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Obama Administration Releases Updated Principles and Guidelines for Federal Investments in Water Resources

WASHINGTON, D.C. - The Obama Administration today released updated Principles and Guidelines (P&G) for Federal investments in water resources to accelerate project approvals, reduce costs, and support water infrastructure projects with the greatest economic and community benefits.

The modernized P&G, which were developed by Federal agencies and incorporate extensive public comment, will allow agencies to better consider the full range of long-term economic benefits associated with water investments, including protecting communities against future storm damage, promoting recreational opportunities that support local business, and supporting other local priorities, as well as their water delivery, navigation, and flood prevention functions. These updates to the P&G, called for in the 2007 Water Resources Development Act, will align Federal policies with the full-spectrum approach many communities are now taking toward water infrastructure projects, and will help the Federal government reduce bureaucracy and make it quicker and easier to pursue projects that communities support.

"Smart investments in America's rivers, lakes, wetlands, and coasts are essential to promoting economic growth, ensuring clean drinking water, and building thriving communities," said Nancy Sutley, Chair of the White House Council on Environmental Quality. "This much needed update of the 30-year-old Principles and Guidelines will help agencies better evaluate and expedite water projects that grow our economy and are essential for protecting our communities from floods, droughts, and storms."

Since 1983, the Principles and Guidelines have provided direction to Federal agencies when evaluating and selecting major water projects, including projects related to navigation, storm resilience, water supply, wetland restoration, and flood prevention. The 1983 standards used a narrow set of parameters to evaluate water investments that made it difficult for agencies to support a range of important projects that communities want, or in some cases precluded support for good projects. As a result, lack of local

support for selected projects has often led to substantial delays, costing taxpayers and leaving communities at risk.

The updated P&G consist of a final set of Principles and Requirements that lays out broad principles to guide water investments, as well as draft Interagency Guidelines for implementing the Principles and Requirements. Released for public review and comment in 2009, the Principles and Requirements incorporate extensive input from the public as well as the National Academy of Sciences. They will promote responsible taxpayer investments with a transparent, inclusive consideration of the long-term economic and community costs and benefits of projects and ensure that communities are engaged in designing projects that work for them.

The draft Guidelines, developed with Federal interagency input, will be available for 60 days of public comment and will incorporate feedback from the public and stakeholders before being finalized. These Guidelines will ensure smart, front-end, collaborative planning among Federal agencies, states, local communities, stakeholders, and the public so that projects move faster, stay on budget, and support community needs.

The updated P&G will foster consistency and informed decision-making across all Federal agencies engaged in water resources planning, including the U.S. Army Corps of Engineers, Environmental Protection Agency, Department of Agriculture, Department of the Interior, National Oceanic and Atmospheric Administration, Tennessee Valley Authority, Federal Emergency Management Agency, and Office of Management and Budget.

For more information and to view the updated Principles and Guidelines, please visit: www.whitehouse.gov/administration/eop/ceq/initiatives/PandG
<<http://www.whitehouse.gov/administration/eop/ceq/initiatives/PandG>>

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Updated P&G Initiative page:

<http://www.whitehouse.gov/administration/eop/ceq/initiatives/PandG>

Press Release:

http://www.whitehouse.gov/administration/eop/ceq/Press_Releases/March_22_2013

Final Principles & Requirements pdf link:

http://www.whitehouse.gov/sites/default/files/final_principles_and_requirements_march_2013.pdf

Draft Guidelines pdf link:

http://www.whitehouse.gov/sites/default/files/draft_interagency_guidelines_march_2013.pdf

Principles and Requirements for Federal Investments in Water Resources

March 2013

The initial "Interagency Guidelines" are included in this pdf.

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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.

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This is a separate doc from preceding pages, though released concurrently; note footnote below.

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¹ This document is a statement of policy, is not a regulation, concerns only expectations for the internal management of the government, does not impose any legally binding requirements on federal agencies, and does not create any rights in third parties.

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1. PREAMBLE

These Interagency Guidelines provide direction to agencies for the development of agency-specific procedures to:

- a. Determine the applicability of the Principles & Requirements for Federal Investments in Water Resources (P&R) to agencies' water resource investments in the context of their missions and authorities; and
- b. Implement the common framework summarized in the Principles and Requirements (P&R) for analyzing those potential and existing water resource investments to which the P&R are determined applicable.

Federal agencies engaged in water resources projects, programs, activities, or related actions are required to develop agency-specific procedures to implement the P&R. Agencies must document the missions, programs, and investments to which the P&R will apply.

Agencies are responsible for ensuring, through the agency-specific procedures, that the spirit and intent of the P&R are carried out in a way that is compatible with that agency's mission and within the framework of the applicable statutes, laws, regulations, and policies that govern the agency's activities. Some agencies may find it appropriate or desirable to develop procedures by department or other unit. The Agency Head or equivalent Executive must make that determination, in consultation with CEQ and OMB.

The P&R applies to the following agencies:

- the Department of the Interior
- the Department of Agriculture
- the Department of Commerce
- the Environmental Protection Agency
- the Army Corps of Engineers
- the Federal Emergency Management Agency
- the Tennessee Valley Authority

Actions by these agencies subject to the P&R are often covered by other laws and regulations. Some laws and regulations, such as the requirements of the National Environmental Policy Act (P.L. 91-190) (NEPA), are applicable to all agencies while others may apply to only a few agencies or a single agency. While these differences among agencies' legal requirements necessitate a certain level of flexibility in the procedures used to meet the goals laid out in the P&R, all agency-developed guidance must be based on a single set of key concepts: the Federal Objective, Guiding Principles, and General Requirements of the P&R. These key concepts help ensure that the planning, design and evaluation of Federal investments are as consistent as possible across agencies.

