

**Principles and Requirements for Federal Investments in
Water Resources**

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Principles and Requirements

Chapter I – Principles for Federal Investments in Water Resources

These Principles and Requirements are established pursuant to the Water Resources Planning Act of 1965 (Public Law 89-8), as amended (42 U.S.C.1962a-2) and consistent with Section 2031 of the Water Resources Development Act of 2007 (Public Law 110-114). They supersede the Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies dated March 10, 1983.

1. Purpose and Scope

These Principles and Requirements, and the supporting Guidelines, are intended to provide a common framework for analyzing a diverse range of water resources projects, programs, activities, and related actions involving Federal investment as identified by the agencies in the context of their missions and authorities. These Principles were, in the past, limited in application to four agencies – U.S. Army Corps of Engineers, Bureau of Reclamation, Tennessee Valley Authority and Natural Resources Conservation Service. In order to increase consistency and comparability in Federal water resources investment decision making across the Federal government, the application of these Principles and supporting documents is hereby expanded to include other relevant projects, programs and activities undertaken by the Environmental Protection Agency, and the Departments of Commerce, the Interior, Agriculture, and Homeland Security (Federal Emergency Management Agency) consistent with statutory authorities as described in the Guidelines¹.

It is intended that these Principles and the supporting Requirements and Guidelines be applied to a broad range of Federal investments that by purpose, either directly or indirectly, affect water quality or water quantity, including ecosystem restoration or land management activities. The kinds of Federal activities to which these Principles may apply include, but are not limited to, as relevant and appropriate: (1) grant programs, such as those associated with the Endangered Species Act, Coastal Zone Management Act, Coastal Wetlands Planning, Protection and Restoration Act, and Consolidated Farm and Rural Development Act, as well as those associated with the Sport Fish Restoration, Wildlife Restoration, National Coastal Wetlands Conservation, North American Wetlands Conservation, Hazard Mitigation Assistance and Public Assistance

¹ The Principles, Requirements and Guidelines for Federal investments and activities discussed in this document refer to those described in the Guidelines which further clarify, scope, scale and thresholds.

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programs; (2) funding programs, such as Pacific Coastal Salmon Recovery Fund, Safe Drinking Water Act State Revolving Fund, Clean Water Act State Revolving Fund, Federal Financing Bank Guaranteed Loan Program and Renewable Loan Program; (3) studies or investigations leading to construction of infrastructure, including new facilities or modernization of existing facilities, dam safety or operational modifications, and ecosystem protection and restoration projects; and (4) proposals and plans that affect the management of Federal assets including National Wildlife Refuges, National Parks, National Forests and National Grasslands.

In general, these Principles do not apply to regulatory activities (such as the issuance of permits associated with Section 404 of the Clean Water Act) or research and monitoring activities.

For the purposes of this policy, “Principles” refer to the overarching concepts that the Federal government seeks to achieve through policy implementation. The “Federal Objective” specifies the fundamental goal of Federal investments in water resources. The “General Requirements” are inputs to alternative plans, programs, designs, strategies, or actions that should be incorporated into analyses for Federal investment. The Interagency “Guidelines” provide guidance to Federal agencies for determining the applicability of the Principles and Requirements and for developing agency-specific procedures to implement a framework for formulating, evaluating, and comparing water resources projects, programs, activities and related actions.

The scope and scale of applicability to Federal investments in water resources will be defined in more detail in the Interagency Guidelines that follow. The Interagency Guidelines by design are expected to be updated on a more regular basis than these Principles and Requirements, and as such, will ensure that the assessment of applicability remains current. It is important that such assessments capture evolving and emerging programs, as well as modernized processes.

These Principles and the supporting Requirements were developed through a collaborative interagency process that promoted the open exchange of information and perspectives. The process engaged the public through formal public reviews and workshops, and included an external peer review by the National Academies of Science as required by the Water Resources Development Act of 2007. The resulting modernized policy provides for: maximizing public benefits relative to costs; the use of quantified and unquantified information; broadened agency application to allow for integration and better coordination across the federal government; flexibility in decision-making to reduce burdens and promote freedom of choice; use of best available

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science and objectivity; and, a peer review process for the Interagency Guidelines, as well as the Agency Specific Procedures. The modernized policy advances transparency and consistency for Federal investments in water resources.

