

CECW-EC

DEPARTMENT OF THE ARMY  
U.S. Army Corps of Engineers  
Washington, DC 20314-1000

\*ER 1110-2-8154

Regulation  
No. 1110-2-8154

31 May 2018

Engineering and Design  
WATER QUALITY MANAGEMENT

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## CHAPTER 1

### General Provisions

1-1. Purpose. The purpose of this regulation is to provide direction for the water quality management of U.S Army Corps of Engineers' (Corps) Civil Works projects.

1-2. Applicability. This regulation applies to Headquarters, U.S. Army Corps of Engineers (HQUSACE) elements, major subordinate commands, districts, centers, and Field Operating Activities having civil works responsibilities.

1-3. Distribution Statement. This publication is approved for public release; distribution is unlimited.

1-4. References. References are at Appendix A.

1-5. Discussion.

a. This regulation provides policy and guidance for the management of water resources and operation of Corps civil works projects to ensure applicable environmental compliance and protection of the nation's air, water, and land resources.

b. The Corps commitment to environmental compliance and protection of estuaries, rivers, lakes, and navigable waters arises from the national policy and directives expressed in many Federal statutes, Executive Orders, and Corps environmental regulations. These regulations are designed to minimize pollution, maximize recreation, protect aesthetics, preserve natural resources, and promote the comprehensive planning and use of water bodies to enhance the public interest rather than private gain. Therefore, the Corps, in the design, construction, management, operation, and maintenance of its facilities, will exert leadership within existing authorities and appropriations in the nationwide effort to protect, enhance, and sustain the quality of the nation's resources. It is Corps policy to comply with the requirements of the Clean Water Act and not to degrade existing water quality conditions to the maximum extent that is practicable, consistent with project authorities, Federal legal and regulatory requirements, the public interest, and water control manuals.

## CHAPTER 2

### Introduction

2-1. Introduction. The purpose of this regulation is to establish a policy for the water quality management program of the Corps civil works projects. The Corps operates a water quality management program to ensure that all applicable state and federal water quality standards are met, water quality degradation of Corps resources is avoided or minimized, and project responsibilities are attained. Project responsibilities are defined by project authorizations, authorized project purposes, and applicable regulatory requirements.

#### 2-2. Authorities.

a. The Corps water quality management requirements derive from the Federal Water Pollution Control Act of 1948 and its amendments, including the Clean Water Act of 1977 and the Water Quality Act of 1987. The Clean Water Act of 1977 strongly affirms the Federal interest in water quality and recognizes, preserves, and protects the primary responsibility and rights of states “to prevent, reduce, and eliminate pollution.” When permitted by Federal supremacy and when not specifically exempted by the President, Executive Order 12088 (Federal Compliance with Pollution Control Standards), 13 October 1978, provides that each Federal agency is responsible for compliance with applicable pollution control standards in the same manner as any non-Federal entity.

b. The Corps water quality management requirements are contained in specific project authorizations and other enabling legislation. When making water resource decisions, the Corps must be cognizant of the impact of such decisions on water quality and authorized project purposes.

c. The Corps environmental management responsibilities including water quality can be found within the Water Resources Development Acts (WRDAs) of 1974, 1986, 1990, 1992, 1996, 2007, and 2016; the Water Resources Reform and Development Act (WRRDA) of 2014; and the River and Harbor and Flood Control Act of 1970, as amended, as well as other statutes. These statutes strongly affirm a Federal interest in environmental management.

