAT upon manufacturing process changes or internal controls, even when these technologies are not common industry practice. See *American Frozen Foods Inst.* v. *Train,* 539 F.2d 107, 132 (D.C. Cir. 1976); *Reynolds Metals Co.* v. *EPA,* 760 F.2d 549, 562 (4th Cir. 1985); *California & Hawaiian Sugar Co.* v. *EPA,* 553 F.2d 280 (2d Cir. 1977).

3. Best Conventional Pollutant Control Technology (BCT)

The 1977 amendments to the CWA required EPA to identify effluent reduction levels for conventional pollutants associated with BCT technology for discharges from existing point sources. BCT is not an additional limitation, but replaces Best Available Technology (BAT) for control of conventional pollutants. In addition to other factors specified in CWA section 304(b)(4)(B), the Act requires that EPA establish BCT limitations after consideration of a two-part ''cost-reasonableness'' test. EPA explained its methodology for the development of BCT limitations in July 1986. 51 FR 24974 (July 9, 1986).

Section 304(a)(4) designates the following as conventional pollutants: biochemical oxygen demand (BOD_5), total suspended solids (TSS), fecal coliform, pH, and any additional pollutants defined by the Administrator as conventional. 40 CFR 401.16. The Administrator designated oil and grease as an additional conventional pollutant. 44 FR 44501 (July 30, 1979).

4. Best Available Demonstrated Control Technology (BADT) for New Source Performance Standards (NSPS)

NSPS apply to all pollutants and reflect effluent reductions that are achievable based on the BADT. New sources, as defined in CWA section 306, have the opportunity to install the best and most efficient production processes and wastewater treatment technologies. As a result, NSPS should represent the greatest degree of effluent reduction attainable through the application of the best available demonstrated control technology. In establishing NSPS, CWA section 306 directs EPA to take into consideration similar factors that EPA considers when establishing BAT, namely the cost of achieving the effluent reduction and any non-water quality, environmental impacts and energy requirements.

5. Pretreatment Standards

The CWA also defines standards for indirect discharges, i.e. discharges into publicly owned treatment works (POTWs). These standards are known as Pretreatment Standards for Existing Sources (PSES) and Pretreatment Standards for New Sources (PSNS), and are promulgated under CWA section 307(b). EPA has no data concerning the discharge of pollutants from construction sites to POTWs and POTW treatment plants. Therefore, EPA did not propose PSES or PSNS for the C&D category and is not promulgating PSES or PSNS for the C&D category. EPA determined that the majority of construction sites discharge either directly to waters of the U.S. or through MS4s. In some urban areas, construction sites may discharge to combined sewer systems (i.e., sewers carrying both stormwater and domestic sewage through a single pipe) which lead to POTW treatment plants. Sediment and turbidity, which are the primary pollutants associated with construction site discharges, are susceptible to treatment in POTWs, using technologies commonly employed such as primary clarification. EPA has no evidence that construction site discharges to POTWs would cause interference, pollutant pass-through or sludge contamination.

6. EPA Authority to Promulgate Non-Numeric Effluent Limitations

The regulations promulgated today include non-numeric effluent limitations that will control the discharge of pollutants from C&D sites. It is well established that EPA has the authority to promulgate non-numeric effluent limitations in addition to, or in lieu of, numeric limitations. The CWA does not mandate the use of numeric limitations and EPA's position finds support in the language of the CWA. The definition of ''effluent limitation'' means ''*any* restriction * * * on quantities, rates, and concentrations of chemical, physical, biological, and other constituents * * *'' CWA section 502(11) (emphasis added). EPA regulations reflect the Agency's long standing interpretation that the CWA allows for non-numeric effluent limitations. EPA regulations explicitly allow for non-numeric effluent limitations for the control of toxic pollutants and hazardous substances from ancillary industrial activities; for the control of storm water discharges; 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. See 40 CFR 122.44(k).

Federal courts have recognized EPA's authority under the CWA to use non-numeric effluent limitations. In *Citizens Coal Council* v. *U.S. EPA,* 447 F3d 879, 895–96 (6th Cir. 2006), the Sixth Circuit, in upholding EPA's use of non-numeric effluent limitations, agreed with EPA that it derives authority under the CWA to incorporate non-numeric effluent limitations for conventional and non-conventional pollutants. See also, *Waterkeeper Alliance, Inc.* v. *U.S. EPA,* 399 F.3d 486, 496–97, 502 (2d Cir. 2005) (EPA use of non-numerical effluent limitations in the form of best management practices are effluent limitations under the CWA); *Natural Res. Def. Council, Inc.* v. *EPA,* 673 F.2d 400, 403 (D.C. Cir. 1982) (''section 502(11) [of the CWA] defines 'effluent limitation' as 'any restriction' on the amounts of pollutants discharged, not just a numerical restriction.'').

7. CWA Section 304(m) Litigation

EPA identified the C&D point source category in its CWA section 304(m) plan in 2000 as an industrial point source category for which EPA intended to conduct rulemaking. 65 FR at 53008 and 53011 (August 31, 2000). On June 24, 2002, EPA published a proposed rule that contained several options for the control of stormwater discharges from construction sites, including ELGs and NSPSs. (67 FR 42644; June 24, 2002). On April 26, 2004, EPA chose to rely on the range of existing programs, regulations, and initiatives that already existed at the federal, state and local level and withdrew the proposed ELGs and NSPSs. (69 FR 22472; April 26, 2004). On October 6, 2004, the Natural Resources Defense Council, Waterkeeper Alliance and the states of New York and Connecticut filed a complaint in federal district court alleging that EPA's decision not to promulgate ELGs and NSPSs for the C&D point source category violated a mandatory duty under the CWA. The district court, in *NRDC* v. *EPA,* 437 F.Supp.2d 1137, 1139 (C.D. Cal. 2006), held that CWA section 304(m) imposes on EPA a mandatory duty to promulgate ELGs and NSPSs for new industrial point source categories named in a CWA section 304(m) plan. At that time EPA argued that the district court should enter an order providing for a four-year schedule for EPA to promulgate the ELGs and NSPSs in order to allow the Agency the opportunity to collect additional data on the construction industry, additional data on stormwater discharges associated with construction activity, and to be able to have the time to solicit additional data based on comments received on the proposed regulation. The district court rejected EPA's proposed schedule, forcing the Agency to proceed under an accelerated schedule by enjoining EPA in an order to propose and publish ELGs and NSPSs for the C&D industry by December 1, 2008 and to promulgate and publish ELGs and NSPSs as soon as practicable, but in no event later than December 1, 2009. See *NRDC, et al.* v. *EPA,* No CV–0408307 (C.D. Cal.) (Permanent Injunction and Judgment, December 5, 2006). On appeal, the Ninth Circuit in *NRDC* v. *EPA,* 542 F.3d 1235 (9th Cir. 2008) affirmed the district court's decision. Consistent with the district court order, EPA published proposed ELGs and NSPSs on November 28, 2008 (see 73 FR 72562) and is publishing final ELGs and NSPSs today.

IV. Overview of the Construction Industry and Construction Activities

The C&D point source category covers firms classified by the Census Bureau into two North American Industry Classification System (NAICS) codes.

- Construction of Buildings (NAICS 236) includes residential, nonresidential, industrial, commercial and institutional building construction.
- Heavy and Civil Engineering Construction (NAICS 237) includes utility systems construction (water and

sewer lines, oil and gas pipelines, power and communication lines); land subdivision; highway, street, and bridge construction; and other heavy and civil engineering construction.

Other types of entities not included in this list could also be regulated.

A single construction project may involve many firms from both subsectors. The number of firms involved and their financial and operational relationships may vary greatly from project to project. In typical construction projects, the firms identifying themselves as ''operators'' under a construction general permit are usually general building contractors or developers. While the projects often engage the services of specialty contractors such as excavation companies, these specialty firms are typically subcontractors to the general building contractor and are not separately identified as operators in stormwater permits. Other classes of subcontractors such as carpentry, painting, plumbing and electrical services typically do not apply for, nor receive, NPDES permits. The types and numbers of firms in the construction industry are described in more detail in the Economic Analysis.

Construction activity on any size parcel of land almost always calls for a remodeling of the earth. Therefore, actual site construction typically begins with site clearing and grading. Earthwork activities are important in site preparation because they ensure that a sufficient layer of organic material (ground cover and other vegetation, especially roots) is removed. The size of the site, extent of water present, the types of soils, topography and weather determine the types of equipment that will be needed during site clearing and grading. Material that will not be used on the site may be hauled away. Clearing activities involve the movement of materials from one area of the site to another or complete removal from the site. When grading a site, builders typically take measures to ensure that new grades are as close to the original grade as possible to reduce erosion and stormwater runoff, which can result in discharge of sediment, turbidity and other pollutants. Proper grade also ensures a flat surface for development and is designed to attain proper drainage away from the constructed buildings. A wide variety of equipment is often used during excavation and grading. The type of equipment used generally depends on the functions to be performed and on specific site conditions. Shaping and compacting of the earth is an important part of site preparation. Earthwork activities might require that fill material be used on the site. In such cases, the fill must be spread in uniform, thick layers and compacted to a specific density. An optimum moisture content must also be reached. Graders and bulldozers are the most common earth-spreading machines, and compaction is often accomplished with various types of rollers. If rock is to be removed from the site, the contractor must first loosen and break the rock into small pieces using various types of drilling equipment or explosives. (Adapted from Peurifoy, Robert L. and Oberlender, Garold D. (1989). Estimating Construction Costs (4th ed.). New York: McGraw Hill Book Company.)

Once materials have been excavated and removed and the ground has been cleared and graded, the site is ready for construction of buildings, roads, and/or other structures. During construction activity, the disturbed land can remain exposed without vegetative cover for a substantial period of time. Where the soil surface is unprotected, soil particles and other pollutants are particularly susceptible to erosion and may be easily washed away by rain or snow melt and discharged from the site. Permittees typically use a combination of erosion and sediment control measures designed to prevent mobilization of the soil particles and capture of those particles that do mobilize and become entrained in stormwater. In some cases permittees treat a portion of the discharge using filtration or other treatment technologies. Common erosion and sediment control measures and treatment technologies are described further in the Development Document.

V. Summary of the Proposed Regulation

EPA published proposed regulations for the C&D category on November 28, 2008. 73 FR 72562. The proposed rule contained several options. One option (Option 1), which is based on the requirements similar to those contained in past EPA CGPs, would have established a set of non-numeric effluent limitations requiring dischargers to provide and maintain effective erosion control measures, sediment control measures, and other pollution prevention measures to minimize, control or prevent the discharge of pollutants in stormwater and other wastewater from construction sites. In addition, reflecting current requirements in the EPA CGP, sediment basins would have been required for common drainage locations that serve an area with 10 or more acres disturbed at one time to contain and settle sediment from stormwater runoff before discharge. Option 1 would have required minimum standards of design for sediment basins; however, alternatives that control sediment discharges in a manner equivalent to sediment basins would have been authorized where approved by the permitting authority.

Another option (Option 2) would have incorporated the same provisions as Option 1 and for sites of 30 or more acres located in areas of the country with the annual Revised Universal Soil Loss Equation (RUSLE) R-factor greater than 50 and that contained more than 10% by mass of soil particles smaller than 2 microns, discharges of stormwater from the site would have been required to monitor and meet a numeric effluent limitation on the allowable level of turbidity. The numeric turbidity limitation proposed was 13 nephelometric turbidity units (NTUs). The technology basis for Option 2 was active or advanced treatment systems (ATS), which consisted of polymer-assisted clarification followed by filtration. A third option (Option 3) was similar to Option 2, except that it would have applied the 13 NTU limitation to all construction sites of 10 or more acres, regardless of location or soil type.

In addition, the proposal presented and solicited comment on another option that would require compliance with a higher numeric turbidity effluent limitation (e.g., 50 to 150 NTU, or some other value) based on passive treatment technologies instead of ATS (see 73 FR 72562, 72580–72582, 72610–72611). Passive treatment technologies include conventional erosion and sediment controls, polymer addition to sediment basins, fiber check dams with polymer addition, and other controls. At proposal, EPA sought additional data on the performance of passive treatment systems, and the cost and pollutant loading reductions that would be attainable from such an option.

In the proposed rule, EPA selected Option 1 as the basis of BPT and BCT, and Option 2 as the basis of BAT and NSPS. At the time of proposal, EPA defined a ''new source'' as any source from which there will be a discharge associated with construction activity that will result in a building, structure, facility, or installation subject to new source performance standards elsewhere under 40 CFR subchapter N.

A summary of the costs, estimated pollutant reductions, cost effectiveness and monetized environmental benefits of the proposed options are contained in the **Federal Register** notice for the proposed rule, in the support documents for the proposed rule and in the record.

VI. Summary of Major Comments Received

EPA received numerous comments on the proposed rule. The majority of comments centered on EPA's selection of ATS as the technology basis for BAT and NSPS and the data and assumptions used to estimate the numeric limitation, costs and pollutant load reductions of the proposed BAT and NSPS. ATS is no longer the technology basis for BAT and NSPS in the final rule.

Some commenters argued that EPA's data used to estimate costs of the proposed option based on ATS did not accurately consider all of the costs, particularly for projects of longer duration. In response, EPA revised the model project analysis to consider projects of longer duration and utilized a unit-cost approach based on data contained in the record for the proposal.

Some commenters argued that EPA's analysis of the amount of construction activity underestimated actual levels of construction activity, since EPA's estimates were based on land use change estimates from 1992 to 2001 using the National Land Cover Dataset (NLCD). In response, EPA revised estimates of annual acres subject to the regulation using industry economic data instead of the NLCD data.

Some commenters argued that EPA's data and assumptions used to estimate loading reductions of the regulatory options did not accurately account for current controls in place nationwide. In response, EPA revised the assumptions used in the model to account for baseline controls. EPA also used data at the watershed level for some modeling parameters.

Some commenters requested that numeric limitations be based on, or consider, the background levels of sediment and turbidity in receiving streams when establishing a turbidity limitation. EPA notes that BAT and NSPS are based on the capabilities of technology, not receiving water quality. It would not be appropriate in establishing technology based effluent limitations pursuant to CWA sections 301 and 306 for EPA to consider the water quality of specific water bodies. See *Weyerhaeuser Co.* v. *Costle,* 590 F.2d 1011, 1040–1044 (D.C. Cir. 1978). Permitting authorities have the ability to develop water-quality based effluent limitations to address receiving water concerns. Some states have set limitations for specific projects considering the background turbidity of the receiving waters. Commenters further argued that discharges of low turbidity water to streams that are naturally high in turbidity could contribute to stream instability. EPA does not agree with this comment. The particles contained in stormwater discharges from construction sites are primarily fine-grained, since sediment controls remove the bulk of the coarser particles. These fine-grained particles are not beneficial from a stream stability standpoint. Therefore, removal of these particles from the stormwater discharge would not be expected to further contribute to stream instability, if the receiving stream was already unstable. It is plausible that discharge of a large volume of stormwater over a short period of time to a small stream with a high natural sediment load could contribute to instability. If this condition were to exist, it could be alleviated simply by controlling the rate of discharge or by dispersing runoff to vegetated areas on site, if available (see also, comment by Dr. Britt Faucette, EPA–HQ–OW–2008–0465–0527 in the rulemaking record).

Some commenters argued that some of the data EPA used to determine the numeric effluent limitation based on ATS should not be used because EPA lacked specific information on factors, such as type of construction project or treatment system configuration. Commenters also argued that the data was not representative, since these data were primarily from the Northwest United States. EPA does not agree with these comments. The data represent a variety of project types. Although EPA may not have detailed information about specific aspects of some projects (such as project size and treatment system flow rate), EPA has conducted an engineering review of the data and determined that the data is representative. EPA has excluded data, where appropriate, to account for factors such as treatment system startup and variation outside of the range that EPA would consider indicative of proper operation. Details of the engineering review of the data can be found in the Development Document. In addition, EPA received additional information on some of the data, such as project type and treatment configuration. EPA also received data from additional projects, including projects in New York and North Carolina. More details on the data can be found in the administrative record.

Some commenters were concerned about the non-numeric effluent limitations proposed, and specifically questioned whether some of the proposed requirements could be implemented on all construction sites. EPA generally agrees that some of the requirements, as proposed, could not be implemented on all sites and made revisions to the non-numeric effluent limitations to make them applicable to all sites. For certain controls, EPA included ''unless infeasible'' to recognize that there may be some sites where a particular control measure cannot be implemented, thus allowing flexibility for permittees. (See Section X.B.)

Some commenters questioned the stringency of the proposed soil stabilization requirements, and were concerned about the costs and feasibility of initiating stabilization of disturbed area ''immediately'' when final grade is reached or any clearing, grading, excavating or other earth disturbing activities have temporarily or permanently ceased and will not resume for a period exceeding 14 calendar days. EPA disagrees that this requirement is not feasible. Given the importance of soil stabilization techniques (see Chapter 5 of the Technical Development Document (TDD)), and the influence of soil cover on soil erosion rates, EPA has determined that initiating soil stabilization measures immediately is an important non-numeric effluent limitation. EPA sees no compelling reason why permittees cannot take action immediately to stabilize disturbed soils on their sites. Erosion control measures, such as mulch, are readily available and permittees need only plan accordingly to have appropriate materials and laborers present when needed. EPA has, however, modified this requirement for clarity (see the final requirement at § 450.21(b).

EPA received comments concerning applicability of the final rule to linear construction projects, including the numeric effluent limitation. EPA considered the unique characteristics of linear projects in determining the appropriate technology based effluent limitations for those sites. The final rule, in part based on the considerations of linear projects, no longer contains a requirement to install a sediment basin (See Section VII.A), the technology basis for the numeric effluent limitation is no longer ATS (See Section X.G.3), and revisions were made to the non-numeric effluent limitations based on comments concerning the feasibility at linear projects. (See Section X.B.2). EPA disagrees with comments that suggested EPA should either exempt all linear projects from the final rule or from the numeric effluent limitation. EPA has determined that numeric effluent limitations are feasible for linear projects and passive treatment systems provide flexibility to linear projects to take into account site specific considerations. (See the TDD for specific examples of the utilization of passive treatment systems at linear projects). Additionally, EPA believes that the permitting authority should exercise discretion when determining the monitoring locations and monitoring frequency for linear construction projects. (See Section XIX.A).

Based on the unique regulatory circumstances of interstate natural gas pipeline construction projects EPA has chosen not to have the numeric limitation and monitoring requirements at 40 CFR 450.22(a) apply to the discharges associated with the construction of natural gas pipelines. This exemption only applies to discharges associated with construction of interstate natural gas pipelines that are under the jurisdiction of the Federal Energy Regulatory Commission (FERC). EPA determined this was appropriate due to the comprehensive regulatory program that FERC requires and enforces for the construction of these projects. Through its program, FERC requires a variety of erosion and sediment controls to be implemented during construction, some of which are more stringent than those contained in today's rule. FERC conducts site-specific reviews to establish the allowable area of disturbance for project construction and dictates the manner in which construction of these projects can proceed. Typical requirements would include minimizing the amount of time that soils are allowed to be exposed, managing the discharges from trench dewatering, limiting the amount of vegetation that can be cleared adjacent to streams and wetlands, and requiring successful revegetation of project areas. FERC has been requiring these projects to implement its erosion and sediment control program since 1989. Thus, it is a well-developed regulatory program that includes stringent requirements, oversight, public participation, and onsite inspection. EPA does not want to limit the flexibility of FERC to implement its program by imposing numeric limitations on these unique projects.

EPA received comments encouraging the Agency to include controls in the final rule on stormwater discharges that occur after construction activity has ceased or what they call ''post-construction'' stormwater discharges. These discharges are outside the scope of the final rule; however the Agency understands that there is a need to address discharges from newly developed and redeveloped sites, such as commercial buildings, roads, or parking lots, in order to protect the water quality of our nation's waters. As the urban, suburban and exurban human environment expands, there is an increase in impervious landcover and stormwater discharges. This increase in impervious landcover on developed property reduces or eliminates the natural infiltration of precipitation. The resulting stormwater flows across roads, rooftops and other impervious surfaces, picking up pollutants that are then discharged to our nation's waters. In addition, the increased volume of stormwater discharges results in the scouring of rivers and streams; degrading the physical integrity of aquatic habitats, stream function and overall water quality. In July 2006, EPA commissioned the National Research Council (NRC) to review the Agency's program for controlling stormwater discharges under the CWA and recommend steps the Agency should take to make the stormwater program more effective in protecting water quality. The NRC Report *Urban Stormwater Management in the United States* (DCN 42101) states that stormwater discharges from the built environment remain one of the greatest challenges of modern water pollution controls, ''as this source of contamination is a principal contributor to water quality impairment of waterbodies nationwide.'' The NRC report found that the current regulatory approach by EPA under the CWA is not adequately controlling all sources of stormwater discharges that are contributing to waterbody impairment. NRC recommended that EPA address stormwater discharges from impervious landcover and promote practices that harvest, infiltrate and evapotranspirate stormwater to prevent it from being discharged, which is critical to reducing the pollutant loading to our nation's waters.

EPA has committed to and begun a rulemaking addressing stormwater discharges from newly developed and redeveloped sites under CWA section 402(p). EPA has published a draft Information Collection Request, 74 FR 56191 (October 30, 2009) for public comment that will seek information and data to support the rulemaking, and plans to complete this rule in the fall of 2012.

Some commenters argued that turbidity is not a ''pollutant'' under the CWA. EPA disagrees with the commenters as turbidity is a ''pollutant'' under the CWA and an indicator for other pollutants and is the appropriate pollutant in this rule to control, under the appropriate levels of technology, for discharges from C&D sites. In this rule, turbidity is being regulated as a nonconventional pollutant and as an indicator pollutant for the control of other pollutants in discharges from C&D sites including metals and nutrients. By providing a measure of sediment and other pollutants in discharges, turbidity is an indicator of the degree to which sediment and other pollutants found in discharges are reduced. Turbidity is also a more effective measure of the presence of fine silts and clays and colloids, which are the particles in stormwater discharges that EPA is primarily targeting in today's rule.

Turbidity is a pollutant as that term is defined in the CWA. See *e.g., Conservation Law Foundation* v. *Hannaford Bros. Co.,* 327 F.Supp.2d 325, 326 (D.Vt. 2004), aff'd 139 Fed.Appx. 338 (2d.Cir. 2005). The CWA defines ''pollutant'' broadly to include ''dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal and agricultural waste.'' CWA section 502(6). *See NRDC* v. *EPA,* 822 F.2d 104, 109 (D.C.Cir. 1987) (''The term 'pollutant' is broadly defined…''); *U.S.* v. *Hamel,* 551 F.2d 107, 110 (6th Cir. 1977) (noting that the definition is set forth in ''broad generic terms.''). EPA describes ''turbidity'' as ''an expression of the optical property that causes light to be scattered and absorbed rather than transmitted with no change in direction of flux level through the sample caused by suspended and colloidal matter such as clay, silt, finely divided organic and inorganic matter and plankton and other microscopic organisms.'' 40 CFR 136.3; 72 FR 11200, 11247 (March 12, 2007). Turbidity fits easily into the broad definition of pollutant. The definition of pollutant is not limited to those terms that are specifically listed in the statute at section 502(6). See *NWF* v. *Gorsuch,* 693 F.3d 156, 174 n.56 (D.C. Cir. 1982); *Sierra Club* v. *Cedar Point Oil Co.,* 73 F.3d 546, 565 (5th Cir. 1996).

Turbidity is also an indicator or measurement of other pollutants in the water body; however merely because turbidity measures other pollutants or can be an expression of the condition of the water body, does not mean it is not itself a ''pollutant'' under the CWA. There are numerous other pollutants, some that Congress explicitly included in the CWA, that are also indicators or measurements of other pollutants. For example, the CWA lists biochemical oxygen demand (BOD) and pH as pollutants. CWA section 304(a)(4). BOD is the measure of the amount of oxygen required by bacteria for stabilizing material that can be decomposed under aerobic conditions and pH is a measure of how acidic or basic a substance is. Additionally, chemical oxygen demand (COD) is a pollutant and a measurement of other pollutants. See *BASF Wyandotte* v. *Costle,* 598 F.2d 637, 651 (1st Cir. 1979). Even total suspended solids (TSS) are a measure of the organic and inorganic particulate matter in wastewater. Like turbidity, there is no question BOD, pH, COD and TSS are pollutants and there is no conflict between a pollutant being a measurement of other pollutants and a pollutant itself under the CWA.

One commenter argued that turbidity is a direct representation of TSS, thus, if anything, turbidity can only be used as a surrogate for TSS, and thus a conventional pollutant. In 1978 EPA interpreted ''suspended solids,'' at section 304(a)(4), as ''total suspended solids (non-filterable) (TSS).'' EPA defined TSS as ''a laboratory measure of the organic and inorganic particulate matter in wastewater which does not pass through a specified glass filter disk.'' See 40 CFR 401.16; 43 FR 32857, 32858 (July 28, 1978). The terms turbidity and TSS are related to sediment and are analogous, but they are not synonymous pollutants or measures of water quality. TSS and turbidity are measured differently, as turbidity is a measure of the light scattering properties of the sample measured as NTU and TSS is generally a measure of the concentration (i.e., milligrams per liter). The size, shape, and refractive index of suspended particulate matter are not directly related to the concentration and specific gravity of the suspended matter. Therefore, measurements of TSS and turbidity are not interchangeable. Pollutants that are not identified as either toxic or conventional pollutants are nonconventional pollutants under the CWA. See CWA section 301(b)(2)(F); 304(a)(4); 40 CFR 401.16; *Rybacheck* v. *EPA,* 904 F. 2d 1276, 1291–92 (9th Cir. 1990). CWA section 304(a)(4) identifies what pollutants are conventional pollutants under the CWA, namely biochemical oxygen demand, suspended solids, fecal coliform, and pH, with EPA adding oil and grease. See also, 40 CFR 410.16; 44 FR 44501 (July 30, 1979). Turbidity is not identified as a conventional pollutant in the CWA or been identified as one by EPA. In the proposal, EPA cited to *Rybachek* v. *EPA,* 904 F.2d at 1291–92, to demonstrate an analogous situation where it was argued that ''settleable solids'' were a component of TSS, or in other words, they are the same pollutant, thus EPA should have classified settleable solids as a conventional pollutant rather than a nonconventional pollutant. Id. at 1291. The Ninth Circuit, agreeing with EPA's analysis in that case and the discussion above, concluded that ''because settleable solids were not designated by Congress as either conventional or a toxic pollutant, they should be considered a nonconventional pollutant under [section 301(b)(2)(F)].'' Id. at 1292. EPA applied a similar analysis to turbidity to conclude that it is a nonconventional pollutant under the CWA.

Commenters' focus on arguing that turbidity is not a pollutant, or at the very least a conventional pollutant, may be based on a desire for a different technology standard applied to this rulemaking (*i.e.,* BCT). However, even if EPA did agree that turbidity is not a pollutant or is a conventional pollutant, TSS and turbidity are not the only pollutants of concern in discharges from C&D sites. Metals, nutrients, and other toxic and nonconventional pollutants are naturally present in soils, and can be contributed during construction activity or by activities that occurred at the site prior to the construction activity (see, *e.g.,* comment from Dr. Britt Faucette, EPA–HQ–OW–2008–0465–0527 in the rulemaking record. EPA recognizes that its understanding of the nature of stormwater discharges associated with construction activity has evolved. However, as early as 1990, in the Phase I stormwater rulemaking EPA identified nonconventional and toxic pollutants of concern in discharges from construction sites stating ''[c]onstruction sites can also generate other pollutants such as phosphorus, nitrogen, and nutrients from fertilizer, pesticides, petroleum products, construction chemicals and solid wastes.'' 55 FR at 48033. The National Academy of Sciences agrees with EPA and the NRC report states ''[t]he pollutant parameters of concern in stormwater discharges from construction activity are TSS, settleable solids, turbidity, and nutrients from erosion; pH from concrete and stucco; and a wide range of metallic and organic pollutants from construction materials, processes, wastes, and vehicles and other motorized equipment.'' NRC at 541. EPA is making clear in this final rule that while conventional pollutants are a concern in discharges from construction sites, there are also nonconventional and toxic pollutants of concern in discharges from these sites. Many of these pollutants are present as particulates and will be removed with other particles. Dissolved forms of pollutants are often absorbed or adsorbed to particulate matter and can also be removed along with the particulates (i.e., sediment). See the Environmental Assessment document for additional discussion about pollutants found in discharges from C&D sites.

Additionally, stormwater discharges from C&D sites in their entirety are ''industrial waste,'' a nonconventional pollutant under the CWA, thus EPA is not obligated to single out specific constituents or parameters in the discharge. See *Northern Plains Resource Council* v. *Fidelity Exploration and Development Co.,* 325 F.3d 1155 (9th Cir. 2003). Due to stormwater discharges being, or including, nonconventional or toxic pollutants, EPA is statutorily obligated to promulgate a BAT level of control for these point source discharges. CWA section 301(b)(2)(A). EPA is also statutorily obligated to promulgate a best available demonstrated control technology (BADT) for NSPS for *all* pollutants from new sources, even if the only pollutants from C&D sites were conventional pollutants.

Some commenters urged EPA to establish numeric effluent limitations for pollutants other than turbidity (such as pH). While EPA agrees there are other pollutants of concern that are discharged from construction sites the Agency determined it is not necessary to establish any other numeric effluent limitations at this time. Many of the pollutants of concern are sediment-bound pollutants, such as metals and nutrients. The non-numeric effluent limitations in the final rule will address the mobilization of sediment and the discharge of these sediment-bound pollutants. The final rule includes a non-numeric effluent limitation that prohibits the discharge of wastewater from washout of concrete, unless managed by an appropriate control. 40 CFR 450.21(3)(1). This requirement was included to specifically address concerns with pH. Additionally, the numeric effluent limitation, in addition to controlling the discharge of turbidity, will control the discharge of some of these other pollutants of concern. If permitting authorities have concerns regarding the discharge of other pollutants they may be addressed with numeric effluent limitations on case-by-case basis through NPDES permits.

Some commenters noted that they believed there may be environmental risks of applying polymers during construction activity to control discharges of pollutants from C&D sites due to what commenters believed was the potential for the polymers to cause fish kills or otherwise cause an adverse effect in the receiving waters. At proposal EPA had no specific examples of the use of treatment chemicals causing fish kills or aquatic toxicity, although anecdotal evidence did exist (see DCN 41110). In the proposal, EPA specifically requested information and data that quantified the number of instances where overuse of polymers occurred, the circumstances resulting in such overuse, and the actual or potential environmental impacts associated with such events. 73 FR at 72573; see also 73 FR at 72610. EPA received one specific comment regarding a fish kill associated with the use of ATS (see EPA–HQ–OW–2004–0465–1287 in the rulemaking record) and one comment that referenced ''significant environmental harm'' resulting from the use of chitosan or other chemicals, although specific details were not provided (see EPA–HQ–OW–2008–0465–0973 in the rulemaking record). One commenter also stated that during pilot testing of two ATS systems that ''chemical overuse and poor operation never purposefully occurred, but happened anyway.'' This commenter also noted, when comparing ATS usage during this pilot testing to ATS that is used in Washington State that ''the treatment system used on the Idaho site was missing many features that made it easier and environmentally safer to operate. The operator did not have the level of training required in Washington. DEQ did not come close to the amount of staff time Washington spends overseeing the operation of these systems and DEQ did not have any staff trained to assess if the system was being operated correctly.'' (see EPA–HQ–OW–2008–0465–1269 in the rulemaking record.

A number of coagulant and flocculants, including polymers, are available on the market and are in wide use for the control of pollutants, not only on construction sites, but to reduce sediment from agricultural fields and to reduce pollutants in discharges from wastewater treatment plants to name a few. While successful in reducing sediment and turbidity in conveyance systems, polymers and other additives should be carefully utilized in passive treatment systems. Several states have approved specific formulations for use on construction sites and EPA will work with the permitting authorities and the construction industry to ensure the proper application of polymers and other additives, if necessary, before owners and operators of construction sites are required to meet the numeric effluent limitation. Knowledge from toxicity studies suggest that polymers are highly variable as to their toxic effects on aquatic organisms (see discussion of toxicity in the Environmental Assessment). States have approved the use of polymers and other additives at construction sites, for example, Washington State has approved chitosan, a cationic polysaccharide biopolymer, for certain uses and has seen wide use in water and stormwater treatment. Therefore, the use of specific compounds should be considered by the permitting authority and owners and operators of construction sites in light of various environmental influences. While EPA recognizes that there is the potential for problems due to improper application of polymers, EPA has determined that when properly used, environmental impacts from polymers or flocculants should not occur through the use of passive treatment systems. The dose ranges where polymers are utilized on construction sites are well below the chronic toxicity levels. The utilization of polymers on construction sites has occurred for a significant period of time and they are currently being used on construction sites throughout the nation. EPA recognizes the merits of ensuring that polymers or other chemical additives, if necessary, are properly used. Permitting authorities should carefully consider the appropriateness of usage of these materials where there are sensitive or protected aquatic organisms in the receiving waters, including threatened or endangered species and their critical habitat. NPDES permitting authorities may establish controls on dosage and usage, protocols for residual toxicity testing, require prior approval before the use of particular polymers, training requirements for site operators or other measures they deem appropriate. In addition, permittees can also specify, and permittees may choose to utilize, on-site infiltration or dispersion to vegetated areas in combination with, or in place of, polymer-based systems. See 73 FR 72562, 72573–74. Based on the information in the record EPA has determined that when polymers are properly applied the risks of toxicity to aquatic life or adverse effects to the receiving water are minimal. However, it is important that permittees be properly trained in the use of polymers. Operators of C&D sites need to have expertise in a number of technical areas, including engineering, stormwater management and implementation of erosion and sediment controls. Technical specialists, such as engineers, hydrologists and soil scientists are involved in many aspects of site design and construction activity. Permittees typically have engineers on staff, or employ consultants to prepare plans, supervise construction and conduct inspections of various aspects of the project. Given that construction activities require rigorous attention to safety and engineering specifications, there is a reasonable basis for EPA to expect that operators can conform to proper operation and maintenance of controls and proper use of polymers and flocculants. The erosion and sediment control and stormwater management industries are large and composed of diverse specialties. There are several national trade and professional organizations whose members are engaged in various aspects of erosion and sediment control and stormwater management and who have an active role in conducting research and technical outreach. EPA believes that there is a range of expertise available across the industry to properly implement controls that may be required to meet a numeric limitation. Also, sampling and compliance with the turbidity limitation is not required until 18 months after the effective date of this final rule for sites with 20 or more acres of disturbed land at one time and four years after the effective date of the final rule for sites with 10 or more acres of disturbed land at one time. This will allow permittees time to obtain any necessary training if they do not already have trained personnel on staff and for the permitting authorities to provide guidance to permittees.

VII. Summary of Significant Decisions and Revisions to Analyses

EPA solicited comments on a number of issues in the proposed rule. Two areas that EPA specifically requested comments on were the regulatory options proposed as well as the data used to estimate the costs, pollutant loading reductions, environmental benefits and economic impacts of various options. Based on comments received, EPA revised the regulatory options that were proposed and further developed a regulatory option that would establish a numeric limitation based on passive, rather than active, treatment at construction sites. EPA used data collected in support of the proposed regulation, data submitted during the public comment period and by the public after the close of the comment period, as well as additional data collected by EPA to estimate costs, environmental benefits and economic impacts for this option. EPA also updated its costs and economic analyses with these new data to revise the estimates for the proposed options. EPA also revised what C&D sites may be new sources and covered by NSPS. This section summarizes the principle regulatory options considered for the final rule and the revisions that were made to EPA's analyses following proposal.

