COLORADO™

HANDBOOK

Colorado Water Supply Planning and Permitting

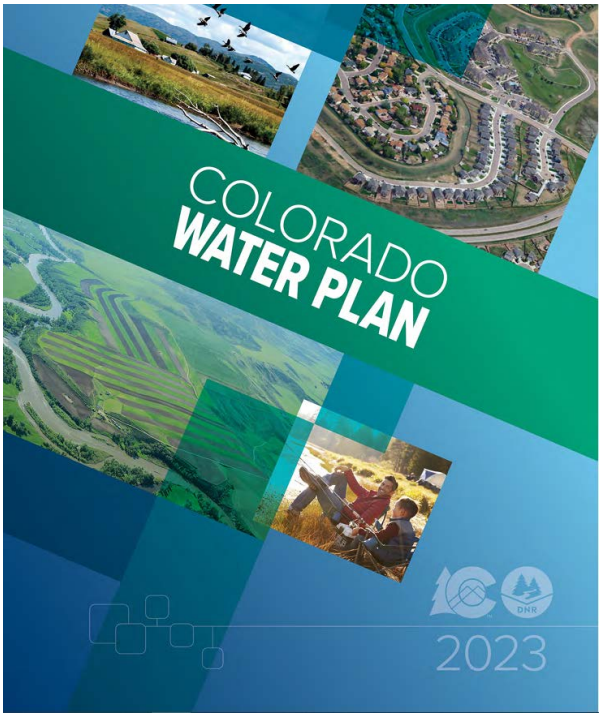
October 2017

This page left blank intentionally

Contents

1. Introduction

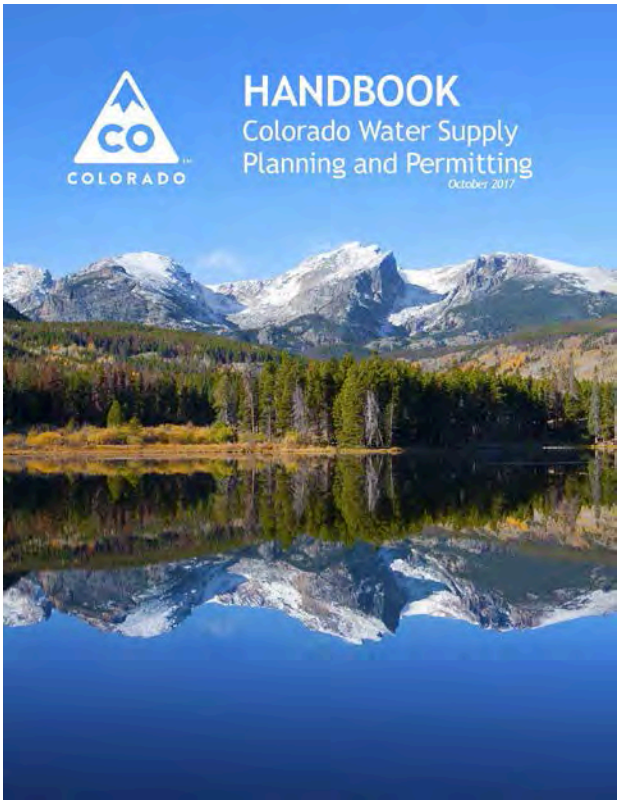
Colorado Water Plan



The Colorado Water Plan details numerous actions needed to secure Colorado's water future in a way that supports municipalities, agriculture and the environment and recreation. One important recommendation in the 2015 plan led to the development of this handbook- also referenced in the 2023 Colorado Water Plan. The handbook aims to improve efficiency and coordination of the water supply permitting process. In response to the 2015 Colorado Water Plan recommendation, the State of Colorado and the U.S. EPA, Region 8, jointly convened a facilitated meeting to identify how to make water supply permitting more efficient. Representatives from state, local and federal agencies, water utilities, environmental groups, and other stakeholder groups shared their individual experiences with large water supply project planning and permitting in Colorado. The discussion was facilitated using a structure called Lean (or process improvement) which is a set of principles and methods to improve customer experience by identifying and eliminating waste from the process. The Lean event and outcomes primarily focused on the initial stages of the water supply planning and permitting process – more specifically on initiating the National Environmental Policy Act (NEPA) and scoping for a water supply project. Given the length and complexity of the entire planning and permitting process, the group agreed that improvements early in the process had the greatest opportunity to create efficiencies that would span the entire process. As a result, outcomes from the Lean event focused on creating efficiencies in the water supply planning and permitting process by increasing communication and cooperation across federal, state and local regulators. This handbook is a result of the Lean event and is intended to provide initial guidance to entities planning to meet a specific water supply need in Colorado. Some options to meet a water supply need may have enormous infrastructure, environmental, and legal complexities necessitating detailed planning and technical analyses to adequately address federal, state and local requirements. This handbook is intended to help project proponents and contractors incorporate regulatory requirements into initial water supply planning phases long before permitting requests are submitted, ensuring projects are developed to meet requirements and take into consideration statewide visions as described in the Colorado Water Plan. Following the guidance in this handbook is not a guarantee that any particular permit will be granted, that the process will be simple, or that the project won't need changes to meet requirements or other objectives. This handbook does not create any right or benefit, substantive or procedural, enforceable by law or equity. Rather, this handbook provides a road map to help project proponents better understand planning and permitting requirements and how to coordinate directly with agencies to achieve greater efficiency and predictability in the process. This handbook can also be a reference document when deciding methodologies for water quality characterizations, identifying data gaps and conducting impacts analyses.

Project permitting is more likely to remove inefficiencies, delays, and re-work if project proponents contact and involve all agencies and relevant stakeholders early in the process. Ideally, this occurs as the water supply need is identified and before specific project alternatives are determined. Because technical issues are complex, project proponents and appropriate agencies should encourage the participation of relevant agencies, either informally in technical meetings or within any formal cooperating agreements. Participation by other agencies may help develop a technically sound and comprehensive environmental impact analysis. If needed, that analysis could eventually be used for permitting requirements of more than one agency. Project proponents are encouraged to become familiar with applicable rules and regulations referenced throughout this handbook.

Overview



Water supply projects require detailed planning and analyses.

Understanding the regulatory processes upfront can result in efficiencies.

Many water bodies in Colorado have existing water quality problems, are over-allocated, and have degraded channel, riparian and flow conditions. Consequently, some rivers, streams, lakes, and wetlands have lost much of their resiliency to recover from additional impacts. A relatively small project today, with seemingly minor impacts, is likely to have a greater impact than the same project would have had when the water body was less stressed. An added complication is that the mitigation of impacts from new projects is likely more complex and expensive than would have been for comparable actions 30 years ago. Given the value and current condition of water resources and the expectation that water supply projects serve many uses, thoughtful and robust planning and assessment of effects on impacted waters help inform decisions that affect the long-term future of Colorado.

This handbook describes key steps in the water supply planning and permitting process and also includes a number of helpful tips and guidance:

- **Chapter 2** describes principles to guide initial planning efforts.
- **Chapter 3** describes various federal, state, and local regulations, their triggers and other processes that may apply to water supply projects in Colorado.
- **Chapter 4** provides a timeline and details possible efficiencies gained when applicants integrate planning, NEPA and the Clean Water Act Section 404 permitting process.
- **Chapter 5** focuses on typical water quality impacts considered in the NEPA, and Clean Water Act Sections 404 and 401 reviews.
- **Chapter 6** provides guidance for consistent assessment methodologies that may reduce duplicative efforts among agencies.

2. Initial planning

The Colorado Water Supply Lean Event identified several best practices in the earliest stages of project planning that could help avoid common pitfalls. Once the project proponent determines a water supply project is needed, three principles should guide the planning process.

1. Understand and incorporate regulatory planning and permitting requirements early

The project proponent should incorporate federal, state, and local requirements in the earliest stages of the project planning process. By following these requirements at the front end, before major investments are made in a particular design, proponents can reduce the possibility of making major investments in a project that may not be eligible for one or more permits. When regulatory requirements are not considered until after a project is planned, that planning can lead to analyses and outcomes that do not fully comply with federal, state or local regulations. Incorporating required planning process steps and permit information needs at the front end can decrease costs associated with re-work, reduce legal vulnerabilities, build community support, and thereby provide a more efficient planning process.

The required planning and permitting process for each water supply project may vary depending on what federal, state or local agencies have regulatory authority over the project. For example, if a project requires a federal permit such as a Clean Water Act 404 permit, a Federal Energy Regulatory Commission (FERC) permit, is located on federal lands, or will use federal funds, it will require compliance with NEPA in addition to other applicable regulatory requirements. It is therefore, both important and useful to work with local, state and federal agencies up front to identify the specific planning and permitting requirements for each proposed project or each project alternative.

2. Combine water supply planning with community environmental expectations

Plans for a sustainable water supply project that identify and protect environmental resources may raise fewer concerns during project review. Non-governmental organizations (non-profit groups) can help identify potential environmental issues and alternatives to meet the water supply need if they are engaged early in planning. Early engagement of stakeholders and consideration of project impacts may also help with the development of less impacting alternatives that meet the water supply need. This, in turn, can help project proponents examine project feasibility and weigh potential costs and mitigation requirements for impacts associated with the project alternatives. Early engagement may allow the project proponent to predict and resolve costly and time consuming conflicts that otherwise might not emerge until late in the project development process.

3. Include statewide goals, conservation and reuse measures to reduce demand across all alternatives and minimize impacts on the environment

Colorado Water Plan identified water conservation and reuse as one of several foundational elements in water supply management. A rigorous, meaningful, quantitative, and transparent analysis of the array of conservation measures the proponent has put in place and/or is committed to implementing is important to justify the need for a project that is intended to address a gap in water supply. Robust analyses and commitments to conserve water will reduce questions about the need for potentially costly infrastructure that impacts the environment.

Avoiding and minimizing impacts to aquatic resources are basic steps in Clean Water Act Section 404 permitting requirements; as such, rigorous conservation measures help demonstrate how the project proponent's planning has considered and worked to avoid and minimize impacts to aquatic resources prior to developing additional supply options. If not considered at the project purpose stage, water efficiency measures can also be considered an alternative form of supply, either alone, or in combination with other alternatives. It is preferable to reduce demand at the project purpose stage by applying rigorous water efficiency measures before structural or storage options are developed.

Increased conservation, reuse, and better integration of land use and water planning will help maintain a healthy environment, promote livable and sustainable cities and preserve agricultural production into the future.

In 2010, the Colorado General Assembly adopted HB10-1051 which requires covered entities (water providers that deliver 2,000 acre-feet or more of water annually) to have a state approved water efficiency plan and to report annual water use and conservation data to be used for statewide water supply planning. Though a framework to plan for and implement water conservation measures is beyond the scope of this handbook, the Colorado Water Conservation Board has compiled a compendium of best practices and a guidance document for water efficiency plans among other information sources to plan for and implement water conservation measures.[1]

Chapter 2 helpful hints summary

The following planning recommendations are advice for anyone considering a water supply project:

- Start the planning process without preconceptions about how a water supply need will be met. Identify the proposed action and alternative actions in a way that is consistent with potential regulatory processes.
- Before designing a project, involve all agencies in the earliest stages of planning to understand their roles and potential regulatory requirements and the data that will be needed for potential permitting.
- Involve community and non-governmental agency stakeholders.
- From the beginning, consider how to minimize environmental impacts.
- Consider a range of reasonable infrastructure, operations and water source options that can meet the purpose and need, are practicable and have the least adverse effect on the environment.

[1] cwcb.state.co.us

3. NEPA, permitting and other agency involvement

3.1 - National Environmental Policy Act (NEPA)

The purpose of NEPA is stated in the preamble to the statute:

> ***"To declare a national policy which will encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; to enrich the understanding of the ecological systems and natural resources important to the Nation; and to establish a Council on Environmental Quality." (NEPA, 1969)***

The NEPA process ensures that federal agencies consider impacts of their actions on the human environment prior to undertaking any major federal action (40 CFR Parts 1500-1508). Major federal actions include projects with potential significant environmental effects that may involve federal funding, occupy federal lands, and/or require work performed by the federal government or permits issued by a federal agency.