2. The Federal Objective

America's water resources – streams, rivers, wetlands, estuaries, lakes, and coasts – are at the heart of our environment, our economy, and our history. These water resources support billions of dollars in commerce, provide safe drinking water for millions of Americans, supply needed habitat for fish and wildlife, affect public safety, and provide a variety of other important benefits. The quality and quantity of America's water resources has wide-ranging impacts at all levels of government and for all living things. The quality and quantity of water resources affect all levels of our society from the national to the individual citizen.

The Federal Objective, as set forth in the Water Resources Development Act of 2007, specifies that Federal water resources investments shall reflect national priorities, encourage economic development, and protect the environment by:

- (1) seeking to maximize sustainable economic development;
- (2) seeking to avoid the unwise use of floodplains and flood-prone areas and minimizing adverse impacts and vulnerabilities in any case in which a floodplain or flood-prone area must be used; and
- (3) protecting and restoring the functions of natural systems and mitigating any unavoidable damage to natural systems.

In consideration of the many competing demands for limited Federal resources, it is intended that Federal investments in water resources as a whole should strive to maximize public benefits, with appropriate consideration of costs. Public benefits encompass environmental, economic, and social goals, include monetary and non-monetary effects and allow for the consideration of both quantified and unquantified measures.

Addressing the complex and often conflicting water resource needs of today and the future requires the formulation of a diverse range of solutions that need to be fully considered in the decision making process. Such solutions may produce varying degrees of effects relative to environmental, economic, and social goals. No hierarchical relationship exists among these three goals and as a result, tradeoffs among potential solutions will need to be assessed and communicated during the decision making process.

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3. Guiding Principles

The following Principles constitute the overarching concepts the Federal government seeks to promote through Federal investments in water resources now and into the foreseeable future. These Principles are presented in no particular order and their organization denotes no hierarchy or rank.

- A. Healthy and Resilient Ecosystems.** Federal investments in water resources should protect and restore the functions of ecosystems and mitigate any unavoidable damage to these natural systems. Ecosystems are dynamic complexes of plant, animal, and microorganism communities and the non-living environment interacting as a system. Ecosystems provide important services to humans both directly and indirectly, and they also encompass vital intrinsic natural values, such as biodiversity. In order to protect ecosystems, alternative plans should first seek to avoid any adverse environmental impact, and when that is not possible, alternatives should minimize environmental impacts. When damage to the environment is unavoidable, mitigation for adverse effects should be provided as required by law. Restoration of ecosystems can enhance the health and resilience of the natural environment and should be part of alternative plans, where feasible and appropriate. A resilient ecosystem has the capacity to respond to changes, including climate change. Healthy and resilient ecosystems not only enhance the essential services and processes performed by the natural environment, but also contribute to the economic vitality of the Nation.
- B. Sustainable Economic Development.** Federal investments in water resources should encourage sustainable economic development. Alternative solutions for resolving water resources problems should improve the economic well-being of the Nation for present and future generations through the sustainable use and management of water resources ensuring both water supply and water quality. Sustainable in this context means the creation and maintenance of conditions under which humans and nature can coexist in the present and into future. Federal investments in sustainable economic development activities contribute to the Nation's resiliency.
- C. Floodplains.** Floodplains are critical components of watersheds. They connect land and water ecosystems and support high levels of biodiversity and productivity. Floodplains that have not been adversely affected can sustain their natural functions and increase the resilience of communities. For this reason, Federal investments in water resources should avoid the unwise use of floodplains and flood-prone areas and minimize adverse impacts and vulnerabilities in any case in which a floodplain

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or flood-prone area must be used. Unwise use of floodplains is defined as any action or change that has an unreasonable adverse effect on public health and safety, or an action that is incompatible with or adversely affects one or more floodplain functions that leads to a floodplain that is no longer self-sustaining. Federal actions should seek to reduce the Nation's vulnerability to floods and storms. In instances where this is not achievable, the agency should identify and communicate the potential direct and indirect adverse effects on floodplain functions.