A. Regulatory Options

In considering options for the final rule, EPA revised the proposed regulatory options in several ways. First, comments received by state environmental agencies, Departments of Transportation (DOTs), the U.S. DOT, and other members of the public indicated that sediment basins are not common practice on all larger construction sites, particularly on linear projects such as road and highway construction. The reasons provided by commenters included the lack of available space within the project right of way as well as the preference to use distributed controls on some sites instead of centralized drainage at sites. Commenters also stressed the need to allow engineers and other professionals that are designing erosion and sediment control plans to choose practices that reflect site-specific factors, and that mandating basins for larger sites would limit that flexibility. Commenters also suggested that active treatment, which typically involves construction of storage basins, was a disincentive to using distributed stormwater controls to manage long-term stormwater discharges from newly developed and redeveloped sites. If permittees construct sediment basins, according to commenters, they are more likely to retain these basins as part of the long-term stormwater management controls. EPA agrees with a number of these comments, particularly the need to give professionals the flexibility to design site-specific controls. Therefore, EPA deleted the sediment basin sizing requirements that were contained in the proposed Options 1, 2 and 3 when considering options for the final rule. Commenters also indicated that the soil clay content provisions proposed by EPA for Option 2 would be difficult to implement, given the variation in soils present at construction sites and the fact that imported soils are often used for fill material. A concern was also raised on the practical applicability of the clay content provision to linear construction projects that may exist over large geographic areas. Therefore, determination of whether or not a particular project would meet the soil clay content thresholds would be difficult for owners and operators of construction sites. EPA agrees with commenters on this issue. Therefore, EPA deleted the soil clay content threshold from Option 2. Commenters also suggested that the R-factor criteria proposed under Option 2 would represent one more unnecessary complexity to the regulation, and that the site size criteria should be based on the disturbed area of the site, not the total project size since stormwater discharges from disturbed areas are the primary discharges containing pollutants. EPA agrees with these suggestions. Therefore, EPA also deleted the R-factor criteria from Option 2. The revised Option 2 would apply to any site that met the disturbed acreage size threshold, regardless of soil type and R-factor.

Comments from the potentially regulated industry and states on the proposal did not favor the use of ATS as the technology basis for a national turbidity limitation. There were a number of reasons given, but the most prominent included the costs, availability and feasibility of ATS. While EPA does not agree with all of these comments, the Agency further evaluated data available to support a numeric turbidity limitation based on technologies other than ATS, including techniques that incorporate either liquid or solid forms of polymer. Examples include liquid polymer dosing of sediment basins, passive dosing in channels through the use of polymer gel socks or floc-blocks or floc-logs, and application of polymer to fiber check dams. EPA also evaluated data available for the placer mining industry. EPA determined that a numeric turbidity limitation based on these and other passive treatment techniques are technically available. As a result, EPA further explored this option and looked at site size thresholds of 1, 5 and 10 acres of disturbed land at one time as potential applicability criteria for a technology-based numeric limitation based on passive treatment.

EPA also received numerous comments about the feasibility of many of the erosion and sediment control and pollution prevention provisions contained in Options 1, 2 and 3. EPA generally agrees that some of these requirements, as proposed, could not be implemented on some construction sites. As a result, EPA made several changes to these provisions which are described in more detail in section X.B.

B. Cost Analysis

EPA received several comments regarding the costs of ATS and the methodology used by EPA to determine costs of the regulatory options. While EPA believes some of these comments have technical merit, EPA found that some commenters greatly overestimated the likely actual costs to implement ATS. Key points made by commenters included (1) that the methodology used at proposal, which was based on a flat cost per gallon to treat, likely did not capture the actual costs of ATS in some applications and in some areas of the country; (2) that the methodology did not factor in the longer duration of some projects (particularly larger residential projects); and (3) the methodology for estimating the size of the industry, which was based on land use change data from 1992 to 2001, likely did not accurately predict the level of construction activity in the near future that would be expected under normal business conditions (i.e., not reflective of the current downturn in the industry), which is the primary analysis case upon which EPA based costs and economic impacts (see discussion in Section XII). EPA has revised and updated the methodology used to estimate the costs of ATS and the expected amount of construction activity to reflect these and other points. The revised analysis significantly increased costs for the revised Options 2 and 3. In the updated methodology, EPA first used data submitted by vendors to develop a series of one-time and monthly costs for ATS. Secondly, EPA estimated the expected amount of construction activity using long-term industry economic data. EPA then estimated the expected duration of projects of varying site size and project types using permit Notice of Intent (NOI) data from approximately 22,000 permit applications from 4 States for construction activities occurring primarily between 2003 and 2009. The combination of all three of these factors (a unit costing approach, longer durations for some projects and a higher estimate of total acres being developed) resulted in significantly higher costs for the revised Options 2 and 3 than were estimated at the time of proposal. Moreover, the cost of the revised Option 2 increased over the proposed Option 2 because EPA removed the R-factor and soil type criteria of proposed Option 2, thereby increasing the number of projects covered by revised Option 2. Additional details can be found in the Development Document and in the Economic Analysis.

C. Pollutant Load Analysis

EPA received several comments on the pollutant loading analysis contained in the proposal, primarily stating that EPA overestimated baseline pollutant loadings and the reductions due to Options 2 and 3 because the assumptions used in EPA's model did not accurately account for current industry practices. EPA generally agrees with some of these comments, and has revised the assumptions used in the model. EPA also used a more detailed analysis of loads for the final rule that uses watershed-specific data for some of the model parameters. The result of these changes is that the load reduction estimates for Options 2 and 3 have decreased since proposal. Additional details on the new assumptions and the results of EPA's analysis can be found in Section XV and in the Development Document.

D. Economic Analysis

The primary revisions to the economic analysis were updates to the approach to developing model projects and then the assignment of project costs to model firms. EPA revised the model projects to include a set of 288 model projects, based on 12 different size categories, 12 duration categories, and two project types (building, transportation). EPA also accounted for the effect that different climate and soil conditions can have on control costs by considering variation in rainfall and runoff factors for each state. This resulted in 14,688 model projects with potentially different costs. These model projects were then combined with activity estimates to develop an estimated 84,000 individual model projects.

Another revision to the economic analysis was the way in which project costs were assigned to firms. For the proposal, project costs were used to develop a weighted average cost per acre for each state. These weighted average costs were then assigned to model firms based on the estimated number of acres they construct on per year. For the final rule, each of the 84,000 projects and their associated costs were assigned to firms. This assignment was based on each category of model firm's capacity to perform projects of various size and duration.

EPA also made changes to the adverse case analysis and the analysis of future costs. EPA received comments that the data used to represent adverse business conditions for the adverse case analysis did not adequately represent the most recent conditions for the industry, which are less favorable. EPA addressed this concern by updating the adverse analysis industry financial profile with 2008 Value Line financial data. For the future costs analysis, EPA was able to use future revenue projections published by Global Insights, to estimate year to year changes in acreage developed, the total number of projects and the number of projects subject to various rule requirements. This allowed for an assessment of changes in the number of firm and employment impacts from year-to-year.

EPA made two adjustments to the housing affordability analysis. For the proposal, EPA evaluated the effect of the proposed options on the price of the median and lower quartile homes. For the final rule, EPA evaluated the impacts of potential price increases for a new home selling for $100,000 and $50,000 to better reflect the impact of price increases at the very low end of the market for new housing. For the proposal, all new home buyers were assumed to buy the most expensive house they could qualify to purchase. However, for the final rule EPA was able to use data from the American Housing Survey, to estimate the average percentage of household income typically spent on a home purchase, for various income ranges. This allowed for a more realistic assessment of the number of home buyers who may have difficulty affording a new home after a price increase.

E. Benefits Estimation and Monetization

Although EPA is not required by statute to quantify environmental benefits for ELGs and NSPSs, EPA did quantify and monetize benefits of the regulatory options to comply with Executive Order 12866. EPA solicited comments on the proposed approach. EPA received comments on the approach and made revisions in order to improve upon the estimates prepared at proposal. Soil on construction sites contains a number of pollutants beyond sediment and turbidity. EPA estimated the degree to which the regulatory options would decrease nitrogen and phosphorus levels in receiving surface waters, and estimated associated water quality impacts using the nitrogen and phosphorus versions of the Spatially Referenced Regressions on Watershed Attributes (SPARROW) model. EPA used these estimates to inform the estimation of the degree to which the public is willing to pay for water quality improvements associated with the regulatory options, which in turn was utilized in EPA's monetized benefits analysis.

EPA expanded the set of potentially impacted waters to include a subset of the nation's estuaries. This enabled the agency to analyze the degree to which the public is willing to pay for improvements in estuarine water quality. EPA utilized this information in conjunction with available data on improvements in estuarine water quality associated with each of the regulatory options in order to monetize benefits associated with those options.

EPA also made refinements to the Water Quality Index (WQI) used for mapping pollution parameter changes to effects on human uses and support for aquatic and terrestrial species habitat. Implementation of the WQI involves transforming the measurements of parameter, such as TSS, nitrogen, and phosphorus, into sub-index values that express water quality conditions on a common scale of 0 to 100. For the pollutant TSS, a unique sub-index curve was developed for each of the 85 Level III ecoregions using baseline TSS concentrations calculated in SPARROW at the enhanced Reach File 1 (RF1) level (see Section XV). In addition, at proposal, EPA did not quantify projected reductions in nutrient loadings as a result of the rule, but these were included in the final rule analysis, including the assessment of changes in the WQI.

VIII. Characteristics of Discharges Associated With Construction Activity

Construction activity typically involves clearing, grading, excavating and other land-disturbing activities. Prior to construction activity, these land areas may have been agricultural, forested or other undeveloped lands. Construction activity can also occur as redevelopment of existing rural or urban areas, or infill development on open space within existing developed areas. The nature of construction activity is that it changes, often significantly, many elements of the natural environment. As described earlier, construction activities typically involve clearing the land of vegetation, digging, and earth moving and grading, followed by the active construction period when the affected land is usually left denuded and the soil compacted, often leading to an increase in the peak discharge rate and the total volume of stormwater discharged and higher rates of erosion. During the land disturbance period, affected land is generally exposed after removal of grass, rocks, pavement and other protective ground covers. Where the soil surface is unprotected, colloids, silt, clay and sand particles may be easily picked up by wind and/or washed away by rain or snow melt.

Stormwater discharges can have variable levels of pollutants. Available data show that turbidity levels in discharges from construction sites range from as low as 10–50 NTU to tens of thousands of NTU. When the denuded and exposed areas contain nutrients, pathogens, metals or organic compounds, these other pollutants are carried at increased rates (relative to discharges from undisturbed areas) to surrounding waterbodies via stormwater and other discharges (e.g., inadequately controlled construction equipment wash water). Discharges of these pollutants from construction activities can cause changes in the physical characteristics of waterbodies, such as pH or water temperature as well as changes in biological characteristics such as aquatic species abundance, health and composition. Changes in stream flow regime can also occur due to deposition of sediment, as well as the altered watershed hydrology resulting from soil compaction and loss of infiltrative capacity.

Discharges from C&D sites associated with construction activity have been documented to increase the loadings of several pollutants in the receiving water bodies. The most prominent and most widespread pollutants of concern discharged from C&D sites are turbidity, suspended solids, total suspended solids (TSS), and settleable solids. Each of these pollutants are indicators of solids contained in the discharge (which, in the case of stormwater discharges associated with construction activities, are primarily due to soil particles), and each of these measures quantify different fractions of these solids.

Discharges associated with construction activity are also expected to contain varying concentrations of metals and toxic organic compounds, some of which may be contributed by equipment used onsite for grading and other construction activities, as well as various construction materials used on-site (such as asphalt sealants, copper flashing, roofing materials, adhesives, and concrete admixtures). Metals are also naturally present in soils and, by removing vegetative cover and increasing erosion and sediment loss, there will likely be an increase in the amount of metals discharged from the C&D site. Metals can also be present as a contaminant from previous activity on the site (such as may occur in redevelopment of industrial areas) or as a contaminant or additive in fertilizers and other soil amendments. Fuels and lubricants are maintained onsite to refuel and maintain vehicles and equipment used during construction activities. These products, should they come in contact with stormwater and other site discharges, could contribute toxic organic pollutants. Pathogenic pollutants can be present in stormwater that comes into contact with sanitary wastes where portable sanitation facilities are poorly located or maintained. Also, trash and other municipal solid waste can be carried away by stormwater.

Nutrients can be present in construction site discharges, either as naturally-occurring components of the soil or due to previous activities on the site, such as enrichment due to agricultural activities. In addition, activities during construction activity, such as hydroseeding, can increase nutrients levels in the soil.

IX. Description of Available Technologies

A. Introduction

As described in Section VIII, construction activity results in the discharge of pollutants to waters of the U.S. These discharges can be controlled by applying site design techniques that preserve or avoid areas prone to erosion and through the effective use of a combination of erosion and sediment control and pollution prevention measures. Construction activities should be managed to reduce erosion and retain sediment and other pollutants in the soil at the C&D site. Erosion and sedimentation are two separate processes and the practices to control them differ. Erosion is the process of wearing away of the land surface by water, wind, ice, gravity, or other geologic agents. Sedimentation is the deposition of soil particles, both mineral and organic, which have been transported by water, wind, air, gravity or ice (adapted from North Carolina Erosion and Sediment Control Planning and Design Manual, September 1, 1988).

Erosion control measures are intended to minimize dislodging and mobilizing of sediment particles. Sediment control measures are controls that serve to capture particles that have mobilized and are entrained in stormwater, with the objective of removing sediment and other pollutants from the stormwater discharge. An overview of available technologies and practices is presented below; see the Development Document for more complete descriptions. Many states and local governments and other entities have also published detailed manuals for erosion and sediment control measures, and other stormwater management practices.

B. Erosion Control Measures

The use of erosion control measures is widely recognized as the most important means of limiting soil detachment and mobilization of sediment. The controls described in this preamble are designed to reduce mobilization of soil particles and minimize the amount of sediment and other pollutants entrained in discharges from construction activity. Erosion can be minimized by a variety of practices. The selection of control measures that will be most effective for a particular site is dictated by site-specific conditions (e.g., topography, soil type, rainfall patterns). The main strategies used to reduce erosion include minimizing the time bare soil is exposed, preventing the detachment of soil and reducing the mobilization and transportation of soil particles off-site.

Decreasing the amount of land disturbed can significantly reduce sediment detachment and mobilization directly from ground disturbance or indirectly through changes in overland flows. Minimizing site disturbance by minimizing the extent of grading and clearing is the most effective means of reducing sediment yield. This approach not only maintains some site vegetative cover but also minimizes the temporary and permanent alteration of the natural hydrology of the site and the receiving waters, thereby reducing the susceptibility of the receiving waters to long-term changes in channel incision and expansion which affects the basin's sediment regime. Short term reductions in sediment yield can also be accomplished by phasing construction so that only a portion of the site is disturbed at a time. Another effective approach is to schedule clearing and grading events to reduce the probability that bare soils will be exposed to rainfall. Many areas of the country have defined times during the year when the majority of rainfall (and hence erosion) occurs. By scheduling major earth disturbing activities outside of the rainy season, erosion can be significantly reduced.

Managing stormwater flows on the site can be highly effective at reducing erosion. Typical practices include actively managing off-site and on-site stormwater using diversion berms, conveyance channels and slope drains to avoid stormwater contact with disturbed areas. In addition, stormwater should be managed using energy dissipation approaches to prevent high runoff velocities and concentrated flows that are erosive. Vegetative filter strips are often considered as sediment controls, but they can also be quite effective at dissipating energy and reducing the velocity (and thus erosive power) of stormwater. Stormwater that is directed to vegetated areas can infiltrate, thus reducing or even eliminating the amount of stormwater discharged from a site, particularly for smaller storm events.

After land has been disturbed and construction activity has ceased on any portion of the site, exposed soils should be covered and stabilized immediately. Simply providing some sort of soil cover on these areas can significantly reduce erosion rates, often by an order of magnitude or more. Vegetative stabilization using annual grasses is a common practice used to control erosion. Physical barriers such as geotextiles, straw, rolled erosion control products and mulch and compost are other common methods of controlling erosion. Polymers (such as PAM) and soil tackifiers are also commonly used. These materials and methods are intended to reduce erosion where soil particles can be initially dislodged on a C&D site, either from rainfall, snow melt or up-slope runoff.

The effectiveness of erosion control measures is dependent on periodic inspection and identification and correction of deficiencies (*e.g.,* after each storm event). Erosion control measures alone will not eliminate the mobilization of soil particles and such controls must often be used in conjunction with sediment control measures.

C. Sediment Control Measures

Despite the proper use of erosion control measures, some sediment detachment and movement is inevitable. Sediment control measures are used to control and trap sediment that is entrained in stormwater runoff. Typical sediment controls include perimeter controls such as silt fences constructed with filter fabric and compost filter berms. Trapping devices such as sediment traps and basins, inlet protectors and check dams are examples of in-line sediment controls. Sediment traps and basins are commonly used approaches for settling out sediment eroded from small and large disturbed areas. Their performance can be enhanced using baffles and skimmers, and additional removal can be accomplished by directing trap or basin discharges to a sand filter or to a vegetated area. Basin and trap performance can also be enhanced by using chemically-enhanced settling (e.g., polymer or flocculant addition). Typical chemicals used on construction sites include polyacrylamide (or PAM), chitosan, alum, polyaluminum chloride and gypsum. Polymers or flocculants are available in either liquid or solid form, and can be introduced at several points in the treatment train in order to increase sediment removal. Liquid chemicals can be introduced via a metering pump in a channel upstream of a basin, or can be sprayed onto the surface of a basin. Rainfall-driven systems can also be used to introduce liquid forms of chemicals into channels or basins. This configuration allows for operation on nights or weekends when construction personnel may not be present on-site.

Conveyances are often used to channelize and manage stormwater on construction sites, and check dams are often placed in channels to control flow velocities and to remove sediment through settling and filtration. Sediment removal by check dams can be enhanced by applying polymer to the check dam, or by placing a polymer enclosed in a permeable material, such as a gel sock, or solid forms sometimes referred to as a floc-block, in the channel. Floc-blocks and gel socks are effective when placed in channels just prior to a basin, a check dam or other structure or conveyance, where the water velocity will be slowed allowing the turbidity, sediment and other pollutants, along with the polymer, to settle out.

Sediment removal can be further enhanced by directing discharges from basins and channels, or by directing discharges through silt fences or filter berms into vegetation or other buffers between the site and surface waters to promote filtration and infiltration. Also, stormwater in basins or other impoundments can be dispersed to vegetated areas using spray or drip irrigation systems, allowing for filtration and infiltration.

Active treatment processes such as electrocoagulation and filtration can also be used to increase sediment removal. Electrocoagulation uses an electrical charge to destabilize particles, allowing removal by settling or filtration. Filtration can be accomplished by directing stormwater to a sand filter bed, or by pumping water through vessels filled with sand or other media. Tube settlers and weir tanks can also be utilized to aid in sediment removal. When discharges from sediment controls or active treatment processes are directed to vegetated areas and stormwater is dispersed and allowed to infiltrate, the amount of stormwater discharged from the site can be reduced, and in some cases the discharge can be eliminated.

More detailed descriptions of sediment and erosion control measures, use of polymers and flocculants and active treatment processes can be found in the Development Document.

D. Other Construction and Development Site Management Practices

Construction activity generates a variety of wastes and wastewater, including concrete truck rinsate, construction and demolition waste, municipal solid waste (MSW), trash, and other pollutants. Construction materials and chemicals should be handled, stored and disposed of properly to avoid contamination of runoff that is discharged from the site. While mobilization by stormwater is one mechanism by which these wastes may be discharged from C&D sites, pollutants may also be discharged if wastes or wastewaters are dumped into streams or storm drains. Pollutants, trash and debris may also be carried away by wind. Control of these wastes can be accomplished using a variety of techniques.

Site planning, sequencing of land-disturbing activities and phasing of construction activities are also important management practices. Limiting the amount of land disturbed at one time, as well as during the entire construction project, are perhaps some of the most effective practices to reduce the amount of sediment, turbidity and other pollutants in discharges. The longer exposed soil areas are left unprotected, the greater the chance of rainfall-induced erosion. Proper planning such that soil stabilization activities can occur in quick succession after grading activities have been completed on a portion of a site can greatly reduce the amount of sediment and turbidity discharged. In addition, limiting the amount of land that is ''opened up'' at one time to the minimum amount that is needed, as well as limiting soil compaction and retaining natural vegetation on the site, can greatly reduce erosion rates and help maintain the natural hydrology. Also, grading of the site to direct discharges to vegetated areas and buffers that have the capacity to infiltrate runoff can reduce the volumes of stormwater requiring management in sediment controls.

E. Performance Data for Passive Treatment Approaches

Passive treatment systems (PTS), as described in this notice, include a variety of practices that rely on settling and filtration to remove sediment, turbidity and other pollutants. Where necessary, PTS includes the use of polymers or other flocculants. Data in the literature indicate that PTS are able to provide a high level of turbidity reduction at a significantly lower cost than active treatment systems. Details on PTS used as a basis for developing the numeric effluent limitation are contained in the Development Document as well as in the administrative record. Several studies and data sources are also summarized here.

For example, McLaughlin (see DCN 41005) evaluated several modifications to standard sediment trap designs at the North Carolina State University Sediment and Erosion Control Research and Education Facility (SECREF). He evaluated standard trap designs as contained in the North Carolina Erosion and Sediment Control Manual utilizing a stone outlet structure as well as alternative designs utilizing a skimmer outlet and various types of porous baffles. Baffle materials tested included silt fence, jute/coconut and tree protection fence tripled over. Tests were conducted using simulated storm events in which sediment was added to stormwater at flows of 10 to 30 liters per second. McLaughlin found that a standard gravel outlet did not significantly reduce turbidity values. Average turbidity values in the basin were 843 NTUs, while average turbidity in the effluent was 758 NTUs using the standard outlet. Use of a skimmer instead of a standard gravel outlet reduced turbidity to an average of 353 NTUs. Additional tests were conducted to evaluate the addition of polyacrylamide (PAM) through the use of floc-blocks. Floc-blocks are a solid form of PAM which are designed to be placed in flowing water. They are typically anchored by a rope or by placing them in a mesh bag or cage either in open channels or in pipes. As the water flows over the floc-blocks, the PAM dissolves somewhat proportional to flow. The floc-blocks typically have substantial amounts of non-PAM components, which are intended to improve PAM release, maintain the physical integrity of the blocks and enhance PAM performance (McLaughlin—Soil Facts; Chemical Treatments to Control Turbidity on Construction Sites). McLaughlin found that addition of PAM to sediment traps resulted in average effluent turbidities of 152 NTUs using a rock outlet and 162 NTUs using a skimmer outlet. For one set of tests, use of a standard stone outlet along with PAM was able to attain an average effluent turbidity of 51 NTUs, while tests with jute/coconut mesh baffles with PAM were only slightly higher, at 71 NTUs.

Warner and Collins-Camargo (see DCN 43071) evaluated several innovative erosion and sediment controls at a full-scale demonstration site in Georgia as part of the Erosion and Sedimentation Control Technical Study Committee (known as ''Dirt II''). The Dirt II project consisted, among other things, of field monitoring as well as modeling of erosion and sediment control effectiveness at construction sites. The demonstration site was a 50-acre lot in a suburban area near Atlanta where a school was being constructed. In total, 22.5 acres of the site was disturbed. A comprehensive system of erosion and sediment controls were designed and implemented to mimic pre-developed peak flow and runoff volumes with respect to both quantity and duration. The system included perimeter controls that were designed to discharge through multiple outlets to a riparian buffer, elongated sediment controls (called seep berms) designed to contain runoff volume from 3- to 4-inch storms and slowly discharge to down-gradient areas, multi-chambered sediment basins designed with a siphon outlet that discharged to a sand filter, and various other controls. Extensive monitoring was conducted at the site. For one particularly intense storm event of 1.04 inches (0.7 inches of which occurred during one 27-minute period), the peak sediment concentration monitored prior to the basin was 160,000 mg/L while the peak concentration discharged from the passive sand filter after the basin was 168 mg/L. Effluent turbidity values ranged from approximately 30 to 80 NTUs. Using computer modeling, it was shown that discharge from the sand filter, which flowed to a riparian buffer, was completely infiltrated for this event. Thus, no sediment was discharged to waters of the state from the sand filter for this event. For another storm event, a 25-hour rainfall event of 3.7 inches occurred over a 2-day period. Effluent turbidity from one passive sand filter during this storm ranged from approximately 50 to 375 NTU, with 20 of the 24 data points below 200 NTU. For a second passive sand filter, effluent turbidity ranged from approximately 50 to 330 NTU, with nine of 11 data points below 200 NTU. In estimating compliance costs for the rule, EPA assumed that most operators would use sediment basins or check dams with polymer addition to enhance settling, rather than a passive sand filter. The Warner study indicates that using a comprehensive suite of erosion and sediment controls, including a basin with a surface outlet coupled with an in-ground passive sand filter may be able to achieve comparable turbidity control to the technologies that EPA costed without relying upon the use of polymers or flocculants. EPA has not costed this approach for the rule, nor included this data in calculation of the numeric limitation.

There are other references in the literature describing the various types of PTS and the efficacy of these systems. One application of a PTS is to add liquid polymer, such as PAM, to the influent of a conventional sediment basin. This can be accomplished by using a small metering pump to introduce a pre-established dose of polymer in the influent pipe or channel. If the polymer is added in a channel far enough above the basin, then turbulent mixing in the channel can aid in the flocculation process. Otherwise, some sort of provision may need to be made to provide mixing in the basin to produce flocs. Polymers typically used in this particular application include PAM, chitosan, polyaluminum chloride (PAC), aluminum sulfate (alum) and gypsum.

The Auckland (New Zealand) Regional Council conducted several trials to evaluate the effectiveness of chemical flocculants and coagulants in improving settling of suspended sediment contained in sediment laden runoff from earthworks sites (DCN 42112). Trials were conducted using both liquid and solid forms of flocculants. Trials were initially conducted on two projects: a highway project and residential development. A follow-on study evaluated passive basin dosing at an additional site (see DCN 42102).

The highway project (ALPURT) evaluated both a liquid polymer system and solid polymers. Liquid polymers evaluated were alum and PAC and solid polymers evaluated were all polyacrylamide products (Percol AN1, Percol AN2 and Percol CN1). Bench tests indicated that AN2 performed best among the solid polymers and that both PAC and alum were effective in flocculating the soils present on the site.

Following bench testing of the polymers, liquid and solid dosing systems were developed. For the liquid dosing system, initial consideration was given to a runoff proportional dosing system which would include a weir or flume for flow measurement, an ultrasonic sensor and signal generating unit, and a battery-driven dosing pump. These components, together with costs for necessary site preparatory work, chemical storage tanks and a secure housing, were estimated to cost approximately $12,000 (1999 NZ $) per installation. An alternative system was developed that provided a chemical dose proportional to rainfall. This rainfall-driven system, which did not require either a runoff flow measurement system or a dosing pump, had a total cost of $2,400 (1999 NZ $) per installation.

The rainfall-driven system operated by collecting rainfall in a rainfall catchment tray that was designed proportional to the watershed area. Rainfall into this tray was used to displace the liquid treatment chemical from a storage tank into the stormwater diversion channel prior to entering the sediment basin. The size of the catchment tray was determined based on the size of the catchment draining to the basin, taking into consideration the desired chemical dosage rate obtained from the bench tests. Accumulated rainfall from the catchment tray fills a displacement tank that floats in the chemical storage tank. As the displacement tank fills with rainfall and sinks, liquid chemical is displaced from the chemical storage tank and flows via gravity to the dosing point.

Field trials of the liquid treatment system using alum were conducted at the ALPURT site. The authors report that the system performed ''satisfactorily in terms of reduction of suspended solids under a range of rainfall conditions varying from light rain to a very high intensity, short duration storm, where 24mm of rainfall fell over a period of 25 minutes.'' Suspended solids removal for the intense storm conditions was 92% with alum treatment. For a similar storm on the same catchment with the same retention pond without alum treatment, suspended solids removal was about 10%.

Field trials at the ALPURT site were also conducted using PAC. In total, 21 systems were used with contributing catchments ranging between 0.5 and 15 hectares (approximately 1 to 37 acres). The overall treatment efficiency of the PAC-treated basins in terms of suspended sediment reduction were reported to be between 90% and 99% for ponds with good physical designs. The authors noted that some systems did not perform as well due to mechanical problems with the system or physical problems such as high inflow energy (which likely caused erosion or sediment resuspension) or poor separation of basin inlets and outlets. The suspended solids removal for all ponds incorporating PAC ranged from 77% to 99.9%, while the removal in a pond not incorporating PAC ranged from 4% to 12%. Influent suspended solids concentrations for the systems incorporating PAC ranged from 128 to 28,845 mg/L while effluent concentrations ranged from 3 to 966 mg/L. In comparison, influent suspended solids concentrations for the untreated ponds were approximately 1,500 mg/L while effluent concentrations were approximately 1,400 mg/L. The authors also noted that dissolved aluminum concentrations in the outflow from the basins treated with PAC, in most cases, were actually less than the inflow concentrations, and were also less than the outflow concentrations from the untreated ponds. Outflow aluminum concentrations in the PAC treated ponds ranged from 0.01 to 0.072 mg/L. The ALPURT trials indicate that a relatively simple PTS using liquid polymers can result in significant reductions in suspended sediment concentrations, even with influent concentrations in excess of 25,000 mg/L. Although some effluent concentrations were as high as several hundred mg/L, the majority were below 100 mg/L. This indicates that a passive liquid polymer system can be used to meet a numeric effluent limitation for turbidity at a capital cost on the order of several thousand dollars per sediment basin. Coupling a system such as this with a gravity sand filter or distributed discharge to a vegetated buffer (as described by Warner and Collins-Camargo, DCN 43071) or dispersion would reduce discharge turbidity levels even further, and for certain storm events would eliminate the discharge altogether.

Field trials of polymer treatment using solid forms of PAM by the Auckland Regional Council were conducted at the ALPURT site as well as a residential project (Greenhithe). Trials at the ALPURT site were conducted by placing the floc-blocks in plastic mesh bags in plywood flumes through which the runoff from the site was directed. Initial trials encountered problems due to the high bedload of granular material, which accumulated against and stuck to the floc-blocks inhibiting solubility of the polymer. The system was reconfigured to incorporate a forebay before the flumes in order to facilitate removal of the bedload fraction. The authors noted that while this system was generally effective at low flow rates, it was difficult to control dosage rates and sediment accumulation in the flumes continued to be a problem. The authors concluded that ''Floc Block treatment has a high potential for removal of suspended solids from stormwater with consistent quality, particularly for small catchments; when flow balancing can be achieved prior to treatment.''

Field trials were also conducted at the Greenhithe site, which was a 4-hectare (approximately 10-acre) residential project. As with the ALPURT trial, a flume was constructed and placed in the flow path immediately before the sediment basin. Results of the trials were mixed. The authors noted several problems with the floc-blocks, such as drying and breakdown of the blocks due to prolonged exposure to the air and softening and breakdown during periods of prolonged submergence. Sediment accumulation around the blocks and breakdown continued to be a problem. Incorporating an effective sediment forebay and limiting bedload are suggestions for increasing performance. In addition, the authors recommended soaking the floc-blocks in water to allow hydration before use and periodic spraying with water as ways to limit drying of the floc-blocks. EPA notes that similar problems with floc-blocks have been noted by some construction site field inspectors (see DCN 41109) and by McLaughlin (see DCN 43082). Because of the additional operation and maintenance requirements associated with the use of floc-blocks, a field inspection and maintenance program should be part of proper application of this technology.

Results of the PAC studies at the ALPURT sites have led the Auckland regional council to require chemical treatment for any site that produces more than 1.5 metric tons of (net) sediment as determined by the Universal Soil Loss Equation. Sites that exceed this threshold require chemical treatment in accordance with a site chemical treatment plan. Exceptions include projects of less than one month duration and sites with granular volcanic soils and sand areas. Chemical treatment may also not be required if bench testing indicates that chemical treatment will provide no improvement in sediment removal efficiency (see DCN 41111).

In addition to (or in place of) adding polymers to sediment basins, polymers can be introduced on other areas of the site as a soil stabilization measure or as components of other BMPs. For example, McLaughlin (DCN 41005) evaluated adding polymer to check dams on highway projects. McLaughlin noted significant reductions in turbidity from the use of fiber check dams coupled with PAM application. Significant reductions were even noted when PAM was added to rock check dams. Other research done by McLaughlin with other researchers includes studying the effectiveness of using PAM dosing systems for turbidity reduction in stilling basins (EPA–HQ–OW–2008–0465–0984.4), and using polymer blocks for turbidity control (EPA–HQ–OW–2008–0465–0984.7 and 0984.10). McLaughlin, Hayes et al. also studied modified sediment control practices including polymer dosing at a transportation construction site (EPA–HQ–OW–2008–0465–0984.3)

Various other researchers evaluated PAM as a soil stabilization agent. There are a number of documents in the administrative record for this rulemaking describing the use of PAM in this manner.

The data from these sources, as well as other data in the record, indicate that various types of PTS that utilize both solid and liquid forms of polymers have been reported to be effective in reducing turbidity levels in discharges from construction and development sites.

EPA also considered the results of a three-year study conducted in Georgia (Warner & Collins-Comargo, DCN 43071) which developed and demonstrated cost-effective erosion prevention and sediment control systems. These controls did not rely on the use of polymer, instead they demonstrate the effectiveness of ponds, passive sand filters and seep berms.

X. Development of Effluent Limitations Guidelines and Standards and Options Selection Rationale

In developing this final rule, EPA considered all the available information, including information, data and analyses conducted in support of the proposed rule, public comments received and additional information and data collected by EPA following proposal which is contained in the record. EPA evaluated a range of options for reducing pollutant discharges associated with construction activity. The options evaluated by EPA are intended to control the discharge of turbidity, sediment and other pollutants in stormwater and other wastewater from C&D sites.

A. Description of the Regulatory Options Considered

1. Options Considered in the Proposal

In developing today's final rule, EPA evaluated several regulatory options. The proposal discussed a wide range of options and presented a detailed analysis for several options. As discussed earlier, Option 1 would have required implementation of erosion and sediment controls and pollution prevention measures for all sites and the installation of a sediment basin with a surface outlet for certain sites and other non-numeric effluent limitations or BMPs; Option 2, would have added to the requirements of Option 1 by establishing a requirement to monitor for a numeric limitation for turbidity (13 NTU) based on the application of ATS at sites of 30 or more acres with soil clay content of 10 percent or more and an R-factor of 50 or larger; Option 3 would have expanded the application of the turbidity limitation based on ATS to all sites which disturb 10 or more acres. The proposal also presented and solicited comment on another option that would require compliance with a higher numeric turbidity effluent limitation (e.g., 50 to 150 NTU, or some other value) based on passive treatment technologies (see 73 FR 72562, 72580–72582, 72610–72611). At proposal, EPA sought additional data on the performance of PTS, and the cost and pollutant loading reductions that would be attainable from such an option.

2. Regulatory Options Considered for the Final Rule and Rationale for Consideration of Revisions to Options in the Proposed Rule

In developing the final rule, EPA considered the wide range of options considered in the proposed rule, and some revisions to those options, based on comments received and additional information obtained by EPA. EPA considered a revision to Option 1 to remove the requirement for a sediment basin in response to concerns raised by commenters about the appropriateness and availability of a basin at all construction sites with 10 or more disturbed acres draining to one location. An example includes areas where excavation is precluded due to the presence of shallow bedrock. In addition to the sediment basin requirements, EPA also considered modifying some of the erosion and sediment control and pollution prevention requirements to make them broadly applicable and compatible with all types of potentially regulated construction activity, and considered deleting certain proposed requirements. These changes to the non-numeric effluent limitations are detailed in Section X.B of this notice.

EPA considered a revision to Option 2 to remove the soil clay content criteria as part of the basis for determining if a site would be subject to the numeric limitation. Numerous commenters expressed concern about difficulties associated with implementation of this soil clay content criterion. Commenters raised questions, for example, about how sites would measure soil content and to what depth would the soil have to be sampled to determine the clay content (e.g., to a depth to which excavation will occur, or only the top several inches). Also, questions were raised as to the number of soil samples that would be required of sites of different size. Also, commenters raised the question of how to account for fill brought onto the site and the variation in soil types present at different depths and at different areas within the site. EPA also considered that adding complexity to the applicability section generally makes it more difficult to comply with, implement and enforce a rule. EPA agrees that the implementation of a soil clay content criterion for determining whether a site would be subject to a numeric limitation would be difficult to implement and therefore considered removing this criterion from Option 2.