#### 2-3. Policy.

a. The Corps commitment to environmental compliance and protection of estuaries, rivers, lakes, and other navigable waters arises from directives in many Federal statutes, Executive Orders, and the Corps environmental regulations. These regulations are designed to minimize pollution, maximize recreation, protect aesthetics, preserve natural resources, and promote the

comprehensive planning and use of water bodies to enhance the public interest. Therefore, the Corps, in the design, construction, management, operation, and maintenance of its facilities, will exert leadership within existing authorities and appropriations in the nationwide effort to protect, enhance, and sustain the quality of the nation's water and land resources. Federal facilities must comply with all applicable Federal, state, and local requirements in the same manner and extent as other entities. The Corps water quality management responsibilities are responsive to the overall objectives established in the Clean Water Act (see Engineer Manual (EM) 1110-2-3600) to restore and maintain the chemical, physical, and biological integrity of the nation's waters and the laws, regulations, and Executive Orders listed in Appendix A.

b. The Corps policy is to be a leader alongside other Federal agencies, and the states, in carrying out the goals and objectives of the Clean Water Act and other Federal environmental statutes by managing the nation's water resources that are under the Corps jurisdiction and control so that they are maintained and restored. As stewards of water resources, the Corps has implemented policy to comply with water quality standards implemented under the Clean Water Act, and seeks not to degrade water quality and environmental resources owned, controlled, regulated, and/or operated by the Corps to the maximum extent practicable, consistent with project authorities, water control manuals, and consistent with meeting or exceeding applicable state and local requirements. This position mirrors the goals articulated in the Clean Water Act to maintain and restore the chemical, physical, and biological integrity of the nation's waters. The Corps will sustainably manage project resources to minimize the degradation of aquatic resources, and in cases where degradation has occurred, it is the Corps policy to restore the resource to a biologically productive, diverse, and ecologically robust condition to the extent such projects are authorized or required by Congress. To the maximum extent practicable, existing in-stream water uses and the water quality necessary to protect them will be maintained within waters under Corps jurisdiction and control.

c. The Corps interests are strictly defined by statute, regulation, and policy to extend to specific areas that are influenced by and influencing the water the Corps manages. Because water resource management activities often interact with environments distant from the boundaries of Corps-managed property and are influenced by actions of others also distant from those properties, the Corps must actively pursue a water quality management philosophy committed to collaborating with a wide range of resource organizations, partners, and stakeholders. It is the Corps policy to develop and implement holistic, environmentally sound water quality management strategies for overall water resource management. These strategies must be developed in concert with applicable Federal environmental laws and authorized project purposes. However, the environment will be addressed as equal in value and importance to other project purposes when developing or carrying out management strategies. It is the goal of the Corps to responsibly manage its projects and activities to maximize their water quality potential while protecting health and human resources and maintaining authorized project purposes. The

Corps Environmental Operating Principles and other Corps guidance directs the Corps policy for water resource management activities.

d. Districts are encouraged to program funds for water quality management and environmental restoration of aquatic and upland habitats where permissible by law. Such restoration projects can be initiated using the General Investigation feasibility procedures, which require Congressional authorization and non-Federal cost-sharing partners. Other authorities can be used to restore environmental resources such as Section 1135 of the WRDA of 1986, Section 204 of the WRDA of 1992, Section 206 of the WRDA of 1996, Section 216 of the Flood Control Act of 1970, Section 2031 of the WRDA of 2007, and Section 1030 of the WRRDA of 2014.

#### 2-4. Commitment.

a. Corps water resource projects store, regulate, divert, constrict, or convey surface waters in the United States and its territories. As water moves through the Corps projects, the projects alter the physical, chemical, and biological components of water quality. In achieving their congressionally authorized purposes, Corps projects influence the water quality of a large percentage of the nation's riverine and estuarine environments. Corps water management decisions affect the environmental value and human usefulness of much of the nation's water resources. As such, the Corps has a responsibility, when authorized or required by Congress, to preserve, protect, and where necessary, restore the portion of the environment altered by specific Corps projects. The Corps is fully committed to environmentally sound project management and operation. It is the policy of the Corps that the environment be given equal weight, not simply consideration, in all aspects of project management and the operational decision-making process.