- D. Public Safety.** Threats to people, including both loss of life and injury, from natural events should be assessed in the determination of existing and future conditions, and ultimately, in the decision making process. Alternative solutions, which include structural and nonstructural elements, must avoid, reduce, and mitigate risks to the extent practicable and include measures to manage and communicate residual risks. The impact and reliability of alternatives on these threats must be evaluated and shared with the public and decision makers.
- E. Environmental Justice.** Environmental justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Agencies should ensure that Federal actions identify any disproportionately high and adverse public safety, human health, or environmental burdens of projects on minority, Tribal, and low-income populations. In implementing the Principles, Requirements and Guidelines, agencies should seek solutions that would eliminate or avoid disproportionate adverse effects on these communities. Specific efforts should be made to provide opportunities for effective public participation by minority, Tribal, and low-income communities in Federal planning and decision making processes. These efforts include identifying potential effects and mitigation measures in consultation with affected communities and improving the accessibility of public meetings, documents, and notices. Further, evaluation methods should eliminate any biases and fully display the effects of alternative actions on affected minority, Tribal, and low-income communities.
- F. Watershed Approach.** A watershed is land area that drains to a common waterbody. A watershed approach to analysis and decision making facilitates evaluation of a more complete range of potential solutions and is more likely to identify the best means to achieve multiple goals over the entire watershed. A watershed approach facilitates the proper framing of a problem by evaluating it on a system level to identify root cause(s) and its interconnectedness to problem symptoms. The approach enables the design of solutions that considers the benefits of water resources for a wide range of stakeholders within and around the

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watershed. It promotes the evaluation of effects within a watershed and other interconnected systems to understand a full range of public benefits. The effects evaluated should include cumulative effects which are the impacts on the watershed that result from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Finally, the watershed approach allows for consideration of upstream and downstream conditions, needs, and potential impacts of proposed actions.

The scope and scale of watershed assessments can vary. Watershed assessments should encompass a geographic area large enough to ensure that plans address cause and effect relationships among affected resources and activities that are pertinent to realizing public benefits. The scope and degree of evaluations across a watershed should reflect the nature of these relationships. It is imperative that assessments evaluate the interaction of a potential Federal investment with other water resources projects and programs within a region or watershed.

Chapter II – Requirements

1. General Requirements

Federal investments in water resources should incorporate the Requirements described below. These Requirements supplement a myriad of requirements that are specified in other laws, such as the National Environmental Policy Act (NEPA), but are not repeated here. Federal investments in water resources through projects, programs or activities will often require NEPA analyses. The NEPA process should be integrated with the processes developed to implement these Principles and Requirements to facilitate the production of a single decision document that fulfills the requirements of both processes. The Interagency Guidelines will provide additional guidance regarding how to effectively integrate these two processes.

A. Evaluation Framework. It is important that potential Federal investments be evaluated for their performance with respect to the Federal Objective using a common framework. This common framework will allow for comparison among potential Federal investments and facilitate the overall decision making process. Evaluation methods should be designed to ensure that potential Federal investments in water resources are justified by public benefits, particularly in comparison to costs associated with those investments. Such methods should apply an ecosystem services approach in order to appropriately capture all effects (economic,

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environmental and social) associated with a potential Federal water resources investment. By design, such an approach traces the effects of a potential action through the watershed or ecosystem in order to capture its effects and feedbacks and better captures the values that ecosystems or watersheds contribute to our economy and well-being. The ecosystems services approach is a way to organize all the potential effects of an action (economic, environmental and social) within a framework that explicitly recognizes their interconnected nature. The services considered under this approach include those flowing directly from the environment and those provided by human actions. Services and effects of potential interest in water resource evaluations could include, but are not limited to: water quality; nutrient regulation; mitigation of floods and droughts; water supply; aquatic and riparian habitat; maintenance of biodiversity; carbon storage; food and agricultural products; raw materials; transportation; public safety; power generation; recreation; aesthetics; and educational and cultural values. Changes in ecosystem services are measured monetarily and non-monetarily, and include quantified and unquantified effects. Existing techniques, including traditional benefit costs analyses, are capable of valuing a subset of the full range of services, and over time, as new methods are developed, it is expected that a more robust ecosystem services based evaluation framework will emerge.