EPA similarly considered modifying Option 2 to remove the RUSLE R-factor criterion as part of the basis for determining if a site would be subject to the numeric limitation. EPA received numerous comments about the potential practical difficulties associated with this criterion. Particularly, R-factor data is not readily available for all areas of the country, including the entire state of Alaska. Also, in certain areas of the country, the annual R-factor may be low, but soil erosion rates may still be very high during certain time periods (such as during spring thawing). Therefore, EPA determined that an annual R-factor criterion, as proposed, would not be easily implementable, nor necessarily target those sites with greater potential for soil erosion.

EPA also considered revising Options 2 and 3 so that the monitoring requirements and turbidity limitation would not apply to interstate natural gas pipeline construction activity (see discussion in Section VI).

EPA also considered changing Option 2 so that the applicability of the turbidity limitation would be a function of disturbed area of the site, as opposed to the total size of the site. In addition, EPA considered revising the non-numeric effluent limitations of Option 2 (as well as Option 3) to be consistent with the Option 1 requirements discussed above.

EPA also considered the option discussed in the proposal (Option 4) that would establish a numeric limitation for turbidity based on the application of PTS for the final rule. This option would require all construction sites to implement the non-numeric effluent limitations described for Option 1, as well as requiring sites equal to or greater than a specified number of acres disturbed at one time to meet a numeric limitation to control turbidity and other pollutants in stormwater discharges from C&D sites. EPA considered thresholds of 1, 5 and 10 acres disturbed at one time for this option. The technology basis for Option 4 consists of a suite of passive treatment technologies and erosion and sediment controls that are currently used at construction sites across the United States and abroad, as well as in other industries, such as drinking water treatment and mining. Examples of passive treatment technologies include sediment basins, sediment traps and other impoundments (with and without polymer or flocculant dosing), polymer addition to fiber check dams, sand filtration, and dispersion of stormwater to vegetated areas. PTS can substantially reduce the amount of turbidity, sediment and other pollutants discharged from construction sites. See Section IX for additional discussion of passive treatment approaches.

B. Non-Numeric Effluent Limitations Included in All Regulatory Options

Today's final rule, as well as the other options EPA considered, includes a suite of non-numeric effluent limitations that apply to all permitted C&D sites. This suite of non-numeric effluent limitations makes up Option 1 and is also a component of Options 2, 3 and 4. These non-numeric effluent limitations are structured to require permittees to first prevent the discharges of sediment and other pollutants through the use of effective planning and erosion control measures; and second, to control discharges that do occur through the use of effective sediment control measures. Permittees are also required to implement a range of pollution prevention measures to limit or prevent discharges of pollutants including those from dry weather discharges.

The non-numeric effluent limitations that are included in all options are designed to prevent the mobilization and discharge of sediment and sediment-bound pollutants, such as metals and nutrients, and to prevent or minimize exposure of stormwater to construction materials, debris and other sources of pollutants on construction sites. In addition, these non-numeric effluent limitations limit the generation of dissolved pollutants. Soil on construction sites can contain a variety of pollutants such as nutrients, organics, pesticides, herbicides and metals. These pollutants may be present naturally in the soil, such as arsenic or selenium, or they may have been contributed by previous activities on the site such as agriculture or industrial activities. These pollutants, once mobilized by rainfall and stormwater, can detach from the soil particles and become dissolved pollutants. Once dissolved, these pollutants would not be removed by down-slope sediment controls. Source control through minimization of soil erosion is therefore the most effective way of controlling the discharge of these pollutants. Therefore, the non-numeric effluent limitations are important components of the final rule not only for the purposes of limiting sediment generation and discharge, but also to minimize the discharge of dissolved pollutants.

The non-numeric effluent limitations in the final rule apply to all permitted C&D sites including the sites that are subject to the numeric effluent limitation and monitoring requirements at 40 CFR 450.22. (See Section X.G.) EPA has the authority under the CWA to establish non-numeric effluent limitations as supplemental to a numeric effluent limitation or in place of a numeric effluent limitation. See *Citizens Coal Council* v. *EPA,* 447 F.3d 879, 896 (6th Cir. 2006). The non-numeric effluent limitations in this rule are necessary for those sites that are also subject to the numeric effluent limitation for turbidity because the non-numeric effluent limitations may address different pollutants or the same pollutants differently, the numeric effluent limitation is not applicable on days when total precipitation on that day is greater than the local 2-year, 24-hour storm event (See Section XIX.A), and the fact that sites may fluctuate above and below ten acres of disturbed land. Thus there will be times when sites are discharging pollutants in excess of the numeric effluent limitation and the non-numeric effluent limitations will be the only applicable effluent limitation and are thus essential to the control of discharges from the site. Also, some of the non-numeric effluent limitations are addressing discharges unrelated to the discharge of turbidity, for example, 40 CFR 450.21(e)(1) which prohibits the discharge of ''wastewater from washout of concrete, unless managed by an appropriate control'' addresses pollutants such as pH and can occur during precipitation related events or dry weather discharges. The structure of the final rule, including the requirement that the non-numeric effluent limitations apply to all sites, was supported by state permitting authorities and is similar to the structure of the newly issued California CGP (see DCN 42104).

The final rule contains non-numeric effluent limitations that require the permittee to minimize the discharge of pollutants. Under the regulatory structure of the final rule the permitee can minimize the discharge of pollutants from construction sites by utilizing non-numeric effluent limitations or BMPs such as the erosion and sediment controls listed below at (i) through (vii) and at 40 CFR 450.21(a)(1) through (7). The erosion and sediment controls at (i) through (vii) below are what EPA has determined are the required non-numeric effluent limitations that are necessary for owners or operators of construction sites to utilize in order to minimize the discharge of pollutants from the site. This is true for the other non-numeric effluent limitations at 40 CFR 450.21 as they are what EPA has determined are the required controls necessary to minimize, control or prohibit discharges of pollutants from construction sites. The permitting authority may determine that additional non-numeric effluent limitations or specific BMPs are necessary in order to minimize the discharge of pollutants and EPA has structured 40 CFR 450.21 to allow the permitting authority that discretion. Due to geographic differences or other variable factors a permitting authority may choose to require additional or more stringent non-numeric effluent limitations in its individual or general NPDES permits for discharges associated with construction activity. For example, the permitting authority may determine that it is necessary for permitees to initiate soil stabilization measures when construction activity has permanently or temporarily ceased and will not resume for a period exceeding 7 calendar days, as opposed to 14 calendar days at X.B.1.b below or that additional erosion and sediment controls are necessary. EPA purposefully drafted the non-numeric effluent limitations to allow for flexibility in how the permitting authority implements the requirement in NPDES permits. For example, in the erosion and sediment control section below at section X.B.1.a.iv EPA simply required that permitees ''minimize the disturbance of steep slopes'' leaving it up to the permitting authority to determine the specific requirements applicable to owners or operators of C&D sites to minimize disturbance of steep slopes in order to minimize the discharge of pollutants from the site. This flexibility built into the final rule will also benefit permittees by allowing the owners or operators of construction sites discretion to choose BMPs that will minimize the discharge of pollutants based on the unique nature of the particular site. For example, at 40 CFR 450.21(a)(5), the final rule states that construction sites must design, install and maintain controls to ''minimize sediment discharges from the site.'' Absent specific requirements from the permitting authority the final rule gives the permittee discretion to choose what practices and controls to use to minimize the discharge of sediment from the site based on the site specific nature of the construction activity.

The non-numeric effluent limitations are required for all sites, but there are site-specific considerations that may make one or more of the provisions infeasible on a particular site. EPA has specifically qualified some of the requirements to state that the requirement must be implemented unless infeasible. By infeasible, EPA means that there is a site-specific constraint that makes it technically infeasible to implement the requirement, or that implementing the requirement would be cost-prohibitive. The burden is on the permittee to demonstrate to the permitting authority that the requirement is infeasible.

With respect to the soil stabilization language at § 450.21(b), EPA has qualified the soil stabilization requirements such that vegetative stabilization may be delayed in arid or semi-arid areas, or if an area is experiencing a drought such that vegetative stabilization practices cannot be initiated. In such cases, the permittee should consider non-vegetative stabilization practices. In addition, EPA would generally not expect permitting authorities to require vegetative stabilization in areas that are excessively rocky or infertile, that have non-erodible soils (such as sands), certain coastal areas, or during periods when snow or ice are covering the ground and generally in areas where vegetative stabilization would not be appropriate. Permitting authorities should incorporate this requirement into permits with consideration of appropriate stabilization measures for various areas within their jurisdiction.

EPA made several revisions to the non-numeric effluent limitation since proposal. Some of these revisions were made in response to comments, while others were made as a result of EPA re-evaluating the feasibility and appropriateness of some of the proposed requirements. Section X.B.1 describes the non-numeric effluent limitations contained in the final rule while Section X.B.2 describes how the non-numeric effluent limitations in final rule differ from those in the proposal.

1. Non-Numeric Effluent Limitations Contained in the Final Rule

The non-numeric effluent limitations contained in the final rule are as follows:

a. Erosion and Sediment Controls

Permittees are required to design, install and maintain effective erosion controls and sediment controls to minimize the discharge of pollutants. At a minimum, such controls must be designed, installed and maintained to:

i. Control stormwater volume and velocity within the site to minimize soil erosion;

ii. Control stormwater discharges, including both peak flowrates and total stormwater volume, to minimize erosion at outlets and to minimize downstream channel and streambank erosion;

iii. Minimize the amount of soil exposed during construction activity;

iv. Minimize the disturbance of steep slopes;

v. Minimize sediment discharges from the site. The design, installation and maintenance of erosion and sediment controls must address factors such as the amount, frequency, intensity and duration of precipitation, the nature of resulting stormwater runoff, and soil characteristics, including the range of soil particle sizes expected to be present on the site;

vi. Provide and maintain natural buffers around surface waters, direct stormwater to vegetated areas to increase sediment removal and maximize stormwater infiltration, unless infeasible; and

vii. Minimize soil compaction and, unless infeasible, preserve topsoil.

b. Soil Stabilization Requirements

Permittees are required to, at a minimum, initiate soil stabilization measures immediately whenever any clearing, grading, excavating or other earth disturbing activities have permanently ceased on any portion of the site, or temporarily ceased on any portion of the site and will not resume for a period exceeding 14 calendar days. Stabilization must be completed within a period of time determined by the permitting authority. In arid, semiarid, and drought-stricken areas where initiating vegetative stabilization measures immediately is infeasible, vegetative stabilization measures must be initiated as soon as practicable.

c. Dewatering Requirements

Permittees are required to minimize the discharge of pollutants from dewatering trenches and excavations. Discharges are prohibited unless managed by appropriate controls.

d. Pollution Prevention Measures

Permittees are required to design, install, implement, and maintain effective pollution prevention measures to minimize the discharge of pollutants. At a minimum, such measures must be designed, installed, implemented and maintained to:

i. Minimize the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other wash waters. Wash waters must be treated in a sediment basin or alternative control that provides equivalent or better treatment prior to discharge;

ii. Minimize the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste and other materials present on the site to precipitation and to stormwater; and

iii. Minimize the discharge of pollutants from spills and leaks and implement chemical spill and leak prevention and response procedures.

e. Prohibited Discharges

The following discharges from C&D sites are prohibited:

i. Wastewater from washout of concrete, unless managed by an appropriate control;

ii. Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds and other construction materials;

iii. Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance; and

iv. Soaps or solvents used in vehicle and equipment washing.

f. Surface Outlets

When discharging from basins and impoundments, permittees are required to utilize outlet structures that withdraw water from the surface, unless infeasible.

2. Changes to the Non-Numeric Effluent Limitations Since Proposal

EPA made a number of changes to the non-numeric effluent limitations for the final rule. EPA does not view these changes as making the final rule requirements less stringent than those contained in the proposal, but rather views these changes as necessary adjustments that make the requirements applicable to all types of construction activities. EPA has determined that many of the requirements, as proposed, could not be implemented on every construction site due to technical reasons. In general, some requirements were eliminated, while others were revised to include ''unless infeasible'' language, recognizing that not every site will be able to implement every one of the proposed requirements. Also, the requirements were re-arranged to separate erosion and sediment control requirements from soil stabilization and pollution prevention requirements. However, EPA believes that most practices can be implemented on most sites, and where a practice is feasible and necessary for effective control of pollutant discharges from stormwater runoff, this rule requires that it be implemented. The changes made, by section of the proposed rule text, along with the rationale for the changes are as follows:

Section 450.21(a): The definition of when erosion controls are considered effective has been deleted since effectiveness varies based on site-specific parameters. In addition, the proposed language was limiting in that there may be other objective measures of effectiveness that were not described by EPA. The requirement to stabilize exposed soils has been incorporated into a ''Soil Stabilization'' section in the final rule at § 450.21(b).

Section 450.21(a)(4): The requirement to minimize the amount of soil exposed at any one time has been removed as the soil stabilization language at § 450.21(b) requires immediate stabilization.

Section 450.21(a)(5): The requirement to preserve natural vegetation was removed as there are cases where preserving the natural vegetation may not be compatible with the ultimate land use. The requirement to preserve topsoil was changed to include ''unless infeasible,'' recognizing that it may not always be feasible to preserve topsoil depending on the ultimate land use.

Section 450.21(a)(6): The language regarding minimizing soil compaction was simplified and now includes ''unless infeasible,'' and the requirements for deep ripping and decompaction and incorporation of organic matter to restore infiltrative capacity were deleted because the use of these techniques is dependent upon the ultimate land use.

Section 450.21(a)(7): The requirement for providing and maintaining natural buffers around surface waters was combined with the requirement to direct discharges to vegetated areas found in § 450.21(b)(9) and now includes ''unless infeasible.''

Section 450.21(a)(8): The requirement to minimize the construction of stream crossings was deleted as the construction of stream crossings on a particular project is determined by consideration of a number of factors, and simply minimizing the number based on erosion and sediment control considerations may conflict with other considerations. EPA has determined that this requirement is best left to the discretion of the permitting authority.

Section 450.21(a)(9): The requirement to sequence/phase construction activities was deleted. EPA believes that permittees should consider sequencing or phasing for projects, particularly for larger or longer-duration projects. Phasing construction so that less than 10 acres of land are disturbed at any one time is one way for owners or operators of construction sites to comply with the rule without having to sample discharges and meet the numeric limitation in Option 4. EPA believes that this is appropriate because of the environmental benefits of such sequencing. However, EPA has determined that this is a site-specific consideration best addressed by the permitting authority.

Section 450.21(a)(11): The requirement to implement erosion controls on slopes was deleted as the soil stabilization requirements encompasses all types of stabilization, not just on slopes.

Section 450.21(a)(12): The requirement to establish temporary or permanent vegetation to stabilize exposed soils was deleted as vegetative controls may not always be the most appropriate stabilization measures. The selection of appropriate stabilization techniques is best left to the discretion of the permitting authority.

Section 450.21(a)(13): The requirement to divert stormwater that runs onto the site away from disturbed areas of the site was deleted as this may not always be feasible, or, in certain instances, may increase off-site erosion.

Section 450.21(b): The sediment control requirements were combined with the erosion control requirements into a new section titled ''Erosion and Sediment Controls'' at § 450.21(a) in the final rule regulatory text. The requirement to install sediment controls prior to commencement of construction and to maintain during all phases of construction activity was deleted as the timing of implementation of controls is site-specific. Maintenance of controls is inherent in permits and it is not necessary to include this requirement in the national rule.

Section 450.21(b)(1): The requirement to establish and maintain perimeter controls was deleted, as the need for perimeter controls is dictated by site topography. The requirement to discharge stormwater from perimeter controls through vegetated buffers and functioning stream buffers was deleted. This requirement now applies to all discharges, unless infeasible, as described at § 450.21(a)(6).

Section 450.21(b)(2): The requirement to control discharges from silt fences using a vegetated buffer or filter strip was deleted as this may not always be feasible, depending on the site location or climate.

Section 450.21(b)(3): The requirement to minimize slope length and to install linear sediment controls and slope breaks on erodible slopes was deleted as the need for these controls is dictated by site-specific considerations and is best left to the discretion of the permitting authority.

Section 450.21(b)(4): The requirements to establish construction entrances and exits and to utilize wheel wash stations were deleted as it may not always be feasible to utilize wheel wash stations (for example, in remote areas). The need for construction entrances and exits are dependent on site configuration.

Section 450.21(b)(5): The requirement to remove sediment from paved surfaces daily and the prohibition on washing sediment and other pollutants into storm drains were deleted. The need for these requirements depend on site configuration (i.e., if storm drains discharge to a sediment control or discharge off-site).

Section 450.21(b)(6): The requirement to implement controls to minimize the introduction of sediment and other pollutants to storm drain inlets was deleted (for the same reason as § 450.21(b)(5) above).

Section 450.21(b)(7): The language regarding dewatering was changed to be specific to dewatering trenches and excavations. This language is now found at § 450.21(c).

Section 450.21(b)(8): All language regarding sediment basins was deleted (see Section VII.A).

Section 450.21(b)(9): The requirement to direct discharges from sediment controls to seep berms and level spreaders and to utilize spray or drip irrigation systems was changed. This requirement now applies to all discharges, but is more general in that it does not specify techniques, but rather requires all discharges to be directed to vegetated areas, unless infeasible (now found at § 450.21(a)(6)). This provides more flexibility for permittees to select appropriate techniques.

Section 450.21(c): The language describing examples of effective pollution prevention measures was deleted and instead the new requirement at § 450.21(d) is to ''design, install, implement and maintain effective pollution prevention measures'' as this language is not limiting to those measures described in the proposal. In addition, pollution prevention requirements in the final rule are presented separately from a series of ''prohibited discharges''. At proposal, these two concepts were presented together.

Section 450.21(c)(1): Discharges of construction waste, trash and sanitary wastes are not prohibited in the final rule, but rather the requirement is to minimize the exposure of a variety of materials to precipitation and stormwater (now found at § 450.21(d)(2)). EPA has determined that a requirement to minimize exposure to precipitation and stormwater, rather than a strict prohibition on the discharge of these materials, is a more appropriate requirement as it may not always be feasible to prevent these materials from being discharged from the site.

Section 450.21(c)(2): Concrete washout is now addressed separately at § 450.21(d)(1), and discharges are allowed if managed by appropriate controls. The concrete washout provision is not a prohibition, as are discharges from other sources, because there are technologies available to treat concrete washout. Therefore, discharges of wastewaters from concrete washout are allowed if managed by appropriate controls. Wastewater from washout of form release oils and curing compounds have been added to the list of prohibited discharges at § 450.21(d)(2).

Section 450.21(c)(4): The requirement was changed to clarify that the prohibition is on the discharge of soaps and solvents.

Section 450.21(c)(5): The requirement was changed so as not to prohibit the discharge of wash waters but rather to control discharges from equipment and vehicle washing and wheel wash, recognizing that wash waters can be managed using appropriate controls.

Section 450.21(c)(6): ''Building products'' were added to the list of materials, and spills and leaks are addressed in a separate requirement (§ 450.21(d)(3)).

Section 450.21(c)(7): The requirement to prevent runoff from contacting areas with uncured concrete was deleted, as this may not be feasible on some sites (such as bridges, roads, etc.).

C. Numeric Effluent Limitations and Standards Considered

EPA considered numeric effluent limitations based on primarily two suites of technologies for the final rule. The first, advanced treatment systems or ATS, were described in the proposed rule under Options 2 and 3. For the final rule, EPA considered effluent limitations for turbidity based on ATS for site size thresholds of 10 acres and 30 acres of disturbed land. As described earlier, these options are similar to those contained in the proposal, except the soil clay content and R-factor criteria have been removed from Option 2. In addition, Option 2 would apply to sites of 30 or more disturbed acres. At proposal, Option 2 would have applied if the site was 30 or more acres, regardless of the amount of land disturbed on the project

The second technology suite, passive treatment systems or PTS, constitutes the technology basis for today's final rule. In the proposal, EPA considered the establishment of numeric turbidity limitations based on PTS and solicited comment and additional information and data on this option. For the final rule, EPA considered numeric limitations for turbidity based on PTS for a site size threshold of 10 or more acres disturbed at one time (Option 4). EPA also evaluated site size thresholds of 1 and 5 acres disturbed at one time.

Additional information on both PTS and ATS is presented in Section IX of today's notice, the development document and in the administrative record. The nomenclature presented in Table X–1 is used to describe these options throughout today's notice.

TABLE X–1—MAIN OPTIONS CONSIDERED FOR NUMERIC EFFLUENT LIMITATIONS AND STANDARDS

Option	Technology basis	Site size threshold (acres disturbed)
2	Active Treatment	30 or more.
3	Active Treatment	10 or more.
4	Passive Treatment	10 or more.

For all of these options, the numeric turbidity limitation would apply to all discharges from the site except on days when total precipitation during the day exceeded the local 2-year, 24-hour storm. If the total precipitation in any one day is greater than the local 2-year, 24-hour storm event, then permittees would still need to sample (because they wouldn't know in advance whether the precipitation on that day was going to exceed the storm size threshold) but the numeric effluent limitation would not apply to discharges for that day. However, the numeric effluent limitation is applicable to all discharges from the site on subsequent days if there is no 2-year, 24-hour storm event during those days. Even when total precipitation during the day exceeds the local 2-year, 24-hour storm permittees must comply with the non-numeric effluent limitations § 450.22(c) through § 450.22(h). (See Section XIX.A for EPA's rationale for selecting the 2-year, 24-hour storm event).

Under all the options considered that contain a numeric limitation, the limitation applies so long as the total amount of disturbed area on the project, at any one time, is at or above the specified acreage threshold (i.e., 10, 20 or 30 acres). For example, under Option 4, if a project initially disturbs 10 or more acres of land at one time during construction activity, but after completion of clearing and grading and infrastructure installation the site is stabilized prior to or during commencement of vertical construction, then the sampling requirements and turbidity limitation would cease to apply at the point where the total disturbed land area at the site is less than 10 acres at one time. So long as the total disturbed land area at one time remains below 10 acres for the remainder of the construction activity, the sampling requirements and turbidity limitation would not apply. If, however, at some point during the remainder of the project 10 or more acres were to be disturbed at one time, then the sampling requirements and turbidity limitation would again apply to all discharges from the C&D site. This 10 acre threshold also applies to projects that are part of a larger common plan of development. If an individual portion of a project disturbs less than 10 acres at one time, but the amount of land disturbed at one time under the larger common plan of development is 10 or more acres, then sampling of discharges from the entire project is required during the period when the total disturbed land for the whole project is 10 or more acres.

EPA has also found it is reasonable to allow time for permitting authorities to develop monitoring requirements and to allow the regulated community time to prepare for compliance with a numeric limitation. Compliance with the numeric limitation and the associated monitoring requirements are not required until 18 months after the effective date of this rule for sites with 20 or more acres of land disturbed at one time and four years after the effective date for sites with 10 or more acres of land disturbed at one time. EPA's rationale for this decision is described in Section XIX.B.

In addition to the issue discussed above regarding EPA's determination that turbidity is the appropriate end point for today's rule because of its applicability to more than simply conventional pollutants, EPA evaluated the advantages and disadvantages of establishing a limitation on turbidity rather than total suspended solids (TSS). Turbidity is more appropriate because turbidity can be easily measured in the field while TSS requires collection of a sample and analysis in a laboratory. Demonstrating compliance with a turbidity limitation is relatively easy and inexpensive for construction site owners or operators to implement. Hand-held turbidity meters (turbidimeters) can be used to measure turbidity in discharges, or data loggers coupled with in-line turbidity meters can be used to automatically measure and log turbidity measurements reducing labor requirements associated with sampling. Since most controls and treatment systems are flow-through systems, the use of TSS would not allow permittees to gauge performance in the field and take any correction action if they are in danger of violating the limitation. With the limitation based on the pollutant turbidity, permittees can measure turbidity levels in discharges continuously, with immediate, real-time information on the efficacy of their controls, and take immediate action if they are in danger of exceeding the turbidity limitation. For these reasons, EPA has determined that turbidity is a more appropriate measure of the effectiveness of the PTS and the technology can be implemented more easily by utilizing turbidity rather than TSS.

D. Selected Options for BPT, BCT, BAT and BADT for NSPS

EPA has selected Option 1 as the basis for BPT and BCT and EPA has selected Option 4 as the basis for BAT and BADT for NSPS. Option 1 requires all C&D sites to implement a range of non-numeric effluent limitations. Option 4 requires all C&D sites to implement the same range of non-numeric effluent limitations as in Option 1 and requires sites with 10 or more acres of disturbed land at one time to meet a numeric limitation based on PTS to control pollutants in stormwater discharges.

E. Selection Rationale for BPT

EPA is establishing BPT effluent limitations on the basis of the technologies described under Option 1. EPA has determined that the non-numeric effluent limitations in Option 1 represent a level of control that is technologically available and economically practicable and represents the average of the best performance of construction sites in the C&D point source category considering the factors in CWA section 304(b)(1)(B). The requirements established by Option 1 are well-established for construction activities in all parts of the country. The Option 1 requirements are generally consistent with the requirements currently in place under the existing Construction General Permits issued by EPA and most states. Many of these types of effluent limitations have been in place in NPDES permits for discharges associated with construction activity since at least the early 1990s. Prior to the issuance of the 1990 NPDES Phase I regulations, many existing state laws and regulations required the implementation of erosion and sediment controls. Many of these controls were first used beginning in the 1960s and 1970s, and they are well-established industry practices. In Option 1, EPA has taken this established approach to controlling stormwater discharges from construction sites and established minimum requirements for owners or operators of the site. In some cases the narrative limitations of Option 1 are more stringent than past EPA general permit requirements, e.g., the soil stabilization requirements are more stringent than the 2008 EPA CGP. These requirements represent the average of the best performance of the industry because they are being used effectively by construction operators and/or EPA's analysis indicates that the costs are small in relation to the effluent reduction benefits to be achieved from such requirements, traditionally measured in terms of cost per pound of pollutant removed. As stated in Section III.D., EPA assesses cost-reasonableness of BPT effluent limitations by considering the cost of treatment in relation to the effluent reduction benefits achieved, typically in dollars/pounds of pollutants reduced. EPA has determined that the costs in relation to the pollutant reduction benefits of the selected option for BPT are reasonable. The costs per pound of sediment removed expressed as TSS for Option 1 is $0.10 per pound ($ 2008). The range of costs per pound removed for other industrial categories is $0.26 to $41.44 per pound in year 2008 dollars.

EPA considered the non-water quality environmental impacts of Option 1 including energy usage, air emissions and solid waste handling associated with the non-numeric effluent limitations. Energy usage associated with the non-numeric effluent limitations includes fuel consumption for construction equipment to excavate and install erosion and sediment controls and excavation and placement or disposal of accumulated sediment (see Section XIV.C). Air emissions associated with the non-numeric effluent limitations would be emissions generated from the burning of fuel by construction equipment (see Section XIC.A). Solid waste generated from stormwater treatment includes the polymer-laden sediment settled out during treatment, if polymers or flocculant are utilized, though they are not part of the technology-basis for BPT (see Section XIV.B). EPA found the non-water quality environmental impacts associated with Option 1 to be minimal and acceptable. The non-water quality environmental impacts associated with the BPT effluent limitations are negligible as there is little incremental energy expended in the implementation of the erosion and sediment controls, since these types of controls are already being implemented by the majority of construction sites nationwide. Selecting Option 1 as BPT for this point source category is consistent with the CWA and regulatory determinations made for other point source categories, in that the Option 1 requirements represent limitations based on the average of the best performance of facilities within the C&D point source category. See *Weyerhauser Co.* v. *Costle,* 590 F. 2d 1011, 1053–54 (D.C. Cir. 1978).

EPA rejected Options 2, 3 and 4 as the basis for BPT because EPA views BPT as the first level of technology-based control representing the average of the best performance on a national basis. Although meeting a numeric limitation represents BAT and BADT for NSPS, as discussed below, meeting a numeric effluent limitation is a substantial change for most owners or operators engaged in construction activity nationwide. EPA's record does not indicate that meeting a numeric turbidity limitation, even for the subset of facilities identified in Option 4, represents today's average of the best performance and therefore it does not represent the BPT level of control for this point source category.

F. Selection Rationale for BCT

EPA is establishing BCT equivalent to BPT, based on Option 1. BCT represents the best control technology for conventional pollutants which is primarily TSS for the construction and development point source category. As discussed in X.E above, the requirements of Option 1have been demonstrated to be technologically available and EPA's analyses show that the requirements are economically practicable. Establishing BCT effluent limitations for a point source category begins by identifying technology options that provide additional conventional pollutant control beyond that provided by application of BPT effluent limitations. Conventional pollutants under the CWA are biochemical oxygen demand (BOD_5), TSS, fecal coliform, pH, and oil and grease. CWA section 304(a); 40 CFR 401.16. Stormwater discharges, if not adequately controlled, can contain very high levels of TSS. In addition, many of the construction materials used at the site can contribute BOD or oil and grease. Fecal coliform can also be present at elevated levels, due to natural sources (contributed by animal wastes) or if stormwater is not segregated from sanitary waste facilities. See Section VIII for additional discussion of pollutant sources.

EPA evaluates the candidate BCT options by applying the two-part BCT cost test. The first part of the BCT cost test is the POTW test. To ''pass'' the POTW test, the cost per pound of conventional pollutant discharges removed in upgrading from BPT to the candidate BCT must be less than the cost per pound of conventional pollutant removed in upgrading POTWs from secondary treatment to advanced secondary treatment. Using the RS Means Historical Cost Indices, the inflation-adjusted POTW benchmark (originally calculated to be $0.25 in 1976 dollars) is $0.92 (2008 $). To examine whether an option passes this first test, EPA calculates incremental values of the candidate option relative to the selected BPT (Option 1). EPA calculated the incremental cost per pound of conventional pollutants removed ($/lb TSS) for Option 2 to be $2.50. Since this result is more than the POTW benchmark, Option 2 fails the first part of the two-part BCT cost test. EPA also calculated the incremental cost per pound of conventional pollutants removed for Option 3, which is $3.22. Therefore, Option 3 also fails the first part of the BCT cost test. EPA also calculated the incremental cost per pound of conventional pollutants removed for Option 4, which is $0.35. Therefore, Option 4 passes the first part of the BCT cost test.

To pass the second part of the BCT cost test, the industry cost effectiveness test, EPA computes a ratio of two incremental costs. The numerator is the cost per pound of conventional pollutants removed by the BCT candidate technology relative to BPT. The denominator is the cost per pound of conventional pollutants removed by BPT relative to no treatment (i.e., raw wasteload). As in the POTW test, the ratio of the numerator divided by the denominator is compared to an industry cost benchmark. The industry cost benchmark is the ratio of two incremental costs: The cost per pound to upgrade a POTW from secondary treatment to advanced secondary treatment, divided by the cost per pound to initially achieve secondary treatment from raw wasteload. If the calculated ratio is lower than the industry cost benchmark of 1.29 (i.e., the normalized cost increase must be less than 29 percent), then the candidate technology passes the industry cost test. Since both Option 2 and 3 fail the first part of the BCT cost test, it is not necessary to compute the ratio for the second part. The calculated ratio for Option 4 is 5.47; therefore, Option 4 fails the second part of the BCT cost test. Therefore, EPA is setting BCT equal to Option 1.

G. Selection Rationale for BAT and BADT for NSPS

1. Selection Rationale

EPA is selecting Option 4 as the basis for BAT and BADT for NSPS. The requirements of the selected Option have been demonstrated to be technologically available, economically achievable, pose no barrier to entry and have acceptable non-water quality environmental impacts (see section XIV) and thus represent BAT and BADT for NSPS. As described above in Section III.D of this notice, the CWA requires EPA to consider several of the same factors when establishing BAT and NSPS. Both levels of control are based on the best technology, considering the cost of achieving such effluent reduction and any non-water quality environmental impacts (including energy requirements). See CWA sections 304(b)(2)(B) and 306(b)(1)(B). The principle difference between the two technology standards is the potential for new sources under NSPS to install the best available demonstrated control technology without the cost to retrofit new technology into an existing site. In both cases, the Agency must determine that the requirement will not cause unacceptable economic impacts to the industry as a whole or by presenting a barrier to entry to new facilities.

The construction industry is different from other industries when considering closures and barriers to entry. For this industry, the permitted activity is a temporary project rather than ongoing operations at a permanent facility. This is an important distinction, in that it provides construction firms with greater flexibility in how they respond to the rule. Not only can they elect to use one or more technologies to ensure compliance with the rule for a project they can also plan the dimensions and timing of the project in such a way as to minimize the effects of the rule on project profitability. As all new construction projects are new and impermanent, there is no meaningful distinction between new and existing sources, from the standpoint of economic affordability. As such, EPA is discussing the basis for both BAT and NSPS together.

EPA has determined that a numeric limitation as well as non-numeric effluent limitations for sites with 10 or more acres disturbed at one time is technically available as that term is used in the CWA. The technologies used to meet the limitation in Option 4 are non-numeric effluent limitations or BMPs, the use of polymer-aided settling, and site planning techniques such as limiting the amount of land disturbed at any one time or phasing construction activities. These technologies are currently being utilized throughout the country and EPA has determined that the use of these technologies will result in stormwater discharges from C&D sites consistently meeting the requirements of Option 4. EPA has determined that a numeric effluent limitation is achievable based on the performance of these technologies measured by the information and data described in Section IX.E and by information concerning similar treatment systems used in the placer mining industrial point source category.

Passive treatment systems are currently used at a range of construction sites as evidenced by the information contained in the record. EPA has determined that a numeric limitation is achievable based on the performance of PTS measured by the data described in Section IX.E and in the Development Document and the record. Multiple studies performed by McLaughlin in North Carolina have demonstrated the effectiveness of passive approaches in reducing turbidity in stormwater discharges from construction sites. Many of McLaughlin's studies were performed on linear transportation projects for the North Carolina Department of Transportation in piedmont areas of the State. Another researcher, Warner, evaluated several erosion and sediment controls at a full-scale demonstration construction site in Georgia. Additionally, there were several studies conducted in New

Zealand on the effectiveness of flocculants and coagulants at improving settling at transportation and residential projects. See Section IX.E for a more detailed discussion of these studies. Adding flocculants or polymers to aid in sediment removal are also routinely used a drinking water plants to treat their source water. Polymer aided settling has also been used in placer mining to treat effluent.

In the proposal, EPA provided data on PTS and solicited comments on the pollutant removal effectiveness, effluent quality attainable and the technical basis for establishing a particular numeric turbidity limitation for C&D sites based on passive treatment. See 73 FR 72562, 72580–82, 72610–11. Commenters provided additional data and papers on PTS and EPA identified additional data on PTS (see the chapter 6 of the TDD for a description of the data EPA has used as a basis for the numeric limitation). EPA also obtained additional data from vendors on ATS, the first component of which, namely polymer-assisted settling, has been used, in combination with data available at the time of proposal, as a basis for the numeric limitation (see Chapter 6 of the TDD). A technology is ''available'' even if it is not widely or routinely used as long as the technology is used at some facilities, a pilot plant or is adequately available. See *e.g., American Frozen Foods* v. *Train,* 539 F.2d 109 (D.C. Cir. 1976) (BAT was based on two exemplary plants); *Ass'n of Pacific Fisheries* v. *EPA,* 615 F.2d 794, 816 (9th Cir. 1980) (legislative history indicates BAT can be established based on statistics from one plant); *FMC Corp* v. *Train,* 539 F.2d 973 (4th Cir. 1976) (BAT limitations based on single pilot plant and a few exemplary plants); *Kennecott* v. *EPA,* 780 F.2d at 458 (Congress required EPA to search out BAT and to strive for zero discharge. BAT was based on two plants). The data and information in the record on the use of these technologies to control stormwater discharges support EPA's determination that a well designed and maintained PTS on varying types of construction sites in several areas of the country will consistently achieve a numeric limitation and is thus technologically available. The data and studies in the record show that these technologies have been used in areas of the country with different rainfall patterns and soil types. Locations of the studies include the Pacific Northwest, North Carolina, and Georgia, as well as outside the U.S. (including New Zealand). In addition, these technologies have been implemented on different project types, including transportation, institutional and residential construction.