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Agencies must review their existing planning, design, and evaluation processes. Where practicable and appropriate, agencies should update, revise, or replace them, in accordance with these Interagency Guidelines.

2. APPLICABILITY TO WATER RESOURCES INVESTMENTS

The Principles and Requirements apply to a diverse range of water resources investments. Per the P&R, this applicability includes potential or existing Federal investments that by purpose, either directly or indirectly, affect water quality or water quantity, including ecosystem restoration or land management activities. Figure 1 provides a flowchart for determining the applicability of the P&R to Federal investments.

The term “federal investment” is broad, and is intended to capture the wide array of projects, programs, and plans that the federal government undertakes in the arena of water resources. Potential federal investments include decisions or recommendations in which the federal government is responsible for implementation of an action, or when another party is responsible for implementation, but uses federally contributed funds. These would include, but not be limited to, infrastructure projects, grant programs, funding programs, and studies and plans for potential new actions. Existing federal investments are decisions or recommendations for modifications or updates to existing federal assets. These include, but are not limited to, the management plans for federal lands and operational plans for existing federally authorized water resources infrastructure.

From this broad suite of Federal investments, the P&R applies to those which are made to directly or indirectly use, alter, or manipulate water resources. This includes, but is not limited to: ecosystem restoration, land management activities, municipal and industrial water supply, agricultural water withdrawals, flood damage reduction, hydropower generation, inland and deep-draft navigation, and recreation.

A special case is activities involving existing infrastructure which may not result in a change in water quality or quantity by themselves, but without which, unintended changes to water resources may occur. This includes circumstances where existing infrastructure may fail or degrade without an activity, resulting in a change in water resources. Examples include dam safety modification to existing projects, which are specifically covered by the P&R, and major rehabilitation or replacement of facilities that have exceeded their useful life.

Agency investments that fall in the following categories are excluded from the P&R: regulatory actions; research or monitoring; or emergency actions. These exclusions are further described below. In addition to the categories excluded below, program or project exemptions may be identified in the agency specific procedures.

- a. Regulatory actions are those that restrict private behavior and include, but are not limited to: permits under sections 402 and 404 of the Clean Water Act, Endangered Species Act Consultations, and requirements under the Safe Drinking Water Act.

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Generally, work performed under a regulatory program does not need further documentation of non-applicability.

- b. Research or monitoring activities that gather or create knowledge that is general in nature, but that do not accomplish additional, permanent site specific actions may be excluded from coverage by the P&R. These actions include, but are not limited to: research on water efficiency, studies to examine the role of water in providing benefits, and monitoring stream characteristics.
- c. Emergency actions are those that are undertaken to remove immediate danger to public health and safety or to prevent immanent harm to property or the environment such as, for example, emergency repair of dams or levees to prevent flood breach and short-term containment and clean-up of toxic chemical spills. Agencies must certify that actions carried out as emergency actions meet the agency's established criteria for emergencies. In many cases a short-term action to address an immediate emergency may be followed up by longer term actions to rehabilitate damaged resources or better prepare for similar emergencies in the future. Such longer term actions would generally be subject to the P&R.
- d. Projects and programs that meet agency specific threshold criteria for exclusion or that fall below the project and program thresholds identified in Tables 1 and 2 in this document may also be excluded from coverage by the P&R.

In addition, agencies, through their agency specific procedures and in consultation with CEQ and OMB, may deem specific processes, planning requirements, or types of analysis as compliant with the goals of the P&R and Guidelines, document how the processes, requirements, or analyses are compliant, and exempt them from further requirements.

These Interagency Guidelines shall apply to relevant investment decision activities which have commenced 180 days after the date of issuance and, at the discretion of the Agency Head, any ongoing investment decision activities. These Interagency Guidelines shall not affect the validity of investment decisions initiated prior to the issuance.

These Interagency Guidelines are not intended to, and do not, create any right or benefit, substantive or procedural, enforceable at law or in equity by any party against the United States, its departments, agencies, or entities, its officers, employees, or agents, or any other person.. This document is a statement of policy, is not a regulation, and concerns only expectations for the internal management of the government.

3. TYPE AND SCALE OF ANALYSIS

Agencies have discretion to select an appropriate level of analysis that is commensurate to the nature of the water resource investment. Agencies can have flexibility in their analyses by: 1) selecting between project and programmatic type

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analysis, and 2) applying full analysis, simplified analysis, or exclusion of a water resources investment as appropriate.

a. Selection of project or program analysis

Agencies can scale their analyses using a project or programmatic level analysis. When circumstances warrant an analysis of a collection of project investments, agencies may choose to use a programmatic-level analysis. In certain circumstances, such an approach can provide efficiencies by combining analyses for multiple projects.

- Project-level analysis: Agencies should generally apply a project-level analysis to water resources investments for which they have discretion in designing site-specific alternatives.
- Programmatic-level analysis: Agencies should apply programmatic-level analysis in circumstances when agencies lack project-level discretion, or when multiple related actions can be better analyzed under one decision document. The program-level process will generally be used when the investment involves grant or funding programs, as well as for some types of Federal asset management plans. Programmatic-level analysis may also be appropriate for a number of projects generally under the same authorization. In some circumstances, individual projects that are evaluated using a programmatic-level process may warrant a separate project-level analysis due to the atypical nature of the particular project relative to the other projects in the program. Agencies should develop a process for identifying these types of atypical projects.

b. Thresholds for full analysis, simplified analysis, and exclusion

Agencies, in coordination with CEQ and OMB, should develop thresholds that will allow them to identify and analyze the applicable water resource investments. Agencies should consider appropriate threshold criteria for both the program and the project processes.