Determination of the lead agency

When a project involves a major federal action significantly affecting the quality of the human environment, the federal agency with the authority to take action is required by NEPA and the Council on Environmental Quality regulations to evaluate environmental impacts as part of its planning and decision-making process prior to making a decision on any such action. If there is more than one federal agency with funding for or regulatory authority over an action or involved in a group of actions directly related to each other because of their functional interdependence or geographical proximity, those agencies will determine by letter or memorandum which agency will be the lead agency and which will be cooperating agencies (40 CFR Parts 1501.5, 6). Federal, state, or local agencies, including at least one federal agency, may also act as joint lead agencies in preparing an environmental impact statement (40 C.F.R. Part 1501.5).

For example, the Windy Gap Firming Project required a Clean Water Act Section 404 permit for the construction of a new dam. The entire project was under the authority of the Bureau of Reclamation due to the requirement of a special use permit and contract with the Bureau of Reclamation to connect to and utilize their Colorado-Big Thompson Project facilities. The Bureau of Reclamation rather than the U.S. Army Corps of Engineers was the lead federal agency.

In another example, the proposed alternative in the Halligan Water Supply Project would require Bureau of Land Management authorization to flood part of a small tract of land managed by the agency and a Clean Water Act Section 404 permit (issued by the U.S. Army Corps of Engineers) to enlarge the dam on the North Fork of the Cache la Poudre River. The agencies agreed that the impacts to the waters of the U.S. were the greater issue, and the U.S. Army Corps of Engineers would be the lead agency.

Primary requirements of NEPA

The Council on Environmental Quality regulations implementing NEPA require the lead federal agency, along with cooperating agencies, to assess the direct, indirect and cumulative environmental impacts of the proposed action and a range of reasonable alternatives that would meet the purpose and need identified by the lead agency as well as proposed mitigation to address the impacts. These are the primary components of a NEPA environmental analysis.

Impacts must be disclosed in the analysis so the public can understand what may occur under different scenarios and so decision makers have the best available information regarding the environmental impacts of their actions. Accurate scientific analysis, reviews by environmental and engineering experts, and public scrutiny are essential for implementing NEPA. Linking phases in other federal, state or local planning or permitting processes with the parallel NEPA requirements may offer the best opportunity to create efficiencies in the overall permitting process. If the NEPA review, various regulatory reviews and project planning can be aligned, the processes may be more efficient.

Levels of environmental review

Depending on the significance of impacts expected from a project, there are three different levels of environmental review and documentation required by the Council on Environmental Quality regulations: (1) Categorical Exclusion; (2) Environmental Assessment, often referred to as an EA; or (3) Environmental Impact Statement, often referred to as an EIS.

Agencies may determine that some actions do not have significant environmental effects, either individually or cumulatively, unless taken under extraordinary circumstances. These kinds of actions may be considered categorically excluded, which means that preparation of neither an environmental assessment nor environmental impact statement is required. Water supply projects in Colorado are generally not categorically excluded.

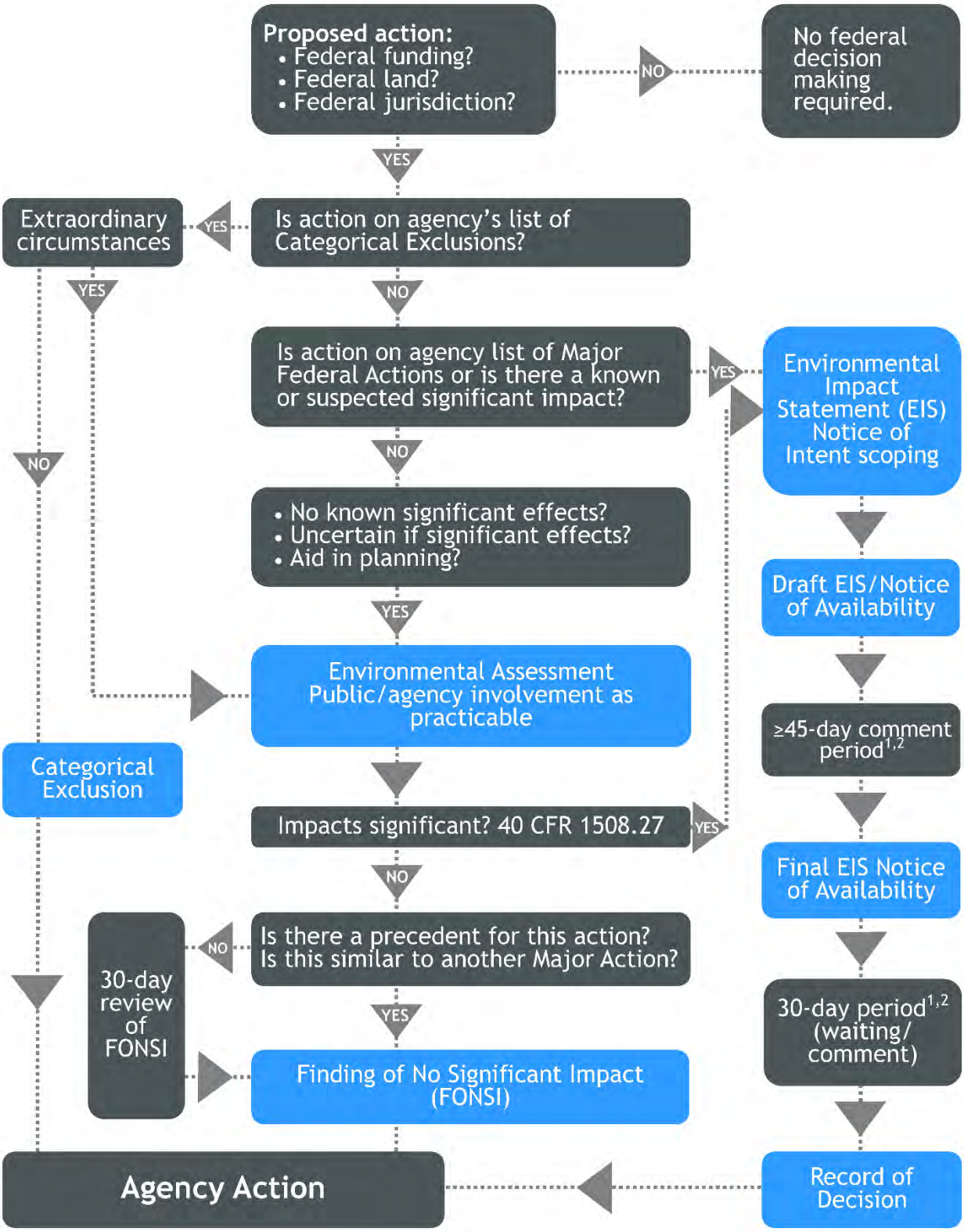
An environmental assessment is a concise public document that briefly provides sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact, the latter often referred to as a FONSI. When an environmental assessment is used to support a finding of no significant impact, a lead federal agency briefly presents the reasons why an action will not have a significant effect on the human environment and therefore why an environmental impact statement will not be prepared.

An environmental impact statement is required when the environmental impacts are expected to be significant. The purpose of an environmental impact statement is to disclose and analyze the environmental impacts of a proposed agency action as well as inform decision makers and the public of reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment. Some small water supply projects in Colorado may only require an environmental assessment, but most are likely to require an environmental impact statement. Projects analyzed through an environmental assessment are typically projects that have temporary or minimal impacts, although each project requires a case-by-case determination. Some recent examples of environmental assessments in Colorado related to water projects include:

- Green Mountain Reservoir Substitution and Power Interference Agreement Environmental Assessment (2008), Proponent- Colorado Springs Utilities; Lead Agency- BOR.
- Old Dillon Reservoir Enlargement Environmental Assessment (2009), Proponent- Summit County, Town of Dillon and Town of Silverthorne; Lead Agency- USFS.
- Upper Colorado River 10825 Project Environmental Assessment (2012), Proponent- Northern Water and 10,825 Water Users; Lead Agency- BOR.

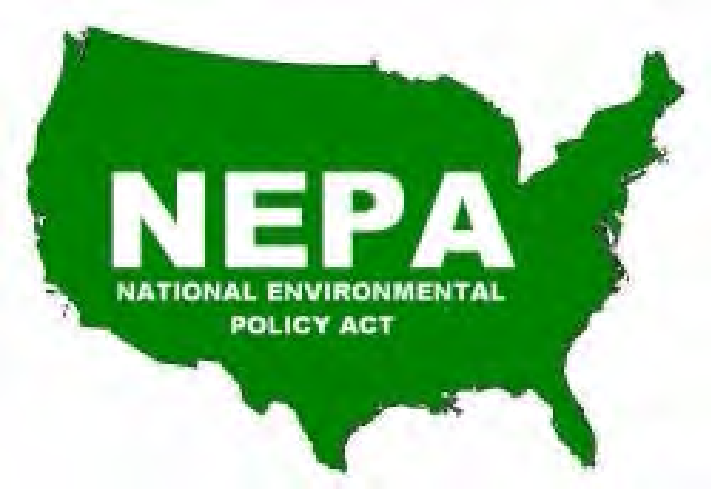
Dillon reservoir – Colorado (Stock image)

Figure 1. Determining the appropriate level of NEPA documentation (with written permission from Environmental Planning Strategies, Inc.)



1. If lead agency changes the analysis in a draft or final EIS so as to change the analysis of environmental impacts/alternatives, the agency should either revise or supplement the document and recirculate it as a draft EIS, exclusive of scoping. 2. Greater than >90 days between draft EIS NOA and publication of Record of Decision.

Through early coordination, the applicable federal agencies can advise the project proponent whether an environmental assessment will be sufficient or if an environmental impact statement will likely be required.[2]



Examples of issues that may be raised when the NEPA document is reviewed by the public, special interest groups, and other federal, state, tribal and local agencies include:

1. Developing a purpose and need statement that artificially narrows the range of possible alternatives to meet the purpose and need.
2. The identification of other alternatives, including those that are less damaging, to meet the identified purpose and need for a project.
3. The process that was used to eliminate alternatives.
4. Types and extent of analyses, such as:
    - Inappropriate screening criteria that artificially constrain the range of alternatives that should be considered.
    - Methodologies insufficient to quantify impacts of the project.
    - Methods used to characterize the magnitude of direct, indirect and cumulative impacts that are not scientifically based or are used inconsistently for all resources.
    - Adequacy of baseline data collection and monitoring.
5. Questions regarding conclusions made from analyses.
6. Questions and/or issues regarding proposed mitigation to offset impacts.

These questions may be accompanied by recommendations such as better documentation of alternatives considered, evaluation of different alternatives, adjusting analytical procedures, using different analytical methods, and/or considering additional or different mitigation. Thorough public and agency involvement **prior to** drafting the environmental impact statement can help avoid delay and expense that may occur if issues are identified later in the process. A project proponent should expect substantial public interest and state or federal agency involvement if the proposed project is complex with potentially significant impacts.

[2] For additional information, a good resource is "A Citizen's Guide to NEPA" http://ceq.hss.doe.gov/nepa/Citizens_Guide_Dec07.pdf or the "Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations" https://energy.gov/sites/prod/files/G-CEQ-40Questions.pdf

3.2 - Clean Water Act Section 404 permit

The Army Corps of Engineers and the EPA jointly implement the Clean Water Act Section 404 Program. Congress gave the Army Corps of Engineers the responsibility to administer Clean Water Act Section 404, and the EPA has an oversight role of the program and develops and interprets the policy, guidance, and environmental criteria used when evaluating Clean Water Act Section 404 permit applications. Water supply projects involving the discharge of dredged or fill material into waters of the U.S. require an Army Corps of Engineers permit issued under Section 404 of the Clean Water Act by the regulatory branch of the appropriate Army Corps of Engineers district. The EPA works with the Army Corps of Engineers to assure that Clean Water Act regulations are met during the pre-application and permitting review processes of some projects.