The Agency also examined the use of these technologies to control sediment, turbidity and other pollutants in other industries. At least six federal circuit courts have upheld EPA's use of transfer of technology in the context of the CWA when promulgating ELGs and NSPSs, concluding that effluent limitations may be based on a technology which has been demonstrated outside the industry, if that technology is transferable to it. See *e.g., CPC International* v. *Train,* 515 F.2d 1032, 1048 (8th Cir. 1975); *Kennecott* v. *EPA,* 780 F.2d 445, 453 (4th Cir. 1986); *CHS* v. *EPA,* 553 F.2d 280, 285–287 (2d. Cir. 1977); *Ass'n. of Pacific Fisheries* v. *EPA,* 615 F.2d 794, 817 (9th Cir. 1980).

EPA examined the use of polymer-aided settling that is used in the placer mining industry to treat effluent from the mining facilities. Placer mining extracts gold from alluvial deposits. Excavation often uses water as the means to disturb the sediments allowing the gold to be extracted. The wastewater generated with placer mining contains the sediment that has been separated from the gold. Though the water used during the gold extraction process is not ''stormwater,'' the water during the mining process acts in a similar manner as stormwater as it detaches, erodes and dislodges the soil and discharges sediment, turbidity and other pollutants from the facility. The placer mining effluent guidelines (40 CFR part 440 subpart M) established limitations for settleable solids based on simple settling for a minimum of 4 hours. While developing the placer mining effluent limitations guidelines, EPA conducted treatability studies on the effectiveness of simple settling and chemically-aided settling (polyethylene oxide (PEO) and PEO with polyelectrolyte). Settleable solids, TSS and turbidity were measured in these studies. EPA has examined the data from these studies to evaluate the effectiveness of settling and polymer aided settling applicable to the C&D point source category. EPA considers this treatment performance data to be appropriate because both placer mining and C&D involve significant disturbance of soils and placer mining process wastewater has similar characteristics to stormwater from construction sites. Untreated wastewater in the tests contained concentrations of TSS ranging from 3,585 mg/L to 161,700 mg/L with turbidity ranging from 2,450 to >80,000 NTU. After simple settling for 6 hours the concentrations of TSS dropped to between 28 mg/L and 26,235 mg/L while turbidity decreased to between 35 to 35,000 NTU. In the tests where polyelectrolyte was added, initial TSS concentrations ranged from 869 to 55,340 mg/L while turbidity ranged from 1,680 to 42,500 NTU. After 6 hours of settling, the TSS in the polyelectrolyte samples ranged from 2 to 23 mg/L while turbidity ranged from 5 to 78 NTU. Notable also was that turbidity had decreased to between 13 and 97 NTU after only one hour of settling in these samples. Similar results were reported for PEO with initial turbidity ranging from 1,235 to 39,500 and results after 6 hours ranging from 51 to 140 NTU (See DCN 42103, 1986 Alaskan Placer Mining Study Field Testing Program Report).

EPA acknowledges that the placer mining treatment data was specific to that industry. There may be other distinctions between the treatment evaluated there and the technology in today's rule (e.g., the placer mining data is based on enhanced settling using a polyelectrolyte and a polyelectrolyte with a polymer only, as opposed to a full range of passive treatment techniques relied upon in today's rule). Nonetheless, the technology (chemically-enhanced settling) and the materials (water containing dirt, rock, sand and similar materials) are fundamentally similar and support EPA's conclusion that this type of well-demonstrated treatment technique can reliably achieve low turbidity levels in sediment bearing waste streams. This data demonstrates that simple settling or enhanced settling is capable of achieving the limitation.

The data in the record on the use of PTS at construction sites supports EPA's determination that a well designed and maintained passive treatment system will consistently achieve the limitation and is thus technologically available. The data in the record on the use of enhanced settling at placer mining facilities supports EPA's determination that PTS will consistently achieve the limitation in discharges associated with construction activity and supports PTS being technologically available.

Besides the use of PTS, owners and operators will often times be able to rely on non-numeric effluent limitations or BMPs, without the use of polymers of flocculants, to meet the limitation. For example, Horner et al. (see NRC at pg. 445 and DCN 01350) showed that a turbidity limitation of 25 to 75 NTUs can be consistently met on highway construction sites in Washington. See also discussion of Warner and Collins-Camargo earlier (DCN 43071). Owners or operators can also choose to modify their site planning, construction operations or the processes in which the construction activity occurs, such as changing the way the site is graded so that stormwater is directed to areas where it can infiltrate. Also, if a vegetated area is available, owners or operators can choose to utilize this area for dispersion of the stormwater. The Agency may base BAT and NSPS limitations and standards upon effluent reductions attainable through changes in a facility's processes and operations, as are available to owners and operators of construction sites. See *Texas Oil & Gas Ass'n* v. *EPA,* 161 F.3d 923, 928 (5th Cir.1998). In addition, owners or operators have the option to phase their construction activity or limit the amount of land disturbed at one time in a manner such that the numeric limitation would not apply to their construction activity. Construction site owners or operators can avoid the application of the numeric limitation in Option 4 to their discharges altogether if they limit construction activity so that less than 10 acres are disturbed at any one time.

EPA's analysis shows that the technologies that form the basis of Option 4 can consistently meet the limitation.

In addition, the non-numeric effluent limitations of Option 4 are technically available. These non-numeric effluent limitations represent the average of the best performance of construction sites across the country. See discussion of BPT in section III.D.1. As BAT represents best available technology, they are also technologically available.

In considering economic impacts, EPA's analyses show that the requirements of Option 4 are economically achievable (BAT) and will not pose a barrier to entry (NSPS). Under the CWA, in the effluent guidelines program, EPA traditionally assesses the economic impact on the industry as a whole, by looking at what percentage of facilities would close or face a barrier to entry as a result of the costs of the regulatory requirements and any resulting loss of employment.

EPA estimates that out of the 82,000 firms expected to be affected by this regulation, 147 firms or 0.2 percent, may close as a result of the requirements. This closure estimate is based on the assumption that some of the costs associated with this regulation will be passed on to the customers of these firms. Based on the typical number of employees working for these firms, EPA estimates 7,257 job losses associated with these closures, out of total in-scope employment of 1.85 million. As discussed in section XII.D, construction firms routinely expand and contract their workforce in response to work load and as a result many workers laid off when a firm closes are rehired by new and other existing more financially healthy firms. Therefore, job losses due to firm closures are in many cases a temporary displacement of the workforce as compared to other industrial point source categories. The construction industry is a highly dynamic industry that is characterized by many small firms with a relatively high turnover that expand and contract their level of activity readily in response to changes in market conditions.

The relatively high rate of entry and exit in the construction industry, compared to other industries, suggests barriers to entry are normally low. Option 4 is not likely to put new firms at a disadvantage as both existing and new firms will need to meet the same requirements for each new project begun. Existing firms are likely to have more assets than new firms and therefore may be able to use more of their own financial resources to finance a new project. The greater the compliance costs in comparison to baseline assets the more likely the rule would pose a barrier to new entrants. EPA assessed the increase in financing requirements in relation to typical baseline assets for the different firm revenue categories, and under Option 4 no firm category would face financing requirements greater than 4.1% of baseline assets. EPA does not consider Option 4 to pose a barrier to entry for new firms into the marketplace. For a more detailed discussion see Section XII below.

Option 4 is projected to have a total industry compliance cost, once fully implemented in NPDES permits and the industry has returned to normal levels of construction activity, of $953 million per year (2008 $). Most C&D sites are permitted under general permits, so this rule will not be fully implemented until all state and EPA general permits have expired and new general permits are issued that incorporate the Option 4 requirements, which will take approximately 5 years after the effective date of this rule. Costs in the first year (2010) are estimated to be approximately $8 million, and annualized costs for the first 10 years after promulgation are estimated to be $577 million (see Table X–2). Given the size of the industry and the current annual value of construction activity of $960 billion (July, 2009), EPA has determined that this cost, which represents less than one tenth of one percent of the current total value of annual construction activity, can be reasonably borne by the industry.

TABLE X–2—OPTION 4 ANNUAL COMPLIANCE COST BY YEAR

	Compliance year									
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Annual Compliance Cost (Millions)	$8	$63	$204	$538	$810	$834	$859	$885	$911	$938

These economic impacts are well within the range of impacts EPA has imposed on other industries subject to ELG and NSPS rulemakings. Congress expressly considered BAT and NSPS to be technology-forcing and that in striving towards the ambitious goals of the CWA either BAT or NSPS may, and likely will, result in some economic impacts to a portion of an industry. See *e.g., American Iron & Steel* v. *EPA,* 526 F.2d 1027, 1052 (3d. Cir. 1975); *Weyerhaeuser* v. *Costle,* 590 F.2d 1011, 1026 (D.C. Cir. 1978). Based on the traditional factors EPA considers under the CWA when promulgating effluent limitations guidelines and standards the Agency determined that Option 4 is economically achievable and will not pose a barrier to entry. For a more complete discussion of EPA's economic impact analysis see Section XII of this notice.

Under the Regulatory Flexibility Act (RFA), EPA also considered the impact to firm revenues for Option 4, at full implementation under normal levels of construction activity. EPA evaluated impacts of the rule on small firms. EPA considers the number of firms where the costs to those firms exceed 1 percent and 3 percent of revenue. Under Option 4, there are no firms, either small or large, that are expected to incur compliance costs exceeding 3 percent of their revenues, while only 230 small firms (0.03% of in-scope firms and 0.84% of those incurring costs) are expected to incur costs exceeding 1 percent of their revenues. Another measure of economic stress considered by EPA is the estimated change in important firm financial metrics, such as the ratio of pretax income to total assets. For this option, a total of 169 out of 82,000 firms expected to be affected by this regulation are estimated to incur financial stress as a result of regulatory requirements, which represents 0.2 percent of in-scope firms. These impacts are not necessarily additive with estimated 147 firm closures, mentioned previously, as they evaluate different aspects of a firm's financial viability, and the same firm may experience more than one measure.

EPA found the non-water quality environmental impacts associated with Option 4 to be minimal and acceptable. The non-water quality environmental impacts associated with the BPT effluent limitations are negligible as there is little incremental energy expended in the implementation of the erosion and sediment controls, since these types of controls are already being implemented by the majority of construction sites nationwide. Depending on the particular polymer or flocculant used, these solids are typically utilized as fill material on the construction site. If they cannot be used as fill, then they would be treated as municipal solid waste. However, EPA would expect permittees to choose polymers or flocculants that would allow for use of removed solids on-site

EPA considered site size thresholds smaller than 10 acres for the applicability of passive treatment systems and a numeric effluent limitation and associated monitoring requirements. While EPA does not have information to indicate a numeric effluent limitation for stormwater discharges is not feasible for smaller construction sites, EPA has determined that a site size threshold below 10 acres disturbed at one time does not at this time represent BAT and NSPS in recognition of other relevant factors, such as the fact that this is the first time EPA has required an enforceable numeric effluent limitation for stormwater discharges from construction sites nationwide, the increased burden on the permitting authorities, and that construction sites less than 10 acres are more likely to be operated by small businesses.

EPA recognizes that meeting a numeric limitation is a significant change for this industry. A 10-acre threshold of land disturbed at one time will result in the numeric effluent limitation for turbidity and the associated monitoring requirements applying to a very substantial number of constructed acres of land per year. EPA has estimated that at a threshold of 10 acres disturbed at one time, 623 thousand acres and more than 21,000 projects annually will be subject to the numeric effluent limitation. Thus, EPA has determined the final rule would result in the numeric effluent limitation and monitoring requirements applying to an estimated 73% of the constructed acres per year. If EPA were to lower the threshold of land disturbed at one time to below 10 acres, the final rule would significantly increase the number of projects subject to the numeric effluent limitation. As stated above, at a 10-acre threshold, about 21,000 projects are subject to the numeric effluent limitation; however, if the Agency were to lower the threshold to, for example, 5 acres, the number of construction projects climbs to 37,000 projects; and at 1 acre, the number of construction projects would jump to 84,000 projects, a four-fold increase in covered projects compared to a 10-acre threshold. EPA received comments from state permitting authorities concerned about the potential increased burden a numeric effluent limitation may have if it were applied to all construction sites. State permitting authorities must oversee incorporation of the final rule into their NPDES permits, in addition to providing logistical and technical support to permittees subject to the new requirements. While the final rule is not mandating specific reporting requirements, EPA expects permitting authorities to develop requirements in their NPDES permits for frequent reporting to assist in compliance monitoring and program development. The permitting authority will have to manage the reported effluent data and discharge monitoring reports. EPA considered the significant further progress that applying a numeric effluent limitation based on passive treatment systems to 73% of the constructed acres would have in meeting the goals of the CWA in combination with the likely increased workload to permitting authorities, especially during a unique period of time when resources may be an issue for permitting authorities.

Additionally, EPA considered that construction sites less than 10 acres are more likely to be operated by small businesses. Larger construction firms, who tend to operate on larger sites, will likely have in-house expertise, while smaller construction firms may need to rely on hiring consultants to implement the passive treatment systems in order to meet the numeric effluent limitation. Based on comments EPA received, the Agency has some concerns regarding the expertise at the small construction firm level and, given the size of the construction industry, the availability of the support industries for small construction sites. The concern is that the support industries for small construction sites, such as consulting firms and erosion and sediment control service providers, will not be available, especially as the entire industry adjusts to the new requirements, to provide the level of support needed for these smaller sites to effectively implement passive treatment systems to meet the numeric effluent limitation. If the threshold was below 10 acres disturbed at one time, an additional 63,000 sites, under a 1-acre threshold, or an additional 15,000 sites, under a 5-acre threshold, may need outside support for passive treatment systems. EPA considered the issue of small businesses' operation of small sites, the availability of expertise for small sites that is necessary to meet a numeric effluent limitation and the resulting questions raised as to whether passive treatment systems are available for construction sites with less than 10 acres disturbed at one time.

In sum, after consideration of all the relevant factors in CWA sections 304(b) and 306(b), EPA has determined that the selected option is technologically available, economically achievable for the industry as a whole, poses no barrier to entry, has acceptable non-water quality environmental impacts and is BAT and NSPS for this point source category. The selected option accommodates the concerns of the regulated community and permitting authorities about the practicalities of meeting a numeric effluent limitation. This rule reflects a new generation of controls and approach to managing stormwater discharges from C&D sites, with objective and enforceable limitations based upon demonstrated technologies that this industry as a whole can achieve and afford.

2. Numeric Limitations

Numeric effluent limitations are feasible for discharges associated with construction activity. Numeric effluent limitations are appropriate on a nationwide basis for some construction sites and in this case are the best way to quantifiably ensure industry compliance and to make reasonable further progress toward the CWA goal of eliminating pollutants into the nation's waters. Numeric effluent limitations are an objective and effective way for the permitting authority to implement, and the regulated industry to comply with, the technology based requirements for this point source category. Numeric limitations put the owner and operator, the permitting authority and the public on notice as to what is required, thereby facilitating effective permit development and management of stormwater discharges associated with construction activity, in order to further the objectives of the CWA.

EPA has in the past indicated that numeric limitations for discharges from C&D sites might not be feasible. Over the last several years, additional data and information has become available indicating that a numeric limitation is technically available and is appropriate for some sites. Several states have recognized that current BMPs used at construction sites are not always able to meet water quality objectives. Therefore, several researchers (such as McLaughlin, Warner and Horner) have investigated improved approaches to managing construction site stormwater. Their research has demonstrated that the performance of current BMPs can be improved and that effluent quality can be substantially improved. In addition, several states have incorporated action levels into their permits, so owners and operators of construction sites have experience with sampling stormwater discharges and analyzing for turbidity. In addition, California has recently established effluent limitations for some sites within the State, and dischargers within the Lake Tahoe basin have been subject to numeric limitations for some time. The industry in general has become more aware of the importance of turbidity control and has developed a number of innovative approaches to improve turbidity removal. Also, a substantial vendor base has developed in recent years that offer a range of expertise and approaches for controlling turbidity. In addition, permittees have many choices regarding when land disturbing activities take place and how they decide to conduct land disturbing activities on a particular site that have a pronounced effect on the amount of sediment generated, and subsequently the amount of sediment and other pollutants requiring management. Consideration of these factors during the planning phases of projects will significantly influence the level of control needed, and the feasibility of meeting a limitation.

Not withstanding a heavy reliance on non-numeric limitations in the past, the use of numeric effluent limitations by EPA in national rulemakings to control stormwater discharges has precedent in a number of contexts. Industries that have exposed areas devoted to production or material storage often have numeric limitations that apply to stormwater discharges from these areas. EPA has promulgated at least eight different effluent limitations guidelines for industrial point source categories that address stormwater or a combination of stormwater and process wastewater with numeric effluent limitations.[1]

In addition to numeric limitations being utilized for stormwater discharges in other industrial categories, several states have effluent limitations or action levels or benchmarks (hereinafter, benchmarks) for stormwater discharges associated with construction activity. A benchmark is a numeric monitoring requirement where discharges must be sampled to determine whether they meet a certain level of pollutant(s) in the discharge. For example, the State of Oregon requires construction sites to monitor, and the permit contains a 160 NTU benchmark for sites discharging to a CWA section 303(d) listed waterbody or a waterbody with a TMDL for sediment and turbidity. The State of Georgia has turbidity benchmarks that are a function of the construction site size in relationship to the watershed size.

The only practical difference between a numeric effluent limitation and a benchmark is that a violation of a benchmark, in and of itself, is not a violation of a NPDES permit. If a benchmark is exceeded, generally, the enforceable requirement is for the discharger to contact the permitting authority, examine its BMPs, and implement additional controls, if necessary. A benchmark requires similar types of site planning, employee education, firm resources, monitoring and sampling, design, installation and maintenance of erosion and sediment controls and compliance with other non-numeric effluent limitations, and application of other passive treatment technologies as are necessary to meet a numeric limitation.

Some commenters argued for a benchmark as opposed to a numeric turbidity limitation due to the variable nature of stormwater and after the comment period industry stakeholders stated that they were supportive of a benchmark approach, albeit at a higher NTU level. EPA believes that benchmarks can be an important tool for permitting authorities and for permittees. However, numeric limitations are feasible and appropriate for larger C&D sites on a nationwide basis and the feasibility of using a benchmark approach is comparable to the feasibility of meeting a numeric effluent limitation. EPA does not believe that a benchmark approach would represent BAT and NSPS at the national level. Technologies and practices that can achieve numeric effluent limitations for stormwater discharges are technologically available and the Agency finds no reason to rely on benchmarks as opposed to numeric effluent limitations in this case. EPA recognizes and has considered the issue of variability of stormwater discharges at C&D sites and has included several provisions in the rule to address this issue. First, today's numeric limitation does not apply on days when total precipitation in that day is greater than the local 2-year, 24-hour storm event. As stated below in Section XIX.A, the reasoning behind this exemption is that for larger storm events, controls may be overwhelmed by the large amount of stormwater and a numeric limitation may be more difficult to meet. Additionally, as discussed below, the numeric turbidity limitation is a daily maximum, meaning an owner or operator will not be in violation of the limitation if individual samples of their discharges exceed the limitation, as long as the average of the samples taken over the course of a day are below the limitation.

In addition to the use of benchmarks, at least one state has state-wide numeric effluent limitations for discharges associated with construction activity. The State of California has an enforceable numeric effluent limitation of 500 NTU in its construction general permit for high risk sites. Also, states have set numeric turbidity limitations for specific areas (such as the Lake Tahoe Basin), or for specific projects.

3. Rationale for Rejecting Options 1, 2 and 3 as the Technology-Basis for BAT and BADT for NSPS

EPA rejected Option 1 as the basis for BAT and BADT for NSPS because there are technologies that remove greater levels of pollutants from stormwater discharges from C&D sites than Option 1 that are technologically available, economically achievable, pose no barrier to entry and have acceptable non-water quality environmental impacts, thus Option 1 is not BAT and BADT for NSPS.

EPA rejected Options 2 and 3 for numerous reasons. For Option 2 and 3 EPA believes that the use of ATS is likely to influence the ability of site planners to select stormwater management controls that can infiltrate

[1] See 40 CFR part 411 (Cement Manufacturing); 40 CFR part 418 (Fertilizer Manufacturing); 40 CFR part 419 (Petroleum Refining); 40 CFR part 422 (Phosphate Manufacturing); 40 CFR part 423 (Steam Electric); 40 CFR part 434 (Coal Mining); 40 CFR part 440 (Ore Mining and Dressing); and 40 CFR part 443 (Asphalt Emulsion).

and manage stormwater on-site through green infrastructure practices because ATS typically requires the use of a centralized drainage system and large stormwater basins. Option 3 would present an even larger disincentive to the use of infiltration and retention practices because of the larger number of sites that may need to use larger basins.

EPA is concerned that basing a numeric limitation on ATS is likely to present a disincentive for site planners to select controls that may be more effective from a hydrologic standpoint to maintain the predevelopment hydrology of the site. In particular, ATS would require larger basins than what may be required under existing state permits. For example, EPA estimates that a construction project on a 17-acre site in Alabama would need a basin providing approximately 200,000 cubic feet of storage to support application of ATS. This is almost three times larger than the sediment basin that EPA estimates may be required on this same project under the Alabama CGP. Since it would be much more expensive to decommission this larger basin, this presents an incentive for the developer to retain this basin as part of the permanent stormwater management controls because the cost of retrofitting this basin would likely be cheaper than installing distributed runoff controls, such as rain gardens, which EPA views as significantly more effective at managing stormwater on the development after construction activity has ceased. As discussed at length in the NRC report noted above, the use of retention, infiltration and other low-impact development techniques is preferable from a hydrologic standpoint to maintain predevelopment hydrology than detention through the use of a sediment basin. Passive treatment systems do not have these same limitations as ATS, since there is more flexibility in the selection of controls. By utilizing passive treatment systems, a sediment basin may not be required, and the site planner may be more inclined to use distributed runoff controls, such as rain gardens, instead of converting the sediment basin into a permanent stormwater management pond. Even where a basin is needed, it may be a smaller basin than would be needed for a full ATS. As discussed in Section VII.A, there is also a concern that was raised by commenters on the reliance on ATS due to the unique characteristics of linear projects. Similar to what was discussed above, passive treatment systems will provide owners and operators of construction sites the flexibility in the selection of controls to include site specific conditions, including right-of-way constraints.

Many states and municipalities are moving in the direction of requiring stormwater discharges from newly developed and redeveloped sites to mimic the hydrology that would have occurred on the site prior to the site being developed. These techniques not only eliminate or reduce stormwater discharges from newly developed or redeveloped sites, they can be designed to prevent stream bank and bed erosion, help recharge groundwater, conserve energy, and mitigate urban heat island impacts. As these practices can provide various environmental benefits, these important environmental outcomes have been factored into EPA's options selection process. As discussed in Section VI, EPA recognizes, as the NRC report concluded, that the current regulatory approach by EPA under the CWA is not adequately controlling all sources of stormwater discharges that are contributing to waterbody impairment. As a result, EPA has committed to and begun a rulemaking addressing stormwater discharges from newly developed and redeveloped sites under CWA section 402(p). EPA has published a draft Information Collection Request, 74 FR 56191 (October 30, 2009) for public comment seeking information and data to support the rulemaking.

Passive treatment systems are able to provide a high level of pollutant reduction at a significantly lower cost than active treatment systems. In particular, Option 2 would have cost about $4.9 billion and removed 70% of the sediment discharged from construction sites. This is in contrast with a $0.95 billion cost with 77% sediment removals for Option 4. While Option 3 achieves somewhat greater removals (87%) it comes at a very high cost ($9 billion).

In rejecting ATS as BAT and NSPS in the final rule, EPA also considered the fact that as discussed above EPA is conducting a rulemaking to address stormwater discharges from development that is likely to impose additional costs on the construction industry. EPA has just begun the rulemaking process for that rule, thus the Agency has not quantified the costs, but the Agency is concerned about the potential additive costs of choosing ATS as BAT and NSPS in this final rule in combination with the potential costs of this new stormwater rule. This was a similar consideration by EPA in the Offshore Oil & Gas ELG where EPA rejected the most stringent option in part because of the potential for the same industry to be required to bear additional costs in a subsequent rule. See 58 FR 12454, 12483 (March 4, 1993).

Although EPA is rejecting ATS as a basis for BAT and NSPS nationally, ATS is an effective and important technology that has broad applicability for construction sites. ATS was applied to construction site discharges initially as a means of addressing water-quality concerns, such as discharging stormwater to high-quality receiving waters with low background turbidity. Indeed, in many areas where ATS use has been most prevalent (such as in the States of California, Washington and Oregon), construction activities are taking place in areas where the receiving waters have background turbidity of only a few NTUs and where sensitive or endangered species are present. In these cases, the use of ATS has allowed construction activity to occur so that discharges are at or below the background turbidity levels in the receiving waters. If not for ATS, it is unlikely that many of these projects would have met water quality requirements if forced to rely on conventional erosion and sediment controls.

As stated above, EPA acknowledges that many state and local governments have existing programs for controlling stormwater and wastewater discharges from construction sites. Today's rule is intended to work in concert with these existing state and local programs and in no way does EPA intend for this regulation to interfere with existing state and local requirements that are more stringent than this rule or with the ability of state and local governments to promulgate new and more stringent requirements. Today's rule is a floor, not a ceiling. To make this point clear EPA included ''at a minimum'' language in the regulation to highlight the fact that EPA does not want to prevent more stringent state technology-based or other effluent limitations from serving as CWA requirements in NPDES permits. This rule is establishing the minimum technology required by construction operators. States and EPA can also require more stringent limitations that are necessary to meet water quality standards. CWA section 301(b)(1)(C). Where TMDLs for sediment or turbidity are established, the use of ATS may be an important tool to ensure water quality standards are met. States also have the authority to require more stringent requirements under state law under CWA section 510. Permitting authorities may establish more stringent effluent limitations subsequent to promulgation of today's regulation based on the application of ATS, or other technologies, where appropriate.

4. Definition of ''New Source'' for the C&D Point Source Category

As stated above, EPA is selecting Option 4 as the best available demonstrated control technology (BADT) for NSPS under section 306. At proposal, EPA stated that it interpreted ''new source'' at CWA section 306 to not include stormwater discharges associated with construction activity from C&D sites. EPA stated that it is a reasonable interpretation of section 306 to exclude C&D sites from the definition of ''new source'' because a construction site cannot itself be constructed. The Agency found that if construction sites were intended to be ''new sources'' it is illogical that there would be a separate definition for ''construction'' or that there would be a requirement in section 306 that ''sources'' be constructed prior to becoming ''new sources.'' See 73 FR 72583. The result of this interpretation is that no C&D sites would ever be new sources. However, the 2006 district court order enjoins EPA to promulgate ELGs and NSPSs.

In order to comply with the district court order, EPA proposed a specialized definition of ''new source'' for purposes of part 450 as any source of stormwater discharge associated with construction activity that itself will result in an industrial source from which there will be a discharge of pollutants regulated by a new source performance standard in subchapter N. (All new source performance standards promulgated by EPA for categories of point sources are codified in subchapter N.) See 73 FR 72583. The definition of new source would mean that the land-disturbing activity associated with constructing a particular facility would itself constitute a ''new source'' when the facility being constructed would be a ''new source'' regulated by NSPSs under section 306 of the CWA. For example, construction activity that builds a new pharmaceutical plant whose process wastewater is covered by 40 CFR 439.15 would be subject to the NSPS under 40 CFR 450.24, as proposed, for its stormwater discharges associated with the construction activity.

Commenters raised numerous objections to the proposed ''new source'' definition, arguing that the proposed definition is overly narrow and there is no rational explanation for treating a C&D site for a commercial facility as an existing source, while treating a C&D site for a new iron and steel facility that happens to have NSPSs for its process wastewater as a new source. EPA's proposed definition of ''new source'' was the result of the difficult application of section 306 to the unique nature of the C&D point source category compared to other industrial categories. Section 306 was part of the 1972 amendments to the CWA, when the focus was on industrial facilities that are traditionally considered ''plants'' or ''factories,'' such as petroleum refineries, power plants and heavy manufacturing. See e.g., 118 Cong. Rec. 10201, 10208, 33747, 33760, 33763 (1972); A Legislative History of the Water Pollution Control Act Amendments of 1972, 93d Cong., 1st Sess. (Comm. Print 1973). However, the CWA has evolved since 1972, most notably through the WQA of 1987 and the addition of a comprehensive program to address stormwater discharges under section 402(p). As a result, the nature and characteristics of the sources that EPA now regulates under the NPDES program may not, and in the case of C&D sites, do not, necessarily align themselves plainly with the provisions of section 306: however EPA does not believe that this results in C&D sites not being subject to section 306.

After a careful review, based on comments received, EPA has decided to reconsider its proposed definition of ''new source.'' EPA agrees with commenters that it is not the best reading of section 306 for the definition of ''new source'' for C&D sites to be dependent upon the result of the construction activity or the activity that occurs on the developed site. EPA recognizes there is difficulty in treating a C&D site for a commercial facility not as a new source, while treating a C&D site for a new iron and steel facility that happens to have NSPSs for its process wastewater as a new source. Even within similarly situated industrial categories, there may be facilities that have NSPSs for their process wastewater and other facilities that do not, and that fact is removed from the concerns of this rule regarding discharges of turbidity, sediment and other pollutants associated with construction activity. The concerns of this rulemaking and the nature of C&D sites exist notwithstanding and independently of the nature of the developed site and the activity on that site that leads to discharges of pollutants after completion of construction activity.

While EPA believes it is a reasonable interpretation of the CWA to exclude C&D sites from the definition of ''new source'' based on the text of section 306, the Agency has determined the better reading of the statute is that C&D sites may be new sources. The term ''source'' is defined in 306(a)(3) of the CWA to mean ''any building, structure, facility, or installation from which there is or may be the discharge of pollutants.'' While it is not clear that a C&D site would be a ''building,'' ''structure,'' or ''installation,'' the regulatory definition of ''facility'' means ''any NPDES 'point source' or any other facility * * * (including land or appurtenances thereto) that is subject to regulation under the NPDES program.'' 40 CFR 122.2. Based on the WQA of 1987, EPA promulgated the Phase I and Phase II stormwater regulations which required NPDES permits for stormwater discharges associated with construction activity. See 40 CFR 122.26(b)(14)(x) and 122.26(b)(15). C&D sites are point sources and subject to regulation under the NPDES program due to their discharge of pollutants. Based on EPA's regulatory definition, C&D sites are ''facilities,'' thus EPA interprets them to be ''sources,'' as that term is defined under section 306. The term ''construction'' is defined as any ''placement, assembly, or installation of facilities or equipment (including contractual obligations to purchase such facilities and equipment) at premises where such equipment will be used, including preparation work at such premises.'' CWA section 306(a)(5). The definition of ''construction'' is broad to include activities that occur, including preparation work, placement of equipment and signing of contracts, before actual construction activity, such as clearing, grading and excavation occurs on the site. This broad, encompassing definition, would allow an owner or operator to begin ''construction'' of the C&D site without actually beginning construction activity. While it is reasonable, based on a common sense understanding of the term, that an owner or operator cannot construct a construction site as that term is commonly used, ''construction'' is specifically defined in the CWA and based on that broad definition it is a better interpretation of ''construction,'' that owners or operators of a C&D site can ''construct'' a C&D site within the meaning of the CWA as interpreted by EPA. See 40 CFR 122.29(a)(4). Given the evolution of the CWA, as discussed above and the focus of the CWA in 1972, it is not illogical that there would be a separate definition for ''construction'' or that there would be a requirement in section 306 that ''sources'' be constructed'' prior to becoming ''new sources.'' EPA did not regulate discharges associated with construction activity at that time, thus there would be nothing illogical with including a separate definition of ''construction.'' While section 306 and EPA's regulations on new source determinations appear to emphasize permanent facilities as opposed to relatively temporary sources like C&D sites, EPA is taking into consideration this evolution of the CWA and viewing the statute as whole in determining a reasonable and appropriate reading of section 306 and EPA regulations. ''New source'' means ''any source, the construction of which is commenced after publication of proposed regulations prescribing a standard of performance under this section which will be applicable to such source * * *'' CWA section 306(a)(2); 40 CFR 122.2. As outlined above, C&D sites are ''sources'' and owners and operators can construct C&D sites given the broad definition of ''construction,'' thus a C&D site may be a ''new source'' under section 306 and subject to NSPS.

For purposes of this rule, EPA has defined ''new source'' as ''any source, whose discharges are defined in 40 CFR 122.26(b)(14)(x) and (b)(15), that commences construction activity after the effective date of this rule.'' Under this definition, the only construction sites that will not be ''new sources'' are those sites that commenced construction activity before the effective date of this rule. The definition aligns itself with the nature of construction sites, the opportunities to utilize the most effective control technologies and Congress' ''recognition of the significantly lower expense of attaining a given level of effluent control in a new facility as compared to the future cost of retrofitting a facility.'' A Legislative History of the Water Pollution Control Act Amendments of 1972, 93d Cong., 1st Sess. (Comm. Print 1973) at 797. Congress ''recognized that new sources could attain discharge levels more easily and at less cost than existing sources which must be retrofitted * * * [and Congress] clearly expressed [a] belief that it would be easier for new sources to attain a particular level of effluent control than it would be for existing sources.'' *American Iron & Steel* v. *EPA,* 526 F.2d 1027, 1058 (3d Cir. 1975).

EPA has the authority to provide specialized definitions of ''new source'' to particular point source categories. See 40 CFR 122.29(b); 401.10. As stated above, the substantive standards for BAT and NSPS are based on the best available technology or best available demonstrated control technology which consider both the cost of achieving such effluent reduction and any non-water quality environmental impacts and energy requirements. See CWA sections 304(b)(2)(B) and 306(b)(1)(B). For this final rule BAT is equal to NSPS.

Some commenters raised the issue of the National Environmental Policy Act of 1969 (NEPA) 33 U.S.C. section 4321 et seq. and its relationship to ''new sources.'' Pursuant to CWA section 511(c) the issuance of a NPDES permit under section 402 for the discharge of any pollutant by a ''new source'' as defined under section 306 may be deemed a major Federal action significantly affecting the quality of the human environment within the meaning of NEPA and would be subject to the environmental review provisions of NEPA. The issuance of a NPDES permit to a new source by an NPDES-approved state is not a federal action; therefore, issuance of these permits is not subject to NEPA. Forty-six (46) states have NPDES authorization. For the remaining four states, tribal lands, territories, and other areas where EPA is the permitting authority the issuance of any NPDES permit to a new source is subject to the environmental review provisions of NEPA as set out in 40 CFR part 6. The vast majority construction sites in these remaining jurisdictions obtain NPDES permit coverage for discharges associated with construction activity under the EPA CGP. EPA intends to comply with NEPA, as necessary, pursuant to the issuance of the EPA CGP.

XI. Methodology for Estimating Costs to the Construction and Development Industry

In developing today's final rule, EPA used numeric models to estimate the costs of compliance with various regulatory options. This approach was used to estimate the incremental costs associated with the regulatory options at the state and national level. This approach is the same as that used at proposal; however, EPA has updated various models and estimates of costs as well as estimates of annual construction activity, based on comments received as well as other factors.

For the proposal, EPA developed a series of nine model projects (3 site size categories and 3 project types). EPA estimated incremental compliance costs for each of these model projects under the various regulatory options and scaled costs to the national level. EPA used a fixed project duration of nine months for each of the model projects as a basis for estimating compliance costs. The annual amount of construction activity was estimated based on the 1992 and 2001 National Land Cover Dataset (NLCD) available at the time of proposal.