b. The Corps is committed to holistic, watershed, ecosystem-based resource management. This requires a comprehensive understanding of the interactions between the uses and users of the watershed and the impact of Corps activities, as well as impacts caused by non-Corps activities, on the aquatic and upland environment. The continued development and evolution of ecological and water quality management skills within the Corps is essential for the maintenance, protection, and restoration of the resources under the Corps jurisdiction and control. Training opportunities to enable this include Proponent Sponsored Engineer Corps Training courses, workshops, conferences, seminars, webinars, and graduate-level courses and degrees. Understanding the interrelationship of physical, chemical, and biological processes of water resources allows the Corps the opportunity to plan, operate, maintain, and modify projects in ways that provide for sustainable human uses while protecting, restoring, and conserving the ecological sustainability of the resource where permissible or required by law.

c. The water quality management program provides one of the greatest opportunities for the Corps to demonstrate its commitment to environmental leadership, conservation, restoration,

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and stewardship. The Corps demonstrates its leadership role in responsible water resource management by planning, designing, constructing, and operating water projects and associated activities in a manner that realizes project purposes while preserving, protecting, and restoring the ecological integrity of environmental resources. As a result of this approach, the Corps can make substantial contributions toward achieving the nation's goal of ecologically sustainable development. Environmental success should be measured by the Corps overall ability to support a dynamic, self-sustaining ecosystem.

## CHAPTER 3

### Policy for the Water Quality Management Program

#### 3-1. Water Quality Management.

a. Recognizing that both water quality and water control comprise water management (see EM 1110-2-3600, EM 1110-2-1201), divisions and districts must ensure that water quality is integral to their water management programs. Water managers in each district must develop district-specific Water Quality Program Management Plans (WQMPs). These plans should be developed in coordination with staff elements of Engineering, Operations, Planning, Office of Counsel, and other offices as needed.

b. WQMPs must be comprehensively developed by the districts and include identified and regularly prioritized goals and objectives. WQMPs must be designed to comply with applicable Federal, state, and tribal laws and regulations to achieve/maintain water quality targets; to achieve environmentally sustainable overall use of the resource; and should consider area-wide interests that influence, and are influenced by, the water it manages.

c. Lessons learned through water quality program execution will allow for the continual updating of WQMPs and, where appropriate, must be included in each project's Water Control Plan when modified or updated, but not less than every 10 years (Engineer Regulation (ER) 1110-2-240, ER 1110-2-8156). However, opportunities for improving water quality through project operations will be actively pursued by investigating and using existing authorities and flexibilities in water control plans and basin master manuals. When proposed water quality improvements rise to the threshold of deviations from Water Control Plans, approval for deviation must be obtained as per division policy. Where existing flexibilities in Water Control Plans exist, and proposed project water quality improvements do not trigger a deviation to a given project's Water Control Plan, approval authority resides with the district's water management chief or appropriate official.

d. Divisions and districts will adopt and implement the following general water quality management objectives for all Corps water resource projects:

(1) Ensure that water quality affected by district activities and projects, and their operations, are suitable for designated purposes, existing water uses, and public health and safety and comply with applicable Federal, state, tribal, and local laws and regulations, while meeting the purpose and objectives of the water resource development project.



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(2) Establish and maintain a water quality monitoring and data evaluation program that ensures the achievement of water quality management objectives, the evaluation of project performance, an understanding of water quality and associated trends and data essential for real-time modeling systems is available.

(3) In a watershed context, identify existing and potential water quality problems, develop and implement effective operational strategies per applicable Corps authority, and initiate management actions that offset or mitigate those problems.

(4) Integrate water quality considerations into all water control management decisions.

(5) Maintain coordination and communication among division and district elements involved in water quality matters.

(6) Maintain close coordination and, where possible, collaboration with all interested governmental and non-governmental entities about activities that may affect (or be affected) by water quality or water control decisions associated with the Corps projects.

(7) Use an interdisciplinary team approach to develop objectives, establish priorities, and execute water quality management programs and activities.

(8) Develop an understanding and continuing awareness of the water quality factors and processes in the project, its watershed, and in the area influenced by project operation.

(9) Where degraded conditions exist, explore appropriate Corps authority or legal requirements to address the conditions and develop plans to restore or improve water quality conditions as appropriate and feasible. These plans should be coordinated with appropriate Federal, state, tribal, local, and other stakeholders.