Waters covered by the Clean Water Act

The Clean Water Act applies to "navigable waters" which are defined in Clean Water Act Section 502(7) as "waters of the U.S.," including the territorial seas. The regulation defining waters of the U.S. is 40 CFR Part 230.3, also found at 33 CFR Part 328.3.

Regulated activities

Discharges of dredged and fill materials are commonly associated with activities such as port development, channel reconstruction and maintenance, transportation improvements, and water resource projects (such as dams, jetties, and levees) (see 40 CFR Part 232.2 and 33 CFR Part 323.2). Fill material is material placed in waters of the U.S. that has the effect of either replacing any portion of a water of the U.S. with dry land or changing the bottom elevation of any portion of a water of the U.S.

Examples of the placement of dredged or fill material associated with water supply projects include but are not limited to:

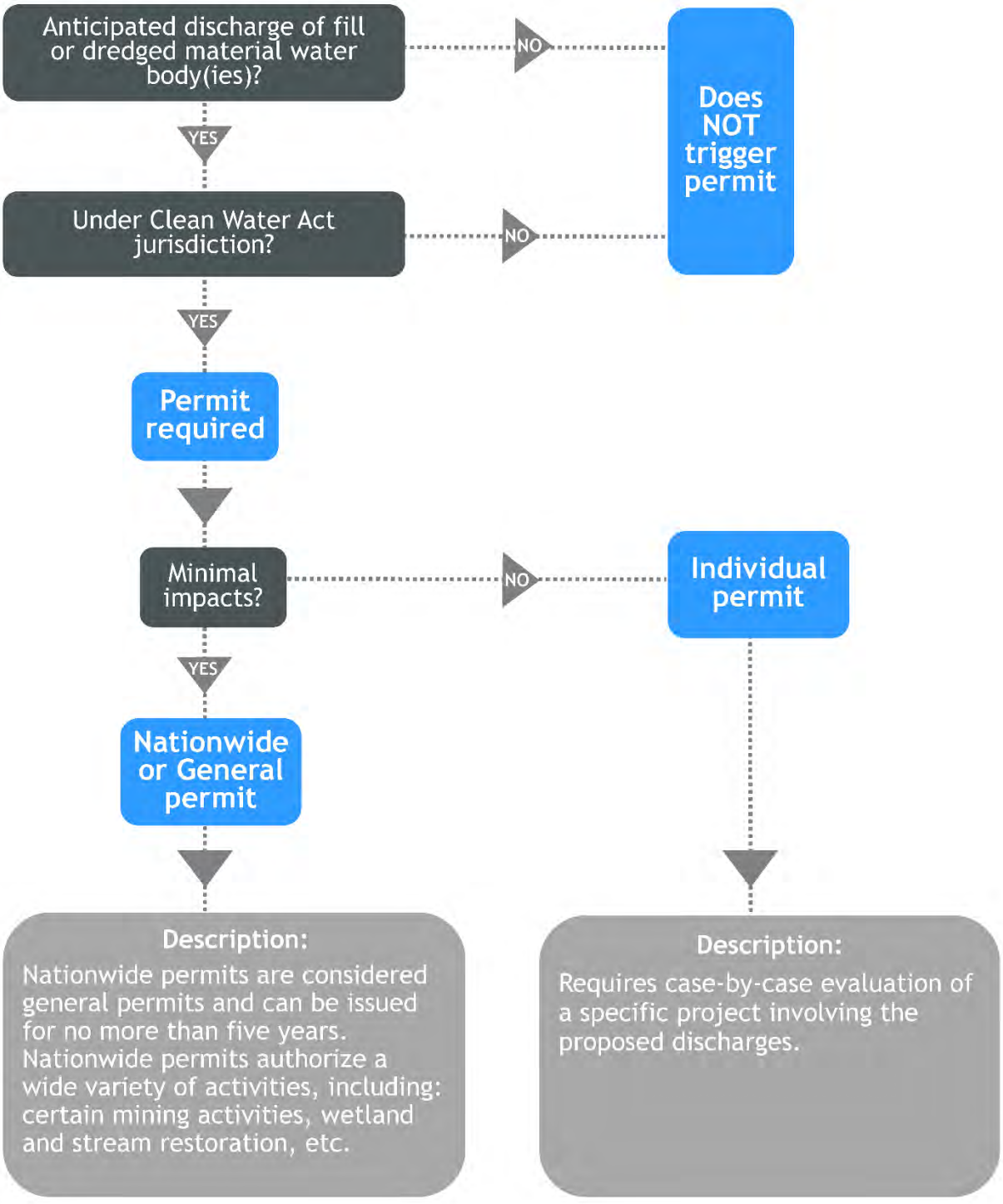
- Crossing a stream with a pipeline where fill needs to be placed into the jurisdictional water.
- Creating new diversion structures in a jurisdictional water.
- Enlarging a dam in a jurisdictional stream or wetland.
- Building a new dam in a jurisdictional water.
- Disposing of material dredged from reservoirs into a jurisdictional water.
- Any other activities needed to construct the project like recreational or maintenance facilities, roads, etc. that would result with fill in a jurisdictional water.

The local Army Corps of Engineers office is the best source of information regarding the need for a Section 404 permit, and project planners are encouraged to contact the office at the earliest possible point in planning for water supply need if it appears there is a possible need for a Clean Water Act Section 404 permit.[3] The Army Corps of Engineers divides regulatory authority in Colorado among three districts, generally based on the geography of the major river basins:

- Omaha District for projects in the South Platte and North Platte River basins.
- Albuquerque District for projects in the Arkansas and Rio Grande River basins.
- Sacramento District for projects west of the Continental Divide.

[3] For more on the Clean Water Act Section 404 dredge and fill permitting program see www.epa.gov/cwa-404/section-404-permit-program and www.usace.army.mil/Missions/Civil-Works/Regulatory-Program-and-Permits/Obtain-a-Permit/

Figure 2: Determining when a Clean Water Act Section 404 permit is needed for a water supply project.



Section 404(b)(1) guidelines

In order to issue a permit, the Army Corps of Engineers must evaluate Clean Water Act Section 404 permit applications in accordance with the Clean Water Act Section 404(b)(1) Guidelines and NEPA and conduct a public interest review. EPA develops and interprets the environmental criteria used in evaluating permit applications. The 404(b)(1) Guidelines are regulations promulgated by the EPA and are the substantive criteria used to evaluate proposed discharges into waters of the U.S. (see 40 CFR Part 230). The Clean Water Act Section 404(b)(1) Guidelines include, among other requirements, four restrictions on discharge (briefly summarized below) that must be met before the Army Corps of Engineers can issue a permit (CFR 40 Part 230.10(a-d)):

1. **Selection of the least environmentally damaging practicable alternative.** Clean Water Act Section 404(b)(1) Guidelines prevent the Army Corps of Engineers from issuing a permit for a particular project if there are other practicable alternatives that meet the need which result in less adverse impacts to the aquatic ecosystem where the Clean Water Act applies. The 404(b)(1) Guidelines also presume that, for non-water dependent activities, there are alternatives available that avoid impacts to special aquatic sites, unless clearly demonstrated otherwise (40 CFR Part 230.10(a)(3)). Special aquatic sites include sanctuaries and refuges, wetlands, mudflats, vegetated shallows, coral reefs, and riffle and pool complexes (40 CFR Parts 230.40 – 230.45).
2. **Compliance with state water quality standards, toxic effluent standards and the Endangered Species Act.** Before the Army Corps of Engineers can issue a permit, the project proponent must demonstrate compliance with other applicable environmental regulations as required under the 404(b)(1) Guidelines. The discharge may not cause or contribute to a violation of water quality standards, violate toxic effluent standards, or jeopardize the continued existence of species listed as endangered or threatened under the Endangered Species Act.
3. **Demonstration that the project does not cause or contribute to significant degradation**. The Army Corps of Engineers must evaluate the direct, secondary (indirect) and cumulative effects, along with proposed mitigation for project related effects, to ensure that the project does not result in significant degradation of aquatic resources.
4. **Documentation of minimization and mitigation efforts.** The project proponent needs to submit information to the Army Corps of Engineers to support a determination that all appropriate and practicable steps have been taken to avoid, minimize and/or compensate for unavoidable adverse effects from the project. The amount and quality of compensatory mitigation may not substitute for avoiding and minimizing impacts. More information on avoiding and minimizing impacts and requirements to compensate for unavoidable impacts can be found in the 2008 Mitigation Rule: Compensatory Mitigation for Losses of Aquatic Resources, 40 CFR Part 230.91(c)(2) or 33 CFR Part 332.1(c)(2)).[4]

The regulations also state that the Army Corps of Engineers must determine **secondary effects** on the aquatic ecosystem. The term secondary is often used interchangeably with the term **indirect effects** by NEPA and Section 404 permitting programs. The Clean Water Act Section 404(b)(1) Guidelines define secondary effects as, "Effects on an aquatic ecosystem that are associated with a discharge of dredged or fill materials, but do not result from the actual placement of the dredged or fill material. Information about secondary effects on aquatic ecosystems shall be considered prior to the time final Section 404 action is taken by permitting authorities" (40 CFR Part 230.11(h)).

[4] www.nap.usace.army.mil/Portals/39/docs/regulatory/regs/33cfr332.pdf.

In order to issue a permit, the Army Corps of Engineers must first determine that the project complies with the provisions of the 404(b)(1) Guidelines and subsequently conclude that the project is "not contrary to the public interest." The public interest review considers many factors including, but not limited to, conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazards, floodplain values, land use, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, consideration of property ownership, and, in general, the needs and welfare of the people (33 CFR Part 320.4). The public interest review involves a weighing and balancing of a wide range of considerations, whereas, the 404(b)(1) Guidelines contain a discrete set of independent tests that must be satisfied for a project to proceed in the permit review process.

Types of Clean Water Act Section 404 permits

General permits

Under Section 404(e) of the Clean Water Act, the Army Corps of Engineers can issue general permits to authorize activities that have only minimal individual and cumulative adverse environmental effects. General permits can be issued for a period of no more than five years. A nationwide permit is a general permit that authorizes a class of activities across the country, unless an Army Corps of Engineers district or division commander revokes the nationwide permit in a state or other geographic region. Currently, the Army Corps of Engineers has numerous nationwide permits, and each authorizes a class of activities such as mooring buoys, residential developments, utility lines, road crossings, mining activities, wetland and stream restoration activities, and commercial shellfish aquaculture activities. There are also several regional general permits that were issued by the Army Corps of Engineers districts that are specific to Colorado. The project proponent should contact the local Army Corps of Engineers office, or check the Army Corps of Engineers' website, for a current list of nationwide and regional general permits.[5]

Flood damage to roads exposed the utility lines in 2013 (photo by Water Quality Control Division staff).

[5] www.usace.army.mil/Missions/Civil-Works/Regulatory-Program-and-Permits/Nationwide-Permits/

Individual permits

If discharges of dredged or fill material to waters of the U.S associated with the project are not covered by a general permit, the impacts would be more than minimal, or the project may be contrary to the public interest, an individual permit is required (CFR 33 Part 32).[6] The Army Corps of Engineers will consider, following initial consultation, whether the project would have the potential for significant adverse impacts, and thus, would involve a major federal action and require preparation of an environmental impact statement. If the Army Corps of Engineers does not believe the proposed project will cause significant environmental impacts, they will wait for a complete application to be submitted and then publish a public notice that describes the project and solicits public comments. After considering any comments received, the Army Corps of Engineers prepares a decision document that contains both the 404(b)(1) analysis, the environmental assessment, and the determination of whether the project is contrary to the public interest. The length and detail of this decision document will vary depending on the complexity and degree of impacts of the proposed action. If the environmental assessment concludes with a finding of no significant impact, then no further evaluation is needed for NEPA. If the Army Corps of Engineers initially believes the proposed project will cause significant environmental impacts or if the environmental assessment does not conclude in a finding of no significant impact, an environmental impact statement must be prepared.