For the final rule analysis, EPA also estimated project-level costs for a series of model projects. The models vary by size (disturbed acres), duration, and type of construction to establish the baseline conditions for factors that can directly influence compliance costs and firm impacts. EPA developed a set of model projects that includes 12 size categories and 12 duration categories. For costing purposes, EPA made a distinction between building and transportation projects. The linear configuration of many transportation projects requires additional considerations for managing stormwater. However, EPA did not consider residential and nonresidential projects of the same size and duration to have appreciably different costs. These two project types (building and transportation) were combined with the size and duration categories to create 288 different model projects. These model projects were then combined with a set of geographic conditions unique to each state, based on a representative metropolitan area within the state, resulting in 14,688 model projects (288×51). There were many factors affecting model project cost for each option. The primary factor was the set of applicable technologies and practices considered necessary for meeting each option's regulatory requirements. The costs associated with each set of technologies and practices varied by project size, but they also vary by duration, state, and construction sector. For all four options, the costs for projects under 10 acres were based on non-numeric effluent limitations or BMPs and only varied by size. For Option 1, projects above 10 acres were also assumed to rely upon non-numeric effluent limitations or BMPs and costs only varied by size. For Options 2, 3, and 4, projects that were required to meet numeric limitations had costs that also varied by duration to reflect either the application of PTS or ATS, as well as O&M costs and costs for monitoring.

In developing unit costs for each model project, EPA refined the approach used at proposal. At proposal, EPA estimated annual rainfall and runoff volumes on a per-acre basis for one indicator city in each state. EPA estimated ATS treatment costs using an estimate of $0.02 per gallon. For the final rule analysis, EPA again used rainfall data from one indicator city in each state to estimate annual rainfall and runoff volumes and determined ATS treatment system sizes (based on a design flowrate) needed in each state for each of the model project site sizes. Using data supplied from vendors on the unit cost of various ATS treatment system components contained in the proposed rule record (see DCNs 41130 and 41131), as well as the Development Document EPA estimated the one-time and monthly recurring costs for deploying ATS in each state. Monthly recurring costs included costs for operator labor, treatment chemicals and fuel usage. Using the distribution of projects by site size and duration in each state, EPA was then able to estimate the costs to implement ATS for Options 2 and 3. EPA also estimated incremental storage requirements to impound runoff prior to treatment from the 2-year, 24-hour storm for each indicator city and added additional storage costs if existing state sediment basin sizing requirements were smaller than these volumes. EPA intended to use this analysis at the time of proposal in order to compare results with the $0.02 per gallon approach, but was unable to complete this analysis prior to publication of the proposed rule. The information that EPA used for this approach was, however, included in the docket (see DCN 51201) and commenters provided comment on this approach (See EPA–HQ–OW–2008–0465–1360 in the rulemaking record).

In developing costs for Option 4, EPA estimated the costs for deploying liquid polymer dosing systems and for implementing fiber check dams with PAM addition on sites. EPA also estimated monthly labor needs for sampling personnel, as well as monthly operation and maintenance costs for polymer dosing systems and for fiber check dam replacement and PAM application. EPA then scaled costs to the state and national level. EPA also estimated costs for firms to purchase turbidity meters. Detailed results of this analysis are presented in the Development Document.

From Table XI–1 it is apparent that there was a wide range of project costs. The $490 project cost reflects the use of BMPs on the smallest model project, estimated to be 1.9 acres in size. The model project with the highest cost, for options 2, 3, and 4 are all based on the largest model project with the longest duration, 145 acres over three years. The $390 thousand, under Option 4, represents a 145 acre transportation project in Florida lasting three years, and the $5.5 million project, under Options 2 and 3, represents a three year 145 acre project in Louisiana.

TABLE XI–1—RANGE OF PROJECT COSTS FOR THE FOUR OPTIONS

	Average cost	Median cost	Minimum cost	Maximum cost
Option 1	$8,026	$5,296	$490	$44,832
Option 2	328,322	5,296	490	5,501,864
Option 3	399,371	224,541	490	5,501,864
Option 4	42,207	28,330	490	389,786

For estimating the total annual construction acreage in-scope, EPA relied on industry economic data rather than the NLCD because recent NLCD data is not yet available. EPA used historical construction spending data to derive a long-term trend for construction activity. This allowed EPA to base its estimates on normal industry conditions rather than large fluctuations in activity seen in recent years. Next EPA used data from the U.S. Housing Census, Reed Construction, and the Federal Highway Administration to estimate the relationship between construction spending levels and the average annual quantity of acres developed. This relationship was then combined with the long-term trend to project expected construction acreage for 2008 under normal conditions (see Section XII for additional discussion of this analysis).

XII. Economic Impact and Social Cost Analysis

A. Introduction

EPA's Economic Analysis (see ''Supporting Documentation'') describes the impacts of today's final rule in terms of firm closures and employment losses, in addition to firm financial performance and market changes. In addition, the report provides information on the impacts of the rule on sales and prices for residential construction. The results from the small business impact screening analysis support EPA's implementation of the Regulatory Flexibility Act (RFA), as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA). Results from the government costs analysis support the implementation of the Unfunded Mandate Reform Act (UMRA). The report also presents identified, quantified, and monetized benefits of the rule as described in Executive Order 12866.

This notice includes related sections such as the cost-effectiveness analysis in Section XIII, benefits analysis in Section XVI, and benefit-cost analysis in Section XVII. In their entirety, these sections comprise the economic analysis (referred to collectively as the ''C&D economic analysis'') for the final rule. EPA's Environmental Assessment provides the framework for the monetized benefits analysis. See the complete set of supporting documents for additional information on the environmental impacts, social costs, economic impact analysis, and benefit analyses.

The C&D economic analysis, covering subsectors that disturb land (NAICS 236 and 237), uses information from, and builds upon, the 2002 final rule (67 FR 42644; June 24, 2002), the 2004 withdrawal of the final rule (69 FR 22472; April 26, 2004), and the 2008 proposed rule (73 FR 72562). In addition to CWA requirements, EPA has followed OMB guidance on the preparation of the economic analyses for Federal regulations to comply with Executive Order 12866. See Section XX.A of today's notice.

B. Description of Economic Activity

The construction sector is a major component of the United States economy as measured by the gross domestic product (GDP), a measure of the output of goods and services produced domestically in one year by the U.S. economy. Historically, the construction sector has directly contributed about five percent to the GDP. Moreover, one indicator of the economic performance in this industry, housing starts, is also a ''leading economic indicator,'' one of the indicators of overall economic performance for the U.S. economy. Several other economic indicators that originate in the construction industry include construction spending, new home sales, and home ownership.

During most of the 1990s, the construction sector experienced a period of relative prosperity along with the overall economy. Although cyclical, the number of housing starts increased from about 1.2 million in 1990 to almost 1.6 million in 2000, with annual cycles during this period. (U.S. Census Bureau, ''Current Construction Reports, Series C20—Housing Starts,'' 2000, available at *http://www.census.gov/const/www*). At the beginning of the 21st century, the economy began to slow relative to previous highs in the 1990s. This slower economic growth had a negative impact on construction starts for new commercial and industrial projects. Driven in part by low mortgage interest rates, consumer spending for new homes continued to remain strong through 2005. However, in 2006 the U.S. residential construction market began a rapid decline in activity that continued all the way through 2008. (Global Insights, ''U.S. Economic Outlook; Executive Summary,'' January 2009). In June of 2009, the single-family housing market began to show signs of recovery, while multi-family construction is still in decline. Government spending increased in the first half of 2009, and is expected to accelerate in the near future as the bulk of the infrastructure projects, funded by the 2009 Stimulus bill, will begin in 2010 and 2011. Conversely, the outlook for nonresidential construction is poor as spending on new commercial and industrial properties is decreasing due to the current recession. Overall construction spending is expected to decline through the first quarter of 2010, as declines in private nonresidential and multi-family housing construction is predicted to outweigh the gains from infrastructure and single-family home construction. (Global Insight, ''An Update on U.S. Construction Spending,'' August 2009.) However, overall construction spending is expected to return to positive growth by 2011 and continue this positive trend through 2014, approximately when this rule will be fully implemented in EPA and state NPDES permits. (Global Insight, ''U.S. Economic Service,'' July, 2009.)

1. Industry Profile

The C&D point source category is comprised of sites engaged in construction activity, including clearing, grading and excavation operations. The projects that fall under this category are performed by business establishments (the Census Bureau uses the term ''establishment'' to mean a place of business; ''Employer establishment'' means an establishment with employees) that are involved in building construction (NAICS 236) as well as heavy and civil engineering construction (NAICS 237). As a starting point, Table XII–1 shows the number of business establishments whose projects are in the C&D point source category in 1992, 1997, and 2002. Only a portion of these establishments would be covered by the final regulation, because some of these establishments are house remodelers and others who build on sites with less than one acre of disturbed land each year. The NAICS classification system changed between the issuance of the 1997 and 2002 Economic Census.

Table XII–1 shows a sharp decline in the number of developers between 1992 and 1997. The decrease in the number of developers may have been a response to changes in tax laws and the Financial Institutions Reform, Recovery, and Enforcement Act (FIRREA) of 1989 (Pub. L. 101–73, August 9, 1989) and the 1993 implementing regulations. The objective of FIRREA and the implementing regulations was to correct events and policies that led to a high rate of bankruptcies in the thrift industry in the late 1980s. The regulations changed lending practices by financial institutions, requiring a higher equity position for most projects, with lower loan-to-value ratios, and more documentation from developers and builders. (Kone, D. L. ''Land Development 9th ed.,'' Home Builder Press of the National Association of Home Builders, Washington, DC 2000).

TABLE XII–1—NUMBER OF C&D INDUSTRY ESTABLISHMENTS, 1992, 1997, AND 2002, ECONOMIC CENSUS DATA

NAICS	Description	1992 (No.)	1997 (No.)	2002 (No.)	Change 92–97(%)	Change 97–02(%)
236	Construction of Buildings, except all other Heavy Construction [a].	168,407	191,101	211,629	13.50	10.70
237 except 2372	Heavy Construction, except Land Subdivision	37,180	42,554	49,433	14.50	16.20
2372	Land Subdivision	8,848	8,185	8,403	−7.50	2.70
Total		214,435	241,840	269,465	12.80	11.30

[a] In the 2002 NAICS classification framework, All Other Heavy Construction was assigned among NAICS 236, 237, and 238. To maintain relevant comparisons, 2002 All Other Heavy Construction data were reassigned back into NAICS 237 (Heavy Construction).

Figures do not necessarily add to totals due to rounding.

Source: U.S. Census Bureau (2005).

Building upon Table XII–1, Table XII–2 shows the number of firms that are expected to be covered under the C&D final regulation. Construction establishments are relatively permanent places of business where the usual business conducted is construction related. Construction firms are an aggregation of construction establishments owned by a parent company that share an annual payroll. EPA estimates that for approximately 99 percent of construction firms there is only one establishment, and those that do have more than one establishment tend to be in the highest revenue categories.

For Table XII–2, EPA subtracted out firms that are engaged in home remodeling (NAICS 236118) from the total of about 269,000 firms in 2002, as they would not be subject to the final regulations. The elimination of remodelers is based on the fact that remodeling and renovation activities generally disturb less than one acre of land, if at all. Thus, the total number of C&D firms would be 178,835.

EPA used data from the Economic Census and other sources to define an average housing density for the nation as a whole (average number of housing units per acre), then used this figure to identify firms to be excluded from regulation based on their likelihood of disturbing less than one acre on a per project basis. EPA believes that these estimates (of firms unaffected by the final options) are conservative, meaning that they potentially overestimate the actual number of firms that will be affected. First, while the regulatory threshold for NPDES regulation applies to each site, EPA excluded firms only if the estimated number of acres disturbed in a whole year falls below the regulatory threshold for needing permit coverage under the NPDES regulations. In addition, the analysis was not adjusted for the portion of a site that is potentially left undisturbed, such as open space and buffers. Furthermore, EPA assumes that all of the housing units built by a firm during a year are covered by NPDES stormwater permits, while in reality the firm could build houses on lots not covered by NPDES permits. However, the Agency does not have information on the amount of houses that are built within subdivisions, rather than on discrete lots, by these firms.

Based upon these adjustments of the total number of firms, EPA believes there currently are about 81,655 firms that would be covered under the rule. However, the Agency has insufficient data to make any further adjustments to the population of developers and builders covered by the rule.

TABLE XII–2—NUMBER OF FIRMS COVERED BY THE CONSTRUCTION AND DEVELOPMENT FINAL REGULATIONS

NAICS	Industry sector	Firms	
		Number	Percent of total
2361	Residential Building Construction		
236115	New Single-family Housing Construction (except operative builder)	18,269	22
236116	New Multifamily Housing Construction (except operative builder)	2,148	3
236117	New Housing Operative Builder	16,040	20
2362	Nonresidential Building Construction		
236210	Industrial Building Construction	1,752	2
236220	Commercial and Institutional Building Construction	33,399	41
237	Heavy and Civil Engineering Construction		
237310	Highway, Street, and Bridge Construction	10,047	12
Total		81,655	

Source: Economic Analysis.

2. Consideration of Current Economic Conditions

EPA received numerous comments expressing concern regarding the effect the rule may have on the construction industry during the current economic downturn. Although, EPA considers the rule to be affordable even under the current adverse circumstances, EPA recognizes that full immediate implementation of the rule could be disruptive to the industry, and potentially slow the pace of the industry's return to normal levels of activity.

The construction industry is distinguishable from other industries in that it has a comparatively large number of firms, the majority of which are small, that operate on many sites, which are temporary and widely dispersed over a broad geographic area. EPA recognizes that these characteristics could pose potentially greater obstacles to mobilizing the necessary resources for compliance, than those normally faced by industries dealing with a new regulation. By phasing in the regulation starting with a smaller number of larger sites, EPA believes that this will minimize the chance of bottlenecks of resources, and reduce the start-up burden for firms as they plan for implementation and learn new techniques. When new methods or techniques are introduced into the production process and employees gain more experience with the technique it is common for there to be a corresponding increase in the efficiency of performing the new technique. This efficiency gain, often referred to as an experience or learning curve, is likely to occur with both the application of passive treatment systems and the monitoring of performance. The gradual phase-in of the regulation, gives the firms and groups such as industry trade associations time to disseminate information on how to meet requirements in the more cost-effective ways.

Construction is a keystone industry of the economy, comprising 10 percent of U.S. businesses and 6.6 percent of total employment. The steep decline in construction activity since 2006 is considered a major factor in precipitating the recent economic recession. However, the four-year phasing process is expected to give the industry sufficient time to experience several years of growth, before all rule requirements are in effect. In 2014, the year that all projects greater than 10 acres will need to comply with the numeric limit, the economic forecasting firm Global Insights predicts that the industry will experience its fifth consecutive year of positive growth. Forecasts of future activity are always uncertain and Global Insights has tried to provide baseline, positive and pessimistic predictions for several important economic indicators. Housing starts are a considered a key measure of industry health and they are estimated to steadily increase during the five years after promulgation. Table XII–3 shows that even the pessimistic forecast predicts sustained growth albeit at a slower pace.

TABLE XII–3—GLOBAL INSIGHT FIVE-YEAR FORECAST OF HOUSING STARTS

[Seasonally adjusted annual rate]

Year	2009	2010	2011	2012	2013	2014
Pessimistic Forecast (20% probability)	556,000	701,000	1,044,000	1,296,000	1,472,000	1,566,000
Baseline Forecast	556,000	865,000	1,294,000	1,563,000	1,659,000	1,665,000
Optimistic Forecast (20% probability)	556,000	1,096,000	1,542,000	1,785,000	1,882,000	1,886,000

Source: Global Insights, U.S. Economic Outlook, July 2009.

C. Method for Estimating Economic Impacts

EPA has conducted economic impact analyses to examine the economic achievability of each of the four ELG and NSPS options presented in this rule. The analyses used to assess economic achievability are based on conditions of both full implementation of the rule requirements and an estimate of normal business conditions. These normal business conditions reflect the long-term trend based on construction activity data from 1990 through 2008. For more information see the Chapter 4: Analysis Baseline of the Economic Analysis.

An important aspect of the economic impact analysis is an assessment of how incremental costs would be shared by developers and home builders, home buyers, and society. This method is called ''cost pass-through'' analysis or CPT analysis. Details of this method may be found in Chapter 6 of the Economic Analysis.

The economic analysis conducted for this rule also uses another method called partial equilibrium analysis that builds upon analytical models of the marketplace. These models are used to estimate the changes in market equilibrium that could occur as a result of the final regulation. In theory, incremental compliance costs would shift the market supply curve, lowering the supply of construction projects in the market place. This would increase the market price and lower the quantity of output, i.e., construction projects. If the demand schedule remains unchanged, the new market equilibrium would result in higher costs for finished construction and lower quantity of output. The market analysis is an important methodology for estimating the impacts of the options presented in today's notice.

The economic analysis also reflects comments in the October 2001 final report from the Small Business Advocacy Review (SBAR) Panel submitted to the EPA Administrator as part of the requirements under SBREFA. The SBAR Panel was convened as part of the 2002 rulemaking effort and EPA considers the information in the 2001 report to still be relevant to today's C&D final rule. EPA also voluntarily convened a SBAR Panel on September 10, 2008 in order to gather more information on the potential impacts of the rule on small businesses and held an outreach meeting with Small Entity Representative (SERs) on September 17, 2008. The current economic analysis contains changes to the initial economic analysis done for the proposed rule, which are based on SER comments and comments received during the proposed rule public comment period. A summary of the changes can be found in section VII.D.

EPA estimated the incremental compliance costs for the regulatory options using an engineering cost model that accounts for cost factors such as treatment costs, labor, materials, and operation and maintenance costs. Because some of the erosion and sediment controls considered have design requirements that take into account meteorological and soil conditions, EPA developed compliance costs that take into account regional differences. EPA also took into consideration the additional monitoring and reporting costs that would be incurred by construction permit holders.

EPA estimated both the incremental compliance costs and the economic impacts of each regulatory option at the project, firm, and industry (national) level. The economic impact analysis considered impacts on both the firms in the construction industry, and on consumers who purchase the homes, and buy or rent industrial buildings and commercial and office space. In the case of public works projects, such as roads, schools, and libraries, the economic impacts would accrue to the final consumers, who, in most circumstances, are the taxpaying residents of the community. The sections below summarize each modeling effort. Detailed information on the data, models, methods, and results of the economic impact analyses are available in the Economic Analysis.

1. Model Project Analysis

EPA estimated project-level costs and impacts for a series of model projects. The models vary by size (disturbed acres), duration, geography, and type of construction to establish the baseline conditions for factors that can directly influence compliance costs and firm impacts. Numerous comments by small business representatives and public comments received by the agency suggested that the approach to modeling projects used for the proposal did not sufficiently account for many of the project characteristics that could affect the feasibility and cost of compliance. Characteristics most often sighted were project size, duration, and geographic conditions. As a result, EPA refined the analysis to use a more refined set of model projects that includes 12 different size categories and 12 different duration categories. To account for how project type can affect control costs, EPA partitioned these categories between building and transportation projects to create 288 model project categories. These 288 different model projects were then combined with a set of geographic conditions unique to each state, based on a representative metropolitan area within the state. This resulted in 7,344 model projects (144 × 51) with distinct size, duration, type and geographic characteristics. EPA used these characteristics to determine what the likely compliance costs would be for each model project under each option considered.

Next EPA determined the frequency of occurrence for each of these 144 model projects within each state. This requires state level information on the distribution of construction projects by size, duration, and type. A comprehensive national data set with this information does not exist. However, this information can be derived for some states based on Notice of Intent (NOI) data. An NOI is submitted to a state permitting authority, by each owner or operator of the C&D site seeking coverage for their project under the state's construction general permit. The information required under an NOI varies from state to state, and state permitting authorities are not required to submit their NOI information to EPA. However, some states have voluntarily submitted their NOI data to the Agency. The Agency identified data sets from four states (California, New York, South Carolina, and South Dakota) containing detailed information on the type of project, the size of the disturbed area, and the period of active construction, which could be used to develop distributions of project size and duration for the residential, commercial & industrial building, and transportation sectors. The Agency used the distribution from each of these states to represent the typical distribution for the region of the country they are in. These four regions were delineated based on similar geography and demographic trends. Table XII–4 shows which representative distribution was assigned to each state. These distributions are then combined with state value of construction data, for each of the three sectors, and revenue per acre estimates to predict how many actual projects are represented by each of the 288 size/duration/type categories. Given the fact there is no comprehensive national data set with this information EPA believes this is a reasonable approach. For more information on this approach see the Technical Development Document.

TABLE XII–4—ASSIGNMENT OF REGIONALLY REPRESENTATIVE PROJECT DISTRIBUTIONS BASED ON NOI DATA FROM FOUR STATES

States with regionally representative NOI data	States assigned regionally representative project distribution
California	Arizona, Colorado, Nevada, New Mexico, Oregon, Texas, Utah, Washington.
New York	Connecticut, Delaware, Dist. of Columbia, Hawaii, Illinois, Indiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, New Hampshire, New Jersey, Ohio, Pennsylvania, Rhode Island, Vermont, Wisconsin.
South Carolina	Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, Missouri, North Carolina, Oklahoma, Tennessee, Virginia, West Virginia.
South Dakota	Alaska, Idaho, Iowa, Kansas, Montana, Nebraska, North Dakota, Wyoming.

2. Model Firm Analysis

EPA analyzed the impacts of the regulations at the level of the firm by building financial models of representative construction firms. Model firms are broken out by seven revenue ranges for each of the six NAICS sectors aligning with the principal construction business segments expected to be affected by the regulation (See Table XII–2). These revenue ranges and sector breakouts are based on data reported by the Statistics of U.S. Business (SUSB) and the Economic Census. Within each business sector and revenue range model firms are further differentiated based on median, lower quartile, and upper quartile measures of baseline financial performance and condition (i.e., capital returns, profit margins, levels of debt and equity to capital, etc.). Firms in the upper quartile have better than normal financial metrics, while the metrics for firms in the lower quartile are worse than normal. Baseline financing costs (cost of debt and equity) was varied over revenue ranges, with firms in higher revenue ranges having access to more favorable terms. However, the financial data was not sufficiently disaggregated to allow financing terms to vary over the three quartiles. These model firms are used in combination with compliance cost estimates to examine the potential for financial stress, firm closures, employment effects, and increased barriers to the entrance of new firms to the industry. EPA did not base its analysis, as it has for many past ELGs, on actual firm-specific data because the Agency was not provided the time necessary by the district court order to survey the industry through an Information Collection Request and gather such data.

The financial statements for the model firms are constructed to capture two business condition cases for the firm-level analysis: General Business Conditions case that reflects the financial performance and condition of construction industry businesses during normal economic conditions; and Adverse Business Conditions case that is meant to reflect financial performance during weak economic conditions. The two business condition cases are differentiated by the baseline operating financial circumstances of the model firms as well as other important factors in firm financial performance, including cost of debt and equity capital.

a. Assigning Projects and Costs to Model Firms

For a given sector of construction activity, model projects are assigned to model firms based on the each model firm's capacity to perform projects. This capacity is measured in terms of annual acreage of construction and is determined by multiplying the firm's estimated revenue by an average acreage per million dollars of construction. For residential construction activity, the acreage per million dollars was derived from the Census Bureau's Census of Housing. For nonresidential construction activity, information on project acreage and estimated project value from Reed Construction Data is used to derive an average number of acres developed per million dollars of value (Reed Construction, March 2008; see DCN 51017). So for each construction sector within each state, model projects were systematically assigned to the firms with the most capacity for performing the work, until all projects and their associated costs had been assigned. For more information on the methodology for assigning projects to firms see Section 6.1 of the Economic Analysis.

EPA was then able to assess the impact of the annual compliance costs on key business ratios and other financial indicators. Specifically, EPA examined impacts on the following measures: (1) Costs to Revenue Ratio, (2) Pre-Tax Income to Total Assets Ratio, (3) Earnings before Interest and Taxes (EBIT) to Interest Ratio, and (4) change in business value. The first is a simple screening level measure which is used for measuring the impact on small entities. The second and third are financial measures reported by Risk Management Associates (RMA) for median, lower and upper quartiles by sector and business size that were used in constructing the baseline financial statements for the model firms. The change in business value measure is based on application of compliance costs to the model firm financial statements, both as the estimated absolute dollar change in value and the fraction of firms whose net business value becomes negative because of compliance outlays. The impacts of the compliance costs were examined by calculating the values of each ratio with and without the compliance costs.

b. Project-Level Cost Multiplier

EPA accounted for the additional costs incurred by firms for financing the compliance costs via debt and equity over the duration of the project. For the firm-level impact analysis, these financing costs are explicitly accounted for by each model firm's estimated cost of debt and cost of equity, and then by the duration of the individual projects that are assigned to it. However, for the housing affordability analysis, and the estimation of social costs, EPA does not go through the process of assigning projects to firms, so a project-level cost multiplier was developed. This multiplier represents how direct compliance costs translate into the change in the cost of the final product being constructed. To develop this multiplier, EPA created a baseline scenario that incorporated assumptions concerning the costs incurred and revenue earned at each stage of land development and construction. EPA has included the following three principal development stages in developing the project-level multiplier.

(1) *Land acquisition.* The starting point is usually acquisition of a parcel of land deemed suitable for the nature and scale of development envisioned. The developer-builder puts together the necessary financing to purchase the parcel.

(2) *Land development.* The developer-builder obtains all necessary site approvals and prepares the site for the construction phase of the project. Costs

incurred during this stage are divided among ''soft'' costs for architectural and engineering services, legal work, permits, fees, and testing, and ''hard'' costs such as land clearing, installing utilities and roads, and preparing foundations or pads. The result of this phase is a parcel with one or more finished lots ready for construction.

(3) *Construction.* The developer-builder undertakes the actual construction activity. A substantial portion of this work may be subcontracted out to specialty subcontractors (foundation, framing, roofing, plumbing, electrical, painting, etc.). In the case of a housing subdivision, marketing often begins prior to the start of this phase, hence, the developer-builder may also incur some marketing costs at this time.

The general approach used in establishing the baseline scenario is to assume normal returns on invested capital and normal operating profit margins to arrive at the sales price for the final product (for example, completed new single-family homes in a residential housing complex, or office space in a new office park). This multiplier was then used to adjust the compliance cost estimates used for the housing affordability analysis and the social cost analysis.

c. Cost Pass-Through

EPA analyzed the impact of today's final rule by adding in the regulatory costs at the appropriate stage of the project life cycle. An important consideration for assessing who ultimately bears the financial burden of a new regulation is the ability of the regulated entity to pass the incremental costs of the rule on to its customers. If the developer-builder can pass all of its costs through to the buyer, the impact of the rule on developer-builders is negligible and the buyer bears all the impact. Conversely, if they are unable to pass any of the cost to buyers through higher prices, then they must assume the entire cost. For the economic impact analysis EPA uses three pass-through cases: zero cost pass-through; full cost pass-through; and partial cost pass-through (85% for residential and 71% for non-residential).

Under the first case, the zero (0%) cost pass-through assumption, the incremental regulatory costs are assumed to accrue entirely to the builder-developer, and appear as a reduction in per-project profits. The sale price of the constructed unit and surrounding lot remains the same as the asking price in the baseline. Using the full (100%) cost pass-through assumption, all incremental regulatory costs are passed through to end consumers. Under this approach, the compliance costs are also adjusted to reflect the developer's cost of debt, equity, and overhead. Consumers experience the impact of the final regulatory options in the form of a higher price for each new building or housing unit. For the partial cost pass-through case, firms are assumed to pass on part of the compliance outlay to other parties. For the partial cost pass-through case, EPA assumes a cost pass-through rate of 85% for residential sectors and 71% for non-residential and non-building sectors. This is the expected average long-term level of cost pass-through based on observed response of market supply and demand to changes in prices for new construction. For more on the method used for determining the level of cost pass-through see Section 8.2 of the Economic Analysis, Analysis of Social Cost of the Economic Analysis. When a sector is stressed, cost pass-through will tend to be below this long-term average (i.e., more costs being borne by builders). Conversely, when a sector is booming, most costs are likely to be passed through.

Information in the record indicates that builders do pass through much of the regulatory costs to customers. This is supported by the academic literature and industry publications. However, the financial impact analysis also calculates results under the two bounding cases, no cost pass-through for firms and full cost pass-through for customers, to assess the ability of these groups to absorb the impact of the regulation under a worst case scenario. The two bounding cases also provide an approximation of the sensitivity of impact estimates to the partial cost pass-through assumptions used for the primary case.

EPA notes that under certain conditions developers might also attempt to pass regulatory costs back to land sellers. For example, in a depressed market, builders may argue successfully that a regulatory cost increase would make a particular project unprofitable unless the land costs can be reduced. If the land seller is convinced that a residential subdivision project would not proceed, they may be willing to accept a lower price for undeveloped land. The ability of developers to pass such costs back would likely depend on the sophistication of the land owner, their experience in land development projects, knowledge of the local real estate market, and, in particular, their understanding of the regulations and their likely cost. While evidence of cost pass-back to land owners exists for fixed and readily identifiable regulatory costs such as development impact fees, it is unclear whether a builder's claim that costs would be higher due to construction site control regulations would induce land owners to make concessions.

3. Housing Market Impacts

EPA developed models to assess the potential impacts of the regulations on the national housing market. Buyers of new nonresidential properties will also be impacted as costs are passed through to them. However, they account for a minority of the construction projects considered and EPA assumes that this group of customers is not as vulnerable to changes in prices as are households in the market for new homes. Therefore, impacts to purchasers of new nonresidential construction sites were not highlighted as part of the financial impact assessment and are accounted for on a more general basis as part of the analysis of impacts on the national economy.

To analyze the impacts of compliance costs on housing affordability, EPA estimated the level of income that would be necessary to purchase both the median and lower quartile priced new home without the final regulation, and the change in income needed to purchase the median and lower quartile priced new home under each of the regulatory options. To assess how low-income home purchasers might be affected, EPA also looked at the change in income needed for a $100,000 priced home. The Agency then used income distribution data to estimate the change in the number of households that would qualify to purchase the median, lower quartile, and $100,000 priced new home under each of the regulatory options. In this way, EPA attempted to estimate the number of households that may not be able to afford the exact same new home they could under baseline conditions. The housing market analysis was performed at the level of the metropolitan statistical area (MSA) to account for regional differences in housing prices and income. The housing market analysis uses the full cost pass-through assumption, to estimate the worst-case impacts on new single-family home buyers.

When assessing the impact of the rule on housing affordability, EPA acknowledges that even those buyers who are able to afford the same newly built home at the new price may still experience an impact. Many households would continue to qualify to purchase (or rent) a housing unit of approximately the same price (or rent) as before the C&D regulation, but might instead experience a reduction in some desirable housing attributes.

4. Impacts on the National Economy

The market model generates an estimate of the change in the total value of construction produced by the industry, i.e., industry output. Two effects of the regulation are acting on the market value of construction output. First, the cost of construction activity increases, leading to a price rise and an increase in market value of final projects. Second, the quantity of houses sold is reduced because of the higher price due to compliance costs. The net effect on market value may be either positive or negative, depending on whether the elasticity of demand for housing is less than or greater than 1. There are also secondary impacts in other markets, caused by the shift in consumer spending, necessitated by the increased housing costs, from other goods to housing.

Construction markets vary in the level of activity, structure of the industry, and ultimately cost pass-through potential, from state-to-state and region-to-region. The modeling approach used for the national impact analysis captures such regional variation in the impacts of the final regulatory options by estimating partial equilibrium models at the state level for four major building construction sectors (single-family, multi-family, commercial, and industrial). EPA assumes that all costs for transportation projects are passed through to governmental entities, and therefore there is no reduction in overall construction activity in the transportation sector. The analysis of state- and national-level economic impacts is based on estimating changes to economic output, employment, and welfare measures that result from the estimated baseline market equilibrium to the estimated post-compliance market equilibrium for each construction sector in each state.

A partial equilibrium analysis assumes that the final regulation will only directly affect a single industry; in this case, the four major construction sectors that were considered. Holding other industries ''constant'' in this way is generally appropriate since the compliance costs of the final regulatory options are expected to result in only marginal changes in prices and quantities and the rule does not directly affect the other industries (HUD, 2006; see DCN 52105).

For the partial equilibrium analysis, EPA uses estimated elasticities of market supply and demand to calculate the impact of incremental costs on the supply curve and, thus, on prices and quantities of construction products under post-compliance conditions.

Economic impacts in the directly affected construction industry can trigger further shifts in output and employment losses in the set of broader U.S. industrial sectors as these changes pass through the economy. The U.S. Department of Commerce uses input-output techniques to derive ''multipliers'' which indicate, for a given change in one industry's output, how output and employment in the whole U.S. economy will respond. EPA has applied the multipliers from the Regional Input-Output Modeling System, version 2 (RIMS II) to the change in output estimated from the market model to estimate some of the anticipated impacts on national output and employment.

D. Results

1. Project-Level Impacts

For most industries the closure of existing facilities and impediments to the opening of new facilities are a good indication of the impact of a regulation on overall industry activity. However, for the construction industry, the permitted activity is a temporary project rather than ongoing operations at a permanent facility. This is an important distinction, in that it provides construction firms with greater flexibility in how they respond to the rule. Not only can they elect to use one or more technologies to ensure compliance with the rule they can also choose to modify the dimensions and timing of the project to further minimize the effects of the rule on project profitability. Potential projects that are not profitable after considering compliance costs will either be modified to avoid or lessen compliance costs, or they will not be performed. Although EPA cannot predict the number or characteristics of future projects that may not occur due to today's rule, the agency has estimated the percent reduction in total construction activity resulting from the rule, expressed in terms of acreage. Under Option 4 the reduced level of construction activity is 231 acres or 0.03% of the total estimated level of activity. EPA does expect the rule to have an effect on overall project characteristics by providing an incentive to minimize disturbed areas, disturb them for shorter durations, and possibly separating the activity into more phases so that fewer acres are disturbed at any one time.

2. Firm-Level Impacts

EPA has estimated the economic impacts of the final rule at the firm level by estimating the traditional factors considered by EPA under the CWA in determining economic achievability: the number of firm closures, and the number of lost jobs. Since in-scope firms are predominantly small businesses EPA also thought it informative to consider the effects on firm profitability, which is typically considered as part of the RFA analysis. EPA also considered it informative to assess the impact of the rule on the financial health of firms. The construction industry is highly reliant on raising capital to fund projects. A firm's ability to raise capital is based in large part on its credit worthiness and the productivity of its assets. Both of these factors can be affected by an increase in compliance costs. Difficulty raising capital resulting from increased costs may not cause a firm to close but it may cause its business to grow more slowly or actually contract.

The economic impact analysis at the firm level looks at two cases. The first, which is the worst-case scenario, assumes that none of the incremental costs would be passed through to the final consumer, i.e., zero cost pass-through. The second, which is the primary analysis case, considered pass-through. The Agency examined the economic achievability of options assuming zero-pass through, because it presents the worst-case scenario (i.e., the largest impacts to the firm). The second case (partial cost pass-through) is the primary analysis case because EPA believes this is more reflective of typical circumstances based on EPA's review of the academic literature and its discussions with industry officials who indicate that under normal business conditions most costs are passed through to the final consumer and are not absorbed by firms in the industry.

EPA analyzed economic impacts at the firm level. The firm is the entity responsible for managing financial and economic information. Moreover, the firm is responsible for maintaining and monitoring financial accounts. For the C&D category, most of the business establishments, as defined by the Census Bureau, are firms. Likewise, a small number of establishments are entities within a larger firm. A small percentage of firms have multiple establishments and some firms are regional or national in scope.

Table XII–5 presents two economic indicators that measure impacts to firms. These indicators are presented using the partial cost pass-through case, which represents the firms' expected ability to pass costs through to buyers, and the no cost pass-through case.

TABLE XII–5—FIRMS EXPECTED TO INCUR FINANCIAL STRESS

	Option 1	Option 2	Option 3	Option 4
Firms Incurring Deterioration in Financial Performance (Partial Cost Pass-through)				
Number Incurring Effect	31	1,181	5,398	169
% of All In-scope Firms	0.0%	1.4%	6.6%	0.2%
% of Firms Incurring Cost	0.1%	3.9%	17.7%	0.6%
Firms Incurring Deterioration in Financial Performance (No Cost Pass-through)				
Number Incurring Effect	123	2,448	18,461	534
% of All In-scope Firms	0.2%	3.0%	22.6%	0.7%
% of Firms Incurring Cost	0.4%	8.0%	60.5%	1.8%
Potential Closures Due to Negative Net Business Value (Partial Cost Pass-through)				
Number Incurring Effect	30	430	1,254	147
% of All In-scope Firms	0.0%	0.5%	1.5%	0.2%
% of Firms Incurring Cost	0.1%	1.4%	4.1%	0.5%
Number of Jobs	1,464	33,044	67,443	7,257
% of In-scope Firm Employees	0.1%	1.8%	3.6%	0.4%
Potential Closures Due to Negative Net Business Value (No Cost Pass-through)				
Number Incurring Effect	172	2,251	7,449	840
% of All In-scope Firms	0.2%	2.8%	9.1%	1.0%
% of Firms Incurring Cost	0.6%	7.4%	24.4%	2.8%
Number of Jobs	7,010	155,364	319,030	35,450
% of In-scope Firm Employees	0.4%	8.4%	17.2%	1.9%

Source: Economic Analysis.