(10) Ensure that all Corps water resource activities result in the lowest potential negative impact to the aquatic environment and that they are managed to accentuate their potential to improve conservation and preservation of natural and cultural resources.

(11) Document the water quality management activities of the Civil Works Programs and individual projects to record trends, identify problems and accomplishments, and provide information and guidance.

(12) Recognize that some problems and opportunities demand rapid, timely response. Per applicable emergency delegation authorities, district water managers may be empowered in some

instances to react in a time frame commensurate with the event and with best available information and judgment. Long-term situations allow for more comprehensive study and refined response.

(13) Promote and develop cost-sharing partnerships for water quality monitoring and data collection activities.

(14) To the greatest extent possible, incorporate ecological sustainability and consider system response in all water resource activities.

(15) In a watershed context, pursue collaboration with stakeholders and support education and communication.

(16) Apply, as appropriate, water quality models and/or watershed-based management tools capable of predicting changes in water quality conditions in response to project operations and other water resource management activities. Water quality models and/or watershed-based management tools must be capable of evaluating changes in water quality within an acceptable level of uncertainty.

### 3-2. Water Quality Data Collection Program.

a. A continuing water quality monitoring and data collection program may be necessary for each Corps project. This monitoring and data collection is essential to understand and manage the environmental resources of the Corps water projects and activities effectively. A water quality monitoring and data collection program may also be used to support other water resource related activities, such as ecosystem restoration.

b. Monitoring and data collection activities should be guided by the following general rules:

(1) Monitoring and data collection efforts will be determined on an activity-specific basis. Local conditions, project characteristics, compliance with water quality standards, and program objectives will be used to determine parameters to be monitored, including sampling and analytical methods, frequency and duration of sampling, number and location of data collection stations, and data analysis techniques to be employed.

(2) Program design and sample collection and handling will be accomplished using scientifically sound and commonly accepted procedures. Traditionally, data collection programs focus heavily on physical and chemical data collection to meet applicable regulatory standards and Corps policies (EM 1110-2-1201). While this approach remains prevalent, evolving standards recognize the importance of biological data in assessing overall water quality.

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Biological monitoring programs are encouraged, and are often the most important component of a water quality monitoring and data collection effort. They are particularly useful in identifying pollution spikes or other forms of environmental stress and are often more cost-effective than conventional chemical and physical monitoring. In most cases, an integration of physical, chemical, and biological data is needed to better understand the performance and behavior of projects and activities and their associated ecological response.

(3) When designing and executing monitoring programs, the Corps must consider/evaluate impacts to threatened and/or endangered species and their habitats to identify operational changes that could potentially improve their supporting ecosystems.

(4) Partnering of data collection efforts with other governmental and non-governmental entities is encouraged and often cost-effective. Per applicable laws and guidance regarding the appropriate use of volunteer services, the use of appropriately trained volunteers for observation and data collection is also encouraged.

(5) A quality assurance/quality control program covering all aspects of data collection and analysis is required to ensure that data is valid and reproducible. Analytical procedures accepted by the United States Environmental Protection Agency (USEPA) should be used as appropriate.

(6) Data collection programs must be periodically evaluated and modified, as necessary, to ensure satisfaction of established objectives, eliminate unnecessary sampling, and address changes in priorities and needs. Additional information can be found in EM 1110-2-1201.

(7) To meet the requirements of Section 1135 of the WRDA of 2016 water quality data will be made publicly accessible by transferring appropriate data to the Corps Water Management System (CWMS) and/or the Access to Water website.

### 3-3. Water Quality Monitoring and Data Collection Objectives.

a. Water quality data must be collected, analyzed, and applied to understand and manage water resources effectively. Examples of water quality monitoring and data collection objectives follow:

(1) Assess compliance with applicable Federal, state, and tribal water quality standards.