Typically, in response to comments on permit applications and in order to comply with the Army Corps of Engineers permitting requirements, project applicants provide any missing analyses to identify impacts or revise their project designs to avoid, minimize, or compensate for those impacts. These changes may make it possible for a project to be permitted in compliance with the regulations.

The project proponent is responsible for preparing the mitigation plan, while the Army Corps of Engineers determines if it is compliant with the 2008 mitigation rule.[7] The Army Corps of Engineers also determines if the mitigation plan is compliant with the Compensatory Mitigation for Losses to Aquatic Resources Rule. The Army Corps of Engineers (and, in some cases, the EPA) will work closely with the applicant to help prepare a plan that meets the requirements of the mitigation rule. Sections 9 and 10 of the Rivers and Harbors Appropriation Act of 1899 (33 U.S.C. 403; Chapter 425, March 3, 1899; 30 Stat. 1151) are administered by the Coast Guard and the Army Corps of Engineers, respectively. This statute applies in Colorado only to the 39 miles of the Colorado River in Colorado before entering Utah and Navajo Reservoir.

When an environmental impact statement must be prepared for a Clean Water Act Section 404 permit application, the Army Corps of Engineers "Guidance on Environmental Impact Statement Preparation, Corps Regulatory Program (1997)" directs that except in limited circumstances project proponents hire a third-party contractor to prepare the environmental impact statement under the direction of the Army Corps of Engineers. Project proponents may submit their own alternatives and impact analysis to the Army Corps of Engineers but the agency and the third-party contractor will need to review and verify the accuracy and adequacy of that information before using it in the environmental impact statement.

[6] www.gpo.gov/fdsys/pkg/CFR-2011-title33-vol3/pdf/CFR-2011-title33-vol3-part323.pdf

[7] Compensatory mitigation for unavoidable impacts may be required to ensure that an activity requiring a Section 404 permit complies with the Section 404(b)(1) guidelines. The purpose of the 2008 Mitigation Rule (33 CFR Parts 325 and 332) is to establish standards and criteria for the use of all types of compensatory mitigation including: on-site and off-site permittee responsible mitigation, mitigation banks, and in-lieu fee mitigation to offset unavoidable impacts to waters of the United States authorized through the issuance of Department of the Army permits pursuant to Section 404 of the Clean Water Act and Sections 9 (or 10) of the Rivers and Harbors Act of 1899. It was jointly developed by the Secretary of the Army and the administrator of the Environmental Protection Agency to clarify mitigation requirements established under the Army Corps of Engineers and the EPA regulations (33 CFR Part 320 and 40 CFR part 230, respectively).

3.3 - Clean Water Act, 401 water quality certification process – Colorado Department of Public Health and Environment, Water Quality Control Division

Water supply projects that require a federal permit or license may need to obtain Clean Water Act Section 401 water quality certification (401 certification) from the Colorado Department of Public Health and Environment, Water Quality Control Division. A Clean Water Act Section 401 certification is intended to ensure there is reasonable assurance that the activity will be conducted in a manner that will not violate applicable water quality standards. Water supply projects will likely require a Clean Water Act Section 404 permit from the Army Corps of Engineers or a Federal Energy Regulatory Commission license. Correspondingly, 404 permits will require a Clean Water Act Section 401 certification from the Water Quality Control Division. The Water Quality Control Division issues, issues with conditions, or denies Clean Water Act Section 401 certifications for most water supply projects. If it is concluded there is no reasonable assurance that the project for which a federal license or permit is required will comply with all applicable requirements - even with the addition of conditions - the Water Quality Control Division shall deny certification of the license or permit.

INDIVIDUAL

Individual 404 permits require a 401 Water Quality Certification from the Water Quality Control Division.

GENERAL

General or nationwide 404 permits are authorized by the U.S. Army Corps of Engineers without additional action from the Water Quality Control Division.

During a Clean Water Act Section 401 certification process, the Water Quality Control Division assesses chemical, biological and physical data to determine direct and indirect water quality impacts from both the construction and operation of the project. In order for the Water Quality Control Division to certify a project, the applicant must provide reasonable assurance that water quality standards and other applicable criteria will not be exceeded during the life of the project.

It is the responsibility of the project proponent to contact the Water Quality Control Division and submit a complete application for a Clean Water Act Section 401 water quality certification if it required for issuance of an Army Corps of Engineers Clean Water Act Section 404 permit or other applicable federal license or permit. After a complete application has been submitted, the Water Quality Control Division must review and issue a Clean Water Act Section 401 certification as soon as practicable. In Colorado as soon as practicable has been determined as one year. If the Water Quality Control Division has not acted on a complete application after the one-year period, the state certification requirement may be waived.

The Clean Water Act Section 401 water quality certification process consists of several steps:[8]

1. Water quality certification application.
2. Impacts analysis/antidegradation review.
3. Development of conditions.
4. Certification.
5. Appeal process.

[8] https://www.epa.gov/cwa-404/overview-section-401-certification-and-focusing-wetlands Additionally, EPA's handbook on 401 certification can be accessed here: www.epa.gov/cwa-404/clean-water-act-401-handbook-2010

Clean Water Act Section 401 certification application

In order for the Water Quality Control Division to certify a project, the applicant must provide reasonable assurance that water quality standards will not be exceeded during the life of the project. Additional requirements found in Section 82.6, apply to all certifications. In order to assess the reasonable assurance requirement, the Water Quality Control Division must have the following information (if not already provided in the 404 permit application):

- An electronic copy of the Clean Water Act Section 404 permit application, signed by the project proponent.
- Pending the timing (and if available), an electronic copy of the final environmental impact statement and associated record of decision.
- An explanation of the project, in terms of the 404 permit, which could be a stand-alone 401 certification application that describes the impacts analysis.
- Site plans and maps.
- A list and detailed description of all best management practices proposed to mitigate water quality impacts for the preferred alternative. This includes any mitigation or enhancement plans and agreements that relate to the project and are not provided verbatim in the preferred alternative within the final environmental impact statement or record of decision.
- A detailed description of long-term water quality monitoring plans to assess compliance with water quality standards throughout the life of the project.
- Any aquatic life resource reports, water quality reports or other technical documents used in the final environmental impact statement for the preferred alternative not provided verbatim in the document.
- An electronic copy of all raw water quality data and analyses used in the environmental impact statement as well as any additional data to be used in the 401 certification assessment.

Project proponents are encouraged to become familiar with required application components. If the above information is not available at the time of application, the Water Quality Control Division will request the project proponent withdraw the application until the information is available.

Impacts analysis/antidegradation review

Upon receiving a complete Clean Water Act Section 401 certification application, the Water Quality Control Division will determine whether the project will comply with all applicable water quality standards. To do this, the division will work with the applicant to conduct an impacts analysis and antidegradation review.

Impacts analysis

Project impacts will be evaluated to determine if the proposed alternative will cause or contribute to an exceedance of water quality standards for one or more pollutants of concern. If the environmental impact statement followed the assessment methods as defined by the Water Quality Control Commission and Water Quality Control Division, the environmental impact statement may be sufficient for the determination of impacts. If a 401 certification is needed, the Water Quality Control Division will likely be a cooperating agency in the NEPA process and will recommend appropriate methodology to be used in the environmental impact statement. The assessment methods in Colorado are typically revised every two years in the Section 303(d) listing methodology report. Water quality standards are found in Water Quality Control Commission Regulations No. 31 through No. 38.

Where impacts are identified, mitigation requirements (incorporated as conditions in the certification) must be included to offset those impacts as specified in Regulation No. 82, Section 82.5(A)(3). The Water Quality Control Division will assess chemical, biological and physical data to determine direct and indirect water quality impacts from the project. This includes both construction of the project as well as the operation of the project. Impacts from water supply projects often relate to additional diversions that could cause increased temperature in stream, loss of dilution flow that could affect pollutant assimilative capacity downstream and changes in aquatic life habitat.

Antidegradation review

An antidegradation review is focused on potential deterioration of water quality. The Water Quality Control Commission assigns three levels of antidegradation protection. Outstanding waters receive the highest level of protection and the quality of those waters must be maintained at current levels (no degradation). Reviewable waters are high quality waters which receive an intermediate level of protection. Reviewable waters are to be maintained and protected at existing quality unless it is determined that allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located (e.g. based on an analysis that considers whether there are non-degrading or less-degrading alternatives).

Antidegradation review procedures apply to the review of regulated activities with new or increased water quality impacts that may degrade the quality of state surface waters that have not been designated as outstanding waters or use protected waters. “Regulated activities” means any activities which require a discharge permit or water quality certification under federal or state law. The Water Quality Control Division is required to conduct an antidegradation review for reviewable waters (also called undesignated waters in Regulation No. 31) that will be affected by the project’s construction and/or operation to protect them from unnecessary degradation. This is not a requirement for NEPA and is not typically included in an environmental impact statement (but such reviews may be necessary for regulated activities including those requiring a Clean Water Act Section 404 permit or Federal Energy Regulatory Commission license). Regulation No. 31, Section 31.8(3)(a) states, “Where possible, the antidegradation review should be coordinated or consolidated with the review processes of other agencies concerning a proposed activity in an effort to minimize costs and delays for such activities.” The Water Quality Control Division developed its antidegradation review guidance to address impacts of new or increased pollutant loads from point sources. The basic concepts of this guidance are applicable to the Clean Water Act 401 certification process but the actual methodology of calculating assimilative capacity in this guidance is not directly applicable to water supply projects because they generally do not involve point source discharges.

For reviewable (or undesignated) waters, during an antidegradation review, the Water Quality Control Division evaluates whether the project will significantly degrade the quality of the waters when compared to conditions that existed in the year 2000 (as a baseline). Regulation No. 31, Section 31.8(3)(c) defines the baseline year and what constitutes a significant degradation. If the antidegradation review finds that impacts of the project will be significant, mitigation will be required. If mitigation cannot be implemented or if mitigation will not reduce impacts such that there is still significant degradation, the division will evaluate whether the proposed project is necessary to accommodate important economic or social development in the area. If so, water quality degradation will be considered necessary only to the extent that there are no feasible alternatives to the proposed project. If the division finds that the project is not necessary for important economic or social development, certification may be denied. The rules require that a public review process must be followed before the assimilative capacity is completely allocated to a project or permit.

The above analysis is for waters designated as reviewable (or undesignated) waters. As described previously, no degradation is allowed for designated outstanding waters. Finally, no further degradation is allowed for waters on the 303(d) list of impaired waters since these waters have already exceeded water quality standards with no existing additional assimilative capacity.

The steps of the antidegradation review:

1. Calculate the baseline water quality representative of conditions in the year 2000.
2. Calculate assimilative capacity using the baseline water quality and applicable standards.
3. Define cumulative project impacts with the preferred alternative.
4. Conduct the significance determination [Regulation No. 31, Section 31.8(3)(c)]: this significance determination shall be made with respect to the net effect of new or increased water quality impacts of the proposed activity, taking into account any environmental benefits resulting from the activity and any water quality enhancement or mitigation measures impacting the segment or segments under review, if such measures are incorporated with the proposed activity.
5. Conduct an alternatives analysis or review the alternatives analysis included in the environmental impact statement.
6. Determine the necessity for degradation [Regulation No. 31, Section 31.8(3)(d)]: a determination shall be made pursuant to this section whether degradation is necessary to accommodate important economic or social development in the area where waters are located.
7. Determine the social and economic benefits of the project.

Water Quality Control Division staff member collecting data for measurement calculations that will be used in multiple studies and assessments (photo by Water Quality Control Division staff).

Development of conditions

The Water Quality Control Division works with the project proponent to develop conditions to prevent, reduce or mitigate water quality impacts identified during the permitting process and associated exercise of water rights. If the project is certified with conditions, the Clean Water Act Section 404 permit must also include those conditions. The development of a condition for a certification begins with an evaluation of project impacts to water quality. The Water Quality Control Division cannot impose conditions or deny certification when such imposition of conditions or denial would result in material injury to water rights (prohibited under Section 25-8-104 C.R.S.).