The first measure estimates the potential decrease in the number of firms considered financially fit. Deterioration of firm financial performance is based on assessing the impact of costs on two financial measures (Pre-Tax Income/Total Assets and Earnings before Interest and Taxes/Interest). EPA estimated the fraction of firms in the various sector and revenue ranges whose financial indicators decline below the lower quartile for these two measures, as reported by Risk Management Associates (RMA). For each sector and revenue category, whichever of the two measures have the greatest decline is used to represent the impact on financial performance. For additional information on EPA's analysis of the change in financial position, see Section 6.2, Estimating the Change in Model Firm Financial Performance and Condition, from the Economic Analysis.

The second measure indicates the number of firms who are no longer profitable as a result of the rule. This is an indicator of the number of likely firm closures and is a commonly used measure of economic impacts under the CWA. These numbers represent the impact on firms with thin profit margins who are most vulnerable to impacts from cost increases, and they do not represent the effects of a reduction in the overall quantity of construction activity as a result of the C&D rule. Both phenomena can result in reduced activity and job losses, but they are two separate measures of impact that are not necessarily wholly additive or overlapping.

Construction is a highly competitive industry that is characterized by many small firms with a relatively high turnover and low barriers to entry. Firms routinely expand and contract their workforce in response to work load and as a result many workers laid off when a firm closes are rehired by new and other existing more financially healthy firms. Therefore, job losses due to firm closures are in many cases a temporary displacement of the workforce. By contrast, job losses due to market contraction result from an overall reduction in the volume of construction and not necessarily from the closure of a firm. Table XII–6 shows the estimated number of job losses within the construction industry resulting from a reduction in overall construction activity due to each of the options considered. These job losses can be considered a more lasting effect until market conditions change again.

TABLE XII–6—CHANGE IN EMPLOYMENT LEVELS DUE TO DECREASED INDUSTRY ACTIVITY, ASSUMING PARTIAL COST PASS-THROUGH

	Option 1	Option 2	Option 3	Option 4
Employment Effect from Reduced C&D Industry Output				
Estimated Permanent Reduction in Construction Jobs	83	3,370	5,802	560

Source: Economic Analysis.

For more information on job losses due to market contraction, see Chapter 9 Economy-wide Analysis in the Economic Analysis.

Table XII–7 presents one economic indicator, the relationship of compliance cost to firms' annual revenue. A comparison between costs and revenues is typically done prior to any consideration of the pass-through of costs to buyers. This comparison provides a simple measure of possible impacts on firm profitability and it is used under the RFA to determine if a rule has the potential to have a significant impact on a substantial number of small entities. Even under the more severe No Cost Pass-through case, firms whose costs exceed 1% of revenue are only 0.3 percent of the approximately 82 thousand in-scope firms for the selected Option 4. Furthermore, there are no firms whose costs exceed 3% of revenue for the selected Option 4.

TABLE XII–7—COST TO REVENUE

Option	Costs exceeding 1% revenue			Costs exceeding 3% revenue		
	Number of firms	Percent of firms in-scope	Percent of firms incurring costs	Number of firms	Percent of firms in-scope	Percent of firms incurring costs
Partial Cost Pass-through Case						
Option 1	0	0.0	0.0	0	0.0	0.0
Option 2	873	1.1	2.9	81	0.1	0.3
Option 3	3,573	4.4	11.7	225	0.3	0.7
Option 4	0	0.0	0.0	0	0.0	0.0
No Cost Pass-through Case						
Option 1	0	0.0	0.0	0	0.0	0.0
Option 2	4,717	5.8	15.5	2,399	2.9	7.9
Option 3	14,021	17.2	46.0	9,126	11.2	29.9
Option 4	276	0.3	0.9	0	0.0	0.0

Source: Economic Analysis.

The construction industry has historically been a relatively volatile sector, and is subject to wider swings of economic performance than the economy as a whole. EPA has used historical financial and census data for the construction industry to discern long-term trends within the market fluctuations. EPA based its primary economic analysis on data that reflects average long-term performance rather than a temporary high or low. The industry is currently experiencing a period of weakness that is likely to persist until residential markets work through the current inventory of unsold homes, credit markets improve, and the general economy returns to a better condition. As such, there will continue to be considerable uncertainty regarding the likely length and severity of the current slump in the construction industry. EPA realizes that the rule will be promulgated during this low period for the industry, and there may be concerns that additional compliance costs, associated with the rule, could have a greater than normal impact on construction firms and potentially slow the industry recovery. To some degree, this will be offset, by the four year phase in of the numeric limitation and monitoring requirements, which is part of today's rule. Additionally, the rule will not be fully implemented, with the associated costs to the industry, until 5 years after the effective date of this rule, sometime in 2015, when all EPA and state construction general permits have gone through their five year permit cycle and new permits are issued incorporating the requirements of this rule. See CWA section 402(b)(1)(B). The time period could be longer if it takes permitting authorities more time to issue revised permits. However, using historical census and financial data for the industry EPA identified periods of weakness for various industry sectors and used them to develop a secondary analysis that represents potential impacts of additional compliance costs during a period of adverse economic circumstances. Three key assumptions EPA used to represent adverse conditions for the industry were that there would be a contraction in overall market activity, firms would finance projects under less favorable terms and no costs incurred by the firm as a result of compliance would be passed through to the buyer. Table XII–8 below shows the results of the adverse analysis case. The number of firms experiencing impacts reflects the market contraction, so they are not directly comparable to the primary analysis case, since they represent differing levels of regulated activity. However, the adverse case analysis shows that the percentage of in-scope firms incurring financial stress is 0.5% of in-scope firms and the percentage of in-scope firms at risk of closure in the adverse case is 0.9%. However, even with the greater impacts seen under the adverse analysis case, the percentage of total firms experiencing financial hardship is very small under any of the metrics considered, with respect to the final option. Another important consideration for the adverse analysis case is that under the no-cost pass through assumption, there are no secondary impacts on small builders or affordability effects for buyers.

TABLE XII–8—ADVERSE IMPACT ANALYSIS RESULTS

Impact analysis concept	Option 1	Option 2	Option 3	Option 4
Costs Exceeding 1 Percent of Revenue:				
Number of Firms	0	2,037	6,960	105
% of Firms In-Scope	0.0%	3.5%	11.8%	0.2%

TABLE XII–8—ADVERSE IMPACT ANALYSIS RESULTS—Continued

Impact analysis concept	Option 1	Option 2	Option 3	Option 4
% of Firms Incurring Cost	0.0%	11.6%	39.8%	0.6%
Costs Exceeding 3 Percent of Revenue:				
Number of Firms	0	751	3,401	0
% of Firms In-Scope	0.0%	1.3%	5.8%	0.0%
% of Firms Incurring Cost	0.0%	4.3%	19.4%	0.0%
Firms Incurring Financial Stress:				
Number of Firms	71	3,163	8,168	315
% of Firms In-Scope	0.1%	5.4%	13.9%	0.5%
% of Firms Incurring Cost	0.4%	18.1%	46.7%	1.8%
Firms With Negative Business Value (Potential Closures):				
Number of Firms	180	1,041	2,966	547
% of Firms In-Scope	0.3%	1.8%	5.0%	0.9%
% of Firms Incurring Cost	1.0%	6.0%	17.0%	3.1%

Source: Economic Analysis.

Since EPA expects that the effluent guidelines requirements will be implemented over time as states revise their general permits (EPA expects full implementation within five years of the effective date of the final rule, in 2015), EPA has used macroeconomic forecasts of construction activity to assess when the industry is likely to return to its long-term trend. (Global Insight, ''U.S. Economic Service,'' July, 2009) Based on these forecasts, EPA anticipates that the industry activity will have recovered to the long-term trend during the period when the rule is being fully implemented.

3. Impacts on Governments

EPA has analyzed the impacts of today's final rule on government entities. This analysis includes the cost to governments for compliance at government-owned construction project sites (construction-related). For construction-related costs, EPA assumed that 100 percent of the incremental compliance costs that contractors incur at government-owned construction sites are passed through to the government. EPA also estimated the additional administrative costs that government entities would incur for reviewing the additional monitoring reports associated with the turbidity monitoring requirements of Options 2, 3, and 4. Table XII–9 shows the costs that government entities are expected to incur at federal, state, and local levels.

TABLE XII–9—TOTAL COSTS BY GOVERNMENT UNIT

[Millions 2008 $]

	Option 1	Option 2	Option 3	Option 4
Compliance Costs				
Federal	$3.8	$87.1	$166.9	$17.7
State	8.1	178.1	323.0	35.3
Local	46.2	1,022.3	1,854.0	202.4
Administrative Costs				
Federal	0.0	0.0	0.0	0.0
State	0.0	2.2	6.2	6.2
Local	0.0	0.0	0.0	0.0
Total Costs				
Federal	3.8	87.1	166.9	17.7
State	8.1	180.3	329.2	41.5
Local	46.2	1,022.3	1,854.0	202.4
State Government Total Revenues	1,097,829	1,097,829	1,097,829	1,097,829
Total Costs as % of Total Revenues	0.00	0.02	0.03	0.00
Local Government Total Revenues	1,083,129	1,083,129	1,083,129	1,083,129
Total Costs as % of Total Revenues	0.00	0.09	0.17	0.02

Source: Economic Analysis.

The additional government costs associated with today's rule are not expected to have a significant impact on state and local governments as they account for less than a tenth of a percent of state government revenues and less than a tenth of a percent of estimated local government revenues. For additional information on the effect of the rule on government entities see the UMRA analysis in Chapter 14 of the Economic Analysis.

4. Community-Level Impacts

EPA has estimated community-level impacts based upon the incremental costs of the final rule at the household level. The household impacts are those that would affect local communities in terms of the costs of housing. EPA's analysis considers the impacts on the price of housing based on the increase/decrease in the price of three representative houses (median, lower quartile, and $100,000). Table XII–10 shows the change by selected option in the price per house. It is important to note that these costs would not apply to all new houses built in the U.S., but rather only to those houses that are part of construction projects that are subject to the given regulatory option. Each of the options are assumed to affect all new homes sales, which are approximately 12.6 percent of total annual home sales. This is a slight over estimate because it includes those new houses built in projects less than 1 acre and those that are built in localities where erosion and sediment controls are more stringent than the ones being promulgated today.

The table also provides estimates of the expected change in monthly payments under each option for the median and lower quartile priced home. The monthly mortgage payments were calculated using the median and lower quartile priced house for each Metropolitan Statistical Area (MSA) in the country. For the MSA's, the weighted average median price for a home is $356,000, the 5th percentile is $117,000, and the 95th percentile is $498,000. For the lower quartile priced home, the weighted average is $251,000, the 5th percentile is $70,000, and the 95th percentile is $371,000. The U.S. Census does not report lot sizes for the upper or lower quartile. Instead the Census reports the median for all new single-family homes and the median for new single-family homes that are attached (townhomes). Housing census data indicates that lower-priced homes have a greater likelihood of having a smaller lot size (U.S. Census Characteristics of New Housing, 2006). To account for this factor, EPA performed the affordability analysis for the lower-quartile price home twice, using both the median lot size for all single family homes and the median lot size for attached single family homes. To assess the impacts on those households that were just able to afford a house at the low end of the housing market, EPA also included an analysis of the expected change in monthly payments for a new house valued at $100,000.

TABLE XII–10—CHANGE IN MONTHLY MORTGAGE PAYMENT FOR NEW SINGLE-FAMILY HOME (FULL COST PASS-THROUGH)

	Option 1	Option 2	Option 3	Option 4
New Single-Family Median Priced Home on Median Sized Lot				
Price Change New Single-Family Home on Median Sized Lot	$59	$2,231	$4,093	$415
Baseline Mortgage Payment ($/month)	$1,953	$1,953	$1,953	$1,953
New Mortgage Payment ($/month)	$1,954	$1,969	$1,982	$1,956
% Change	0.02%	0.80%	1.45%	0.14%
New Single-Family Lower Quartile Priced Home on Median Sized Lot				
Price Change New Single-Family Home on Median Sized Lot	$59	$2,231	$4,093	$415
Baseline Mortgage Payment ($/month)	$1,352	$1,352	$1,352	$1,352
New Mortgage Payment ($/month)	$1,352	$1,367	$1,380	$1,355
% Change	0.03%	1.15%	2.10%	0.21%
New Single-Family Lower Quartile Priced Home on Median Sized Attached Lot				
Price Change New Single-Family Home on Median Sized Attached Lot	$20	$745	$1,367	$139
Baseline Mortgage Payment ($/month)	$1,352	$1,352	$1,352	$1,352
New Mortgage Payment ($/month)	$1,352	$1,357	$1,361	$1,353
% Change	0.01%	0.38%	0.70%	0.07%
New Single-Family $100,000 Priced Home on Median Sized Lot for Attached Single-Family Home				
Price Change New Single-Family Home on Median Sized Attached Lot	$20	$745	$1,367	$139
Baseline Mortgage Payment ($/month)	$681	$681	$681	$681
New Mortgage Payment ($/month)	$681	$686	$691	$682
% Change	0.02%	0.76%	1.39%	0.14%

Source: Economic Analysis.

The increase in mortgage payments attributable to the final options compared to the estimated mortgage payment for the median price of a new house in the U.S., currently about $1,953, is a small percentage of the overall payment. For these costs, the average monthly mortgage payment would increase by $1, $16, $29, and $3 per month for Options 1, 2, 3, and 4, respectively. For the analysis, EPA assumes that buyers finance approximately 80% of the home purchase price using a 30-year conventional fixed rate mortgage with an interest rate of 7.39%.

EPA also estimated how the change in home prices would affect mortgage availability. EPA estimated that 1,249 prospective home purchasers seeking to buy a new median priced single-family home would be affected by the final rule, of which 354 would no longer qualify using a 29% housing payment-to-income ratio. At the lower end of the housing market, 518 prospective home purchasers seeking to buy a new $100,000 priced single-family attached home would be affected by the final rule, of which 246 would no longer qualify using a 29% housing payment-to-income ratio. However, these are only specific points along the spectrum of housing prices and therefore do not represent the total number of households that would have to make a different homebuying decision as a result of the rule. For more information on the affordability analysis see Section 7, Analysis of Single-Family Housing Affordability Impacts, of the Economic Analysis.

5. Foreign Trade Impacts

As part of its economic analysis, EPA has evaluated the potential for changes in U.S. trade (imports, exports) of construction-related goods and services. A significant component of the U.S. C&D category operates internationally, and, in addition, numerous foreign firms that participate in this category also operate in the U.S. EPA judged that the potential for U.S. construction firms to be differentially affected by the final rule is negligible. The final rule will be implemented at the project level, not the firm level, and will affect projects within the U.S. only. All firms undertaking such projects, domestic or foreign, will be subject to the final rule. U.S. firms doing business outside the U.S. will not be differentially affected compared to foreign firms, nor will foreign firms doing business in the U.S.

This final rule could theoretically stimulate or depress demand for some construction-related goods. To the extent that the final rule acts to depress the overall construction market, demand for conventional construction-related products may decline. This decline may be offset by purchase of goods and services related to erosion and sediment control. Overall, EPA does not anticipate that any shifts in demand for such goods and services resulting from the rule would have a significant implication for U.S. and foreign trade.

6. Impacts on New Firms

The construction sector is a relatively fluid industry, as documented in the industry profile, with low barriers to entry and considerable entry and exit activity from year to year. As a result, the potential employment losses or capital idling effects of weakness in a specific firm are likely to be offset by changing levels of activity in other existing firms or entry of new firms into the local market. In addition, existing firms would need to meet the same requirement, and therefore would not obtain a competitive advantage over new entrants.

EPA conducted an analysis to assess the impacts on new firms that choose to enter the C&D point source category. This analysis uses a method called ''barrier to entry'' and is relevant to determining BADT for NSPS. EPA examined the ratio of compliance costs to current and total assets to determine if new market entrants could find it more difficult to assemble the capital requirements to start a project than would existing firms. The methodology is conservative, because it doesn't account for the fact that a firm would typically be expected to finance 20 percent of the incremental compliance costs from their own financial resource to obtain the loan, not the full amount as assumed here.

For the selected regulatory option (Option 4), the increase in financing requirement varies from approximately 0.0 percent to 4.1 percent of baseline assets depending on the firms size and business sectors. This comparison assumes that the new firm's compliance outlay would be financed and recorded on its balance sheet. To the extent that the compliance outlay is financed and recorded not on the firm's baseline sheet but as part of a separate project-based financing for each individual project, this comparison is likely to be overstated, perhaps substantially. EPA does not consider the increase in financing requirements to pose a significant barrier to entry for potential businesses and projects.

This analysis likely overstates the costs that will need to be financed by new entrants to the industry. For the economic analysis, industry firms were grouped into one of seven revenue ranges. Firms with higher revenues are considered to be more capable of performing larger projects. This assumption formed the basis for assigning model projects and their associated compliance costs to model firms. Under Option 4, compliance costs for projects under 10 acres are considerably less than they are for projects 10 acres and above. EPA believes that most new entrants will likely be small firms starting in one of the lower revenue ranges considered for the economic analysis, and so they will likely be performing projects less than 10 acres.

7. Social Costs

EPA's analysis of social costs for each option contains three cost components: (1) Firm compliance costs; (2) incremental increase in government administrative costs; and (3) deadweight loss (loss of economic efficiency in the construction market). When summed, these three cost categories comprise the total social costs for each option.

EPA has conducted a social cost analysis for each option. The Economic Analysis provides the complete social cost analysis for the final regulation. The firm-level estimate compliance cost, however, does not account for the potential affect of the final options on the quantity of construction activity/units performed in the various construction markets. Compliance costs for each final option have the effect of increasing builder/developer costs, which can cause a leftward shift in the market's supply curve. Part of the increased costs may raise the price of new housing, with the balance of increased costs being absorbed by the builder, depending on the relative elasticities of supply and demand. The resulting shift in market equilibrium may also reduce the quantity of construction units produced in a given market.

EPA has estimated a state-by-state linear partial equilibrium market model for each construction building sector to estimate this potential market effect on the quantity of output. The estimated change in the quantity of output produced in each construction market segment is then used to not only adjust the firm-level resource cost of compliance, but also to compute the economic value of the reduction in construction output, and estimate the total loss of consumer and producer surplus, referred to as the deadweight loss. Table XII–11 shows the change in cost due to the quantity effect (i.e. reduction in market activity), the dead weight loss, and their combined effect on total costs.

TABLE XII–11—TOTAL SOCIAL COST OF OPTIONS [MILLIONS OF $2008]

	Option 1	Option 2	Option 3	Option 4
Total Costs, Unadjusted for Quantity Effect	$176	$4,866	$9,090	$953
Change in Costs Due to Quantity Effect	0.01	10	31	0.29
Total Costs, Adjusted for Quantity Effect	176	4,856	9,059	952
Total Dead Weight Loss	0.0	5.0	15.5	0.15
Additional Government Administrative Costs	0.0	2.2	6.2	6.2
Total Social Cost of the Regulation	175.7	4,863.1	9,081.1	958.7

8. Small Business Impacts

Section XX.C of today's notice provides EPA's Regulatory Flexibility Analysis (RFA) analyzing the effects of the rule on small entities. For purposes of assessing the economic impacts of today's final rule on small entities, small entity is defined by the US Small Business Administration (SBA) size standards for small businesses and RFA default definitions for small governmental jurisdictions. The small entities regulated by this final rule are small land developers, small residential construction firms, small commercial, institutional, industrial and manufacturing building firms, and small heavy construction firms.

Table XII–12 shows the impacts of the final rule using the one percent and three percent revenue tests, a method used by EPA to estimate the impacts on small businesses for the regulatory options.

TABLE XII–12—SMALL BUSINESS ANALYSIS FOR OPTIONS, 1% AND 3% REVENUE TESTS

Option	1% revenue test		3% revenue test	
	Number of small firms	Percent of small firms	Number of small firms	Percent of small firms
Partial Cost Pass-through Case				
Option 1	0	0.0	0	0.0
Option 2	593	0.8	60	0.1
Option 3	3,008	3.9	187	0.2
Option 4	0	0.0	0	0.0
No Cost Pass-through Case				
Option 1	0	0.0	0	0.0
Option 2	3,454	4.5	1,843	2.4
Option 3	11,889	15.4	8,106	10.5
Option 4	230	0.3	0	0.0

Source: Economic Analysis.

Under the No Cost Pass-through case, Table XII–12 shows that for the selected option (Option 4), less than a thousand small firms would be likely to incur direct costs exceeding one percent of revenue, which accounts for less than one percent of the approximately 78 thousand small in-scope firms. Therefore, EPA does not consider the selected option to have the potential to cause a significant economic impact on a substantial number of small entities. EPA acknowledges that additional small builders may experience secondary impacts in the form of higher lot prices as larger developers attempt to pass some of their compliance costs through to them. The ability of large developers to pass-through costs to builders will vary based on market conditions in the same manner that the pass-through rate to the purchaser of the finished construction can vary. Additionally, as noted above, some of these small builders may also be copermittees who are required to be in compliance with these standards. To the extent they are copermittees, they are not accounted for in the firms incurring costs. However, all costs have been attributed to firms. Allocating costs over a broader number of firms may or may not increase the estimated impacts, but spreads the costs over a larger number of firms.

XIII. Cost-Effectiveness Analysis

For many effluent limitations guidelines, EPA performs a cost-effectiveness (C–E) analysis using toxic-weighted pound equivalents. The C–E analysis is useful for describing the relative efficiency of different technologies. The pollutant removals estimated for today's final rule are all based on sediment and sediment bound nutrients. While EPA expects that today's rule would also result in a significant reduction of other pollutants associated with sediment at construction sites, such as turbidity, metals, organics, oil and grease, pesticides and herbicides, the Agency has not quantified these reductions. The Agency does not have a methodology for converting sediment, measured as TSS or turbidity, into toxic-weighted pound equivalents for a C–E analysis. Instead, EPA compared the cost of each regulatory option to the pounds of sediment removed. This unweighted pollutant removal analysis is meaningful because it allows EPA to compare the cost effectiveness of one option against another, and to other sediment reduction efforts. Table XIII–1 shows a comparison of the cost-effectiveness of the options for controlling sediment discharges. Details on the estimates of sediment reductions can be found in Section XV.B.

TABLE XIII–1—COST-EFFECTIVENESS OF OPTIONS

	Option 1	Option 2	Option 3	Option 4
Compliance Cost (millions 2008$)	$176	$4,866	$9,090	$953
Sediment Removed (million lbs/yr)	1,743	3,616	4,507	3,971
Cost per Pound Removed ($/lb)	0.10	1.35	2.02	0.24

Source: Economic Analysis.

XIV. Non-Water Quality Environmental Impacts

Under sections 304(b) and 306(b) of the CWA, EPA is to consider the ''non-water quality environmental impacts'' (NWQEI) when promulgating ELGs and NSPSs. EPA used various methods to estimate the NWQEI for each of the options considered for today's final rule.

A. Air Pollution

EPA estimates that today's final rule would have no significant effect on air pollution because the final rule would not significantly alter the use of heavy equipment at construction sites. Accordingly, the levels of exhaust emissions from diesel-powered heavy construction equipment and fugitive dust emissions generated by construction activities would not change substantially from current conditions as a result of the final rule. The final rule, which relies on the use of passive treatment, typically does not utilize large diesel-powered or gasoline pumps. The only anticipated use of pumps would be due to the use of small metering pumps to introduce polymer in certain situations. These pumps would only use a trivial amount of energy and would produce only a trivial amount of air emissions. On certain sites, it may be necessary to remove accumulated sediment from basins and traps. In these cases, construction equipment may need to periodically remove accumulated sediment. In these cases, additional emissions due to construction equipment may occur. EPA estimates that the final rule will result in the removal of approximately 1,986,000 tons of sediment annually. EPA estimates that increased emissions from construction equipment to remove this quantity of sediment would be approximately 0.0009 percent of current industry emissions. Table XIV–1 shows the expected emissions due to the final rule.

TABLE XIV–1—AIR EMISSIONS DUE TO FINAL RULE

Parameter	Emissions (pounds/year)
Reactive organic gases	4,707
Carbon monoxide	15,335
Nitrogen oxides	43,970
Sulfuric oxides	45
Particulate matter	1,809
Carbon dioxide	4,167,800
Methane	424

B. Solid Waste Generation

Generation of solid waste could be affected under today's final rule because of the large volumes of sediment containing polymers or other chemicals that may accumulate in sediment basins and traps and behind check dams and other sediment control structures. Where permittees are using polymers or other chemicals to treat stormwater, then sediment accumulated in sediment basins, traps or in drainage channels may need to be handled as solid waste, depending on the nature of the chemical used. However, most permittees using chemical additives are expected to select polymers that would enable the operator to apply solids (i.e., sediment) on-site as fill material to avoid the transportation and disposal costs associated with hauling off-site.

C. Energy Usage

The consumption of energy as a result of today's final rule is not expected to be significant because the operations that currently consume energy (both direct fossil fuel use and electricity) will not be changing to any substantial degree during land disturbance. PTS utilize little or no energy, hence no significant increase in fuel consumption by the industry is anticipated. However, removal of accumulated sediment would require use of construction equipment, which would increase diesel fuel and gasoline consumption by the industry. However the additional fuel consumption for these activities is expected to be small compared to current consumption for this industry. EPA estimates that gasoline and diesel fuel consumption due sediment removal would be approximately 76,000 gallons per year as a result of the final rule. This represents an increase in fuel usage by the industry of approximately 0.0009 percent over current usage, which was estimated at approximately 8.3 billion gallons per year in 2002 (2002 Economic Census, U.S. Census Bureau). In addition, polymers such as polyacrylamide are produced from petroleum, so additional polyacrylamide usage to treat construction site stormwater discharges would result in increased petroleum consumption. However, usage on construction sites is not expected to significantly increase demand for acrylamide. U.S. acrylamide demand in 2001 was estimated to be approximately 253 million pounds, and additional usage on construction sites would be approximately 4.56 million pounds per year if all discharges from all regulated sites were to use PAM at a dosage of 2 mg/L. Therefore, additional petroleum and energy consumption due to PAM production and usage is expected to be small. See section 11 of the TDD for additional discussion.

XV. Environmental Assessment

A. Surface Water Impacts From Discharges Associated With Construction Activity

In its Environmental Assessment (see ''Supporting Documentation''), EPA evaluated environmental impacts from stormwater discharges associated with construction activity.

As discussed in Section VIII, stormwater discharges associated with construction activity have been documented to increase the loadings of several pollutants to receiving surface waters. The most prominent and widespread pollutant discharges from construction sites are turbidity and sediment. Discharges of metals, nutrients, and petroleum hydrocarbons have also been documented. Other pollutants discharged from construction sites include polycyclic aromatic hydrocarbons (PAHs) and other toxic organic compounds.

Pollutants other than sediment and turbidity derive from construction equipment and materials, natural soil constituents, and contamination existing prior to the start of construction activity at a site. Construction activities mobilize sediments and other pollutants by disturbing soil and altering stormwater discharge quantity and patterns during precipitation events and from exposure of rainfall and runoff to construction materials. Excavation dewatering and irrigation of revegetation areas, if not properly managed, can mobilize pollutants during dry weather.

Surface water effects from construction site discharges include physical, chemical and biological changes. Physical and chemical changes include modified stream flow and elevated levels of turbidity, suspended solids and other pollutants. Biological changes include reduced organism abundance, modified species composition, and reduced species diversity.

Sediment and turbidity are the primary pollutants in discharges associated with construction activity and are also significant sources of water quality impairment. Nitrogen and phosphorus, also present in construction site discharges, contribute significantly to water quality impairment as well. EPA's *Wadeable Streams Assessment* (2006) is a statistical survey of the smaller perennial streams and rivers that comprise 90 percent of all perennial stream miles in the coterminous United States. Excess nitrogen, phosphorus, and streambed sedimentation are among the most widespread stressors examined in the survey. According to the survey, 25 percent of streams have ''poor'' streambed sediment condition, 31 percent have ''poor'' phosphorus condition, and 32 percent have ''poor'' nitrogen condition relative to reference streams. The risk of having poor biological condition was two times greater for streams scoring ''poor'' for nutrient or streambed sediment condition than for streams that scored ''good.''

In addition, EPA's Assessment TMDL Tracking and Implementation System (ATTAINS) provides information on water quality conditions reported by the states to EPA under Sections 305(b) and 303(d) of the Clean Water Act. According to ATTAINS (as of September 17, 2009), turbidity contributes to impairment of 26,278 miles of assessed rivers and streams, 1,008,276 acres of assessed lakes, and reservoirs, and 240 square miles of assessed bays and estuaries. The total area of impaired surface waters due to turbidity is probably underestimated due to the low percentage of surface waters that have been assessed. See the Environmental Assessment for additional information on the *Wadeable Streams Assessment* and ATTAINS.

Discharges from construction sites impair or place additional stress on already impaired surface waters. Multiple states have identified construction activity as a source of impairment for surface waters within their jurisdiction.

Ecological impacts from sediment and turbidity discharges to surface waters can be acute or chronic and vary in severity depending on the quantity of sediment and turbidity discharged, the nature of the receiving waterbody and aquatic community, and the length of time over which discharges take place. Sediment and turbidity can depress aquatic organism growth, reproduction, and survival, leading to declines in organism abundance and changes in community species composition. Threatened and Endangered (T&E) and other special status species are particularly susceptible to adverse habitat impacts. According to the United States Fish and Wildlife Service, increased sedimentation is one of the main contributors to the demise of some fish, plants, and invertebrates.

There are numerous ways in which sediment and turbidity affect aquatic communities. Sediment deposition on waterbody beds can bury benthic communities, smothering fish eggs and other benthic organisms and severing connections to organisms in the water column. Sedimentation also modifies some benthic habitats by filling crevices and burying hard substrates, making recolonization by the previously existing community difficult unless the sediment is removed.

In the water column, elevated turbidity levels block light needed for photosynthesis by submerged aquatic vegetation (SAV), resulting in its reduced growth or death. Because SAV is a primary producer depended upon by many other organisms in aquatic ecosystems, its loss or reduction can create a cascade of impacts through aquatic communities, lowering community health and productivity. Increased turbidity also impairs the ability of visual predators (e.g., many fish species) to forage successfully. Increased sediment concentrations in the water column can impair fish gill function, reducing the ability of fish to breathe. These and other processes by which sediment and turbidity discharges impair aquatic ecosystems are discussed in more detail in the Environmental Assessment.

Increased sediment and turbidity levels in surface waters also adversely affect direct human uses of water resources. These uses include navigation channels, reservoirs, drinking water supply, industrial process water supply, agricultural water supply, and recreational use. Property values also depend in part on the quality of nearby surface waters, though these may reflect the values already discussed and not necessarily represent a separate benefit.

Sediment deposition on riverbeds and in harbors can fill and impede use of navigable channels. Between 1995 and 2008, the U.S. Army Corps of Engineers (USACE) funded nearly 3,400 dredging projects at a cost of more than $9 billion (2008 dollars) to remove more than 2.6 billion cubic yards of sediment from U.S. navigable waters (United States Army Corps of Engineers Dredging Database 2009). Reservoirs and lakes serve a variety of functions, including drinking water storage, hydropower supply, flood control, and recreation. Sediment deposition on reservoir and lake beds reduces their capacity to serve these functions. An increase in sedimentation rate reduces the useful life of these waters unless measures are taken to reclaim their capacity. In waters serving as a drinking water source, elevated turbidity, suspended sediment, and other pollutants degrade water quality, and may require increased treatment levels.

Sediment can also have negative effects on industrial activities. Suspended sediment increases the rate at which hydraulic equipment, pumps, and other equipment wear out, causing accelerated depreciation of capital equipment. Sediment can also clog water intakes at power plants and other industrial facilities and drinking water intakes.

Elevated levels of sediment and other pollutants in irrigation water used for agriculture can harm crops and reduce agricultural productivity. Suspended sediment can form a crust over a field, reducing water absorption, inhibiting soil aeration, and preventing emergence of seedlings. Sediment can also coat plant leaves, inhibiting plant growth and reducing crop value and marketability. Other pollutants can damage soil quality.

Sediment deposition in river channels, ditches, stormwater basins and culverts reduces their capacity and can increase flood levels and frequency, increasing the level of adjoining property damage from flooding. Sediment and turbidity can degrade surface water appearance, lowering property values near impacted surface waters and the desirability of surface waters for recreational activities such as boating, fishing, and swimming.

Sediment and turbidity are the primary pollutants known to be associated with construction activity, but as stated earlier in this section, other pollutants such as nitrogen, phosphorus and metals are also discharged from construction sites. These pollutants can also harm aquatic ecosystems. Additional qualitative information on the environmental impacts associated with all pollutants from construction sites is provided in the Environmental Assessment. The remaining discussion in this section describes EPA's quantitative analysis of discharge levels and water quality impacts associated with sediment, nitrogen, and phosphorus from construction sites.

B. Quantification of Sediment Discharges Associated With Construction Activity

EPA used a model project approach to estimate baseline sediment loads and to estimate loading reductions for the C&D industry under the regulatory options evaluated. EPA used RUSLE to estimate loads and load reductions at the RF1 scale. This approach consisted of the following steps:

- Developing a series of model projects of differing sizes, durations and types based on an analysis of NOI data;
- Determining RF1-level estimates for RUSLE and hydrologic parameters using national GIS data layers, supplemented with BPJ estimates of parameters for which data were not available;
- Estimating baseline and option-specific estimates of sediment loads for each RF1. For Option 1, estimates were developed based on changes in the RUSLE practice factors and cover factors from baseline. For Options 2, 3 and 4, estimates were developed using a concentration approach for acres subject to turbidity limitations, and the Option 1 approach for acres not subject to turbidity limitations; and
- Summing RF1 loads to the national level.

For Options 2 and 3, EPA used a TSS value of 25 mg/L as an approximation of the level of sediment contained in discharges following ATS. For Option 4, EPA used a TSS value of 250 mg/L as an approximation of the level of sediment contained in discharges following the application of passive treatment. EPA calculated removals based on the change in concentration between baseline conditions and the respective level under the regulatory options. Under baseline conditions, modeled TSS concentrations for RF1s ranged from approximately 8 to 8,200 mg/L, with a median value of approximately 1,550 mg/L. Estimated sediment loading reductions for the options can be found in Table XIII–1.

C. Quantification of Surface Water Quality Improvement From Reducing Discharges Associated With Construction and Development Activity

This section describes the methodology EPA used to quantitatively assess national water quality impacts from construction activity sediment, nitrogen, and phosphorus discharges and the water quality benefits expected from today's rule. This analysis has been revised since the proposed rule in that it expands the quantitative analysis of the water quality benefits beyond sediment reductions to include reductions in nitrogen and phosphorus discharges from construction sites. Other pollutant discharges associated with construction activity (e.g., toxic organic compounds and metals) also create water quality impacts, but the information available to EPA on their discharge is insufficient to quantitatively analyze their impacts. These pollutants are instead discussed qualitatively in the Environmental Assessment document.

The water quality impact analysis utilized estimates of sediment discharges from construction sites throughout the coterminous United States. EPA estimated discharges under current conditions as well as under the requirements set forth in today's rule.

To estimate improvements to water quality from reducing construction site discharges, EPA used SPARROW models. SPARROW is a statistically-based modeling approach developed by the United States Geological Survey that relates surface water quality component levels to attributes of contributing watersheds. EPA used national versions of the models that allow quantification of water quality in the RF1 surface water network which encompasses approximately 700,000 miles of the largest, perennial rivers and streams and associated lakes, reservoirs, and estuarine waters in the coterminous United States. The sediment, nitrogen, and phosphorus versions of SPARROW allowed EPA to estimate baseline concentrations of suspended sediment, nitrogen, and phosphorus, respectively, in these surface waters, as well as levels of sediment accumulation in reservoirs.