(2) Provide an adequate, publicly available database for understanding current water quality conditions, identifying trends, identifying problems and solutions, and facilitating coordination with Federal, state, and tribal agencies regarding watershed activities influencing water quality.

- (3) Investigate special problems [such as harmful algal blooms (HABs), fish kills, radionuclides, or other acute or chronic conditions] and design and implement modifications to improve water management procedures.
  - (4) Provide data to support reservoir regulation and other civil works activities, support effective management, manage water quality, and address environmental problems.
  - (5) Provide water quality data required for real-time project operation, which may include regulatory compliance, environmental flow management, and ecological sustainability.
  - (6) Evaluate sediment physicochemical interactions with water quality conditions and their effects on overall water quality.
  - (7) Understand, protect, and restore aquatic and riparian environments and ecosystems.
  - (8) Through training, Community of Practice lessons learned, and close attention to system response, develop and maintain water quality awareness to ensure sound stewardship of environmental resources.
  - (9) Monitor recreational areas and water supplies to ensure public safety and resource integrity.
  - (10) Ensure stormwater, erosion, and sediment control best management practices are designed, constructed, maintained, and functioning per applicable state and local requirements.
  - (11) Collect water quality data to support studies, evaluations, and water resource modeling.
  - (12) Consider spatial watershed relationships or conditions through both short and long term seasonal, annual, and/or multi-annual trends in water quality.
  - (13) Identify/modify water quality data collection requirements to meet evolving management objectives, regulatory requirements, and/or Corps policies.
  - (14) Develop a sufficient data record to document water quality impacts or harm to project purposes and/or resources from external sources.
  - (15) Provide timely response to incidents that could impact project operations and/or resources.
- b. Other objectives or special needs for water quality monitoring and data collection may be identified. Districts must take the initiative in determining data needs, identifying problems

or opportunities, proposing solutions, justifying resources, implementing approved actions, and reporting results.

c. When designing water quality monitoring plans, or developing or revising Water Control Plans, the views of other Federal, state, tribal, and local agencies regarding data needs should be considered per applicable law(s). Every efficiency and opportunity to share data and partner on data collection efforts must be pursued. Coupling water quality data with hydrologic and other environmental data is essential.

### 3-4. Emerging Issues and Management Challenges.

There are multiple relatively new water quality and ecological issues and challenges affecting Corps projects and activities that may require increased awareness, attention, and evaluation. Some examples include environmental flow management, new techniques and approaches for mineral extraction, harmful algal blooms, climate change, invasive species, and non-Federal hydropower development.

a. Environmental Flow Management. The natural flow regime reflects the characteristics of the pre-impoundment condition with unaffected response to a wide range of hydrologic conditions, ranging from flood to drought. It is widely understood that impounding rivers to create reservoirs substantially alters their natural character, including flow, energy, thermal, and sediment regimes. In evaluating the possibility of integrating environmental flow management principles, it must be clearly understood that the Corps must first fulfill its obligated flow requirements per the Congressional authorization for each project, and any existing contractual obligations. Modifications to operations may be evaluated and approved for compliance with the Endangered Species Act and Clean Water Act. The remaining operational flexibilities for seasonal and annual flow management vary from project to project and are defined by operational, statutory, and physical constraints and opportunities and the riverine systems they influence. Opportunities for achieving enhanced water quality and ecological sustainability without incurring deviations from existing Water Control Plans (see ER 1110-2-240) should be explored and pursued wherever possible. Potential authorities supporting environmental flow management include: Section 1135 of the WRDA of 1986, Section 206 of the WRDA of 1996, and Section 1030 of the WRRDA of 2014.

b. New Techniques and Approaches for Mineral Extraction. Mineral extraction activities, including coal mining, conventional and unconventional oil and gas development, and waste disposal have historically exerted, and will continue to exert, pressure on water quantity, water quality, and ecological health across much of the nation's waters, including Corps projects. Mineral extraction activities can potentially compromise human health and safety and the full execution of the purposes of congressionally authorized projects.