The project proponent and Water Quality Control Division work on accurate mapping of impacts and proposed mitigation. The following describes potential conditions that may be applied in 401 certifications:

- Use of adaptive management activities.
- Monitoring requirements, including chemical, biomonitoring, continuous temperature monitoring and habitat.
- Incorporation of fish and wildlife mitigation (and potentially enhancement) plans prepared for the Colorado Parks and Wildlife Commission and Colorado Water Conservation Board in accordance with C.R.S. 37-60-122.2. The Water Quality Control Division and Department of Natural Resources signed a memorandum of agreement that encourages the Water Quality Control Division to participate and advise in the development of the fish and wildlife mitigation and enhancement plans. This agreement also encourages the Department of Natural Resources to participate and advise in the development of 401 ceritifications.
- Incorporation of any local 1041 permits and interagency agreements.

Certification

A draft certification will be issued based on an initial review of the proposed project and related water quality impacts. The Water Quality Control Division is required to publicly notice both the preliminary antidegradation review and draft certification. These findings are published in the Water Quality Information Bulletin[9] for a public comment period of 30 days. All comments received on water quality impacts during the public comment period are forwarded to the project proponent. The Water Quality Control Division reviews all public comments to evaluate and determine if the comment has been adequately addressed in the draft certification, or if additional information/analysis is necessary for the evaluation process and also to determine if changes to the draft certification are necessary.

Certifications are categorized as regular, conditional or emergency. The Water Quality Control Division may issue a regular certification if the project will comply with all applicable requirements if constructed and maintained as designed. The Water Quality Control Division may issue a conditional certification if the project will comply with all applicable requirements if constructed and maintained as designed with one or more conditions placed on the license or permit. Emergency certifications may be granted if the Army Corps of Engineers makes a determination that it will process an application for a Section 404 permit pursuant to its procedures for emergency authorizations. The Water Quality Control Division may issue and emergency certification if it determines that such certification is necessary to preserve public health or welfare. Certifications may also be denied. If the Water Quality Control Division denies a certification, the 404 permit will not be issued and the project/activity will not be allowed.

Appeals

The Clean Water Act 401 certification decision can be appealed to the Water Quality Control Commission as specified in C.R.S. 25-8-302(1)(f); Regulation 21, Section 21.4(A)(2)(d).

[9] www.colorado.gov/cdphe/wq-bulletin

3.4 - State fish and wildlife mitigation plan

The Fish and Wildlife Resources Fund and Authorization (C.R.S. 37-60-122.2), declares that fish and wildlife resources are a matter of statewide concern. Project proponents proposing water diversion, delivery or storage projects should mitigate future impacts on such resources in a manner that is economically reasonable and maintains a balance between the development of the state's water resources and the protection of the state's fish and wildlife resources. A fish and wildlife mitigation plan is required when a project proponent seeks a permit, license, or other approval from the federal government for any water diversion, delivery, or storage facility, with some exceptions as noted in the statute. This process also fulfills the obligations of the Fish and Wildlife Service under the Fish and Wildlife Coordination Act to consult with the appropriate state wildlife agency.

Project proponents are largely in control of this process and must submit a proposed fish and wildlife mitigation plan to the Colorado Parks and Wildlife Commission for review and approval. Before submittal, project proponents are encouraged to discuss and develop consensus on the proposed mitigation with agency staff. It is recommended that the project proponent begin the process to develop mitigation proposals after the release of the draft environmental impact statement using the impacts from the preferred alternative. If the project changes significantly as a result of the final environmental impact statement, the project proponent will need to revisit the fish and wildlife mitigation plan.

Following the submittal and public release of the fish and wildlife mitigation plan by the project proponent, the Colorado Parks and Wildlife Commission has 60 days to respond, unless the response period is extended in writing by the project proponent. If the project proponent and the Colorado Parks and Wildlife Commission reach a mutual agreement, the commission forwards the proposed plan to the Colorado Water Conservation Board and recommends that the Board adopt the plan as the state position on fish and wildlife mitigation actions required by the project proponent at its next meeting. While this has not occurred to date, if the Colorado Parks and Wildlife Commission disagrees with the proposed fish and wildlife mitigation plan, the commission must transmit to the Colorado Water Conservation Board its evaluation of the project's impact on fish and wildlife, its mitigation recommendations, and its analysis of the mitigation plan. (See Colorado Code of Regulations (CCR) 406-16, Regulation No. 1602-1604) The Colorado Water Conservation Board will then determine its position on the fish and wildlife mitigation plan, which then is sent to the governor for final determination of the state's position regarding the fish and wildlife mitigation plan. If the Colorado Water Conservation Board makes modifications or additions to the recommended mitigation plan, the governor has 60 days to affirm or modify mitigation recommendations, resulting in the state position regarding the fish and wildlife mitigation plan.

After adoption, the project proponent submits the fish and wildlife mitigation plan to the lead federal agency. The fish and wildlife mitigation plan is not independently enforceable under state law. Components of the plan may become enforceable if they are included as a term (or condition) of a permit, license, or approval issued by an authorizing agency or if the mitigation plan is included in the record of decision. Other components typically become enforceable through a separate agreement such as a memorandum of understanding or intergovernmental agreement between the applicant and Colorado Parks and Wildlife. Project proponents need to be aware of this and identify how components of the plan may fit within other approval processes such as the 401 certification or the Clean Water Act Section 404 permit. Project proponents are encouraged to include staff from the Water Quality Control Division during water quality discussions to determine how proposed mitigation may also fit within the conditions required under the 401 certification.

If the cost of implementing mitigation recommendations exceeds five percent of the construction costs of the project, the applicant may apply to the Colorado Water Conservation Board for grant funding.

Examples of projects with completed fish and wildlife mitigation plans include the following:

- Southern Delivery System.
- Windy Gap Firming Project.
- Moffat Collection System Project.
- Chatfield Reservoir Reallocation Project.
- Northern Integrated Supply Project.

3.5 - Local government 1041 permit

House Bill 1041 (C.R.S. 24-65.1-101 et seq.), also known as the Areas and Activities of State Interest Act, was enacted in 1974. The bill allows counties and municipalities to regulate a wide variety of areas and development activities, including new or major extensions of water projects.[10] The purpose of the 1041 regulations is to mitigate environmental and socio-economic impacts of a designated matter of state interest. In accordance with statutory requirements, local governments adopt permit procedures and regulations which are tailored to protect the resources and interests of their communities. When adopting 1041 powers, a local government determines the areas or activities of state interest, from the list in the legislation, that they will regulate and subsequently adopts regulations for the community. After a local government designates a matter of state interest in a public hearing, no development in a designated area, and no designated activity can proceed without a local government permit. Development may only proceed if it is in line with 1041 regulations. The activity in the legislation that applies to water supply permitting is "Site Selection/Construction of Major New or Expanded Water/Sewer Treatment System." A list of local governments that have adopted 1041 regulations can be found at www.colorado.gov/dola/colorado-land-use-survey.

Typically, a 1041 permit application for a water project calls for adequate information to assess impacts and determine if the water project will satisfy the criteria in the 1041 regulations. The regulations address concerns such as impacts to wildlife, local government service delivery, land use and the environment. 1041 regulations do not give local governments the power to prohibit water projects. It simply allows local governments to require that a project complies with local regulations before construction begins. If an applicant fails to prove that the project satisfies the regulations, the permit may be denied or conditioned.

An important issue for coordination of water supply projects between local government 1041 permitting with other state and federal requirements is making sure that any studies, data collection and analysis, or other information gathered for permit applications is adequate and appropriate for all permitting authorities. One option for improving coordination among permitting entities when a 1041 permit is required is to make sure the local government is a cooperating agency with other permitting authorities. At a minimum, the project proponent should have a pre-application meeting with the local government early in the process. The project proponent should seek to understand what types of information is required in the 1041 permit application and discuss how the application requirements of other agencies can be used in the 1041 permit application.

Coordination of water supply projects between local, state and federal agencies is paramount for project approval and success (Stock image).

[10] These are often called 1041 regulations, see www.colorado.gov/dola/1041-regulations

3.6 - Endangered Species Act, Fish and Wildlife Coordination Act

The Endangered Species Act[11] [12] directs all federal agencies to conserve endangered and threatened species and use their authorities to further the purposes of the act. Section 7 of the act, interagency cooperation, is the mechanism by which federal agencies ensure the actions they take, including those they fund or authorize, do not jeopardize the existence of any listed species or result in the destruction or adverse modification of their designated critical habitat. Under Section 7, federal agencies must consult with the Fish and Wildlife Service when an action a federal agency funds, authorizes or carries out may effect a listed threatened or endangered species or its designated critical habitat.[13]

Whether or not a federal action is involved, all persons are prohibited by Section 9 of the Endangered Species Act from taking a listed species. Taking is defined as harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, collecting, or attempting to engage in any such conduct; or significant habitat modification that results in the killing or injuring of a threatened or endangered species unless permitted or exempted in accordance with Section 10 of the act.

(Photos by Water Quality Control Division staff)

[11] www.fws.gov/r9esnepa
[12] www.fws.gov/midwest/endangered/permits/hcp/hcp_wofactsheet.html
[13] www.fws.gov/midwest/endangered/section7/section7.html

The Fish and Wildlife Coordination Act requires federal agencies to consult with both the Fish and Wildlife Service and the respective state fish and wildlife agency on potential impacts of a water supply project on fish and wildlife resources. In Colorado, this requirement is largely fulfilled through completion of a state fish and wildlife mitigation plan explained in Section 3.4. The Fish and Wildlife Service must prepare a Fish and Wildlife Coordination Act report, which "provides 1) clear documentation of the proposed project's impacts on fish and wildlife resources and 2) specific recommendations as to the measures that should be taken to conserve those resources."[14]

(Photo by Joe Lewandowski, Colorado Parks and Wildlife)

3.7 - Historic properties

Section 106 of the National Historic Preservation Act of 1966 requires federal agencies to take into account the effects of their undertakings on historic properties, and consult with the appropriate state historic preservation office, Indian tribes, and the Advisory Council on Historic Preservation regarding those effects. Historic properties are properties that are included or meet the criteria for the National Register of Historic Places. If the lead federal agency determines that the project is the type of activity that could affect historic properties, the agency then identifies historic properties in the area of potential effects by reviewing background information, consulting with appropriate parties, searching the National Register, and conducting additional studies and surveys as needed.

If the lead federal agency finds that historic properties are present and would be affected, the agency, in consultation with the state historic preservation office and tribes, makes an assessment of adverse effects on the identified historic properties. If they agree that there will be no adverse effect, the agency proceeds with the project and any agreed upon conditions. If an adverse effect is determined, the parties work together to develop a memorandum of agreement that outlines agreed upon measures to avoid, minimize or mitigate the adverse effects. If there is no agreement on how to resolve adverse effects, the Advisory Council on Historic Preservation helps to resolve differences.[15]

Detailed requirements for the section 106 process are in the regulations promulgated by the National Historic Preservation Act at 36 CFR Part 800.

In Colorado, the responsibilities of state historic preservation office, as described in Section 106 of the National Historic Preservation Act, are handled by the Office of Archaeology and Historic Preservation.[16] Some counties and cities also have laws and regulations protecting historic properties. Projects that would affect historic properties may require permits or approvals from those cities and counties.

[14] More information on the Fish and Wildlife Coordination Act can be found at: www.fws.gov/ecological-services/es-library/pdfs/fwca.pdf

[15] www.achp.gov/106summary.html

[16] www.historycolorado.org/archaeologists/office-archaeology-historic-preservation

3.8 - Land use and other permits

U.S. Army Corps of Engineers

An Army Corps of Engineers[17] permit is required under Section 14 of the Rivers and Harbors Act of 1899 (33 U.S.C. 408) for a project that would alter, use, or occupy an Army Corps of Engineers civil works project or property. If it is determined that the activity does not interfere with public interest or the projects ability to meet its authorized purpose, the permit which is essentially a land use permit, is authorized by the civil works division of the appropriate Army Corps of Engineers district. The permit is subject to NEPA and all other applicable federal environmental laws.

