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**OFFICE OF THE ASSISTANT SECRETARY**
**CIVIL WORKS**
**108 ARMY PENTAGON**
**WASHINGTON, DC 20310-0108**

SACW

22 April 2024

MEMORANDUM FOR COMMANDING GENERAL, U.S. ARMY CORPS OF ENGINEERS

SUBJECT: Incorporation of Nature-Based Solutions in Civil Works Projects

1. Purpose. Increasingly, non-federal interests working in partnership with the U.S. Army Corps of Engineers (USACE) are requesting the integration of natural or nature-based solutions (NBS) in Civil Works (CW) projects and programs. This memorandum recognizes progress being made by USACE in developing and using NBS in CW projects and provides additional guidance and direction to continue this trend to incorporate NBS where appropriate. While there are challenges in implementing NBS and data gaps that require further research and analysis, the intent of this memorandum is to expand the use of NBS and identify challenges and possible solutions in implementing NBS. This memorandum applies to all CW programs and missions except the Regulatory Program.

2. References:

a. Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, February 11, 1994

b. Executive Order 13985, Advancing Racial Equity and Support for Underserved Communities Through the Federal Government, January 20, 2021

c. Executive Order 13990, Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis, January 20, 2021

d. Executive Order 14008, Tackling the Climate Crisis at Home and Abroad, January 27, 2021

e. Office of Management and Budget Memorandum M-21-28, Interim Implementation Guidance for the Justice40 Initiative, July 20, 2021

f. Comprehensive Documentation of Benefits in Decision Document, January 5, 2021, issued by the Assistant Secretary of the Army (Civil Works)

g. Opportunities to Accelerate Nature-based Solutions: A Roadmap for Climate Progress, Thriving Nature, Equity, & Prosperity, November 2022, issued by the White House Council on Environmental Quality, White House Office of Domestic Climate

Policy, and White House Office of Science and Technology Policy

h. Water Resources Development Act of 2007, Section 2031

i. Principles, Requirements and Guidelines for Water and Land Related Resources Implementation Studies, 2014

j. Implementation Guidance for Section 1184 of the Water Resources Development Act of 2016, Consideration of Measures, dated November 16, 2017

k. Implementation Guidance for Section 1149 of the Water Resources Development Act of 2018, Inclusion of Alternative Measures for Aquatic Ecosystem Restoration, dated April 12, 2019

l. Water Resources Development Act of 2020, Section 116

m. Corps of Engineers Agency Specific Procedures to Implement the Principles, Requirements, and Guidelines for Federal Investments in Water Resources, proposed rule issued February 15, 2024

n. Engineer Regulation 1105-2-103, Policy for Conducting Civil Works Planning Studies, November 7, 2023

o. Civil Works Actions to Sustain and Advance the Nation's Waters and Wetlands After the Sackett Decision, Assistant Secretary of the Army (Civil Works) Memo for Commanding General, USACE, dated March 18, 2024

3. Background.

a. NBS are actions to protect, sustainably manage, or restore naturally functioning or modified ecosystems to address societal challenges, while simultaneously providing benefits for people and the environment. NBS are described in existing laws and guidance including references j. through n. NBS may include beaches, dunes, wetlands, fluvial flood plains, and oyster reefs, among other solutions. A nature-based feature is a feature that is created by human design, engineering, and construction that works in concert with natural processes or to mimic as closely as possible conditions which would occur absent human changes to the landscape or hydrology to achieve study objectives. NBS will be used throughout this memorandum as the overarching term for nature-based solutions and nature-based features.

b. Benefits – NBS can provide multiple environmental, social, and economic benefits that other types of solutions may not. As laid out in reference g., the Administration is committed to maximizing NBS as a critical tool to confront climate change and other major challenges while promoting community resilience. NBS can be

essential to fighting the climate crisis by reducing emissions, removing carbon from the atmosphere, making ecosystems more resilient, and lowering climate change risks for people. NBS do not replace the need for conventional engineering approaches; rather they can work hand in hand with traditional methods for an outcome that is greater than its parts. This wider range of benefits is why NBS should be incorporated, as appropriate, into CW projects. The use of NBS has also been directed in recent Water Resources Development Acts (WRDAs) as discussed in 5.b. below.