c. HABs. Algal blooms occur naturally and typically pose no significant threat. However, certain species of algae can produce toxins. When these species bloom, the event can be characterized as a harmful algae bloom. In the last few years, the incidence of HABs has been increasing in the United States, and more specifically, at Corps projects. HABs can compromise water supplies, recreation, and/or aquatic life, and affected waters can become unfit for human use for weeks or months. Reservoirs are typically more susceptible to HABs, but they have also been reported in free-flowing rivers. There is currently no known control for avoiding or halting HABs. They present a growing concern to the Corps water supply, water quality, recreation, and ecosystem restoration mission areas.

d. Climate Change. Climate change is a significant variation in weather patterns occurring over time. Corps policy requires that climate change adaptation be mainstreamed into all Corps activities to help enhance the resilience of the Corps built and natural water resource infrastructure and to reduce its potential vulnerabilities to the effects of climate change and variability.

e. Invasive Species. Invasive species are non-native plants, fish, and wildlife which, by their introduction, can compete with and threaten the health and existence of native species and their supporting ecosystems. Invasive species often spread and dominate ecosystems due to the absence of natural biological controls that tend to keep native populations in balance. Asian carp, zebra mussels, quagga mussels, and Eurasian water milfoil are examples of non-native aquatic species that may need to be managed on Corps project lands and waterways.

f. Non-Federal Hydropower Development. Hydropower modification involves retrofitting a Corps project with a non-Federal hydropower plant. The development and operation of non-Federal hydropower at Corps Civil Works projects must not interfere with authorized project purposes and Corps water quality and water control interests and responsibilities, nor compromise its structural and operational integrity. This applies to storage impoundments and locks and dams requiring consideration of upstream and downstream impacts as well as cumulative effects.

### 3-5. Reporting.

a. Corps projects and water management activities may impact natural resources in a variety of ways. Corps projects and their mode of operation may influence the quality of the ecosystems, the usefulness of the water resource, and the overall benefit derived from a project and/or water resource management activity. The impacts of projects and their operation may be far reaching in some cases and may have the capacity to affect the environment quite distant from the project. This makes effective monitoring and reporting essential to responsibly manage water resources under the Corps jurisdiction and control. Various types of reports are required to ensure that adequate information is available to HQUSACE, divisions, districts, other agencies,

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and the public. Reports are not limited to reservoir projects, but encompass all civil works activities that influence the physical, chemical, or biological condition of the aquatic and riparian environment.

b. Reports are prepared to meet the following general objectives:

- (1) To provide information needed to manage the water quality program.
- (2) To provide a comprehensive review and understanding of division and district water quality management programs.
- (3) To disseminate information within the Corps to other agencies, academia, the public, and the media.
- (4) To identify potential water quality and ecological research and development (R&D) needs, program R&D resources to meet these needs, and establish new and/or terminate existing R&D programs.
- (5) To evaluate the influence the operation and management of each project and civil works activity has on water quality.
- (6) To document identified water quality opportunities, problems, and solutions.
- (7) To serve as a basis for developing technical guidance.
- (8) To provide a basis for formulation of Corps-wide programs.
- (9) To store institutional knowledge and provide historical documentation.
- (10) To provide feedback needed to improve project planning, design, adaptive management, operations, and maintenance of projects and other water resource activities.

### 3-6. Report Types.

a. Accomplishment of the reporting objectives requires several types of reports. Each type should be tailored to address the specific characteristics of the project and meet the information needs of the report user.

b. The following is a list of report types:

(1) Project-Specific Reports. Project-specific reports provide basic information on all pertinent factors affecting water quality and the aquatic and riparian environment. These reports should be prepared for each project and be updated as needed. These technical reports should contain: a general project description; watershed characteristics; physical project elements affecting water quality; water quality management objectives; water quality monitoring and data collection activities and needs; evaluation of water quality conditions; effect of water control operations on water quality; and a description of the physical, chemical, and biological processes that take place in the project, affect the project, or are affected by the project. The report should comprehensively describe project water quality and the project's impact on water quality. It should identify specific concerns, problems, or opportunities for enhancing water quality and ecological sustainability. Project-specific reports describe historical and current water quality conditions and are developed along the lines of an "owner's manual" for the project. These technical reports are extremely useful to HQUSACE, divisions, and districts. The reports may also be useful to other resource agencies so they can better understand and appreciate the project and its effect and influence on water quality and the environment it affects.