U.S. Bureau of Reclamation

The U.S. Bureau of Reclamation has authority for federal water projects authorized by Congress under the Reclamation Act of 1902 and other project specific authorizations (e.g. Colorado River Project Storage Act). Federal water projects authorized under these acts or that utilize federally-owned reclamation project features for the conveyance and/or storage of project and non-project waters require approval, contracts and other permits from the Bureau of Reclamation. These approvals, contracts and agreements are subject to NEPA and all other applicable federal environmental laws.

U.S. Forest Service

Projects on lands managed by the Forest Service and are part of a national forest or national grasslands require authorization from the Forest Service. The Forest Service also has responsibility for the Cache Le Poudre River National Wild and Scenic River and any potential wild and scenic river or future wild and scenic rivers within lands managed by Forest Service. The Forest Service may be a cooperating agency on projects that are outside of but may impact a national forest, national grasslands, or the Cache Le Poudre River National Wild and Scenic River.[18]

U.S. Bureau of Land Management

Projects on lands managed by the Bureau of Land Management require authorization from the Bureau of Land Management. The Bureau of Land Management also has authority over and manages mineral rights under federal land. The agency may also have retained federal mineral rights under private land and/or be a cooperating agency on projects that are outside of but may impact Bureau of Land Management public land or mineral resources.

National Park Service

Projects within national parks, national monuments, federally managed national historic sites, and national historical parks require authorization from the National Park Service. The National Park Service may also be a cooperating agency on projects that are outside of but may impact national parks, national monuments, federally managed national historic sites and national historical parks.

U.S. Fish and Wildlife Service

Projects within national wildlife refuges require authorization from the Fish and Wildlife Service. The Fish and Wildlife Service may also be a cooperating agency on projects that are outside of but may impact national wildlife refuges.

[17] www.usace.army.mil/Missions/Civil-Works/Section408/

[18] www.fs.fed.us/emc/nepa/

Federal Energy Regulatory Commission

The Federal Energy Regulatory Commission[19] is the agency that licenses hydropower projects. Some water supply projects will include hydropower projects located on waters of the U.S. For these projects a Federal Energy Regulatory Commission license (or relicense) might be required.

U.S. Department of Transportation

The federal Department of Transportation[20] has authority over projects impacting interstate highways and railroads.

State of Colorado entities with land use or other permits:

Colorado Department of Transportation - Authority over projects that may impact state highways. [21]

Colorado Department of Natural Resources, Colorado State Land Board - Projects on state trust land would require authorization or land purchase from the Colorado State Land Board. The Colorado State Land Board may also be a cooperating agency on projects that are outside of but may impact state trust lands.

Colorado Department of Natural Resources, Colorado Parks and Wildlife - Projects within Colorado state parks or state wildlife areas require authorization from Colorado Parks and Wildlife. Colorado Parks and Wildlife may also be a cooperating agency on projects that are outside of but may impact state parks or wildlife areas.

Cities and counties

Actions on land owned by cities and counties require authorization from the owner. The property owner may also be a cooperating agency on projects that are outside of but may impact their property.

District wildlife managers patrol state wildlife areas and parks on horseback (photo by Windi Padia, Colorado Parks and Wildlife).

[19] www.ferc.gov/industries/hydropower/enviro.asp
[20] www.fhwa.dot.gov/environment/index.htm
[21] www.codot.gov/programs/environmental/nepa-program

3.9 - Agencies

Throughout the planning and permitting process, various agencies may be involved. The following is a comprehensive list of agencies that have regulatory authority or have resource-specific expertise. Many projects will not require all of the following agencies to be involved in the planning and permitting process. This comprehensive list may help project proponents and the lead federal agency identify and initiate early involvement and coordination with appropriate agencies. With early involvement of applicable regulatory agencies, concerns and requirements can be addressed early in the process. Once the lead federal agency has selected a third-party contractor and started the NEPA process, the lead federal agency directs the process and controls when and how the project proponent may communicate with the third-party contractor and cooperating agencies.

Agencies	Regulatory authority/area of interest
Federal agencies	

Army Corps of Engineers[22] [23]	• NEPA lead or cooperating federal agency.
	• Evaluates permit applications under
	  o Section 404 of the Clean Water Act.
	  o Section 9 and 10 of the Rivers and Harbors Act.
	• Evaluates requests for permission under Section 14 of the Rivers and Harbors Act.

Bureau of Reclamation	• NEPA lead or cooperating federal agency. • Special use permit to connect to or modify Bureau of Reclamation facilities. • Repayment contracts. • Contracts for conveyance, storage and/or excess capacity utilizing federally-owned Bureau of Reclamation facilities.
Bureau of Land Management	• Land use permitting. • NEPA lead or cooperating federal agency.
Environmental Protection Agency[24] [25]	• NEPA cooperating agency. • Reviews and comments on environmental review documents and rates draft environmental impact statements. • Clean Water Act Section 404 permit oversight; comment on permit application. • Review final permit in some cases.
Fish and Wildlife Service[26] [27] [28] [29]	• NEPA lead or cooperating agency. • Compliance with the Endangered Species Act. • Compliance with Fish and Wildlife Coordination Act
Forest Service	• Land use permitting. • NEPA lead or cooperating agency.
National Park Service[30]	• NEPA lead (if project located on park lands) or cooperating agency.
U.S. Department of Transportation[31]	• Land use permitting. • Potential NEPA cooperating agency.
Federal Energy Regulatory Commission[32]	• Hydropower license. • NEPA lead or cooperating agency.

[22] www.nwo.usace.army.mil/Media/Fact-Sheets/Fact-Sheet-Article-View/Article/487716/nepa/
[23] www.nwo.usace.army.mil/Missions/Regulatory-Program/Permitting-Program/
[24] www.epa.gov/compliance/resources/policies/nepa
[25] www.epa.gov/cwa-404/section-404-permit-program
[26] www.fws.gov/r9esnepa/
[27] www.fws.gov/midwest/endangered/section7/section7.html
[28] www.fs.fed.us/emc/nepa/
[29] www.fws.gov/midwest/endangered/permits/hcp/hcp_wofactsheet.html
[30] www.nature.nps.gov/protectingrestoring/DO12site/index.htm
[31] www.fhwa.dot.gov/environment/index.cfm
[32] www.ferc.gov/industries/hydropower/enviro.asp

Agencies	Regulatory authority/area of interest
State agencies	
Colorado Department of Public Health and Environment, Water Quality Control Division[33]	• Issues the 401 certification for the Clean Water Act 404 permit and/or the Federal Energy Regulatory Commission license. • NEPA cooperating agency.
Colorado Department of Natural Resources including Colorado Parks and Wildlife, Colorado State Land Board and the Colorado Water Conservation Board	• State fish and wildlife mitigation plan. • NEPA cooperating agency.
Office of Archaeology and Historic Preservation[34]	• Responsibility for compliance with Section 106 of the National Historic Preservation Act.
Colorado Department of Transportation[35]	• Potential NEPA cooperating agency.
Local agencies	
Counties and municipalities	• 1041 permits. • NEPA cooperating agency.

Chapter 3 helpful hints summary:

National Environmental Policy Act (NEPA):

- NEPA steps are similar to steps in typical planning processes. If complementary steps are aligned, the process can be more efficient.
- Some smaller water supply projects may only require an environmental assessment, but most are likely to require an environmental impact statement. Projects analyzed through an environmental assessment typically do not involve construction and have minimal impacts. It is advantageous to design projects with minimal environmental impacts.
- The draft and final impact statement will be reviewed by the EPA; other state, federal, and local agencies, and the public. Examples of issues that may be raised when the document is reviewed include:
    - Developing a purpose and need statement that artificially narrows the range of possible alternatives to meet the purpose and need.
    - The identification of other alternatives, including those that are less damaging, to meet the identified purpose and need for a project.
    - The process that was used to eliminate alternatives.

[33] www.colorado.gov/cdphe/wq-401-water-quality-certification
[34] www.historycolorado.org/archaeologists/office-archaeology-historic-preservation
[35] www.codot.gov/programs/environmental/nepa-program

- Types and extent of analyses, such as:
  - Inappropriate screening criteria that artificially constrain the range of alternatives that should be considered.
  - Methodologies insufficient to quantify impacts of the project.
  - Methods used to characterize the magnitude of direct, indirect and cumulative impacts that are not scientifically based or are used inconsistently for all resources.
  - Adequacy of baseline data collection and monitoring.
- Questions regarding conclusions made from analyses.
- Questions and/or issues regarding proposed mitigation to offset impacts.

- Expect substantial public interest and state or federal agency involvement if the proposed project is complex with potentially significant impacts. Projects affecting ecosystems that support features such as species listed under the Endangered Species Act or sources of drinking water will face additional scrutiny.
- If a project may require issuance of a Clean Water Act 404 permit or other federal action or permit and, therefore potential NEPA compliance, project proponents are strongly encouraged to consult with the appropriate federal agencies before planning a water supply project. Linking phases in the state or local planning processes along with requirements offers the best opportunity to incorporate efficiencies.

COMMON PITFALL: The purpose and need statement identified by the project proponent is written so narrowly that only the desired project fits. Both NEPA and Clean Water Act Section 404 have requirements for defining the purpose and need statement that is broad enough to allow a range of alternatives to meet the need. It would also be inefficient to have a purpose and need statement that is broader than the regulatory requirements. It is advised to seek guidance and coordinate with the federal lead agency and the Army Corps of Engineers when defining purpose and need for action.

COMMON PITFALL: Alternatives are screened by the project proponent before NEPA and the Clean Water Act Section 404 permit processes have begun and/or alternatives do not comply with regulatory requirements

Clean Water Act Section 404 permit:

- Water supply projects involving the discharge of dredged or fill material into waters of the U.S. require an Army Corps of Engineers permit issued by the regulatory division of the appropriate district under Section 404 of the Clean Water Act.
- In order to issue a permit, the Army Corps of Engineers must evaluate Clean Water Act Section 404 permit applications in accordance with the Clean Water Act Section 404(b)(1) Guidelines and NEPA and conduct a public interest review. The Clean Water Act Section 404(b)(1) Guidelines (40 CFR Part 230) are regulations promulgated by the EPA and are the substantive criteria used to evaluate proposed discharges of dredged or fill material into waters of the U.S.
- The Clean Water Act 404(b)(1) Guidelines include four regulatory requirements that must be met before the Army Corps of Engineers can issue a permit:
  - Selection of the least environmentally damaging practicable alternative.
  - Compliance with state water quality standards, toxic effluent standards and the Endangered Species Act.
  - Demonstration that the project does not cause or contribute to significant degradation.
  - Documentation of efforts to minimize and/or mitigate impacts.

COMMON PITFALL: Mitigation costs are not taken into account at the beginning of the planning process. The kind and amount of mitigation or offsets to impacts will depend on the kind and amount of resources being impacted. Other conditions (such as monitoring of effects) required in federal, state, and local permits should be incorporated into the costs of the project. Impacts to aquatic resources will require mitigation.

The Clean Water Act Section 404 permitting process may or may not occur concurrently with the NEPA process. Integrating the NEPA and Clean Water Act Section 404 processes may create efficiencies in the overall process.

Clean Water Act 401 certification process:

- A Clean Water Act Section 401 certification is intended to ensure there is reasonable assurance that the activity will be conducted in a manner that will not violate applicable water quality standards.
- The Colorado Department of Public Health and Environment, Water Quality Control Division issues, issues with conditions, or denies Clean Water Act Section 401 certifications for water supply projects (limited exceptions apply).
- Project proponent should work with lead federal agency to ensure the Water Quality Control Division is included as a cooperating agency from the beginning.
- The water quality analysis in the environmental impact statement should take into account the Clean Water Act Section 401 certification process.