Tables 1 and 2 display baseline threshold criteria that agencies should build upon when developing their agency-specific procedures. An appropriate addition to this table within the agency specific procedures would be the inclusion of mission-specific thresholds and criteria for selecting between full analysis, simplified analysis, and exclusion. The agency-specified thresholds should be sufficiently adaptable to encompass the range of missions and authorities, yet not burden agency efforts with requirements beyond what is needed to inform the decision making process efficiently and effectively at a chosen level of confidence. Agency may also modify the thresholds below through the development of their agency-specific procedures.

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Table 1. Baseline threshold criteria to use in selection of the appropriate level of analysis for projects.

PROJECT SPECIFIC ANALYSIS	Financial Considerations		Environmental Considerations
	Implementation Costs (\$M)	Cost-share/ Federal Involvement	Level of NEPA Analysis ¹
<i>Predecision/Preauthorizaion</i>			
Full Project Analysis/Reporting	>20	≥ 50%	EIS
Simplified Project Analysis/Reporting	10 - 20	< 50%	EA
<i>Postdecision/Postauthorization</i>			
Full Project Analysis - Not Required	-	-	-
Simplified Project Analysis/Reporting	>10	≥50%	EA or EIS
<i>Operations and Maintenance²</i>			
Full Project Analysis - Not Required	-	-	-
Simplified Project Analysis/Reporting	>5	≥50%	EA

¹EIS = Environmental Impact Statement; EA = Environmental Assessment . The level of P&R analysis should be identified when the level of NEPA analysis is decided, in order than NEPA and P&R review may be done concurrently.

²Operations and Maintenance activities that are included in original project authorizations do not require separate analysis as long as activity is carried out consistent with authorization. Significantly changed O&M plans will require new analysis and potentially authorization.

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Table 2. Baseline threshold criteria to use in selection of the appropriate level of analysis for programs and plans.

PROGRAMMATIC LEVEL ANALYSIS	Financial Considerations		Environmental Considerations
	Annual Appropriations or Plan Development Costs (\$M)	Cost-share/ Federal Involvement	Level of NEPA Analysis ¹
<i>Grant Programs</i>			
Full Program Analysis/Reporting	>50	≥25%	EIS or EA
Simplified Program Analysis/Reporting	10 - 50	<25%	EA
<i>Funding Programs</i>			
Full Program Analysis/Reporting	>50	≥50%	EIS or EA
Simplified Program Analysis/Reporting	10 - 50	>25%	EA
<i>Plans (Watershed, Master, Landscape, etc.)</i>			
Full Program Analysis/Reporting	>50	≥25%	EIS or EA
Simplified Program Analysis/Reporting	10 - 50	<25%	EA

¹EIS = Environmental Impact Statement; EA = Environmental Assessment. The level of P&R analysis should be identified when the level of NEPA analysis is decided, in order that NEPA and P&R review may be done concurrently.

The criteria identified in Tables 1 and 2 should be considered "and" criteria; if all of the criteria in a row are met, then the specified level of analysis should generally be applied. If an investment does not meet all of the criteria in a row (cost, cost-share, or level of NEPA analysis), then a lower level of analysis may be applied. Projects or programs that fall below the thresholds identified in the tables may be excluded from analysis under the P&R (analytical requirements under other authorities may still apply). This does not prevent any agency from applying a higher level of analysis to particular programs or projects, if the agency deems a higher level of analysis to be warranted. Project level analysis can also be used for any individual project supported by grant or funding programs that meet the criteria set forth here.

Although Tables 1 and 2 provide baselines for agencies to use in their selection of appropriate analysis type, they are not meant to be comprehensive. Agencies may revise or supplement this table within their agency-specific procedures with thresholds that are relevant to their missions and authorities, and use professional judgment when selecting the appropriate level of analysis for an investment. Projects or programs that are excluded from the requirements of project or programmatic-level analysis on the basis of financial or environmental considerations (with NEPA analysis as a proxy for this consideration) may still be elevated to simplified or full analysis if a significant

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concern is anticipated in any one of the areas emphasized in the Principles and Requirements. Additionally, projects that are of broad geographic scope, cross state boundaries, or are substantially vulnerable to the effects of climate change may warrant an increased level of analysis, regardless of where their general financial or environmental considerations place them on Tables 1 and 2.

Water resource investments that fall below the defined threshold may be excluded from the analytical process described below, similar to the NEPA categorical exclusion framework. In addition, through development of Agency Specific Procedures, agencies, in coordination with CEQ and OMB, can determine certain activities that will not require analysis.

Agencies should use thresholds to deal with operations and maintenance activities on existing Federal investments. Some operations and maintenance activities may call for full analysis and others may be excluded from full analysis. The P&R specifically applies to operational modifications, modernization of existing facilities, and dam safety modifications. In the absence of changed conditions, activities that are generally expected as part of normal, planned operations like mowing of levees; painting of structures, including bridges; periodic nourishment of beaches; and maintenance dredging of channels, for example, may be excluded from P&R analysis using an appropriate threshold if they have been analyzed during the original project analysis and thus would already be covered. However, compliance with NEPA is still required. Those activities that result in consequential effects on water quantity or quality that have not been previously accounted for should be appropriately analyzed using either project or program-level processes. These activities may include major reconfiguration of assets like installing a fish ladder, or major rehabilitations of an asset. More significant operational changes, such as adding a new project purpose or significantly modifying project outputs, would normally warrant analysis under the P&R. Agencies should also determine if operational changes warrant a review and/or update of the NEPA and other environmental compliance documents.

c. Descriptions of full analysis, simplified analysis, and exclusions

Full analysis is a complete application of the P&R to a water resources investment. The steps to be included in agency-specific procedures for full analysis for project and programmatic-level analysis are discussed in Section 5.