(2) Needs Assessment Reports. Needs assessment reports are similar to project-specific reports and they can often be incorporated into the same document. They describe a project based on its needs and the investment of resources required to attain them. For example, a needs assessment report should identify all the needs of a project related to its water quality and the management thereof. The report should identify problems (sedimentation, eutrophication, watershed management, erosion, fisheries, wetlands, etc.) and their causes, potential solutions to identified problems, and to the extent possible, an estimate of the potential costs and benefits of implementation. The reports are useful for scheduling and allocating funding resources for maximum impact. These reports are primarily for project managers and division and district water control/water quality managers, project operations, environmental and project offices, and interested Federal, state, and local agencies. Needs assessment reports are encouraged for all civil works projects. Care should be taken to ensure that sensitive cost information, which may be contained in these reports, is not distributed to non-Corps offices.

(3) Special Situation Reports. Special situation reports summarize unique events that warrant reporting. Examples include, but are not limited to, fish kills, hazardous waste spills, operational emergencies, and health emergencies. The report must include adequate detail to explain the event, actions taken, monitoring activities, and plans for additional action to address the event and to prevent future occurrences and an indication of whether there will be follow-up reports. These reports are brief, factual accounts of the situation and must be forwarded to division offices and HQUSACE as the situation unfolds. Districts are required to report on the nature and extent of special situations as they occur. Because of their time-sensitive nature, these reports must be completed in an expeditious manner.



(4) **Special Study Reports.** Special study reports are detailed reports that describe a special topic or specific issue and delve in-depth into the significance, character, and potential solutions to the issue. Special study reports are prepared for all activities that affect project operation or water quality performance. Typically, these reports address new operating plans, changes in or new management objectives, modeling results, or other activities that may impact project performance or benefits. These reports should be coordinated with division offices and HQUSACE as appropriate and forwarded for information as soon as they are completed.

(5) **Annual Water Quality Summary Reports.** The annual water quality report summarizes the water quality management program for the past fiscal year and highlights specific project information and activities. Districts are strongly encouraged to prepare summary reports that characterize notable, non-routine water quality issues and observations they encountered throughout the year. The districts should send their annual summary reports to their division offices for review. Division offices should further summarize district reports and compile them into a division-wide annual summary for HQUSACE.

(a) The report summarizes the goals and objectives of each division's overall water quality management program, progress made toward meeting division-wide water quality management goals, and activities that are planned for out years. Other items include changes in technical capabilities in the division and district offices, relationships between water quality and water control management activities, pertinent division regulations, laboratory facilities, data management systems, and training needs. The report will include a discussion of R&D needs, special studies completed or required, water quality coordination with other agencies, scheduling for detailed project evaluations, and problems encountered with contracted work. The divisions should identify any hindrances to meeting their goals and objectives and should propose solutions for removing them. The report should highlight special assistance from the Committee on Water Quality, the Water Operations Technology Support Program, the Corps laboratories, and/or HQUSACE. Other information may also be required by HQUSACE.

(b) The report should provide a summary of water quality conditions, problems encountered and how those problems were addressed, opportunities identified and how those opportunities were addressed, and innovative techniques used to improve water quality. Special regulation activities, new or modified data collection programs, plans to address identified problems, possible Corps-wide applications of available data (e.g., R&D), and ongoing applied research should also be included. Any changes to basic information, such as project water quality objectives, regulation/operation modifications for water quality, or modifications to sampling programs and objectives, should be summarized. Tabular format is encouraged for summarizing this information.