COMMON PITFALL: Applicants fail to engage the Water Quality Control Division early in the planning process.

State fish and wildlife mitigation plan:

- Before submittal of a proposed fish and wildlife mitigation plan, applicants are encouraged to discuss and develop consensus on the proposed mitigation with Colorado Parks and Wildlife staff (per C.R.S. 37-60-122.2).
- Applicants should be aware that the fish and wildlife mitigation plan is not independently enforceable under state law. Components of the plan become enforceable if they are included as a term or condition of a permit, license, or approval issued by an authorizing agency or if the mitigation plan is included in the record of decision. Other components typically become enforceable through a separate agreement such as a memorandum of understanding or intergovernmental agreement between the applicant and Colorado Parks Wildlife.
- Identify how components of the plan may fit within other approval processes such as the Clean Water Act Section 401 certification or the Clean Water Act 404 permit.
- Applicants are encouraged to involve the Water Quality Control Division when discussing water quality impacts during the development of the mitigation plan.
- This process fulfills the obligations of the Fish and Wildlife Service under the Fish and Wildlife Coordination Act to consult with the appropriate state wildlife agency.

Local government 1041 permit:

- A list of local governments that have adopted 1041 regulations is found at: www.colorado.gov/dola/colorado-land-use-survey.
- To improve early coordination, project proponents should have a pre-application meeting with the local government early in the process. Lead federal agencies should also consider allowing the local government to participate as a cooperating agency.

4. Linking regulatory and planning requirements

Project proponents should carefully consider regulatory planning and permitting requirements **together** in the early planning stages when addressing water supply needs and potential project alternatives. Timely consideration of requirements during initial discussions of water needs and potential solutions may help the federal, state and local review and permitting processes proceed more smoothly. Project proponents and regulatory agencies are encouraged to integrate these processes with the aim of creating efficiencies by meeting as many requirements as possible in documents or other actions, such as public involvement.

Although obtaining a Clean Water Act Section 404 permit decision (when applicable) occurs toward the end of the process, seeking to comply with the Clean Water Act regulations from the beginning and throughout the NEPA process can help the Army Corps of Engineers' and the state's permitting decisions by demonstrating compliance with regulatory requirements.

The steps in the NEPA process are similar to steps in the project planning process and the Army Corps of Engineers' process for permits issued under Section 404 of the Clean Water Act. For those projects that trigger NEPA and also require a Clean Water Act Section 404 permit, aligning the NEPA planning and the environmental impact analysis with the Clean Water Act Section 404(b)(1) Guidelines should result in efficiencies and a more timely permit decision than if the requirements are not considered early and combined as much as possible.

The following provides a suggested integrated planning process for a hypothetical project that requires both a NEPA environmental impact statement and a Clean Water Act Section 404 permit. This hypothetical project also triggers the need for the State of Colorado to issue a Clean Water Act Section 401 water quality certification as well as approval of a state Fish and Wildlife Mitigation Plan.[36]

1. The project proponent and/or lead federal agency identifies the water supply purpose and need. For a water supply project, this could mean defining a specific amount of water to meet projected future demands after consideration of current supplies and consumption, projected population growth, and future conservation measures and savings. While generally focusing on the project proponent's statement, the lead federal agency will exercise independent judgment in defining project purpose (33 CFR Part 325, Appendix B).
2. The project proponent, with assistance from the lead federal agency and the Army Corps of Engineers, identifies a range of potential alternatives and alternatives screening criteria consistent with the Clean Water Act Section 404(b)(1) Guidelines. The project proponent then identifies the alternatives that are both reasonable and practicable, meet the purpose and need for the project, and result in the fewest environmental effects.
3. The project proponent identifies the federal, state, and local government agencies that have a regulatory requirement to which the project is subject.
4. The project proponent requests a meeting(s) with identified agencies to discuss the proponent's preliminary purpose and need, potential alternatives and screening criteria.
5. When a NEPA analysis is required, the lead federal agency or a contractor that the lead agency may select, will prepare the environmental impact statement (40 CFR 1506.5).

[36] Note: Because this handbook focuses on initial NEPA planning and scoping as identified in the Lean event, the following activities do not include all potential federal, state, county or municipal requirements or recommendations. It is meant to help project proponents better understand the requirements within the NEPA and Clean Water Act permitting processes so they can determine how to best integrate the processes to create efficiencies. It is not an all-inclusive step-by-step set of instructions.

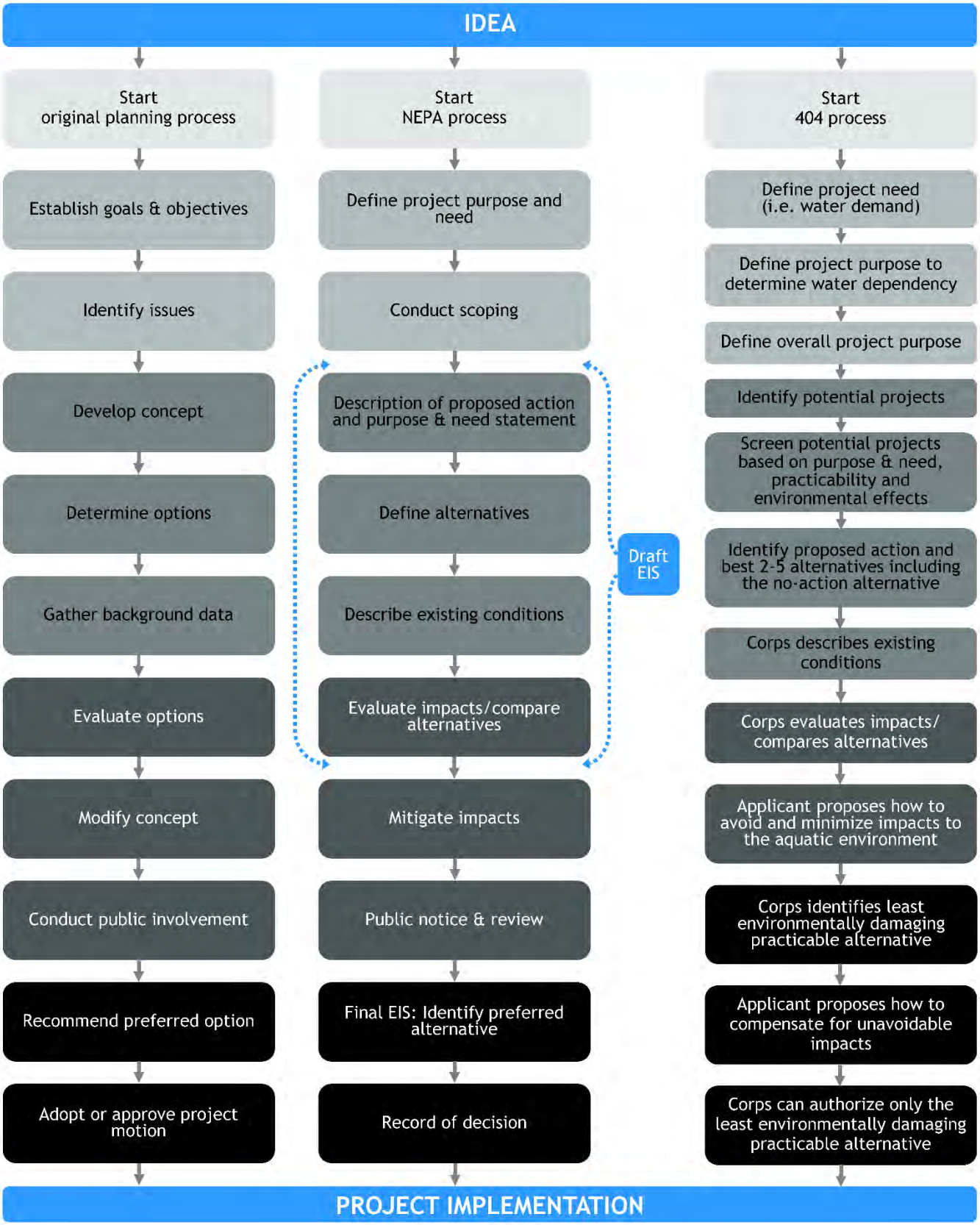
6. The lead and cooperating agencies develop and execute cooperating agency agreements clarifying the lead and cooperating agency roles for the NEPA analysis. Generally, the lead federal agency directs the third-party contractor, coordinates with cooperating agencies, manages the process, and makes final decisions regarding process and content. During or prior to the scoping process, lead and cooperating agencies should provide clear information about resources that should be evaluated and the preferred analysis methods for those resources. Cooperating agencies are also able to review and comment on the preliminary draft environmental impact statement chapters that are within their area of expertise and authority. Upon request of the lead agency, any other federal agency which has jurisdiction shall be a cooperating agency unless a cooperating agency replies that other program commitments preclude their involvement or the degree of involvement requested in the action (40 CFR Part 1501.6). In addition, any other federal agency which has special expertise on any environmental issue may also be a cooperating agency upon request of the lead agency, and any agency may request the lead agency to designate it a cooperating agency (40 CFR Part 1501.6).
7. The lead federal agency initiates the scoping process by publishing a notice of intent to prepare an environmental impact analysis in the Federal Register as well as notice of public scoping meetings. The project proponent provides a detailed description of the proposed project and initial alternatives. This includes estimates for footprints of the facilities that would be constructed, construction activities and schedule, manpower needs, transportation needs, environmental protection measures, etc. These estimates and details are used to help analyze potential impacts.
8. From the scoping process, the third-party contractor and lead and cooperating agencies identify resources and any additional alternatives that need to be evaluated in the environmental impact analysis.
9. The lead federal agency reviews the project purpose, need, and alternatives screening reports provided by the project proponent to ensure that they comply with NEPA and other regulatory requirements. If inadequate, the lead federal agency may require or make modifications and request additional information from the project proponent. Cooperating agencies can also review reports if they choose.
10. The lead federal agency or the third-party contractor prepares the preliminary (or also referred to as the administrative) draft environmental impact statement, which should include the analysis needed for the Clean Water Act Section 401 water quality certification. If not, the project proponent or third-party contractor should prepare the additional, required analysis for this purpose. The preliminary draft environmental impact statement is reviewed by the lead agency. Cooperating agencies may also review and comment on the resource chapters within their area of expertise and authority.
11. The Army Corps of Engineers may make a preliminary determination of the least environmentally damaging practicable alternative (per Clean Water Act Section 404) and/or environmentally preferable alternative (per NEPA). The Army Corps of Engineers preliminary determination for the least environmentally damaging practicable alternative takes into account avoidance and minimization measures but not compensatory mitigation.
12. The project proponent should propose how to compensate for unavoidable environmental effects including the mitigation needed for Clean Water Act Section 401 water quality certification and the state fish and wildlife mitigation plan. The project proponent should prepare an avoidance, minimization and compensatory mitigation plan for purposes of the Clean Water Act Section 404(b)(1) Guidelines to be included in the draft environmental impact statement.
13. The lead federal agency finalizes and publishes the draft environmental impact statement and a notice of availability is published in the Federal Register, initiating a public review and comment period. The EPA reviews and publicly comments on draft environmental impact statements and provides a rating of the environmental impact of the action and the adequacy of the document per Section 309 of the Clean Water Act. Cooperating agencies should also review the draft environmental impact statement providing comments and suggestions to ensure the final environmental impact statement provides the information adequate to comply with NEPA and as well as the information needed for the state's antidegradation review, Clean Water Act Section 401 certification and other regulatory requirements.