Simplified analysis involves a more limited scope investigation and are appropriate for low risk/low cost projects or actions, as well as those with minimal consequences of failure and which do not pose a threat to human life or safety, or result in significant impacts to the environment. Under simplified analysis, fewer alternative plans will be required. Alternative plans should be developed to the level of detail necessary to support recommendation of a justified and implementable action. In general, the formulation process is streamlined and justification procedures reflect the scope and complexity of the problem being assessed.

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Actions that fall under the thresholds for applicability may be excluded, particularly when the activities are routine and have inconsequential effects on water resources. Agencies should ensure that the cumulative effects of many small, routine actions would not elevate those activities to simplified or full analysis.

d. Commensurate level of detail

Commensurate level of detail is a concept described in the P&R. Within both full analysis and simplified analysis, the appropriate level of detail for a given water resources investment may vary. The appropriate level of detail, including levels of effort in data collection, number and types of analyses to be performed, and models to be used, is a function of a wide variety of factors, including but not limited to:

- Magnitude and significance of specific problems and opportunities the investment seeks to address
- Significance of natural resources within the study area
- Magnitude and significance of expected impacts of the investment
- Expected investment scale and/or costs
- Complexity in science, engineering, ecosystems, culture, resource management
- Projected service or operational life of the project or facility
- Stakeholder concerns
- Authority under which the investment decision/recommendation is made
- Uncertainty in decision variables and resulting risk exposure
- Degree of permanence or irreversibility of potential investment decision
- Controversy associated with any of the above

These factors should be evaluated holistically. No single factor is necessarily determinative. However, in some cases, a single factor could drive a decision process to a higher level of detail if it were especially significant. The level of detail must also be adequate for determination of cumulative environmental, economic and social impacts. The requirement to use the best available science does not dictate using the highest level of detail in all situations. Rather, the best available science should be used to provide results with an acceptable confidence level appropriate to the level of detail needed to inform the necessary decisions.

e. Integration of existing planning processes, including the National Environmental Policy Act (NEPA) and land management planning efforts

Agency-specific procedures must integrate the requirements of the existing planning processes required by law or regulation, including NEPA and land management planning. Integration in this case means that the production of a single decision document for the NEPA and P&R analyses should be typical.

The P&R and these Interagency Guidelines are intended to be consistent with the policies and goals of NEPA. However, agency specific procedures and NEPA processes are not interchangeable. While it is possible and desirable for agencies to

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develop their agency-specific procedures in a way that will satisfy or complement their existing NEPA process, the NEPA process alone will not necessarily satisfy the requirements of P&R. For instance, a broad consideration of public benefits versus costs is not required as an element of the NEPA process, but is an element of P&R analysis.

In cases where other decision processes are mandated by statute or regulation, Federal agencies should integrate these into the agency-specific procedures to the extent possible. If full integration is not achievable, the parallel processes should be coordinated to avoid duplicative efforts and make maximum use of the information resulting from the processes.

f. Financial constraints

To help achieve a more effective and strategic allocation of resources at the Federal, state, and local levels, agencies should look for cost-beneficial options over long-term horizons when developing their project and program plans. Agencies therefore should ensure that each element of a proposed investment will provide substantial net benefits (which include environmental, economic and social benefits minus costs). The objective is to develop a portfolio of proposed investments that the Federal government or others can implement, which together would provide the greatest overall value to the taxpayer and the nation's economy, ecosystems and communities from the available funds. Lower cost investments with large benefits may be preferable to large scale investments with smaller benefits at the margin. The analysis should account for the economics of a potential investment, and fully consider the benefits and costs to communities and ecosystems as set out in the P&R. For instance, a proposed investment that seeks to reduce a community's damages from flooding should consider a full range of options, including smaller scale solutions or those that may not traditionally be within the Federal government's authority to implement, such as floodplain acquisitions. Floodplain acquisitions may be the most appropriate long term investment strategy when the full range of costs and beneficial effects are considered in the analysis, and as a result, need to be fully considered as part of the decision making process.

4. DOCUMENTATION

In agency-specific procedures, agencies must clearly document: the water resources investments within the agency to which the P&R will apply, the thresholds used to determine P&R applicability, and the analytical procedures the agency will use to implement the P&R and these Interagency Guidelines. Such documentation will improve transparency of federal water resource investment decisions.

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5. DEVELOPMENT OF AGENCY-SPECIFIC PROCEDURES

Agencies must develop procedures for applying the P&R at either the project or program-levels. Some agencies may have both types of procedures depending on their missions and authorities. More detail on these procedures is provided below.

Project and program-level procedures must reflect systems approaches that explicitly recognize the interconnectedness within and among physical systems, ecological systems, economic systems, and social/cultural systems. Systems are complex, changeable, and interconnected. Proposed water resources actions must be considered in the context of the greater whole in order to identify the best alternatives for achieving desired public benefits as well as to reduce the likelihood of undesirable or unintended consequences. Agency procedures should anticipate that addressing water resources problems and opportunities in a systems context may require a broader partnership to effectively address them.

a. Development of project-level procedure

The project-level procedures should reflect agency-specific authorities, missions, and statutory or regulatory constraints, as well as budget resources. This procedure must, at a minimum, contain a written planning process that provides a systematic and structured approach to informing the Federal investment decision. The procedure must address the overarching concepts:

- Incorporate the Federal Objective, Guiding Principles, and General Requirements.
- Incorporate the purposes and need for the project.
- Provide for quantitative and qualitative analysis at the appropriate commensurate level of detail.
- Identify a transparent process to make and document the Federal Investment decision.