Heretofore, Federal investments in water resources have been mostly based on economic performance assessments which largely focus on maximizing net economic development gains and typically involve an unduly narrow benefit-cost comparison of the monetized effects. Non-monetized and unquantified effects are often included in the overall analysis process, but are not necessarily weighted as heavily or considered key drivers in the final decision making process. As a result, decision making processes are, at this point in time, unnecessarily biased towards those economic effects that are generally more easily quantified and monetized. A narrow focus on monetized or monetizable effects is no longer reflective of our national needs, and from this point forward, both quantified and unquantified information will form the basis for evaluating and comparing potential Federal investments in water resources to the Federal Objective. This more integrated approach will allow decision makers to view a full range of effects of alternative actions and lead to more socially beneficial investments.

B. Best Available Science and Commensurate Level of Detail. Analyses to support Federal investments in water resources should utilize the best available science, data, analytical techniques, procedures, models, and tools in hydrology, engineering, economics, biology, ecology, risk and uncertainty, and other fields to the extent that sufficient funding is available. To the extent feasible, it is appropriate to quantify the

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effects of water resources projects. Agencies should continuously seek to update data and to modernize tools, models, and analytical techniques and not simply rely upon those used in the past because they are familiar. Though widespread use of some established tools may be appropriate, particularly as it promotes consistency and comparability among the agencies, it is also important to employ the evolving tools and methods in analyses in order to fully inform the decision-making process.

The level of detail required to support Federal investments in water resources may vary, but should not be greater than needed to inform the decision making process efficiently and effectively. The level of detail, scope, and complexity of analyses should be commensurate with the scale, impacts, costs, scientific complexities, uncertainties, risks, and other sensitivities (e.g., public concerns) involved in potential decisions.

C. Collaboration. Federal agencies should collaborate fully on water resources related activities with other affected Federal agencies and with Tribal, regional, state, local, and non-governmental entities, as well as community groups, academia, and private land owners (stakeholders) to realize more comprehensive problem resolution and better informed decision making. The water challenges facing the Nation are great and require a collaborative, transparent, and inclusive approach in order to responsibly address current and future needs. The Federal, State, regional, Tribal, and local governments, as well as stakeholders, share the responsibility of managing and protecting public water resources. Resolving water resources related problems will take time, funding, and commitment by decision makers and stakeholders at all levels. Integration of programs and engagement in the decision making process by relevant stakeholders is necessary for successful water resource decisions. This can further promote efficiency of effort and save resources, while enabling government at all levels to accomplish more.

The Federal government's role in water resources related activities has changed over time. In many cases, the Federal government is no longer the primary investor in, or developer and protector of, water resources related activities across the Nation. Increasingly, the solutions put forth to address the complex water resources problems facing the Nation involve activities by many other entities at varying levels of scale and scope. State, Tribal, and local governments, private entity and non-profit participation is to be actively encouraged in all aspects of water resources planning in the multitude of Federal projects and programs carried out by Federal agencies.

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Specific efforts should be made to provide opportunities for effective participation by minority, Tribal, and low-income communities in the Federal planning and decision making processes. Such efforts include improving the accessibility of public meetings, documents, and notices as well as consulting with affected communities to identify potential effects and mitigation measures. The intent of collaboration is to ensure that Federal activities reasonably consider the needs, interests, and concerns of stakeholders. Collaboration should provide adequate opportunities for all to participate throughout the decision making process.