14. The lead federal agency receives and reviews public and agency comments. The lead federal agency advises the project proponent of substantive comments and how they will be addressed. The proponent can use this information to revise and expand on the mitigation plan. At this time, the project proponent is encouraged to begin discussions with Colorado Parks and Wildlife regarding the state fish and wildlife mitigation plan and Colorado Water Quality Control Division regarding the Clean Water Act Section 401 water quality certification.
15. The project proponent submits a final mitigation plan. The lead federal agency and cooperating agencies review the mitigation plan to make sure it meets the requirements of NEPA, the Clean Water Act Section 404(b)(1) Guidelines, Clean Water Act Section 401 certification, Fish and Wildlife Coordination Act and any other land use permits or statutory or regulatory requirements.
16. The lead federal agency reviews and responds to comments received and prepare the preliminary final environmental impact statement. A preferred alternative must be chosen by the lead agency at this time. Cooperating agencies may review and comment on the resource chapters within their area of expertise and authority.
17. The lead federal agency publishes the final environmental impact statement and notice of availability in the Federal Register.
18. Concurrent with or soon after the publication of the final environmental impact statement, the project proponent should apply for a Clean Water Act Section 401 certification. The Water Quality Control Division will publicly notice the preliminary antidegradation review and a draft 401 certification determination for the 30-day public comment period. As much as is practicable or legally acceptable, the preliminary antidegradation review and a draft 401 certification determination should consider the analysis and findings of the final environmental impact statement. At this time (or before), the project proponent should submit a state fish and wildlife mitigation plan if not already completed.
19. Once the final environmental impact statement is published, the Army Corps of Engineers will begin drafting the record of decision. By regulation, the Army Corps of Engineers must wait at least 30 days from the availability of the final environmental impact statement before they issue a record of decision (40 CFR Part 1506.10, 33 CFR Part 325, Appendix B, and 33 CFR Part 230). The Water Quality Control Division will evaluate comments received regarding the preliminary antidegradation review and draft 401 certification determination. This often involves working with the project proponent to address the comments. The two agencies can share and discuss comments received and how to address them in final documents. The Water Quality Control Division will finalize the certification and develop certification conditions. The Clean Water Act Section 404 permit will incorporate the conditions of the 401 certification. The two agencies may independently or jointly advise the project proponent of their respective decisions.
20. If the project proponent disagrees with decisions about the Clean Water Act Section 404 permit and/or Clean Water Act Section 401 certification, they may submit administrative appeals through the appropriate state or federal regulatory process.

Chapter 4 helpful hints summary

- We recommend that project proponents carefully consider and integrate federal, state and local statutory and regulatory requirements **together** at the early planning stages of addressing water supply needs and potential project alternatives.
- Timely consideration of the various regulatory requirements during initial discussions about water needs and potential solutions may help the permitting processes go more smoothly.

Figure 3: New ideas through the processes.



5. Potential water quality and aquatic resources concerns

Water supply projects are evaluated for potential water quality concerns and other impacts through the planning and permitting processes.

Typical water quality impacts considered in the NEPA, Clean Water Act 404 permit and the 401 certification review include:

- Changes in stream temperatures and the impact on aquatic communities.
- Changes in stream chemistry due to changes in dilution and flows.
- Stream morphology changes and impacts to the aquatic community.
- Water quality in newly constructed reservoirs.
- Changes in water quality in existing reservoirs with a change of source water.
- Changes in sediment transport with changes in magnitude and frequency of flushing flows.
- Changes in habitat for aquatic macroinvertebrates.
- Bioaccumulation of mercury in fish tissue in new and existing reservoirs.
- Impacts on and/or loss of wetlands, waterways and riparian areas.
- Impacts on aquatic biologic resources.

Impacts associated with water quality are typically the major focus in the impacts analyses for all required permits and certifications.

How do water projects impact water quality?

Impacts from water supply projects are often related to additional diversions that may cause increased temperature in a stream, loss of dilution flow and thus potentially increase the concentration of pollutants and subsequently limit the amount of pollutants that can be discharged downstream of the project, and/or changes in aquatic life habitat.

Other resources considered in the NEPA review may include:

- Surface water.
- Stream channel morphology.
- Groundwater.
- Geology.
- Soils.
- Vegetation.
- Riparian and wetland areas.
- Wildlife.
- Special status species.
- Aquatic biological resources.
- Air quality.
- Land use impacts.
- Visual resources.
- Recreation.
- Noise.
- Transportation.
- Cultural/historical/paleontological resources.
- Socieconomics.
- Hazardous materials.

Examples of issues that may be raised through public comment and review includes the possibility of less damaging alternatives to meet the project purpose, types and extent of analyses, conclusions made from the analyses and the proposed mitigation to offset impacts. Thorough scoping and consultation with the agencies and public prior to drafting the environmental impact statement can help avoid delays and expenses from issues identified by the public or agencies on the draft environmental impact statement and other documents required by various permits or approvals, and addressing concerns raised by public interests.

Applicants and project proponents are advised to seek consultation with local, federal and state agencies and non-governmental organizations early in the process. Obtaining advice from agencies and experienced water quality consultants early on may help with identifying data needs for the impact analysis and concerns the public may raise.

(Stock image)

Chapter 5 helpful hints summary

- Early in the planning process, collect sufficient data to use as a baseline for the analysis of environmental effects. Project proponents should start gathering data (including field studies) about the affected environment long before final phases of permitting process.
- Project proponents, lead federal agencies, and third-party contractors are advised to seek consultations with federal and state agencies early in the process to identify data needs.

6. Recommended assessment methodologies

Water supply projects have site specific environmental considerations that consider the unique nature of the watershed(s) impacted, the project and projected future conditions. Although it is challenging to prescribe a "one-size fits all" list of recommendations for assessment methodologies, it is helpful to describe where to start.

Environmental impact statements have been developed for major water supply projects in Colorado. These projects may serve as examples of varying types of analyses and considerations:

- Southern Delivery System - www.sdseis.com/FEIS.html
- Windy Gap Firming Project - www.nwo.usace.army.mil/Missions/Regulatory-Program/Colorado/EIS-Windy-Gap-Firming/
- Moffat Collection System Project - www.nwo.usace.army.mil/Media/News-Releases/Article/487264/moffat-collection-system-project-final-eis-available-for-public-review/

This handbook is intended to provide guidance on assessment methodologies that can be used for assessing impacts across the various processes, permits and certifications. Applicants and project proponents are encouraged to find ways to reduce duplicative efforts through collaboration.

The Windy Gap project has been underway for decades. This is a pump house under construction in the 1980s (© 2012 Northern Colorado Water Conservancy District. All rights reserved).

These assessment methodologies are reviewed periodically and adjustments may be needed depending on the project review timeframe. Adjustments should be considered in the planning and scoping phases. Project proponents, lead federal agencies, and third-party contractors are encouraged to consult with agencies early to determine if water quality assessment methods have changed and if so, determine current methodologies.

Applicants, project proponents and the lead federal agency are advised to identify data gaps early in the process and begin data collection. Analyses should be robust, focused on the decision needed and based on sound science. These efforts will produce stronger NEPA documents and mitigate delays caused by insufficient data. The role of the lead agency is to direct the work of a third-party consultant during the NEPA process and environmental impact statement development. The lead federal agency will typically set up a communications protocol (via a memorandum of understanding) so there will be no undue influence from the project proponent on the impacts analyses and conclusions.

Hydrologic models

Most assessments of water supply projects begin with the development of hydrologic models. These models account for diversions, inflows, reservoir operations and other factors. They often consider long ranges of flow history and include wet, dry and average years. Models that consider a daily time step can be more useful than those that operate on a monthly time step.

Water quality analyses

The Colorado Water Quality Control Commission assigns use classifications, narrative and numeric standards, and antidegradation designations and requirements, for all waters in Colorado in accordance with Clean Water Act Section 303. These standards should be used in the water quality analyses and are found in the following regulations:

- Regulation No. 31, Basic Standards.
- Regulation No. 32, Arkansas River Basin.
- Regulation No. 33, Upper Colorado River Basin.
- Regulation No. 34, San Juan River Basin.
- Regulation No. 35, Gunnison River Basin.
- Regulation No. 36, Rio Grande Basin.
- Regulation No. 37, Lower Colorado River Basin
- Regulation No. 38, South Platte River Basin.

The Water Quality Control Division developed the following assessment methods and policies:

- Policy 13-1: Interim Guidance for Implementation of Discharger Specific Variances Provisions (expires Mar. 31, 2018).
- Policy 10-1: Aquatic Life Use Attainment (expires Aug. 31, 2017).
- Policy 06-1: Temperature Criteria Methodology (expires Jun. 30, 2017).
- Policy 98-1: Guidance for Implementation of Colorado's Narrative Sediment Standard, Regulation #31, Section 31.11(1)(a)(i) (expires Dec. 31, 2017).
- Policy 98-2: A Guide to Colorado Programs for Water Quality Management and Safe Drinking Water (expires Dec. 31, 2018).
- Policy 96-2: Human Health-Based Water Quality Criteria and Standards (expires Dec. 31, 2017).
- 303(d) Listing Methodology, 2018 listing cycle.
- Antidegradation Significance Determination for New or Increase Water Quality Impacts.
- Antidegradation Alternative Analysis Examples.

Assessment methods and policies are found at:

www.colorado.gov/cdphe/wqcc-policies and www.colorado.gov/cdphe/wqcc-reports-and-plans

To the extent possible, it is important to conduct a quantitative analysis of the data. In some instances, it may be appropriate to include a qualitative analysis.

Water quality antidegradation review

Clean Water Act Section 401 certification analysis requires that an antidegradation review is conducted on waters designated as reviewable under state regulations. The antidegradation review is described in earlier in this handbook in Section 3.3.

Temperature analyses

Some projects will have an impact on the temperature regime of affected streams and reservoirs. Increased diversions may result in increased stream temperatures. It is important to gather continuous in-stream temperature data to predict how future changes in hydrology can impact temperature regimes. Future stream temperature projections can be determined through models.

Channel geomorphology/sediment transport analyses

Changes in flow, flood disturbance regimes, and sediment transport capacity may impact channel and floodplain morphology and function, and aquatic life habitat. Decreases in sediment flushing flows may cause the channel to fill in with sediment and/or prevent the creation and maintenance of diverse floodplain and riparian habitats. Increases in sediment flushing flows may result in channel erosion and channel degradation. Bedload sediment transport rates can be computed using models or general equations. Changes in sediment transport may also impact downstream ecosystems that depend on sediment transported from upstream watersheds.

Aquatic life analyses

Aquatic life use attainment may be assessed through the Water Quality Control Commission Policy 10-1: Aquatic Life Use Attainment. Methodology to Determine Use Attainment for Rivers and Streams is found at http://www.colorado.gov/pacific/cdphe/wqcc-policies.

Policy 10-1 provides guidance for determining whether sites on rivers and streams are attaining their aquatic life use. It offers a systematic assessment method for comparing the biological condition of a sample site in a given biotype, as characterized by a Multimetric Index score, against an expectation of biological condition (threshold) of a reference site for a similar biotype. Policy 10-1 relies exclusively on the benthic macroinvertebrates assemblage in streams.

Other metrics and assessment methodologies exist and may be used in evaluating impacts to the aquatic life in effected streams and waterbodies.

Additional considerations

- Analyses for the environmental impact statement require evaluating cumulative effects by looking at relevant past, ongoing and reasonably foreseeable future actions in the affected watersheds. This requires an investigation of human-caused changes in the watershed including other water supply projects, changes in stream configuration and flows, changes in floodplain condition and function, population changes, climate change and other changes.
- To the extent possible, it is important to conduct a quantitative analysis of the data. In some instances it is appropriate (or you may be limited to) a qualitative analysis.

Chapter 6 helpful hints summary:

- Applicants and project proponents are encouraged to find ways to reduce duplicative efforts regarding data analyses through collaboration.
- Applicants, project proponents and the lead federal agency are advised to identify data gaps early in the process and begin data collection to document baseline environmental conditions and to enable impact analyses.
- Data collection and analyses should be robust enough to answer key regulatory questions and to inform decision-making. Collecting necessary data before entering the formal planning and permitting processes will likely support strong technical documents and should expedite decision-making for permits and certifications.
- Clearly described analytical methods based on sound science that use a good set of environmental data will reduce questions and help inspire trust from the public and interested organizations in the process, the project proponent and the decisions.