Following estimation of baseline water quality conditions, EPA used the SPARROW sediment model to quantify the reductions in surface water suspended sediment concentrations and sediment accumulation in reservoirs associated with reducing sediment discharges from construction sites under today's rule. To quantify water quality improvements from reducing nitrogen and phosphorus discharges, EPA used results from the SPARROW sediment, nitrogen, and phosphorus models' estimation of baseline water quality conditions to estimate watershed-level relationships between suspended sediment and nitrogen and phosphorus loading from land-related sources. EPA used these relationships to estimate the surface water reductions in nitrogen and phosphorus associated with surface water sediment reductions as estimated by the SPARROW sediment model for conditions under today's rule. Additional description of this analysis is provided in the Environmental Assessment.

For certain estuarine waters, EPA also used the Dissolved Concentration Potential (DCP) approach developed by the National Oceanic and Atmospheric Administration (NOAA) to estimate suspended sediment concentrations. This model estimates ambient concentrations of conserved contaminants that are subject to mixing and dilution when introduced to estuaries. EPA used the DCP approach for those estuarine waters for which available data on flow was insufficient to estimate suspended sediment concentrations. NOAA has provided DCP factors for most major estuaries in the coterminous United States. These factors allow estimation of estuarine TSS concentrations without detailed numerical simulation modeling. Additional description of this analysis is provided in the Environmental Assessment.

Construction activity in the United States is unevenly distributed among watersheds. It is highly concentrated in some areas and is sparse or absent in others. For this reason, EPA presents in this discussion the results of its water quality analysis for two different sets of watersheds. The first set includes all RF1 watersheds containing more than 1 acre of annual construction activity, or 93% of all construction acres. This set contains all RF1 watersheds for which EPA estimated reductions in construction site sediment discharges and encompasses approximately 412,000 RF1 surface water miles (''All''). The second set contains the 10 percent of RF1 watersheds in ''All'' with the highest number of construction acres (''Top 10%''). This set encompasses 58 percent of all construction activity and therefore reflects conditions associated with the majority of construction activity in the coterminous United States. This set encompasses approximately 64,000 RF1 surface water network miles.

EPA estimates that construction sites in ''All'' RF1 watersheds discharge approximately 5.2 billion pounds of sediment per year under current conditions. Construction discharges elevate suspended sediment, nitrogen, and phosphorus levels, on average, 2.4 mg/L, 0.02 mg/L, and 0.0060 mg/L, respectively, beyond what they would otherwise be in 412,000 RFI surface water miles. They also cause deposition of 1.7 million cubic yards of sediment in reservoirs each year.

The rule will reduce construction site sediment discharges from ''All'' RF1 watersheds by approximately 4 billion pounds per year. TSS, nitrogen, and phosphorus concentrations in affected surface waters are expected to decrease approximately 2 mg/L, 0.015 mg/L, and 0.0058 mg/L respectively, on average. Sediment deposition in reservoirs is expected to fall by more than 1.3 million cubic yards annually. In the ''Top 10%'' set of watersheds, TSS, nitrogen, and phosphorus levels are expected to decrease approximately 4 mg/L, 0.049 mg/L, and 0.024 mg/L respectively, on average. Average TSS, nitrogen, and phosphorus concentration reductions are greater for ''Top 10%'' watersheds because construction sites exert a stronger influence on water quality in these areas. Current median concentrations of TSS, nitrogen, and phosphorus in RF1 reaches receiving construction site discharges are 289 mg/L, 1.65 mg/L, and 0.25 mg/L, respectively.

Because surface waters transport pollutants downstream, water quality will also improve in additional reaches downstream of those reaches directly receiving construction site pollutants. EPA's analysis indicates that today's rule will improve water quality in more than 431,000 miles of surface waters, or approximately 69% of the more than 627,000 miles in the RF1 surface water network for the coterminous United States assessed in EPA's analysis.

The numbers above reflect average surface water conditions over very large geographic areas and long time scales. They do not convey the spatial and temporal variability in pollutant concentrations seen in actual surface waters. Construction sites are dispersed throughout the United States, but they comprise only approximately 0.04% of total land area in the coterminous United States on an annual basis. In addition, as described earlier in this section, construction acreage concentrates in a relatively small number of watersheds. It is notable that, despite their small land area, construction sites impact a large proportion of the nation's surface waters. Temporally, most construction site discharges are driven by precipitation events and are therefore highly episodic. In-stream turbidity, TSS, nitrogen, phosphorus and other pollutant concentrations in surface waters deriving from construction site discharges are typically higher during and shortly after precipitation events and lower during periods in between precipitation events. For these reasons, the most highly visible impacts from construction sites are observed in surface waters immediately downstream of construction sites during and immediately following precipitation events. During these periods, suspended sediment levels can rise from several to hundreds of milligrams per liter above those observed immediately upstream of construction sites. Likewise, turbidity levels can rise from tens to hundreds of NTUs. With the cessation of precipitation and movement and dilution of pollutants as water flows downstream, suspended pollutant concentrations decline (deposited sediment and associated pollutants, however, can persist). EPA's quantification of water quality impacts from construction site discharges reflects an averaging of these discharge events both over time and over the 412,000 miles of surface waters directly impacted by construction site discharges in today's rule.

EPA did not attempt to quantify pollutant discharges from other construction site sources, such as discharges from dewatering activities, vehicle and equipment washing, and erosion and deposition by wind. Since these discharges may occur at any time during the construction project and are not necessarily tied to storm events, EPA expects that these discharges would influence receiving water quality during inter-event periods and that benefits would accrue if these discharges were reduced from baseline levels. EPA, however, lacked data and an appropriate methodology for quantifying the nature and extent of these potential discharges.

Estimates from EPA's national quantitative analysis of water quality impacts were used for a quantitative analysis of the economic benefits of today's rule. This analysis is discussed in Section XVI.

XVI. Benefit Analysis

EPA has assessed the potential benefits associated with the final rule by identifying various types of benefits that can result from reducing the level of turbidity, sediment and other pollutants being discharged from construction sites. Where possible, EPA has attempted to quantify and monetize benefits attributable to the regulatory options. Section III of the Environmental Impact and Benefits Assessment, describes in more detail the analytical framework for the benefits analysis.

A. Benefits Categories Estimated

Discharges of turbidity, sediment, nutrients, and other pollutants from construction activity can have a wide range of effects on down stream water resources. As discussed in Section XV, there are numerous potential impacts to local aquatic environments, but there are also consequences for human welfare, which are discussed here. Human activities and uses affected by construction discharge-related environmental changes include recreation, commercial fishing, public and private property values, navigation, and water supply and use. Sediments, nutrients, and other pollutants in discharges from C&D sites can also cause environmental changes that affect the non-use values (values that do not depend on use of the resource) that individuals have from knowing that environmental resources are in good condition. These existence services, sometimes described as ''ecological benefits,'' are reflected under the Clean Water Act as aquatic life, wildlife, and habitat designated uses.

Stormwater control measures reduce the amount of sediment that reaches waterways from C&D sites. As sediment loads are reduced, TSS, nutrient, and turbidity levels in adjacent waters decline, which in turn increases the production of environmental services that people and industry value. These environmental services valued by industry and the public include: Recreation, public and private property ownership, navigation, water supply and use, and existence services. Table XVI–1 provides a summary of various water related activities and their associated environmental services potentially impacted by discharges of sediment from C&D sites.

TABLE XVI–1—SUMMARY OF BENEFITS FROM REDUCING SEDIMENT RUNOFF FROM CONSTRUCTION SITES

Activity	Environmental service potentially affected by runoff from construction sites	Benefits category
Recreation: —Outings —Boating —Swimming —Fishing	Aesthetics, water clarity, water safety, degree of sedimentation, weed growth, fish and shellfish populations.	Non-market direct use.
Commercial Fishing and Shellfishing	Fish and shellfish populations	Markets.
Property Ownership	Aesthetics, safety of property from flooding, property value.	Markets.
Water Conveyance and Supply: —Water conveyance —Water storage —Water treatment	Turbidity, degree of sedimentation	Avoided Costs.
Transportation	Degree of sedimentation	Avoided Costs.
Water Use: —Industrial —Municipal —Agricultural	Turbidity	Avoided Costs.
Knowledge (No Direct Uses)	Environmental health and ecosystem function	Non-market non-use value.

However, not all of the changes in these services can be readily quantified as it requires a thorough understanding of the relationship between changes in water pollutant loads and production of environmental services. This problem is exacerbated by the fact that both the pollutant source and load reductions are relatively small, sporadic, numerous, and dispersed over a wide area when compared to more traditional sources of pollutants, such as a wastewater treatment plant. As a result of the difficulty in assessing changes in each environmental service associated with an activity listed in Table XVI–1, EPA chose to focus on two main categories of benefits: Avoided costs and non-market benefits. The specific categories of avoided costs considered were: reservoir dredging, navigable waterway dredging, and drinking water treatment and sludge disposal. Non-market benefits considered were improvements in recreational activities and existence value from improvements in the health of aquatic environments.

B. Quantification of Benefits

Reduced costs for water treatment, water storage, and navigational dredging are three benefit categories that EPA is using to estimate the benefits of the final rule. EPA used estimates of changes in sediment deposition and in-stream TSS concentrations from the SPARROW model runs to quantify the reduction in the amount of sediment that would need to be dredged from reservoirs and the reduction in the amount of TSS that must be removed from the source water used for the production of potable water. The SPARROW results provided these changes for each waterbody in the RF1 network (approximately 60,000 stream segments). This allowed EPA to associate these changes with data from the US Army Corps of Engineers on navigable waterways that are routinely dredged; EPA data on source water for drinking water treatment plants; and USGS data on the location of reservoirs used for hydroelectric power, flood control, a source for drinking water, and recreation.

SPARROW results also allowed for the estimated change in TSS and nutrient concentrations in the RF1 network to be mapped to a Water Quality Index (WQI). The index is used to map changes in pollutant parameters, such as TSS and nutrients, to effects on human uses and support for aquatic and terrestrial species habitat. Implementation of the WQI involves the transformation of parameter measurements into subindex values that express water quality conditions on a common scale of 0 to 100. For the pollutant TSS, a unique subindex curve was developed for each of the 85 Level III ecoregions using baseline TSS concentrations calculated in SPARROW at the RF1 reach-level. The SPARROW generated concentration change estimates for sediment and sediment-bound nutrients were used to measure improvement along the WQI for each RF1 watershed. Section 10.1.1 of the Environmental Assessment Document provides detail on the WQI index and its application to the benefits analysis for the C&D regulation. The WQI presents water quality by linking to suitability for various human uses, but does not in itself identify associated changes in human behavior. Behavioral changes and associated welfare effects are implied in the benefit transfer approach for measuring economic values. The use of benefit transfer allows the results from economic valuation studies in the published literature to be used to generate WTP estimates associated with changes in the WQI. For more on the benefit transfer approach see Appendix G Meta-Analysis Results from the Environmental Impact and Benefits Assessment.

The benefits analysis results are shown in Table XVI–2. The NMB_i terms are included to demonstrate that the monetized benefits represent an unknown portion of total benefits of the rule, and are likely to vary with the options.

TABLE XVI–2—ANNUAL BENEFITS (MILLION 2008 $) FOR OPTIONS

	Regulatory Options			
	Option 1	Option 2	Option 3	Option 4
Avoided Costs:				
Reservoir Dredging	$1.4	$2.9	$3.6	$3.2
Navigable Waterway Dredging	1.3	2.6	3.3	2.9
Drinking Water Treatment	1.2	1.8	2.1	1.8
Total Avoided Costs [a]	3.8	7.2	8.9	7.9
Welfare Improvements	210.3	352.9	413.4	361.0
Total Annual Benefits [a b]	214.1+NMB_1	360.1+NMB_2	422.3+NMB_3	368.9+NMB_4

[a] Totals may not add due to rounding.
[b] NMB_i are the non-monetized benefits of the ith Option.
Source: Economic Analysis; Environmental Assessment.

XVII. Benefit-Cost Comparison

EPA has conducted a comparison of monetized benefits to costs of the C&D effluent guidelines detailed in today's notice. The benefit-cost analysis may be found in the complete set of support documents. Sections XII, XV, and XVI of this notice provide additional details of the benefit-cost analysis. Table XVII–1 provides the results of the benefit-cost analysis. A discount rate of 3% was used to annualize costs and benefits.

TABLE XVII–1—TOTAL ANNUALIZED BENEFITS AND COSTS OF OPTIONS (YEAR 2008 $)

Option	Social costs (2008 $ millions per year)	Benefits [a] (2008 $ millions per year)
Option 1	$175.8	$214.1 + NMB_1
Option 2	4,863.1	$360.1 + NMB_2
Option 3	9,081.1	$422.3 + NMB_3
Option 4	958.7	$368.9 + NMB_4

[a] NMB_i are the non-monetized benefits of the i^{th} Option.
Source: Economic Analysis; Environmental Assessment.

XVIII. Approach To Determining Effluent Limitations and Standards

The same basic procedures apply to the calculation of all effluent limitations guidelines and standards for this industry, regardless of whether the technology basis is BAT or NSPS. For simplicity, the following discussion refers only to effluent limitations guidelines; however, the discussion also applies to new source performance standards. The numeric limitation is 280 NTU, expressed as a maximum daily discharge limitation. Chapter 6 of the TDD provides a detailed description of the data and methodology used to develop the long-term average, variability factor, and limitation and standard for today's final rule.

A. Definitions

The limitation for turbidity, as presented in today's notice, is expressed as a maximum daily discharge limitation. Definitions provided in 40 CFR 122.2 state that the ''maximum daily discharge limitation'' is the ''highest allowable 'daily discharge.' '' Daily discharge is defined as 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.''

B. Percentile Basis for Limitations, Not Compliance

EPA promulgates limitations that sites are capable of complying with at all times by properly operating and maintaining their processes and treatment technologies. EPA established these limitations on the basis of percentiles estimated using data from sites with well-operated and controlled processes and treatment systems. However, because EPA uses a percentile basis, the issue of exceedances (i.e., values that exceed the limitations) or excursions is often raised in public comments on limitations. For example, comments often suggest that EPA include a provision that allows a facility to be considered in compliance with permit limitations if its discharge exceeds the specified daily average limitation one day out of 100. As explained in Section 6 of the TDD, the limitation was never intended to have the rigid probabilistic interpretation implied by such comments. The following discussion provides a brief overview of EPA's position on this issue.

EPA expects that all sites subject to the limitation will design and operate their treatment systems to achieve the long-term average performance level on a consistent basis because sites using well-designed and operated treatment systems have demonstrated that this can be done. Sites that are designed and operated to achieve the long-term average effluent levels used in developing the limitation should be capable of compliance with the limitation at all times, because the limitation incorporates an allowance for variability in effluent levels about the long-term average. The allowance for variability is based on control of treatment variability demonstrated in normal operations.

EPA recognizes that, as a result of the requirements in 40 CFR part 450, some dischargers may need to improve treatment systems, process controls, and/or treatment system operations in order to consistently meet the new effluent limitation and/or standard. As noted previously, however, given the fact that the promulgated limitation reflects an allowance for variability and the demonstrated ability of sites to achieve the LTA, the limitation is achievable.

XIX. Regulatory Implementation

A. Monitoring Requirements

EPA is requiring the monitoring of turbidity in stormwater discharges from C&D sites subject to the numeric limitation in order to determine whether the numeric limitation is being met. The NRC report highlighted that one of the weakest areas of the stormwater program is the lack of monitoring. NRC at 329. Until today, EPA has not required any monitoring requirements beyond visual inspections for discharges associated with construction activity, although some NPDES-authorized states (e.g., California, Georgia, Oregon, Vermont, and Washington) have imposed monitoring requirements on construction operators in their permits. See relevant state permit requirements in the rulemaking record (DCNs 42104, 42108–42111). Now that EPA is adopting a numeric effluent limitation for turbidity for certain construction sites, permits authorizing discharges associated with construction activity from those sites are required to include monitoring requirements in NPDES permits for discharges associated with construction activity. Pursuant to the NPDES regulations, the permit must specify the type, interval, and frequency of sampling ''sufficient to yield data which are representative of the monitored activity'' and must require monitoring for specific pollutants that are limited in the permit. 40 CFR 122.48(b); see also 122.44(j)(1)(i). While the final rule does not enumerate the specific requirements (i.e., frequency, location, etc.) regarding the monitoring of turbidity in discharges from construction sites EPA emphasizes that compliance monitoring is required of permittees and that pursuant to EPA's NPDES regulations permitting authorities must specify requirements and procedures in their NPDES permits for representative sampling to ensure effective monitoring.

While monitoring is routine in industrial discharge permits, EPA acknowledges that for most permitting authorities, including EPA, the inclusion of monitoring requirements in individual or general construction permits is new. EPA also recognizes that while it is appropriate to provide sufficient flexibility for permitting authorities to design monitoring protocols that are appropriate for their specific permits, given the particular circumstances in their jurisdiction, it will be important for EPA to provide additional guidance on monitoring of stormwater discharges from construction sites so that permitting authorities have a general sense of how to structure requirements that are consistent with today's rule. For that reason, EPA intends to provide monitoring guidance prior to the issuance of the next EPA CGP to provide a technical resource guide to permit writers in establishing monitoring requirements in their construction permits.

The following is a discussion of a number of significant issues implicated by the numeric turbidity limitation and the requirement to monitor discharges from certain construction activities:

Applicability of Numeric Turbidity Limitation and Monitoring Requirements: The turbidity limitation and monitoring requirements apply to construction activities that disturb 10 or more acres of total land area at one time. The 10-acre disturbance threshold includes non-contiguous land disturbances that take place at the same time and are part of a larger common plan of development or sale. Smaller construction activities occurring at the same time, but in separate and distinct areas of a project site, which together disturb 10 or more acres of land, are also required to meet the sampling requirements. This clarification is consistent with EPA's NPDES stormwater regulations, which require permits for smaller scale disturbances that are part of a common plan of development or sale. See definition of large and small construction activities at 40 CFR 122.26(b)(14)(x) and (15), respectively.

The numeric limitation and monitoring requirements only apply when the total disturbed area is 10 or more acres. Therefore, when stabilization of disturbed areas reduces the amount of total disturbances to less than 10 acres, the numeric limitation no longer applies and monitoring of discharges is no longer required. This provision creates an incentive for large sites to stabilize disturbed areas as quickly as possible, thereby reducing the turbidity in stormwater discharges from the site. This is also an incentive to phase construction activities so that less than 10 acres are disturbed at any one time. EPA recognizes that as construction activity progresses, less area of the construction site will consist of disturbed land. At present under the

EPA CGP, the Agency regulates stormwater discharges associated with construction activity until the owners or operators file a Notice of Termination to cease permit coverage. Often owners or operators must stabilize the construction site before a Notice of Termination is submitted to terminate permit coverage. Therefore, EPA is applying the numeric limitation to sites that disturb 10 or more acres at one time until such time as the site has stabilized disturbed areas bringing the total disturbance below 10 acres, recognizing that discharges may continue after this time. The non-numeric effluent limitations, at 40 CFR 450.21, of this rule would still apply to any continuing discharges. With this threshold, EPA expects that the turbidity limitation may not apply at some sites during some periods of construction activity when less than 10 acres are disturbed at one time. EPA has made this determination for various reasons (see section X.G) while still controlling the discharge of pollutants from C&D sites during the majority of land disturbing activities.

EPA emphasizes that the applicability of the turbidity limitation is tied to acres disturbed at one time, not to the ultimate amount of land disturbance on a site. Thus, the applicability of the numeric effluent limitation and monitoring based on a size threshold of disturbed land differs from the applicability provisions of the NPDES regulations at 40 CFR 122.26(b)(14) and (15) that determine whether discharges associated with construction activity need NPDES permit coverage. Under the 40 CFR 122.26 permit coverage is required for any site that will result in land disturbance of equal to or greater than one acre or will result in 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 acre. For example, a construction site that ultimately disturbs over 1 acre at any point during the construction activity must obtain NPDES permit coverage, even if at all points during construction activity the total disturbed land area at one time is less than 1 acre. However, for purposes of the applicability of the numeric effluent limitation and monitoring requirement in the final rule a construction site could ultimately disturb 10 or more acres, but as long as that site does not disturb 10 or more acres *at one time,* monitoring and compliance with the turbidity limitation would not be required.

An example may help to illustrate how EPA will implement the 10-acre threshold trigger for requiring sampling.

Examples of when individual disturbances of less than 10 acres are required to sample:

- If construction activities as part of a large residential subdivision that disturb 5 acres of land in one lot, and, at the same time, 5 acres of land in another lot, and the two lots are not adjacent to one another, samples of the discharges from these sites would be required pursuant to 40 CFR 450.22(a). Sampling is required under this scenario because together the two land disturbances measure 10 or more acres, and they are considered part of the same common plan of development or sale. However, no discharge sampling would be required if the two construction projects under this same scenario disturb less than 10 acres of land total at the same time.
- Alternatively, if one of the 5-acre projects occurs at a different time than the other, such that at no time are 10 or more acres being disturbed at the same time, then sampling is not required for these activities. In the same way, if one of the 5-acre projects has achieved final stabilization in accordance with 40 CFR 450.21(b) by the time the other 5-acre project commences, then no sampling is required because the combined acreage of ground disturbance at one time is less than 10 acres.

Daily Maximum Limitation: EPA's numeric effluent limitation is a daily maximum limitation; meaning that permittees may sample the turbidity in their discharges multiple times over the course of a day and the average of all measurements may not exceed the limitation. During any given day, samples may be averaged to determine the average turbidity for the day. It is this average daily value that must be below the limitation specified in the rule. If one or more individual samples are above the limitation, but the average turbidity for the day is below the limitation, then discharges for that day are deemed to be in compliance with the limitation. This takes into consideration the variability of the discharge and allows higher levels of turbidity to be discharged temporarily, such as may occur during an intense period of rainfall. As explained previously, if a site has difficulty complying with the limitation on an ongoing basis, then the site should improve its controls, operations, and/or maintenance.

If the permitting authority samples the discharge, those samples may be averaged with the measurements taken by the permittee for the same discharge event. For example, if the permittee takes three samples and the permitting authority takes one sample, then these four samples may be averaged to determine the daily value. As another example, if the permitting authority takes a sample or samples, but the discharger did not sample, then the permitting authority can use its sample or samples for determining compliance.

Sampling Frequency: EPA is leaving the specific monitoring requirements to the discretion of each permitting authority, including such issues as the sampling frequency during any one discharge event and the number of discharge events that must be sampled. EPA would, however, discourage the practice of allowing the number of monitoring samples to vary arbitrarily merely to allow a site to achieve a desired average concentration, i.e., a value below the limitation that day. Additionally, as discussed above, EPA's NPDES regulations state that the permit must specify the type, interval, and frequency of sampling sufficient to yield data which are representative of the monitored activity. EPA expects that enforcement authorities would prefer, or even require, monitoring samples at some regular, pre-determined frequency. In general, EPA expects that, at a minimum, three samples per day will need to be collected at each discharge point while a discharge is occurring. In reviewing its data used as a basis for the limitation, EPA notes that 95 percent of daily values are based upon three or more samples per day which demonstrates the need for multiple samples. The recently-issued California Construction General Permit offers one method of ensuring that at least three samples are collected from the discharge event by requiring that turbidity samples be collected three times per day for the duration of the discharge event. See State Water Resources Control Board NPDES General Permit for Storm Water Discharges Associated with Construction Activities, Attachment E, p. 12. Permitting authorities may require more frequent monitoring than three samples per day in order to obtain representative sampling, and permittees may elect to perform more frequent monitoring. For example, the permit could specify that sampling must begin within one hour of the start of the discharge, and must continue until the discharge ends or until the end of the working day. The permit could also include exceptions to the minimum sampling frequency for circumstances such as adverse weather conditions (such as high winds or lightning) or intense rainfall, which would cause a reasonable person to believe that the safety of the sample collection personnel would be in jeopardy. In such instances, the permit might specify that sampling be conducted as soon as it is deemed safe by the sampling personnel. If, at the start of the next working day, there continues to be a discharge, then sampling should resume until the discharge ends or until the end of the working day.

NPDES permitting authorities will also need to determine the minimum number of discharge events during which monitoring is required. It is EPA's general view that any storm event or snowmelt that generates a discharge from the construction site should be monitored since this is the surest way to determine the effectiveness of the site's passive controls during all phases of active construction.

Testing Methodology: The permitting authority must specify in NPDES permits the requirements concerning the proper use, maintenance, and installation, when appropriate, of monitoring equipment or methods used. 40 CFR 122.48(a). Thus, permittees may elect to use automated samplers and/or turbidity meters with data loggers, if approved by the permitting authority. Each sample must be analyzed for turbidity using methods approved by the permitting authority, but EPA expects that the use of a properly calibrated field turbidimeter is sufficient. EPA is also leaving up to the permitting authority the applicable reporting requirements on the permitees sampling of their discharges from C&D sites.

Monitoring from Linear Construction Activities: EPA believes that the permitting authority should exercise discretion when determining the monitoring locations and monitoring frequency for linear construction projects. For instance, the permitting authority might choose, for example, to utilize representative sampling at certain discharge locations that are representative of the discharge characteristics of other locations. EPA views the use of representative sampling points as being acceptable for linear projects due to the potential unique nature of these projects. Because of the size of linear projects, there may be dozens or more discharge points spaced over a large geographic area. In addition, accessing certain areas of the project during a storm event (such as areas that have recently been stabilized) may not be possible without significant disruption of the stabilization measures in place (such as might occur if it would be necessary to drive a vehicle over an area that has been recently stabilized in order to access the discharge point). EPA would generally recommend that permitting authorities concentrate on those areas of linear projects that are actively being constructed and not concentrate on areas that have been completed and stabilized. An example, for a project such as a pipeline or underground utilities, would be those areas where trenching activities are occurring.

Exception for Larger Storm Events: The numeric limitation applies to all discharges from the site except on days when total precipitation during that day exceeds the local 2-year, 24-hour storm event. Even when total precipitation during the day exceeds the local 2-year, 24-hour storm permittees must comply with the non-numeric effluent limitations § 450.22(c) through § 450.22(h). If the total precipitation on a day exceeds this amount, then the turbidity limitation would not apply to discharges for that day. However, the numeric effluent limitation is applicable to all discharges from the site on subsequent days if there is no local 2-year, 24-hour storm event during those days. Although the limitation would not apply on days with precipitation greater than the 2-year, 24-hour event, permittees would still be expected to monitor discharges during that day. Permitting authorities may extend the standard to larger or less frequent storm events if it is determined that the 2-year, 24-hour storm is not adequate for a particular project or larger geographic area. Controls would then need to be designed to handle these less frequent storm events and the corresponding larger volumes of stormwater.

Although the numeric limitation would not apply on days where precipitation exceeds the 2-year, 24-hour event, permittees must still complywith the non-numeric effluent limitations § 450.22(c) through § 450.22(h). Also, permittees would still be required to manage the discharges from the site, and if passive treatment techniques are being utilized, permittees would still be expected to utilize those techniques. So for example, if a polymer dosing system is being utilized, permittees would be expected to continue dosing polymer and to continue managing the stormwater after the point at which the 2-year, 24-hour storm precipitation amount was exceeded. The limited short-term exemption from the numeric effluent limitation is not an exemption from the requirement to manage discharges. In addition, it would be inappropriate for permittees to intentionally discharge large volumes of stormwater on these days, or to bypass treatment in addition to likely not being in compliance with the non-numeric effluent limitations in 40 CFR 450.21 and thus their NPDES permit. If a basin is being utilized, it is expected that the primary outlet would be utilized for the discharge (unless overflow occurs). Intentionally bypassing the primary outlet would be inconsistent with the non-numeric effluent limitations of the rule.

EPA selected the 2-year, 24-hour storm event as the limiting event for determining compliance in recognition of the fact that passive controls can only be expected to consistently meet a numeric limitation to the level that they are designed to function. Typically, construction site controls are designed to manage stormwater up to a certain design storm event. For larger storm events, basins will likely overflow. Likewise, channels and conveyances will overtop and may begin to erode unless they are armored with materials such as flexible channel liners. EPA considered basing compliance on a 1-year storm, a 2-year storm and a 5-year storm. A 1-year storm has a 100% chance of occurring in any given 12 month period, a 2-year storm has a 50% chance of occurring in any 12 month period and a 5-year storm has a 20% chance of occurring in any 12 month period. To EPA's knowledge, designing for a 5-year storm is not common practice on construction sites, with the exception of emergency spillways on basins. However, many states require that basins and other controls be designed to manage a 2-year storm. Given that designing controls to manage runoff from a 2-year 24-hour storm provides a reasonable compromise between designing for a larger storm (at more expense) and allowing multiple discharges per year to potentially exceed the limitation (as would be the case with a smaller storm) EPA selected the 2-year storm as the maximum compliance storm event.

Monitoring Locations: The numeric limitation applies to all discharges from C&D sites. However, diffuse stormwater, such as non-channelized flow through a silt fence or other perimeter control that infiltrates into a vegetated area, and does not then discharge to surface waters, would not generally require sampling. EPA is encouraging (although not requiring) permittees to utilize dispersion of stormwater to vegetated areas and infiltration of stormwater instead of discharging it from the site. EPA encourages increased usage of such techniques, where appropriate. This is consistent with the concept of Low Impact Development (LID) techniques as well as the zero discharge goal of the Clean Water Act. Some projects present unique monitoring challenges, such as projects that are adjacent to or actually within waterbodies. Examples include locks, dams, piers, and stream stabilization activities. For these types of projects, permitting authorities may need to exercise discretion when considering appropriate monitoring locations for discharges.

Sampling Times: Although EPA has left the issue of when sampling is required during any given discharge event to the discretion of the permitting authority, it is EPA's general view that sampling should be conducted, at a minimum, during normal business hours at a project. This can generally be considered to be between the hours of 6 a.m. and 6 p.m., or when workers are normally present on the construction site. The exception would be if unsafe conditions, such as heavy rain or lightning, would cause a reasonable person to determine that sampling would be dangerous.

Notification to Permitting Authorities: Although not a requirement in today's rule, permitting authorities may want to consider requirements in their permits and consider mechanisms by which permittees would notify the permitting authority when they have exceeded the 10 acre disturbed land threshold and monitoring would be required at a particular project.

B. Implementation

While pursuant to the CRA this entire rule is effective February 1, 2010 the numeric effluent limitation and the associated monitoring requirements for sites with 20 or more acres of land disturbed at one time will become applicable to discharges associated with construction activity 18 months following the effective date of this final rule on August 2, 2010. The numeric effluent limitation and the associated monitoring requirements for sites with 10 or more acres of land disturbed at one time will become applicable to discharges associated with construction activity four years following the effective date of this final rule on February 2, 2014. The non-numeric effluent limitations in Option 4 will become applicable when the rule is effective or 60 days after the final rule is published in the **Federal Register** on February 1, 2010.

Once EPA has promulgated effluent limitations and standards under CWA sections 301 and 306, and those limitations and standards become effective, the permitting authority must incorporate those limitations into NPDES permits as effluent limitations. 40 CFR 122.43–44. For discharges associated with construction activity, once the ELGs and NSPSs become effective the permitting authority must include permit limitations at least as stringent as those promulgated in this regulation in any individual NPDES permits or in the next construction general permit issued after the effective date of this regulation. EPA anticipates that the permitting authorities, particularly those whose construction general permits will expire within the next 18 months, would like time to develop guidance on the new requirements given the change in focus from past construction permits of non-numeric effluent limitations and BMPs to numeric limitations and monitoring requirements. EPA is aware of at least 10 states whose construction general permits are scheduled to expire within the first 18 months after the effective date of this final rule, in addition to the 4 states and other jurisdictions who are permitted by the EPA CGP, proposed to expire on June 30, 2011. In order to provide permitting authorities time to develop guidance on the requirements of this rule, including monitoring requirements, EPA is providing a 18 month lead time for the permitting authorities between the effective date of this final rule and when the numeric limitation and monitoring requirements are applicable to stormwater discharges associated with construction activity. The C&D ELG, including the numeric limitations and monitoring requirements, will be effective February 1, 2010, even though the numeric limit will not be applicable to discharges for 18 months from the effective date of this rule for sites with 20 or more acres of land disturbed at one time and four years after the effective date for sites with 10 or more acres of land disturbed at one time. Thus, the permitting authorities whose construction general permits will expire after the effective date of the C&D ELG must still incorporate the numeric limitation and monitoring requirements into their newly issued CGPs even though it will not be applicable until 18 months from the effective date for sites with 20 or more acres of land disturbed at one time and four years after the effective date for sites with 10 or more acres of land disturbed at one time. After the effective date of this rule, permitting authorities must incorporate the requirements into newly issued permits. Without an 18 month lead time in the applicability of the numeric limitation and monitoring requirements permitting authorities and the permittees in those states would have, what EPA believes, an unreasonably short time period to digest these new requirements and plan accordingly. While it is impossible to determine exactly how much time is necessary for permitting authorities and permittees, EPA weighed the need to provide enough time, for the reasons stated below, against the desire to apply these important numeric limitations and monitoring requirements in a timely manner in order to achieve important reductions in pollutant discharges from C&D sites and determined that 18 months for sites with 20 or more acres of land disturbed at one time and four years for sites with 10 or more acres of land disturbed at one time are reasonable periods of time.

In this rule EPA has determined that passive treatment technologies and a numeric effluent limitation with monitoring requirements is BAT and NSPS. As discussed above, it is clear that passive technologies are technologically available, as they are used widely throughout the U.S., however before this rule there were no nationwide numeric limitations or monitoring requirements connected with the construction industry, and particularly with the use of passive treatment technology at C&D sites. Monitoring requirements are a critical part of any numeric limitation. Given the sea change to the regulated industry there may be implementation issues associated with incorporation of monitoring requirements into permits, for example, permitting authorities may specify the frequency of monitoring; the location of monitoring; The duration of monitoring in relation to storm events; the samples that will be representative of the flow and characteristics of the discharges from the C&D site; whether it will approve the use of automated samplers and/or turbidity meters with data loggers; and establish procedures for analyzing the sample for turbidity and appropriate quality assurance/ quality control procedures. The 18 month period will also allow permitting authorities to develop any necessary training or certification programs. An important factor in the effective implementation and compliance with this rule will be the permitting authority being able to digest the numeric limitation and monitoring requirements and developing guidance and outreach to the regulated community to provide assistance so the requirements are understood and can be effectively met by owners and operators of C&D sites. This will provide the regulated industry with the guidance, knowledge and tools necessary in order to effectively monitor their discharges in order to ensure they are meeting the numeric limitation.

In addition to the reasons stated above regarding the permitting authority having the time to develop guidance to assist C&D site operators, for this industry, it is necessary to allow it a period of time to become accustomed to monitoring discharges and understand how different passive approaches impact the level of turbidity in their stormwater discharges. Allowing a phase-in of the monitoring requirements and turbidity limitation will allow the industry time to adjust their controls to determine what the most effective passive technology or combination of technologies are to reduce levels of turbidity, and to train personnel on any new techniques or technologies implemented at the site, how to sample and analyze stormwater discharges, and how to correctly apply polymers or treatment chemicals, if necessary, without causing environmental harm. As noted previously, the monitoring requirements are a critical part of the numeric limitation developed as BAT and NSPS and the establishment of a numeric limitation and monitoring requirements for discharges associated with the construction industry represents a sea change for the industry and permitting authorities. This change is in line with the technology forcing nature of the CWA; however, it may require significant time and resources for many construction firms to adapt their operations in light of the new stormwater control measures.