The method and scope of the collaborative effort should be driven by the nature of the activity, problems, and likely solutions. Collaboration may include (but is not limited to): the sharing of science and data, analytical tools, or expertise unless protected from release by law; inclusion on interdisciplinary or inter-agency study teams; participation in independent or peer review of study products; development and implementation of complementary projects and programs by others; and post-project review and development of adaptive management strategies.

D. Risk and Uncertainty. When analyzing potential investments in water resources, areas of risk and uncertainty should be identified, described, and considered. Knowledge of risk and uncertainty and the degree of reliability of the estimated effects will better inform decision making. Risk and uncertainty inherent in the analyses performed as well as risk and uncertainty associated with the future conditions and potential effects of each alternative should be identified. Decisions should be made with knowledge of the degree of reliability and the limits of available information, recognizing that even with the best available engineering and science, risk and uncertainty will always remain.

Risks and uncertainties should be identified and described in a manner that is clear and understandable to the public and decision makers. This includes describing the nature, likelihood, and magnitude of risks (including quantitatively where feasible), as well as the uncertainties associated with key supporting data, projections, and evaluations for competing alternatives. This should also include a concise discussion of what must occur, including the related probability or likelihood to the extent these can be determined, in order to realize any projections. When there are considerable uncertainties concerning an alternative's ability to function as desired and produce desired outputs, its capacity to produce potential undesired outputs, and/or the general acceptability of the alternative, the option of pursuing improved data, models, and analyses should be considered. Reducing risk and uncertainty may involve increased costs or loss of benefits. The advantages and costs of reducing risk and uncertainty should be explicitly considered in both the formulating

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of alternatives, and in the overall decision making process. The items below identify and provide further explanation of areas of risk and uncertainty that should be evaluated, as well as a tool with which to address them.

- i. **Climate Change.** Climate change poses a significant challenge for water resources planning and conditions resulting from a changing climate should be accounted for and addressed. Varying degrees of uncertainty are associated with climate change impacts on water resources. The increased variability in temporal and spatial patterns of precipitation and water availability will challenge water resource systems serving all human and ecological needs. From specification of existing problems and opportunities to the formulation, evaluation and selection of plans, projected accelerating changes in aquatic systems and sea level resulting from a changing climate should inform the understanding of water resource needs and how these needs can be realistically addressed. Analysis of climate change impacts should be informed by both historical records and models of projected future impacts of an altered climate on water resources.
 - ii. **Future Land Use.** Future land use patterns should be assessed and analyzed as part of the evaluation process. The best available data and forecasts should be used to complete an analysis of these uncertain conditions. Future land use patterns should be evaluated based on historical trends and projections. An assessment of any approved local master plan or other land use plans that guide community growth and development should be included in the evaluation in order to promote full disclosure of effects.
 - iii. **Adaptive Management.** Adaptive management is a deliberate, iterative, and scientific based process of designing, implementing, monitoring, and adjusting an action, measure, or project to reduce uncertainty and maximize one or more goals over time. Adaptive management should be evaluated and incorporated into alternatives where warranted to avoid and minimize adverse impacts on the environment. Adaptive management measures should be clearly identified and evaluated as part of alternative actions or strategies in order to further reduce uncertainty, particularly when more detailed information and better tools are not readily available. Adaptive management approaches should be used to the extent they are commensurate with the significance of the proposed activity and available resources.
- E. Water Use.** Water supplies will continue to be subject to annual variability in precipitation and runoff, and subject to the uncertain effects of climate change on global weather patterns. As such, it is critical to consider water availability and promote water efficiency with all Federal investments in water resources. The

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efficient use of water and the consideration of multiple uses and competing demands on water resources should be taken into account when designing solutions to water resources problems. Alternative actions or plans, where applicable, should first consider opportunities to improve water efficiency with respect to existing water infrastructure and supplies. When efficiency alone will not suffice, the reuse and reclamation of water should be promoted.