The project-level procedure must embody the following key steps:

i. Define the water resources challenge(s) to be addressed

The procedure must begin with a clear definition of the water resources and economic challenge(s) being faced: stating the problems and/or opportunities to be addressed, the cause or causes of the problem(s), any constraints related to the problem(s), and the relationship of the problem(s) to the missions, statutory authorities, and other specific statutory or regulatory requirements of the agency or agencies involved. Clearly defined problems, needs, opportunities, and constraints will help determine whether there is a national interest in finding a means for managing the problem in light of the goals identified in the P&R. The definition of the water resource challenge must be developed through a watershed, ecosystem or systems approach, to the extent practicable.

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While a single perceived problem or opportunity may lead to an investment decision by a single agency, collaboration can enhance the potential for developing more integrated solutions in a more complete, acceptable, effective, and efficient way. The procedure should also assess and evaluate the potential interaction with other Federal and non-Federal water resources projects, programs, and investments within a region or watershed to maximize effectiveness and reduce costs.

ii. Define the decision context

The procedure must require a clear definition of the decision context. This includes:

- Defining the study area, the geographically affected area framed in a watershed/ecosystem/systems context where applicable
- Identifying the other water resource investments within the study area
- Describing how stakeholders in the decision will be identified and collaboration realized

iii. Identify existing conditions

Identifying the existing condition and the baseline levels of ecosystems services (which include economic services) in an investment decision study will provide the basis for confirming the needs to be addressed in the investigation, and provide the project baseline for forecasted future conditions. Inventories of the quantity and quality of current and potential environmental, economic, and social resources and services found within the study area, and the relationships and connections between them can identify the key resources and services for analysis. Inventories should focus not only on the targeted water resources but also on all of the interconnected resources that may be affected by a change in the targeted water resource. These inventories will also provide an opportunity to identify potential alternative investments. The development of inventories will be done at the commensurate level of detail with the rest of the analysis, and may range from development of a conceptual model (described below) to detailed surveys and fieldwork.

Inventories must include an explicit list of the services that flow from the existing study area ecosystems and infrastructure (including operational plans) with identification of those that are likely to meaningfully change because of the Federal investment. The inventories will facilitate analysis under the ecosystem services approach, described in section (f) Evaluate Alternatives.

Agencies should appropriately document the relationships and linkages of key resources and services, drivers of change, and impacts of proposed actions. One method of documenting these components is through a conceptual model. A conceptual model is a simplified visual representation and written description of interactions among natural, social, and economic systems that affect or are affected by identified actions. Such documentation will help analysts and the public clearly understand how ecosystems contribute to the provision of services.

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iv. Forecast future conditions of the study area

The procedure must require the forecast of future conditions of the study area absent the investment to understand how key resources and services will change in the future. This forecast will also serve as a project baseline with which to assess the effects of each proposed investment alternative. The evaluation of any Federal water resources investment is dependent on contrasting how future conditions would differ with and without the investment. A forecast of future conditions in the absence of a Federal investment, but including all reasonably foreseeable actions by public and private entities other than the Federal government, provides the project baseline condition. The period of this forecast should be comparable to the expected service or operational life of the project. This is the equivalent of the NEPA “no action” alternative and is the standard to which all federally sponsored alternatives are compared to determine the effects of each alternative investment. Because forecasts of future conditions are inherently uncertain, the degree of uncertainty must be characterized (quantitatively and/or qualitatively at the commensurate level of detail) for all forecasts. Key assumptions used in the forecasts must be explicitly stated. Where uncertainty may meaningfully affect the baseline in a manner that could affect the investment decision, multiple baselines can be used, with a clear explanation of the basis and assumptions underlying each. However, comparisons of social benefits and costs must be based on the same baseline.

Forecasts of future conditions should account for expected changes in hydrologic and other conditions as a result of a changing climate when these are likely to be significant. Expected increases in variability in temporal and spatial patterns of precipitation and water availability (e.g.: increased flooding in some areas and water scarcity in other areas) may challenge water resource systems. In addition, inundation of coastal land areas as sea levels rise may pose a long-term threat to water resources infrastructure located in these areas. Forecast of climate changes and analysis of impacts should be informed by both historical records and the best available models of projected future conditions. Consideration of climate related changes to water resources is especially important for projects with relatively long design life as these projects are most likely to experience significant climate related impacts.

The forecasts of future conditions should consider the effects of climate change on the water resources in question by applying the best available science. These forecasts should be designed to enable the subsequent evaluation of each alternative’s impacts on ecosystem resilience, the sustainability of critical ecosystem services, and the vulnerability of human and natural systems to climate change.

Future land use patterns should also be assessed when forecasting future conditions. Using historical trends, projections, and approved local land use plans will improve transparency and understanding of the long-term effects of a Federal investment in its local or regional context.