(c) Division water quality proponents should prepare an annual water quality report for the preceding fiscal year. This report should reach the Headquarters, US Army Corps of Engineers (HQUSACE) water quality proponent by 1 June each year.

(6) HQUSACE water quality proponent should review division reports and may prepare an HQUSACE water quality report summarizing key water quality issues of national significance. This report should be distributed to the divisions, who are responsible for distributing these reports to the districts.

3-7. Funding. Many of the necessary water quality and environmental-related activities for completed projects may be charged to Operation and Maintenance funds. However, special studies for use in the design of specific projects should be funded with planning, engineering, and/or construction funds. Additional opportunities for funding for water quality and ecosystem restoration and protection may be pursued through project authorities and/or the Continuing Authority Program as defined in the previously noted WRDAs and the WRRDA of 2014.

FOR THE COMMANDER:

Appendix  
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RICHARD L. HANSEN  
COL, EN  
Chief of Staff

## APPENDIX A

### References

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## GLOSSARY

### Terms and Abbreviations

<u>Term</u>	<u>Definition</u>
A2W	<a href="#">Access to Water Website</a>
CECW	Directorate of Civil Works, U.S. Army Corps of Engineers
Corps	U.S. Army Corps of Engineers
CWMS	Corps Water Management System
EM	Engineer Manual
ER	Engineer Regulation
FWPCA	Federal Water Pollution Control Act
HQUSACE	Headquarters, U.S. Army Corps of Engineers
PL	Public Law
PROSPECT	Proponent Sponsored Engineer Corps Training
QA/QC	Quality Assurance/Quality Control
U.S.	United States
USACE	U.S. Army Corps of Engineers
USEPA	United States Environmental Protection Agency
WQMP	Water Quality Program Management Plan
WRDA	Water Resources Development Act
WRRDA	Water Resources Reform and Development Act

## GLOSSARY

### Terms

<b>Term</b>	<b>Definition</b>
Best management practices (BMPs)	Techniques, measures, or structural/non-structural controls used for a given set of conditions to manage the quantity and improve quality of water in the most practical and cost-effective manner.
Civil Works activities	Corps projects, studies, events, partnerships, and facilities potentially impacting water quantity/quality and ecosystem sustainability.
Ecological sustainability	The capacity of ecosystems to perform their essential processes and functions and to support and maintain a healthy natural diversity of biotic communities.
Environmental flow management	Replicating, where constraints and opportunities allow, aspects of the natural, or pre-impoundment, flow regime of a given riverine system via management of Corps facilities to improve overall ecological function and sustainability. Environmental flow management may include both operational and/or structural modification of Corps facilities.
Environmental management	The attempt to ensure the sustainability of the resource for future generations.
Harmful algal blooms (HABs)	Algal blooms composed of phytoplankton known to naturally produce biotoxins. They can occur when certain types of microscopic algae grow quickly in water, creating biochemical conditions that may harm the health of the environment, plants, or animals. HABs can occur in marine, estuarine, and fresh waters.
Project	Corps water resource engineering facilities, such as locks, dams, levees, reservoirs, navigation channels, etc.
Water	The surface and ground waters of the United States and its territories and protectorates, including fluvial, estuarine, and coastal waters.
Water management	The management of water resources by the Corps to meet congressionally authorized purposes in compliance with all applicable laws and regulations, including applicable environmental laws.

<b>Term</b>	<b>Definition</b>
Water Control Plan	Chapter 7 in the Water Control Manual (see ER 1110-2-8156).
Water quality	The physical, chemical, biological, and radiological characteristics of surface and ground water affecting abiotic and biotic conditions and interrelationships.
Water quality benefit	Outcome resulting from the effective management of water resource systems that serve to conserve, enhance, and protect the full spectrum of human and ecosystem needs.
Water Quality Program	The management of water resources by the Corps to improve, restore, conserve, and protect the physical, chemical, biological, and radiological quality of the water for natural and human use.
Water resource management	Processes that promote the coordinated development and use of water, lands, and related resources to sustainably support economic, social, and ecological systems.