4. Applicability. This memorandum applies to studies for projects that are initiated after this memorandum is issued, although USACE should also strive to follow the principles in this memorandum for study efforts that are currently underway, where appropriate. NBS should be considered across the project life cycle, to include operation, maintenance, repair, and rehabilitation, and not just during the construction phase.

5. Current Efforts.

a. Principles, Requirements and Guidelines (PR&G) – The PR&G recognizes the many competing demands for limited federal resources with the intention that federal investments in water resources should strive to maximize public benefits, with appropriate consideration of costs. Public benefits, which can be significantly supported by NBS, encompass environmental, economic, and social goals, include monetary and nonmonetary effects, and allow for the consideration of both quantified and unquantified measures. The Agency Specific Procedures (ASPs) for the PR&G would govern how USACE evaluates proposed water resource development projects. As proposed, the ASPs would require that a fully NBS alternative be included in the final array of alternatives, if they exist, for full transparency and consideration using the same level of rigor and detail as the other solutions proposed. The ASPs acknowledge that NBS should also be considered and encouraged as an element of other developed solution alternatives, providing a hybrid comprehensive solution.

b. WRDA Provisions – Congress has shown its growing interest and support for NBS with recent WRDA provisions directing NBS efforts. These provisions define and encourage the use of natural and nature-based features in the development of flood risk management, coastal storm risk management, and ecosystem restoration projects.

c. Engineering with Nature (EWN) – The EWN program pursues the intentional alignment of natural and engineering processes to efficiently and sustainably deliver economic, environmental, and social benefits through collaboration. Natural processes are used to maximum benefit, thereby reducing demands on limited resources, minimizing the environmental footprint of projects, and enhancing the quality of project benefits. EWN’s lessons learned, and best practices can help inform NBS in CW projects.

d. Additional Efforts – USACE is also supporting additional NBS efforts through the beneficial use of dredged material. USACE can develop and implement best management practices for more efficient and effective use of sediments in coastal,

estuarine, and inland environments for healthier and more resilient systems. Research, pilot projects, and other efforts are being utilized to collect more information and data on the uses and effectiveness of NBS.

6. Incorporating NBS in CW Projects. Implementing NBS in CW projects, while increasing, has been sporadic and more must be done to better incorporate and expand NBS use across the project life cycle where appropriate and feasible. Project hereafter refers to projects, plans, and programs.

a. USACE's role is to identify, evaluate, and incorporate NBS in potential solutions for CW projects that meet the federal objectives to the maximum extent practicable. In planning and developing CW projects, USACE will present all possible solutions, including the use of NBS, clearly and transparently to inform the recommendation for the final project authorized by Congress for federal action. In collaboration with the non-federal interest and the broader community, USACE should consider water resources problems holistically and consider comprehensive solutions that may include alternatives beyond USACE's missions. USACE should also consider the use of Indigenous Knowledge which can help inform NBS that are better aligned with community values and outcomes.

b. In instances where alternatives are beyond USACE missions, the alternative should specifically identify the relevant parties with requisite responsibility for any action beyond USACE missions, their authority for that action, the interrelation between that action and the recommended USACE project, and appropriate sequencing of implementation. Any recommendations for authorization should clearly delineate the federal water resources development project being recommended for authorization and USACE implementation and any condition precedent for construction.

c. NBS should be evaluated with the same rigor and attention as other alternatives.

d. The final array of alternatives should include a complete NBS to the extent such a solution exists. Nature-based solutions and features should also be considered as components of other alternatives in the final array, providing integrated or "hybrid" alternatives with these other measures.

e. The Army recognizes that NBS have an important place for consideration in CW projects but may not be appropriate in all circumstances to fully address the water resources problem.

f. The NBS alternative must be feasible, which means environmentally acceptable,

justified, technically feasible, and appropriate to address, or address in part, the water resources problem presented. NBS will also need to be within the study authority for the project.

g. Throughout NBS planning and design, consideration, as with all projects, should be given to the biddability, constructability, operability, degree of environmental compliance, and sustainability of the proposed NBS.