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v. Formulate a range of alternative investments

The procedure must require the formulation of a range of alternative investments that will address the defined water resource challenge and achieve the objectives, principles and requirements outlined in the P&R. A range of alternatives is necessary to ensure the analysis of significantly different approaches. It is also necessary to provide a reasonable basis for comparing the relative effectiveness and efficiency of the alternatives, and thus identify or bracket the most appropriate solutions from Federal and non-Federal perspectives for more detailed evaluations. The procedure must encourage the formulation of alternatives that will comprehensively integrate multiple objectives for water resource investments. Agencies should consider alternatives within the purview of state, local, or other Federal agencies. Among the more promising alternatives, the agencies should formulate alternatives of varying scale to enable the evaluation of incremental efficiency. Alternatives should only be considered valid for more detailed analyses and/or selection when they are considered complete, effective, efficient, and acceptable.

Alternatives must be designed to achieve environmental, economic, and social goals. Given the tradeoffs involved in addressing some of the complex water resources problems facing our Nation, some alternatives may involve actions that produce unavoidable adverse environmental, economic and social impacts. In designing solutions to such complex problems, agencies shall first seek to avoid and/or minimize adverse effects. When damage to the environment is unavoidable, mitigation for, adverse effects must be provided as required by law to the extent practicable. Such mitigation or restoration measures to address effects on the natural environment must be determined in accordance with applicable laws, regulations, and Executive Orders, in consultation with Federal and State fish and wildlife agencies, or other appropriate authorities.

When mitigation is necessary, agencies should use appropriate techniques based on best available science to mitigate for a broad range of impacts resulting from the investment. This range could go beyond those impacts traditionally considered, and could include services such as cultural importance and carbon storage.

When an alternative includes a proposal that relies upon removal of an institutional barrier, (i.e. the alternative would only be acceptable with the proposed change, such as a statutory revision), it should also include a description of any other effects of removing the institutional barrier to be considered complete. With the exception of proposals that explicitly identify changes in legal requirements as part of the alternative, all alternatives should comply with existing laws and regulations.

When an alternative investment consists of multiple discrete measures and one or more of those measures could perform in a beneficial and sustainable manner without other measures in the alternative (i.e., there are no obvious dependencies or a scientific need to implement all of the measures as a system), those measures should be evaluated as

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discrete units. These evaluations should focus on whether the alternative investment is an effective and efficient means of achieving the study objectives. As with the evaluation of full alternatives, these evaluations and any subsequent tradeoff analyses and selections must fully consider the array of economic, environmental and social effects - quantifiable (monetary and non-monetary) and non-quantifiable effects, and they must be displayed in a transparent manner to help inform the public and the decision-makers. In many cases, the most efficient investment will be one that selects a subset of discrete features with the greatest public benefits. Plan formulation needs to describe the features and capabilities of any discrete measures as well as the full alternatives.

The procedure must require the formulation of a range of alternative investments that will address the defined water resource challenge and achieve the policies and goals outlined in the P&R. To achieve these policies and goals, the procedure must encourage the development of alternatives that will comprehensively address the range of problems and opportunities associated with the defined water resource challenge. Alternatives must be formulated to reflect a range of scales and management measures, and be assessed against the formulation criteria presented in the Principles & Requirements: completeness, effectiveness, efficiency, and acceptability.

vi. Evaluate alternatives

Agency procedures for evaluating alternatives must require the comprehensive evaluation of the formulated array of alternatives to assess the contributions of each alternative to the Federal Objective and the Guiding Principles. Agency evaluation procedures must incorporate: 1) methods to evaluate how public benefits of an alternative compare to its costs, and 2) methods to evaluate how the alternative performs with respect to the Guiding Principles.

As described in the P&R, alternatives should be evaluated through an ecosystem services approach that organizes all the relevant 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; economic growth; and educational and cultural values.

- Public benefit and cost comparison

The public benefits of alternatives are evaluated in terms of differences in the quality and value of ecosystem services (which include economic services) provided between the expected future condition with the alternative in place and the most likely “future without” conditions (the No Action alternative). The following general framework must be

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employed: 1) measuring the economic, environmental, and social changes in the watershed or ecosystem condition between a future condition with and without the investment alternative in place, 2) measuring how those changes affect the quantity and quality of ecosystem and economic functions, processes, outputs, and resulting services, and 3) where valid and practical, applying monetary valuation to those changes in ecosystem and economic services. Agencies should strive to focus their analyses on the most important consequences, using current and relevant information about economic, ecological, and social importance, likely human and social consequences, and public concerns. This evaluation framework recognizes that services are produced through the interrelationships of various biophysical and social components. Agencies should focus their analyses on impacts that are relevant in terms of institutional, public, and/or scientific importance. In determining which impacts are most important, agencies should consider characteristics such as reversibility, retrievability, and sustainability.”

For example, if a proposed water resource alternative impacts a wetland marsh, the ecosystem services approach could be structured as follows. The agency should identify the wetland impact among the effects of the action and measure the nature of the wetland impact, including areal extent. Next, the agency should gather information on the role of the wetland in producing services important within the watershed or ecosystem in question. Such services may include flood control, groundwater replenishment, recreation and tourism, fish habitat, and carbon storage. Next the agency should describe (quantitatively, where appropriate) how the impact to the wetland would affect the services in question. Lastly, the agency should attempt to place an economic value on the change in the identified ecosystem services. If the wetland impact leads to a reduction in ecosystem services, the agency should consider the full range of lost services provided by the impacted wetland in designing appropriate mitigation. Note that the impact to the wetland may be one of several effects that should be analyzed in a similar manner.