The effect of Federal investments on water quality should also be considered and evaluated for all alternative plans or actions. Utilizing a watershed approach will help identify unintended adverse effects on water quality, and opportunities to minimize them. For many projects, some adverse effects may be unavoidable; these should be presented in the final array of alternatives. Potential tradeoffs between water efficiency and water quality should be considered and the impact of water resource investments on both water efficiency and water quality should be identified and examined as appropriate.

F. Nonstructural Approaches. Nonstructural approaches to water resources problems alter the use of existing infrastructure or human activities to generally avoid or minimize adverse changes to existing hydrologic, geomorphic, and ecological processes. Nonstructural approaches can often be the most cost-effective and environmentally protective alternative to implement. Nonstructural measures are particularly effective in minimizing adverse effects on floodplain functions and the aquatic environment. Such approaches are typically linked to floodplain projects but can also be appropriate for ecosystem restoration, water supply, water quality, and other water resource projects. Nonstructural measures include, but are not limited to, modifications to public policy, regulatory policy and pricing policy, as well as management practices, including green infrastructure.

A nonstructural measure or measures may in some cases offer a more effective alternative to a traditional structural measure. In other cases, nonstructural measures may be combined with fewer or smaller traditional structural measures to produce a complete alternative plan. Full consideration and reporting on nonstructural alternative actions or plans should be an integral part in the evaluation of Federal investments in water resources.

G. International Concerns. Federal water resources investments must consider treaty and other international obligations and develop alternatives that are consistent with meeting such obligations. Analyses should identify any way in which an international obligation constrains choices or precludes selection of a better plan to meet the Federal Objective. In all cases, timely consultations with relevant foreign governments should be undertaken when a Federal action is likely to have a

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significant impact on any land or water resources within its territorial boundaries or on the high seas.

- H. Design of Alternatives.** Alternative plans, strategies, or actions are to be formulated in a systematic manner to ensure that a range of reasonable alternatives are evaluated. The final analysis should include, at a minimum, the following concepts in order to support full disclosure and promote transparency in the decision making process. Each alternative plan, strategy or action is to be formulated to consider the following four criteria: completeness, effectiveness, efficiency, and acceptability.

Final Array of Alternatives

- a. In some cases, plans, strategies, or actions may be formulated which require changes in existing statutes, implementation authority, administrative regulations, and/or established law and policies (including existing cost-sharing requirements). Such required changes are to be identified.
 - b. Alternative plans, strategies, or actions that can effectively address a problem through the use of nonstructural approaches, if they exist, must be fully considered and carried forward to the final array of solutions. Such solutions must be given full and equal consideration in the decision making process.
 - c. An alternative plan, strategy, or action that is preferred by a local interest with oversight or implementation responsibilities must be included in the final analysis.
 - d. The environmentally preferred alternative, where required by the National Environmental Policy Act, must be included in the final analysis.
 - e. Mitigation of unavoidable adverse effects associated with each plan, strategy, or action is to be an integral part of all alternatives.
- I. Transparency in Decision Making.** These modernized Principles, Requirements and Guidelines are intended to significantly increase the transparency of and consistency in the planning and implementation process for Federal investments in water resources in this country. By providing a common framework for describing the effects of alternatives, Federal investments can be more easily viewed and compared within and among Federal programs. Both qualitative and quantitative

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information should be considered and displayed, including monetized and non-monetized effects, when alternatives are compared and evaluated.

- J. Plan Selection.** Any recommendation for Federal investments in water resources to address identified water resources needs must be justified by the public benefits when compared to costs. The basis for selection of the recommended plan should be fully reported and documented, including the criteria and considerations used in the selection of the recommended course of action by the Federal government. It is recognized that most of the activities pursued by the Federal government will require an assessment of tradeoffs by decision makers and that in many cases the final decision will require judgment that considers the extent of both monetized and non-monetized effects.