7. Tradeoffs. As with all potential solutions, NBS has risks, benefits, and costs that need to be evaluated and presented openly and transparently for decisionmakers and the public.

a. Tradeoffs among potential alternatives will be assessed and described throughout the decision-making process and in a manner that informs decision-making. The tradeoff displays shall be understandable, transparent, and constructed in a generally consistent fashion for all analyses.

b. Costs and benefits across the entire life cycle of the project should be considered. For instance, some NBS alternatives may have a higher operation and maintenance need over time or require additional monitoring and adaptive management that will result in a greater total cost than other solutions over the life of the project. Alternatively, NBS may promote greater community resilience, and identifying these benefits are also important in the comparison of alternatives.

c. In some instances, more data and information are needed to compare the effectiveness, longevity, sustainability, and resilience of NBS to known engineering solutions. Engineering guidance or criteria will be needed to support these evaluations and tradeoff analyses.

8. Stakeholder Interest and Communication. As noted, many non-federal interests and stakeholders have expressed significant interest in pursuing NBS to address their water resources challenges. The USACE should consult with communities and non-federal interests about the benefits NBS can provide along with the long-term costs, operation and maintenance needs, and risks associated with these solutions. The intent of the transparent tradeoff analysis, as described in paragraph 7.a. above, is to enable open, honest discussions with stakeholders about all alternatives, including NBS.

9. Challenges to Address. Significant challenges remain to implement NBS broadly across USACE CW programs. Technical information is lacking in some areas to understand the capability, capacity, resilience, and regional variability of NBS. Additional direction will be needed as USACE implements the ASPs for the PR&G and incorporates NBS in discrete alternatives but also as part of comprehensive solutions. Challenges may also exist in assessing and quantifying benefits and costs associated with NBS. Further coordination between planning, engineering, construction, and

operations disciplines will be needed for broad incorporation of NBS across the project life cycle to be successful. Additional tools and technology will likely need to be developed to support analyses and incorporation of NBS.

10. Path Forward to Address Challenges. While challenges remain, important work is ongoing to address these needs. Engineering guidance on NBS based on specific applications has begun to be disseminated across USACE to provide support as project teams look to use these solutions in the coastal and riverine environments (see e.g. guidance on Oyster Reefs, Tidal Wetlands, Use of Woody Materials as Nature-Based Solutions, and Floodplain Reconnection). As USACE incorporates the PR&G ASPs in relevant planning guidance, inclusion of NBS and the consideration of these solutions should also be explicit. USACE must work to identify tools which can help assess benefits and costs associated with NBS.

These tools should seek to quantify and monetize benefits and costs to the extent practicable, but tools and information which describe benefits and costs in qualitative manners should also be considered for development. USACE should consider establishing a Planning Center of Expertise and/or Technical Center of Expertise to support project teams in developing and implementing NBS. The Army will continue to support resourcing further NBS research and developing pilot programs, such as in Miami-Dade, Florida, to overcome some of the issues identified. Regardless of the challenges, NBS need to be formulated for and incorporated into analyses for all CW projects as appropriate.

11. Briefing. USACE is directed to provide a comprehensive brief to me within 45 days on the ongoing, planned, and additional CW actions that can further NBS in CW projects along with an assessment on how to overcome known barriers, including any legal authority issues that preclude the use of NBS across the project life cycle. This comprehensive brief should be coordinated and timed with the briefing called for in paragraph 3.c of reference o.

12. Point of Contact. Questions regarding this matter may be directed to Lauren Leuck, Strategic Communication and Policy Specialist, Office of the Assistant Secretary of the Army (Civil Works) at lauren.d.leuck.civ@army.mil.

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