These differences in services provided (i.e. the effects of the alternative) are the basis of comparison in terms of public benefits. Public benefits and costs should be measured in monetary terms, when possible, and in non-monetary terms, when this is not possible. To the extent possible, changes in services resulting from a proposed investment must be quantified in a scientifically valid and accepted way. Those effects that cannot be acceptably quantified must be qualitatively described in sufficient detail so that the decision maker can understand the importance and magnitude of the changes. Descriptions that merely list and/or laud the benefits of the affected services are less useful to decision makers than descriptions that allow meaningful differentiation of more and less important services. Whenever valid and practical, quantified effects should be monetized. Monetization should follow sound economic principles and practices (See OMB Circular A-4 for examples of currently accepted monetization practices and a discussion of the opportunity cost and willingness to pay concepts of value). Discounting is to be used to convert future monetary values to present or annualized values, consistent with the statutory requirements for the agency and relevant agency or Administration guidance (e.g., OMB Circular A-4).

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It will not always be possible to express in monetary units all of the important benefits and costs. When it is not, the most efficient alternative will not necessarily be the one with the largest quantified and monetized net benefits estimate. In such cases, professional judgment must be exercised in determining how important the non-quantified benefits or costs may be in the context of the overall analysis. If the non-quantified benefits and costs are likely to be important, "threshold" or "break-even" analyses are approaches that may be useful to evaluate their significance. Whatever analytical technique is used, reports should indicate, where possible, which non-quantified effects are most important and why.

While quantification of all important ecosystem service effects might not be possible, these effects should remain instrumental in the analysis. Additionally, important ecosystem services may flow beyond an immediate project site; thus, effects beyond that immediate area are also important to consider.

- Performance against guiding Principles

Alternatives must be evaluated for their performance with respect to each of the six Guiding Principles. This requires an assessment of how each alternative contributes to the overarching concepts the Federal government seeks to promote through investments in water resources. Such an evaluation must include quantified effects to the extent feasible, but must also give full and equal consideration to important effects that cannot be quantified and/or monetized, to inform the valuing of the tradeoffs among the various alternatives.

Agencies must continually strive to employ and advance the best available techniques and best available science for accounting for the full range of ecosystem services. Agencies should attempt to evaluate the services that are important in a given situation. These evaluations may extend beyond the services traditionally evaluated to account for services, like carbon storage and cultural values, which may not have been evaluated in the past.

Agency procedures for evaluating alternatives must require the comprehensive evaluation of the formulated array of alternatives to assess the contributions of each alternative to the Federal Objective and the Guiding Principles. Agency evaluation procedures must incorporate: 1) methods to evaluate how public benefits of an alternative compare to its costs; 2) methods to evaluate how the alternative performs with respect to the Guiding Principles; and 3) methods to evaluate the alternative against the four formulation criteria: completeness, effectiveness, efficiency, and acceptability.

vii. Display the effects/comparison of alternatives

The procedures must display the effects of investment alternatives in a manner that allows for the unbiased comparison of alternatives for their contributions to the Federal

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Objective and Guiding Principles. This comparison highlights the similarities and differences in plans and identifies the trade-offs and quantified and unquantified costs.

These comparisons may be best communicated through effective displays. Displays may include graphs, charts, tables, drawings, photographs, summary statements, or other indications of impacts. The method of display for a specific category must be the same across all alternatives. A matrix where all alternatives and all evaluation categories are shown in one display is desirable. Displays help the public and the decision-maker to understand the similarities and differences among alternatives, the effectiveness of alternatives in addressing the project purpose or purposes, and the trade-offs in quantified and unquantified benefits and costs among the various alternatives.

The tradeoffs among and within economic, environmental, and social goals must be explicitly identified across alternative plans. These tradeoffs include monetary, non-monetary, quantified, and unquantified benefits and costs. Tradeoffs are compared from the perspective of the specific circumstances of each study, including the study area, resources, and study authority, to form the basis for deciding which plan best addresses the Federal Objective and Guiding Principles.

Some effects measured will be more relevant than others to the achievement of the investment objective(s), and these must be noted and separated from incidental effects. Agencies will note effects that are irreversible or that have high end-of-lifecycle costs to reverse (including decommissioning costs). The display must emphasize the contribution of each alternative to the Federal Objective as well as to each of the Guiding Principles. This comparison should be documented in narrative form in addition to the display, and include a discussion of trade-offs. The display should also present the performance of each alternative relative to study objectives, the four formulation criteria, and any other screening or selection criteria used in the analyses.

Different project components may be justified based on different types of public benefits - for example, public safety may be the primary justification for one component, whereas a mix of economic and environmental benefits may support the justification for another component. Similarly, justification may be based on a combination of quantifiable (monetary and non-monetary) and non-quantifiable effects. The tradeoffs among the goals and objectives of separable project components should also be identified to provide a basis for the rationale supporting their inclusion in or exclusion from the alternative.

The level of detail in assessing separable components and the associated description of the specific tradeoffs among the goals and objectives of the investment decision should be sufficient to inform the decisions to be made and to provide transparency to the decision making process.

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viii. Selection criteria that conform to the P&R and any agency specific requirements

Agency procedures must include criteria to guide the selection of an investment. The criteria must conform to the Guiding Principles, the General Requirements, and the Federal Objective. The selected alternative shall be justified as follows: 1) a complete discussion of the tradeoffs involved in making a decision regarding the proposed Federal investment; 2) a discussion of how economic, environmental, and social benefits (monetary and non-monetary, quantified and unquantified) justify the costs (monetary and non-monetary, quantified and unquantified) and 3) the selected alternative shall adequately attain the goals outlined in the Guiding Principles, recognizing how tradeoffs between the various goals will affect the level of attainment within each Guiding Principle. In this analysis, the plan that reasonably maximizes the public benefits to the nation relative to costs must be clearly identified. It is recognized that the valuing of tradeoffs among alternatives could result in the identification of more than one plan that reasonably maximizes public benefits relative to costs. If the plan that reasonably maximizes public benefits is not selected for implementation, the rationale must be clearly outlined in the decision document (for example, because of institutional barriers that cannot be removed). The information required by these three steps should also be developed for any separable measures contained within the competing alternatives. The selection criteria will reflect agency-specific legal requirements in statutes or regulations as well as applicable guidance. The entire selection process must be properly documented and transparently explained, including a discussion of stakeholder and/or sponsor preferences. Transparency will be critical for the public to understand how the final selection was made.