Learning how to use what for many firms will be new control techniques will likely require some initial period of adjustment, modification, and revision to ensure that the selected control measures achieve the required discharge limitation. EPA would expect that most of the firms affected in the first phase will be relatively large firms with in-house expertise or access to the necessary resources to implement passive treatment technologies. Because, as noted, the final rule requires a significant change in the controls necessary for the discharges associated with construction activity from current practices for many firms, there may be, at least in the near term, a limited universe of available expertise in passive treatment in the form of available guidance information and trained engineering personnel specialized in these treatment measures. EPA also expects that expertise and understanding will grow over time and that technologies may well both improve and decrease in cost. In these circumstances, phasing in the application of the numeric limitations provides time to facilitate the efficient development and transfer of this expertise, and allows the industry to explore opportunities for cost savings.

EPA estimates that sites which disturb 20 or more acres at any one time represent 48 percent of all sites subject to the numeric limits. The pollutant reduction associated with these sites is estimated to represent 69 percent of the pollutants discharged by construction sites. Expanding the application of the numeric limit after two and a half years to sites that disturb 10 or more acres at any one time will achieve a 77 percent sediment reduction over baseline discharges. EPA has determined that phasing the application of the limitation ensures that effective progress is made towards achieving the pollutant reductions and benefits associated with BAT and BADT while providing the construction industry with additional time to implement the regulation in recognition of the current economic downturn.

EPA plans to work closely with states and industry to ensure effective implementation of this rule. EPA will also monitor progress with respect to a range of variables, including appropriate technologies and their performance, costs, and overall industry conditions, with the ability to make adjustments if warranted.

C. Upset and Bypass Provisions

A ''bypass'' is an intentional diversion of the streams from any portion of a treatment facility. An ''upset'' is 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. EPA's regulations concerning bypasses and upsets for direct dischargers are set forth at 40 CFR 122.41(m) and (n).

Because much of today's rule includes requirements for the design, installation, and maintenance of erosion and sediment controls, EPA considered the need for an additional bypass-type provision in regard to large storm events. However, EPA did not specifically include such a provision in the text of the regulation because the rule only requires dischargers to meet a numeric turbidity limitation for discharges on days with storm events smaller than the 2-year, 24-hour storm. Because EPA is not establishing requirements for control of larger storm events, specific bypass provisions were not necessary. Standard upset and bypass provisions are generally included in all NPDES permits, and EPA expects this will be the case for construction stormwater permits issued after this rule becomes effective.

D. Variances and Waivers

The CWA requires application of effluent limitation guidelines established pursuant to section 301 to all direct dischargers. However, the statute provides for the modification of these national requirements in a limited number of circumstances. Moreover, the Agency has established administrative mechanisms to provide an opportunity for relief from the application of ELGs for categories of existing sources for toxic, conventional, and nonconventional pollutants. ''Ability to Pay'' and ''water quality'' waivers do not apply to conventional or toxic pollutants (e.g., TSS, PCBs) and, therefore, do not apply to today's rule. However, the variance for Fundamentally Different Factors (FDFs) may apply in some circumstances.

EPA will develop effluent limitations or standards different from the otherwise applicable requirements if an individual discharging facility is fundamentally different with respect to factors considered in establishing the limitation of standards applicable to the individual facility. Such a modification is known as a ''fundamentally different factors'' (FDF) variance.

Early on, EPA, by regulation provided for the FDF modifications from the BPT and BAT limitations for toxic and nonconventional pollutants and BPT limitations for conventional pollutants for direct dischargers. For indirect dischargers, EPA provided for modifications for PSES. FDF variances for toxic pollutants were challenged judicially and ultimately sustained by the Supreme Court. *Chemical Manufacturers Assn* v. *NRDC,* 479 U.S. 116 (1985).

Subsequently, in the Water Quality Act of 1987, Congress added new section 301(n) of the Act explicitly to authorize modifications of the otherwise applicable BAT effluent limitations or categorical pretreatment standards for existing sources if a facility is fundamentally different with respect to the factors specified in section 304 (other than costs) from those considered by EPA in establishing the effluent limitations or pretreatment standard. Section 301(n) also defined the conditions under which EPA may establish alternative requirements. Under section 301(n), an application for approval of a FDF variance must be based solely on (1) information submitted during rulemaking raising the factors that are fundamentally different or (2) information the applicant did not have an opportunity to submit. The alternate limitation or standard must be no less stringent than justified by the difference and must not result in markedly more adverse non-water quality environmental impacts than the national limitation or standard.

EPA regulations at 40 CFR part 125, subpart D, authorizing the Regional Administrators to establish alternative limitations and standards, further detail the substantive criteria used to evaluate FDF variance requests for direct dischargers. Thus, 40 CFR 125.31(d) identifies six factors (e.g., volume of process wastewater, age and size of a discharger's facility) that may be considered in determining if a facility is fundamentally different. The Agency must determine whether, on the basis of one or more of these 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 (e.g., infeasibility of installation within the time allowed or a discharger's ability to pay) that may not provide a basis for an FDF variance. In addition, under 40 CFR 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 (a) a removal cost wholly out of proportion to the removal cost considered during development of the national limitations, or (b) a non-water quality environmental impact (including energy requirements) fundamentally more adverse than the impact considered during development of the national limitations. EPA regulations provide for an FDF variance for indirect dischargers at 40 CFR 403.13. 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 section 301(n) underscores the necessity for the FDF variance applicant to establish eligibility for the variance. EPA's regulations at 40 CFR 125.32(b)(1) are explicit in imposing this burden upon 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 guidelines. An FDF variance is not available to a new source subject to NSPS. See *E.I. du Pont de Nemours* v. *Train,* 430 U.S. 112, 138–39 (1977).

E. Safe Drinking Water Act Requirements

EPA is encouraging the use of stormwater dispersion and infiltration to manage stormwater discharges from construction activity. By using dispersion and infiltration techniques, permittees may be able to significantly reduce or even eliminate discharges in certain situations. While permittees may choose to utilize infiltration practices such as infiltration trenches and wells to manage postconstruction stormwater discharges, EPA does not expect that permittees will utilize these practices to any great degree during the construction phase because sediment may cause clogging of these practices and therefore reduce their useful life. However, it is important to note that certain types of infiltration practices used to manage stormwater from construction activity may be subject to regulation under the Safe Drinking Water Act's (SDWA) Underground Injection Control (UIC) program and EPA's implementing regulations at 40 CFR parts 144–147. SDWA established the UIC program to provide safeguards so that injection wells do not endanger current and future underground sources of drinking water (USDWs) (42 U.S.C. 300h). The UIC program is implemented by Federal and state government agencies that oversee underground injection activities in order to prevent contamination of USDWs.

Some infiltration practices may involve injection into a well, which is defined as a bored, drilled, driven shaft, or dug hole that is deeper than its widest surface dimension, or an improved sinkhole, or a subsurface fluid distribution system (40 CFR 144.3). In those cases, the infiltration practices would be regulated under the UIC program as a Class V well. For example, an infiltration trench that includes an assemblage of perforated pipes, drain tiles, or similar mechanism intended to distribute fluids below the surface would probably be considered a Class V injection well. Also, commercially manufactured stormwater infiltration devices such as pre-cast or pre-built proprietary subsurface detention vaults, chambers or other devices designed to capture and infiltrate stormwater runoff are generally considered Class V wells. Drywells, seepage pits, and improved sinkholes are also generally considered to be Class V wells if water is directed to them and their depth is greater than their widest surface dimension or they are connected to a subsurface fluid distribution system.

Typically, Class V wells are authorized by rule and do not require a permit if the owner or operator submits inventory information to the State, if it has primary enforcement responsibility for the UIC Class V program, or EPA, and complies with the other requirements for Class V wells. The state or EPA regional UIC program director with primacy for the UIC Class V program should be contacted when these types of infiltration practices are planned to assist in determining whether they are Class V wells.

There are some geologic settings that are so sensitive that contaminated stormwater may move too rapidly through the soil profile for sufficient pollution removal. As a result, USDWs may be threatened. The source water assessments required under the 1996 Amendments to the Safe Drinking Water Act are good sources of information on sensitive geologic settings for public water supplies, as is EPA's *Source Water Practices Bulletin: Managing Stormwater Runoff to Prevent Contamination of Drinking Water* (Office of Water, EPA 816–F–007, July 2009).

F. Other Clean Water Act Requirements

Compliance with the provisions of this rule would not exempt a discharger from any other requirements of the CWA.

XX. Related Acts of Congress, Executive Orders, and Agency Initiatives

A. Executive Order 12866: Regulatory Planning and Review

Under section 3(f)(1) of Executive Order 12866 (58 FR 51735, October 4, 1993), this action is an ''economically significant regulatory action'' because it is likely to have an annual effect on the economy of $100 million or more. Accordingly, EPA submitted this action to the Office of Management and Budget (OMB) for review under Executive Order 12866 and any changes made in response to OMB recommendations have been documented in the docket for this action.

In addition, EPA prepared an analysis of the potential costs and benefits associated with this action. This analysis is contained in Section 8.3, Comparison of Social Cost and Monetized Benefits in Chapter 8 of the Economic Analysis. A copy of the analysis is available in the docket for this action and the analysis is briefly summarized here. Table XX–1 provides the results of the benefit-cost analysis.

TABLE XX–1—TOTAL ANNUALIZED BENEFITS AND COSTS OF THE REGULATORY OPTIONS

Option	Social costs (2008 $ millions per year)	Benefits [a] (2008 $ millions per year)
Option 1	$175.8	$214.1 + $(NMB)_1$
Option 2	4,863.1	360.1 + $(NMB)_2$
Option 3	9,081.1	422.3 + $(NMB)_3$

TABLE XX–1—TOTAL ANNUALIZED BENEFITS AND COSTS OF THE REGULATORY OPTIONS—Continued

Option	Social costs (2008 $ millions per year)	Benefits [a] (2008 $ millions per year)
Option 4	958.7	368.9 + $(NMB)_4$

[a] NMB_i are the non-monetized benefits of the i^{th} Option.

Source: Economic Analysis; Environmental Assessment.

B. Paperwork Reduction Act

The information collection requirements in this rule will be submitted for approval to the Office of Management and Budget (OMB) under the Paperwork Reduction Act, 44 U.S.C. 3501 et seq. The information collection requirements are not enforceable until OMB approves them.

EPA is establishing mandatory monitoring requirements for construction sites under authority of Clean Water Act (CWA) Section 308 to demonstrate compliance with effluent limitations and standards for turbidity promulgated under today's rule. Sediment, created as a result of construction activity and measured by turbidity, is the primary pollutant that causes water quality impairment for streams and rivers. It is also one of the leading causes of lake and reservoir water quality impairment and wetland degradation. The sediment entrained in stormwater discharges from construction activity can harm aquatic ecosystems, increase drinking water treatment costs, and degrade recreational uses of impacted waters. Sediment can also accumulate in rivers, lakes, and reservoirs, leading to the need for dredging or other mitigation. Additionally, Section 402(a)(2) of the CWA directs EPA to prescribe permit conditions to assure compliance with requirements ''including conditions on data and information collection, reporting and such other requirements as [the Administrator] deems appropriate.''

EPA estimates a total annual burden to regulated construction sites larger than 10 acres and regulatory authorities, as a result of the monitoring requirements of this final rule, of 3,018,750 hours and average annual costs of $91,978,103. These are based on the following assumptions:

- *Total number of projects ongoing at some point in a year, but not necessarily active for the entire year:* 39,361.
- *Average reporting frequency:* monthly.
- *Average number of monitoring reports submitted per year:* 7.07.
- *Total number of DMR reports submitted per year:* 278,251.
- *Average burden hours per response:* 10.85 (10.30 hours per permittee, 0.55 hour per permitting authority).

These estimates account for full implementation of the monitoring requirements which will not occur for 4 years after the effective date of this rule. EPA will submit an Information Collection Request (ICR) to the Office of Management and Budget for approval which requests approval for only a portion of this burden reflecting the implementation of the rule over the next three years. Upon expiration of that ICR, EPA will update the clearance request to reflect full implementation of the numeric limitations in the subsequent request.

In addition, EPA estimates annual capital costs to the industry of $7,085,890. The capital cost to the industry is based on the use of one turbidimeter per active site per year (28,922) and the annual purchase of a turbidimeter calibration kit, for a total annual cost of $245 per project. For the states, EPA estimates start-up costs of $1,564,000, based on an average expected cost of $31,280 per state for equipment purchases and program set-up. Annualized over 10 years, this cost is $3,667 per state. Burden means the total time, effort, or financial resources expended by persons to generate, maintain, retain, or disclose or provide information to or for a Federal agency. This includes the time needed to review instructions; develop, acquire, install, and utilize technology and systems for the purposes of collecting, validating, and verifying information, processing and maintaining information, and disclosing and providing information; adjust the existing ways to comply with any previously applicable instructions and requirements; train personnel to be able to respond to a collection of information; search data sources; complete and review the collection of information; and transmit or otherwise disclose the information.

An agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for EPA's regulations in 40 CFR are listed in 40 CFR part 9. When this ICR is approved by OMB, the Agency will publish a technical amendment to 40 CFR part 9 in the **Federal Register** to display the OMB control number for the approved information collection requirements contained in this final rule.

C. Regulatory Flexibility Act

The Regulatory Flexibility Act (RFA) generally requires an agency to prepare a regulatory flexibility analysis of any rule subject to notice and comment rulemaking requirements under the Administrative Procedure Act or any other statute unless the agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. Small entities include small businesses, small organizations, and small governmental jurisdictions.

For the purposes of assessing the impacts of today's rule on small entities, small entity is defined as either a: (1) A small business as defined by the Small Business Administration's (SBA) regulations at 13 CFR 121.201; (2) a small governmental jurisdiction that is a government of a city, county, town, school district or special district with a population of less than 50,000; or (3) a small organization that is any not-for-profit enterprise which is independently owned and operated and is not dominant in its field. EPA does not anticipate any impacts on small organizations and impacts on small governments are discussed under the UMRA analysis section. The RFA provides that EPA generally define small businesses according to the size standards established by the Small Business Administration (SBA). The SBA established criteria for identifying small businesses is based on either the number of employees or annual revenues (13 CFR 121). These size standards vary by NAICS (North American Industrial Classification System) code. For the C&D industry NAICS categories (236 and 237) the small business annual revenue threshold is set at $33.5 million. The SBA sets the small business threshold for NAICS 2372 (Land Subdivision of NAICS 237) at $7 million. However, for the purpose of the economic analysis, EPA allocated this sector amongst the four primary building construction sectors: Single-family housing, multifamily housing, industrial building, and commercial and institutional building construction. By merging the land subdivision sector with sectors that have a higher small business revenue threshold, there is likely to be an overestimate of the number of these firms considered small businesses. However, according to the 2002 Economic Census, 93 percent of firms in the land subdivision sector made less than $5 million annually, and 98 percent made less than $10 million. So nearly all the firms in this sector would already be considered a small business under $7 million threshold, and merging this sector with the four primary building construction sectors, will not have a meaningful affect on the estimate of small businesses for this industry.

In order to gather more information on the potential impacts of today's rule on small businesses, EPA used the discretion afforded to it under the Regulatory Flexibility Act (RFA), as amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), to convene a Small Business Advocacy Review (SBAR) Panel for this rulemaking on September 10, 2008. EPA held an outreach meeting with Small Entity Representative (SERs) on September 17, 2008. A list of SERs and the outreach materials sent to SERs are included in the docket (see DCN 41115–41133). EPA prepared a report that summarizes information obtained from the Panel, which is also included in the docket. (see DCN 41136).

After considering the economic impacts of today's final rule on small entities, I certify that this action will not have a significant economic impact on a substantial number of small entities. Overall, EPA estimates that in a typical year there will be 82,000 in-scope firms, and of this total, approximately 78,000, or about 96 percent, are defined as small businesses. Under Option 4, EPA estimates that only 230 small businesses would experience costs exceeding 1 percent of revenue and no small businesses would incur costs exceeding 3 percent of revenue. Both numbers represent very small percentages of the in-scope small firms. The 230 firms estimated to incur costs exceeding 1 percent of revenue represent about 0.3 percent of all estimated potentially in-scope small businesses. Therefore, EPA does not consider the selected option to have the potential to cause a significant economic impact on a substantial number of small entities.

All of the options considered for the final rule require the use of BMPs. As the rule applies to construction projects and not directly to firms, the most effective way for EPA to minimize impacts to small firms was by crafting options that did not impose significant costs on small projects. EPA's final rule does this by establishing an acreage threshold for the numeric turbidity limitation.

D. Unfunded Mandates Reform Act (UMRA)

Title II of the Unfunded Mandates Reform Act of 1995 (UMRA), Public Law 104–4, establishes requirements for Federal agencies to assess the effects of their regulatory actions on State, local, and tribal governments and the private sector. Under section 202 of the UMRA, EPA generally must prepare a written statement, including a cost-benefit analysis, for proposed and final rules with ''Federal mandates'' that may result in expenditures to State, local, and tribal governments, in the aggregate, or to the private sector, of $100 million or more in any one year. EPA has determined that this rule contains a Federal mandate that may result in expenditures of $100 million or more for State, local, and tribal governments, in the aggregate, or the private sector in any one year. Accordingly, EPA has prepared under section 202 of the UMRA a written statement which is summarized below.

Before promulgating an EPA rule for which a written statement is needed, section 205 of the UMRA generally requires EPA to identify and consider a reasonable number of regulatory alternatives and to adopt the least costly, most cost-effective or least burdensome alternative that achieves the objectives of the rule. Moreover, section 205 allows EPA to adopt an alternative other than the least costly, most cost-effective or least burdensome alternative if the Administrator publishes with the final rule an explanation why that alternative was not adopted. Of the four options considered for the final rule option, one was the least costly. However, EPA concluded that option one was not technology forcing and did not reflect ; therefore, it did not meet CWA objectives. Of the remaining three options, EPA selected the least costly, most cost-effective or least burdensome option, satisfying section 205 requirements.

As part of the financial impact analysis, EPA looked specifically at the impact on government entities resulting from both compliance with construction site requirements and from administering the additional monitoring reports submitted by in-scope firms. Table XX–2 shows the results of this analysis. The estimated administrative costs are conservative, as they do not take into account that part of the NPDES permit program is administered by the federal government. For more information on how this analysis was performed, see Section 14–1 Assessing Costs to Government Entities in Chapter 14 of the Economic Analysis.

TABLE XX–2—IMPACTS OF REGULATORY OPTIONS ON STATE & LOCAL GOVERNMENTS (MILLION 2008 $)

	Option 1	Option 2	Option 3	Option 4
Compliance Costs:				
Federal	$3.8	$87.1	$166.9	$17.7
State	8.1	178.1	323.0	35.3
Local	46.2	1,022.3	1,854.0	202.4
Administrative Costs:				
Federal	0.0	0.0	0.0	0.0
State	0.0	2.2	6.2	6.2
Local	0.0	0.0	0.0	0.0
Total Costs:				
Federal	3.8	87.1	166.9	17.7
State	8.1	180.3	329.2	41.5
Local	46.2	1,022.3	1,854.0	202.4
Total	58.1	1,289.7	2,350.1	261.6

Source: Economic Analysis.

Before EPA establishes any regulatory requirements that may significantly or uniquely affect small governments, including tribal governments, it must have developed under section 203 of the UMRA a small government agency plan. The plan must provide for notifying potentially affected small governments, enabling officials of affected small governments to have meaningful and timely input in the development of EPA regulatory proposals with significant

Federal intergovernmental mandates, and informing, educating, and advising small governments on compliance with the regulatory requirements.

After performing an assessment of the economic impacts on small government entities, EPA determined that the rule would not significantly or uniquely affect small governments, and therefore did not develop a small government agency plan as specified in UMRA. This rule does not impose any requirements uniquely on small governments. The assessment of impacts on small governmental entities involved three steps: (1) Identifying small government entities (i.e., those serving populations of less than 50,000, (5 U.S.C. 601[5])), (2) estimating the share of total government costs for the regulatory options incurred by small governments, and (3) estimating the potential impact from these costs based on comparison of small government compliance costs with small government revenue and outlays. For details of this analysis see Section 14.2 Assessing Costs and Impacts on Small Government Entities in Chapter 14 of the Economic Analysis. Table XX–3 has the results of the small government entity impact analysis. The table shows that under Option 4, total small government costs are estimated to be only 0.08% of total small government revenue, and under no option considered did total small government costs exceed 1% of total small government revenues.

TABLE XX–3—IMPACTS OF REGULATORY OPTIONS ON SMALL GOVERNMENT UNITS (MILLION 2008 $)

	Option 1	Option 2	Option 3	Option 4
Compliance Costs:				
Small Government Entities	$21.7	$480.5	$871.4	$95.1
Administrative Costs:				
Small Government Entities	0.0	0.0	0.0	0.0
Total Costs:				
Small Government Entities	21.7	480.5	871.4	95.1
Small Government Impact Analysis Concepts:				
Total Revenues	125,515	125,515	125,515	125,515
Total Costs as % of Total Revenues	0.02%	0.38%	0.69%	0.08%
Capital Outlay	13,455	13,455	13,455	13,455
Total Costs as % of Total Capital Outlay	0.16%	3.57%	6.48%	0.71%
Construction Outlay Only	8,529	8,529	8,529	8,529
Total Costs as % of Total Construction Outlay	0.25%	5.63%	10.22%	1.12%

Source: Economic Analysis.

Consistent with the intergovernmental consultation provisions of section 204 of the UMRA, EPA initiated consultations with the governmental entities affected by this rule. EPA took and responded to comments from government entities on the earlier proposed C&D rule and on this rule. To help characterize the potential impacts to government entities, EPA has gathered state government data regarding NOI submissions, and from U.S. Census data and Reed Construction Data. EPA has compiled information on how much construction activity is undertaken by government entities. EPA has routinely consulted with EPA regional offices who maintain direct and regular contact with state entities. Finally, EPA met directly with and solicited data from all the state Stormwater Coordinators who attended EPA's Annual Stormwater Conference in 2007. During 2008 and 2009, EPA attended several conferences and workshops to present information on the Agency's C&D rule. These meetings were open to the public and widely attended.

E. Executive Order 13132: Federalism

Executive Order 13132, entitled ''Federalism'' (64 FR 43255, August 10, 1999), directs agencies to develop an accountable process to ensure ''meaningful and timely input by State and local officials in the development of regulatory policies that have federalism implications.''

Although EPA expects the final rule would have little effect on the relationship between, or the distribution of power and responsibilities among, the federal and state governments, EPA has concluded that this final rule has federalism implications as defined by the Executive Order. As previously noted, it is estimated to impose substantial direct compliance costs on State and local governments combined. Accordingly, EPA provides the following federalism summary impact statement as required by section 6(b) of Executive Order 13132. As noted in the UMRA section above, EPA consulted with State and local governments early in the process of developing the proposed action to permit them to have meaningful and timely input into its development. While EPA did not consult with State and local elected officials, the Agency did consult with all of the state Stormwater Coordinators in attendance at EPA's Annual Stormwater Coordinator's conferences in 2008 and 2009. EPA also attended several conferences where governmental officials were present, such as the International Erosion Control Association (IECA) conference in February 2009, the MAC–IECA conference in September 2009, and the Northwest Environmental Business Council meeting in March of 2009. In general, the concerns EPA heard included the costs of the regulation as related to publicly funded projects, increased burden and the lack of dedicated funding sources for permitting authorities to implement and enforce the new requirements given that permitting authorities are already over-burdened.

EPA also tried to mitigate compliance costs on State and local governments by incorporating a disturbed acreage threshold of 10 acres for applicability of the turbidity limitation. Although EPA does not have comprehensive data on construction projects conducted by state and local governments, EPA believes that a large proportion of building projects undertaking by these entities are likely to fall below this threshold. Building projects constructed by local governments are typically projects such as schools, libraries, recreation centers, parks, office buildings, etc., which EPA believes would tend to have construction footprints smaller than 10 acres. And like private projects, those that are bigger may be able to use sequencing to prevent more than 10 acres from being disturbed at one time. Likewise, many local government non-building projects are likely to have smaller construction footprints as well. EPA expects that the majority of local government non-building projects would be activities such as small-scale road improvements, sewer and water line repair projects, and other miscellaneous construction activities with smaller amounts of land disturbance. With respect to state government projects, highway construction projects are the one category of construction undertaken by state governments that are likely to be the most significantly impacted by the final rule requirements, since many of these projects may exceed 10 acres disturbed at one time. However, as highway projects constitute a significant portion of construction projects nationwide, EPA has no reasonable basis for exempting these projects from regulation. As discussed above, EPA has included a number of provisions to facilitate compliance with the numeric limitation, including phase-in of the limitation, an exemption from the limitation on days when precipitation exceeds the 2-year, 24-hour storm event, and averaging of monitoring samples over a full day for determining compliance with the limitation. EPA expects that many state government building projects would fall below the 10 acres disturbed threshold.

F. Executive Order 13175 (Consultation and Coordination With Indian Tribal Governments)

Executive Order 13175, entitled ''Consultation and Coordination with Indian Tribal Governments'' (65 FR 67249, November 6, 2000), requires EPA to develop an accountable process to ensure ''meaningful and timely input by tribal officials in the development of regulatory policies that have tribal implications.''

''Policies that have Tribal implications'' is defined in the Executive Order to include regulations that have substantial direct effects on one or more Indian Tribes, on the relationship between the Federal government and the Indian Tribes, or on the distribution of power and responsibilities between the Federal government and Indian Tribes. This final rule does not have tribal implications. It will not have substantial direct effects on Tribal governments, on the relationship between the Federal government and Indian Tribes, or on the distribution of power and responsibilities between the Federal government and Indian tribes as specified in Executive Order 13175. Today's final rule contains no Federal mandates for Tribal governments and does not impose any enforceable duties on Tribal governments. Thus, Executive Order 13175 does not apply to this rule.

G. Executive Order 13045: Protection of Children From Environmental Health Risks and Safety Risks

Executive Order 13045, ''Protection of Children from Environmental Health Risks and Safety Risks'' (62 FR 19885, April 23, 1997) applies to any rule that: (1) is determined to be ''economically significant'' as defined under Executive Order 12866, and (2) concerns an environmental health or safety risk that EPA has reason to believe may have a disproportionate effect on children. If the regulatory action meets both criteria, the Agency must evaluate the environmental health or safety effects of the planned rule on children, and explain why the planned regulation is preferable to other potentially effective and reasonably feasible alternatives considered by the Agency.

This final rule is not subject to Executive Order 13045 because it does not concern an environmental health or safety risk that EPA has reason to believe may have a disproportionate effect on children. This rule is based on technology performance, not health or safety risks.

H. Executive Order 13211 (Energy Effects)

This rule is not a ''significant energy action'' as defined in Executive Order 13211, ''Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use'' (66 FR 28355, May 22, 2001) because it is not likely to have a significant adverse effect on the supply, distribution, or use of energy. Additional fuel may be required for construction equipment conducting excavation and soil moving activities. EPA determined that the additional fuel usage would be very small, relative to the total fuel consumption at construction sites and the total annual U.S. fuel consumption.

I. National Technology Transfer and Advancement Act

Section 12(d) of the National Technology Transfer and Advancement Act (NTTAA) of 1995, (Pub. L. 104–113, section 12(d); 15 U.S.C. 272 note) directs EPA to use voluntary consensus standards in its regulatory activities unless to do so would be inconsistent with applicable law or otherwise impractical. Voluntary consensus standards are technical standards (e.g., materials specifications, test methods, sampling procedures, and business practices) that are developed or adopted by voluntary consensus standard bodies. The NTTAA directs EPA to provide Congress, through OMB, explanations when the Agency decides not to use available and applicable voluntary consensus standards.

The Agency is not aware of any consensus-based technical standards for the types of controls contained in final rule and did not receive any comments to this effect from the public.

J. Executive Order 12898: Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations

Executive Order 12898 (59 FR 7629 (Feb. 16, 1994)) establishes Federal executive policy on environmental justice. Its main provision directs federal agencies, to the greatest extent practicable and permitted by law, to make environmental justice part of their mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations in the United States.

EPA has determined that this final rule will not have disproportionately high and adverse human health or environmental effects on minority or low-income populations because it increases the level of environmental protection for all affected populations without having any disproportionately high and adverse human health or environmental effects on any population, including any minority or low-income population. The final rule will reduce the negative effects of discharges from construction sites in the nation's waters to benefit all of society, including minority communities.

K. Congressional Review Act

The Congressional Review Act, 5 U.S.C. 801 *et seq.,* as added by the Small Business Regulatory Enforcement Fairness Act of 1996, generally provides that before a rule may take effect, the agency promulgating the rule must submit a rule report, which includes a copy of the rule, to each House of the Congress and to the Comptroller General of the United States. EPA will submit a report containing this rule and other required information to the U.S. Senate, the U.S. House of Representatives, and the Comptroller General of the United States prior to publication of the rule in the **Federal Register**. A Major rule cannot take effect until 60 days after it is published in the **Federal Register.** This action is a ''major rule'' as defined by 5 U.S.C. 804(2). This rule will be effective February 1, 2010.

L. Judicial Review

In accordance with 40 CFR 23.2, today's rule is considered promulgated for the purposes of judicial review as of 1 p.m. Eastern Standard Time, December 15, 2009. Under Section 509(b)(1) of the Clean Water Act (CWA), judicial review of today's effluent limitations guidelines and new source performance standards may be obtained by filing a petition in the United States Circuit Court of Appeals for review within 120 days from the date of promulgation of these guidelines and standards. Under Section 509(b)(2) of the CWA, the requirements of this regulation may not be challenged later in civil or criminal proceedings brought to enforce these requirements.

List of Subjects in 40 CFR Part 450

Environmental protection, Construction industry, Land development, Erosion, Sediment, Stormwater, Water pollution control.

Dated: November 23, 2009.

Lisa P. Jackson,

Administrator.

■ 40 CFR part 450 is added as follows:

PART 450—CONSTRUCTION AND DEVELOPMENT POINT SOURCE CATEGORY

Subpart A—General Provisions

Sec.

450.10 Applicability.

450.11 General definitions.

Subpart B—Construction and Development Effluent Guidelines

450.21 Effluent limitations reflecting the best practicable technology currently available (BPT).

450.22 Effluent limitations reflecting the best available technology economically achievable (BAT).

450.23 Effluent limitations reflecting the best conventional pollutant control technology (BCT).

450.24 New source performance standards reflecting the best available demonstrated control technology (NSPS).

Authority: 42 U.S.C 101, 301, 304, 306, 308, 401, 402, 501 and 510.

Subpart A—General Provisions

§ 450.10 Applicability.

(a) This part applies to discharges associated with construction activity required to obtain NPDES permit coverage pursuant to 40 CFR 122.26(b)(14)(x) and (b)(15).

(b) The provisions of § 450.22(a) do not apply to discharges associated with interstate natural gas pipeline construction activity.

(c) The New Source Performance Standards at § 450.24 apply to all new sources and are effective February 1, 2010.

(d) The BPT, BCT and BAT effluent limitations at § 450.21 through 450.23 apply to all sources not otherwise covered by paragraph (c) of this section and are effective February 1, 2010.

§ 450.11 General definitions.

(a) *New Source.* New source means any source, whose discharges are defined in 40 CFR 122.26(b)(14)(x) and (b)(15), that commences construction activity after the effective date of this rule.

(b) [Reserved]

Subpart B—Construction and Development Effluent Guidelines

§ 450.21 Effluent limitations reflecting the best practicable technology currently available (BPT).

Except as provided in 40 CFR 125.30 through 125.32, any point source subject to this subpart must achieve, at a minimum, the following effluent limitations representing the degree of effluent reduction attainable by application of the best practicable control technology currently available (BPT).

(a) *Erosion and Sediment Controls.* Design, install and maintain effective erosion controls and sediment controls to minimize the discharge of pollutants. At a minimum, such controls must be designed, installed and maintained to:

(1) Control stormwater volume and velocity within the site to minimize soil erosion;

(2) Control stormwater discharges, including both peak flowrates and total stormwater volume, to minimize erosion at outlets and to minimize downstream channel and streambank erosion;

(3) Minimize the amount of soil exposed during construction activity;

(4) Minimize the disturbance of steep slopes;

(5) Minimize sediment discharges from the site. The design, installation and maintenance of erosion and sediment controls must address factors such as the amount, frequency, intensity and duration of precipitation, the nature of resulting stormwater runoff, and soil characteristics, including the range of soil particle sizes expected to be present on the site;

(6) Provide and maintain natural buffers around surface waters, direct stormwater to vegetated areas to increase sediment removal and maximize stormwater infiltration, unless infeasible; and

(7) Minimize soil compaction and, unless infeasible, preserve topsoil.

(b) *Soil Stabilization.* Stabilization of disturbed areas must, at a minimum, be initiated immediately whenever any clearing, grading, excavating or other earth disturbing activities have permanently ceased on any portion of the site, or temporarily ceased on any portion of the site and will not resume for a period exceeding 14 calendar days. Stabilization must be completed within a period of time determined by the permitting authority. In arid, semiarid, and drought-stricken areas where initiating vegetative stabilization measures immediately is infeasible, alternative stabilization measures must be employed as specified by the permitting authority.

(c) *Dewatering.* Discharges from dewatering activities, including discharges from dewatering of trenches and excavations, are prohibited unless managed by appropriate controls.

(d) *Pollution Prevention Measures.* Design, install, implement, and maintain effective pollution prevention measures to minimize the discharge of pollutants. At a minimum, such measures must be designed, installed, implemented and maintained to:

(1) Minimize the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other wash waters. Wash waters must be treated in a sediment basin or alternative control that provides equivalent or better treatment prior to discharge;

(2) Minimize the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste and other materials present on the site to precipitation and to stormwater; and

(3) Minimize the discharge of pollutants from spills and leaks and implement chemical spill and leak prevention and response procedures.

(e) *Prohibited Discharges.* The following discharges are prohibited:

(1) Wastewater from washout of concrete, unless managed by an appropriate control;

(2) Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds and other construction materials;

(3) Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance; and

(4) Soaps or solvents used in vehicle and equipment washing.

(f) *Surface Outlets.* When discharging from basins and impoundments, utilize outlet structures that withdraw water from the surface, unless infeasible.

§ 450.22 Effluent limitations reflecting the best available technology economically achievable (BAT).

Except as provided in 40 CFR 125.30 through 125.32, any point source subject to this subpart must achieve, at a minimum, the following effluent limitations representing the degree of effluent reduction attainable by application of the best available technology economically achievable (BAT).

(a) Beginning no later than August 2, 2010 during construction activity that disturbs 20 or more acres of land at one time, including non-contiguous land disturbances that take place at the same time and are part of a larger common plan of development or sale; and no later than February 2, 2014 during construction activity that disturbs ten or more acres of land area at one time, including non-contiguous land disturbances that take place at the same time and are part of a larger common plan of development or sale, the following requirements apply:

(1) Except as provided by paragraph (b) of this section, the average turbidity of any discharge for any day must not exceed the value listed in the following table:

Pollutant	Daily maximum value (NTU)[1]
Turbidity	280

[1] Nephelometric turbidity units.

(2) Conduct monitoring consistent with requirements established by the permitting authority. Each sample must be analyzed for turbidity in accordance with methods specified by the permitting authority.

(b) If stormwater discharges in any day occur as a result of a storm event in that same day that is larger than the local 2-year, 24-hour storm, the effluent limitation in paragraph (a)(1) of this section does not apply for that day.

(c) *Erosion and Sediment Controls.* The limitations are described at § 450.21(a).

(d*) Soil Stabilization.* The limitations are described at § 450.21(b).

(e) *Dewatering.* The limitations are described at § 450.21(c).

(f) *Pollution Prevention Measures.* The limitations are described at § 450.21(d).

(g) *Prohibited Discharges.* The limitations are described at § 450.21(e).

(h) *Surface Outlets.* The limitations are described at § 450.21(f).

§ 450.23 Effluent limitations reflecting the best conventional pollutant control technology (BCT).

Except as provided in 40 CFR 125.30 through 125.32, any point source subject to this subpart must achieve, at a minimum, the following effluent limitations representing the degree of effluent reduction attainable by application of the best conventional pollutant control technology (BCT). The effluent limitations are described at § 450.21.

§ 450.24 New source performance standards reflecting the best available demonstrated control technology (NSPS).

Any new source subject to this subpart must achieve, at a minimum, the following new source performance standards representing the degree of effluent reduction attainable by application of the best available demonstrated control technology (NSPS): The standards are described at § 450.22.

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