The rationale supporting Federal investment in water resources at the programmatic or project levels should summarize and explain the decision rationale leading from the identification of need through to the recommendation of a specific action. This should include the steps, basic assumptions, methods and results of analysis, criteria and results of various screenings and selections of alternatives, peer review proceedings and results, and the supporting reasons for other decisions necessary to execute the planning process. The information should enable the public to understand the decision rationale, confirm the supporting analyses and findings, and develop their own fully-informed opinions and/or decisions regarding the validity of the analysis and any associated recommendations. This information should be presented in a decision document or documents, and made available to the public in draft and final forms. The document(s) must demonstrate compliance with the National Environmental Policy Act (NEPA) and other pertinent Federal statutes and authorities.

2. Interagency Guidelines

The Council on Environmental Quality (CEQ) will issue Interagency Guidelines to provide direction to agencies for developing agency specific procedures to implement these Principles and Requirements. The draft Guidelines will be subject to public review and comment prior to finalization. Further, the draft Guidelines will be subjected to peer review, similar to the independent peer review conducted on a prior draft of this document. Following completion of the Interagency Guidelines, each Federal agency will develop Agency-Specific Procedures to direct the implementation of these Principles, Requirements and Guidelines to their pertinent missions and authorities. These Agency-Specific Procedures will be approved by Agency Department Heads, in consultation with the Council on Environmental Quality prior to implementation.

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Completion of this overall process will take deliberative action and, therefore, time. To the extent possible, agencies are encouraged to begin implementing the concepts laid out in these modernized Principles and Requirements consistent with law.

3. Effective Date

These Principles and Requirements shall take effect 180 days after the publication of the final Interagency Guidelines.

4. Approval

The Principles and Requirements for Federal Investments in Water Resources are hereby approved.

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GLOSSARY

Acceptability is the viability and appropriateness of an alternative from the perspective of the Nation's general public and consistency with existing Federal laws, authorities, and public policies. It does not include local or regional preferences for particular solutions or political expediency.

Adaptive management is a deliberate, iterative, and scientific based process of designing, implementing, monitoring, and adjusting an action, measure, or project to address changing circumstances and outcomes, reduce uncertainty, and maximize one or more goals over time.

Completeness is the extent to which an alternative provides and accounts for all features, investments, and/or other actions necessary to realize the planned effects, including any necessary actions by others. It does not necessarily mean that alternative actions need to be large in scope or scale.

Cumulative effects are the impacts on the environment which result from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions.

Ecosystem is the dynamic complex of plant, animal, and microorganism communities and the non-living environment interacting as a system.

Ecosystem functions are the interactions among organisms and between organisms and their environment.

Ecosystem services are the direct or indirect contributions, including economic, environmental and social effects, which ecosystems make to the environment and human populations.

Effectiveness is the extent to which an alternative alleviates the specified problems and achieves the specified opportunities.

Efficiency is the extent to which an alternative alleviates the specified problems and realizes the specified opportunities at the least cost.

Federal Objective specifies the fundamental goal of Federal investments in water resources.

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Interagency Guidelines provide guidance, in the form of more detailed procedures, to Federal agencies in designing and evaluating potential Federal investments in water resources at project, program and activity scales.

Local interest is a non-Federal entity with some implementation responsibility associated with a water resources investment.

Master plan is used to guide the growth and development of a community.

Nonstructural approaches alter the use of existing infrastructure or human activities to generally avoid or minimize adverse changes to existing hydrologic, geomorphic, and ecological processes.

Principles are overarching concepts that the Federal government seeks to achieve through policy implementation.

Public benefits encompass environmental, economic, and social goals, include monetary and non-monetary effects and allow for the inclusion of quantified and unquantified measures.

Regulatory activities are generally those activities subject to legal restrictions promulgated by the Federal government.

Resilience is the capacity of an ecosystem or community to respond to changes, including climate changes.

Restore means to return to a less degraded state.

Requirements are inputs to alternative plans, programs, designs, strategies, or actions that should be incorporated into analyses for Federal investment.

Sustainable means the creation and maintenance of conditions under which humans and nature can coexist in the present and into future.

Unwise use of floodplains is any action or change that diminishes public health and safety, or an action that is incompatible with or adversely impacts one or more floodplain functions that leads to a floodplain that is no longer self-sustaining.

Watershed is a land area that drains to a common waterbody.