ix. Iteration within the process

Decisions or recommendations involving Federal investments affecting water resources, quantity or quality should be made through a dynamic process, one both iterative and progressive. The process should be responsive to significant changes in information, conditions, and/or objectives. These can occur at any point in the process and, depending on the potential consequences of the changes, may dictate that previous decision points, assumptions, and forecasts be reviewed in light of these changes.

b. Development of program-level procedures

Certain circumstances may warrant the use of a program-level procedure to implement federal water resource investments. Such circumstances include, but are not limited to, situations where an agency:

- Funds project level activities but has limited discretion in designing site-specific alternatives for addressing water resources issues. These situations include federal grant programs that solicit project proposals to address specific types of water resource challenges (e.g., wetland restoration, fish passage improvements).

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- Funds another entity (e.g., state, tribe, locality) to carry out project grants to address a specific water resource challenge.
- Undertakes a set of actions similar in nature that can be analyzed under one decision document. Such actions may include those that individually do not have consequential water resources effects, but in the aggregate have cumulative effects on water resources. This may include situations where an agency has project-level water resource activities that do not meet agency-defined thresholds for individual P&R applicability, but have cumulative effects that warrant a P&R analysis.

The program-level procedures must embody the following key elements:

- i. Program-level procedures do not relieve agencies from designing and evaluating water resources investments consistent with the P&R; however, program-level processes may warrant different approaches to investment design and evaluation than those used for project-level procedures. These different approaches must incorporate in concept the same key elements of the project-level procedure.
- ii. Program-level procedures should account for circumstances where an individual project, evaluated under a program-level analysis, may need further evaluation using project-level procedures. Such circumstances address “outlier” projects that are not typical of other projects evaluated at the program level. Such outlier projects may include those that, with respect to the typical program projects, are larger in size, greater in impact, more costly, more controversial, employ novel techniques, or address new problems not typically addressed through the program in question. Agencies should develop thresholds to identify outlier projects and evaluate them using a project-level procedure. Depending on the circumstance and as defined by agency guidance, the project-level procedures may need to be applied in part or in whole to the outlier projects.
- iii. In circumstances where agencies fund water resources investments through another entity (e.g., state, tribe, locality), agencies should regularly evaluate (subject to available resources), in conjunction with the third party, how those investments perform with respect to the P&R and take appropriate action to ensure sound performance.
- iv. Program-level procedures must, at a minimum, contain:
 - a written process that provides a systematic and structured approach to informing the Federal investment decision and
 - the agency’s approach to:
 - Designing and evaluating water resource programs consistent with the P&R.
 - Transparently making and documenting the water resources investment decision.

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v. Program-Level Approaches:

Agencies have some discretion to design their program-level procedures to accommodate agency-specific circumstances. While there are potentially many valid approaches to structuring program-level procedures, a few approaches are described below:

- **Tiered programmatic analysis:**

- Appropriate for: Grant programs that solicit water resource projects through a request for proposals.
- How it works: The agency conducts a programmatic analysis of typical projects within a program to understand how they perform with respect to the P&R. The programmatic analysis will characterize typical project types; describe the effects of typical project types; describe how typical projects perform with respect to the P&R; and determine whether the typical level of performance is acceptable. If typical level of performance is determined to be acceptable, the agency will use a checklist, tiered from the programmatic analysis, to review the effects of proposed actions or projects and determine whether they are typical. If a proposed action or project is determined to be typical, then it is covered by the programmatic analysis and may move forward in agency decision-making. If the project is determined to be atypical, then the agency will need to further supplement the programmatic analysis before moving the project forward.

- **Retrospective analysis:**

- Appropriate for: Funding programs, such as Safe Drinking Water Act State Revolving Fund and the Clean Water Act State Revolving Fund, where the federal government funds another entity to carry out a program to address specific water resource challenges.
- How it works: The federal agency structures its program guidance to other parties to require, to the extent that statutory authority allows, that funded projects reflect the P&R. The federal agency will periodically review a collection of funded projects to assess whether they perform appropriately with respect to the P&R. Based on the review, the federal agency will take appropriate action to structure its program guidance so that appropriate performance is achieved.

- **Grouped analysis:**

- Appropriate for: Known actions similar in nature that can be analyzed under one decision document. Such actions may include those that individually do not have consequential water resource effects, but have cumulative effects on water resources.
- How it works: In a programmatic analysis, the agency characterizes the nature of the proposed actions, their individual and combined effects on water resources, and how those effects perform with respect to the P&R.

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6. INTERAGENCY CONSISTENCY

The Federal agencies will collaborate in the development of their agency-specific procedures to promote consistency of water resource investment decisions across the Federal government. Such efforts may include both formal and informal collaboration mechanisms. Collaboration will be especially important to advance newer requirements like the ecosystem services approach.

Each agency's procedures must undergo an interagency peer review process prior to approval by their respective Agency Department Head. Agency-specific procedures should also be reviewed and updated, if necessary, when the Interagency Guidelines are modified.

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Figure 1. Determining the applicability of the Principles and Requirements.

