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Hurdles to Beneficial Use of Dredged Material: Root Cause Analysis

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PURPOSE: This technical note (TN) summarizes high points of an internal review of US Army Corps of Engineers (USACE) dredging and dredged material management practices, specifically beneficial use of dredged material (BUDM), that USACE manages from various navigation channels and ports around the nation.

BACKGROUND: BUDM is defined as "productive and positive uses of dredged material which cover broad use categories ranging from fish and wildlife habitat development to human recreation, to industrial and commercial uses" (USACE 2015). Section 125 of the Water Resources Development Act of 2020 (WRDA 2020; Public Law 119-260) renewed Congress's continued commitment to maximize BUDM by establishing BU as a national policy. WRDA 2020 Section 125 expanded the ability of USACE to incorporate economic and environmental benefits of BUDM when calculating the Federal Standard (FS). The FS is defined as "the dredged material disposal alternative or alternatives identified by the Corps which represent the least costly alternatives consistent with sound engineering practices and meeting the environmental standards established by [the Clean Water Act Section] 404(b)(1) evaluation process or ocean dumping criteria" (33 Code of Federal Regulations [CFR] 335.7). Establishing one or more FS placement alternatives for a project is not necessarily accomplished via a prescriptive equation. Prior to Section 125, FS calculations were primarily evaluated strictly on monetized parameters (cost of dredging and placement) to produce a simple benefit cost ratio. But determining the FS is a process of evaluation that, following the expanded authority granted with Section 125, can include both monetary and nonmonetary benefits directly related to BUDM. For example, the cost of dredging and placement, habitat units created, spatial relationship to disadvantaged communities, improvements in climate resiliency, and recreation can all be considered.

Through Section 125, Congress also amended Section 204(d) of WRDA 1992 (Public Law 102-580) to direct that the federal portion of the incremental cost of other-than-least-cost placements of DM for certain purposes (aquatic ecosystem restoration and beach renourishment) be funded using appropriations available for the construction or operation and maintenance (O&M) of water resource development projects. Prior to this, costs for BUDM exceeding the FS were either shared through the Continuing Authorities Program or paid for in full by a nonfederal entity. Now, nonfederal interests can request that their cost share be paired with the larger, regularly funded resources in construction and O&M appropriations, which makes BUDM more accessible.

USACE documented that approximately 30% to 40% of dredged material was used for beneficial purposes from 1998 to 2022 (USACE-ERDC, n.d.). Subsequently, the USACE Chief of Engineers issued a Command Philosophy Notice, on 27 January 2023, establishing the goal of 70% BUDM

from navigation projects by 2030 (USACE-ERDC 2022). The first step of this process is to evaluate the hurdles, solutions, and milestones to improve the current (estimated) 30% to 40% BUDM.

Figure 1 illustrates the BUDM vision that the USACE Chief of Engineers laid out, which emphasizes the following three key tenets: (1) dredged material is a valuable resource; (2) there are opportunities to expand BUDM within the Federal Standard; and (3) strategic collaborative partnering is the key to success. Achieving enterprise wide BUDM requires multistakeholder collaboration comprising strong partnerships. Continued tracking of BUDM project performance and identification of best management practices are key to the long term success of the program. This TN is one of several ongoing efforts related to identifying and addressing key obstacles to BUDM implementation.

Figure 1. Summary of USACE chief's vision for the beneficial use of dredged material.

STUDY METHODS: In response to the chief's 70/30 goal, USACE Headquarters (HQUSACE) conducted two BUDM hurdles discussion sessions internal to USACE between December 2021 and January 2022. Input on barriers to BUDM was elicited from the Honolulu, Jacksonville, Mobile, Philadelphia, and Rock Island Districts; the South Atlantic, Northwestern, and South

Pacific Divisions; the Coastal Planning and Regional Sediment Management Centers of Expertise; and representatives from the Engineer Research and Development Center (ERDC) and the Revolutionize, Aquatic Ecosystem Restoration (AER) and Navigation programs at HQUSACE. A Five-Whys approach was used to get to the root cause of the barriers identified by questioning why the barrier exists repeatedly to uncover the fundamental, underlying issues.

With feedback from USACE staff and further analysis, barriers to BUDM were refined, summarized, and grouped into the key themes presented in this TN. Recognizing there may also be external perceptions on BUDM hurdles, Anchor QEA, LLC conducted further analysis with a group of practitioners who provided their views on the barriers to BUDM, specifically focusing on data gaps. A third industry engagement was implemented at the 2023 Western Dredging Association (WEDA) conference in July. This was a panel discussion organized by USACE, ERDC, Texas A&M University, and Anchor QEA. Prior to this panel, an industry engagement questionnaire prepared with input from Anchor QEA was sent out by WEDA; the results were synthesized and presented at the panel. Data from these additional efforts will be summarized in a companion document to this TN to provide industry and stakeholder perceptions to USACE leadership. A third, follow-up TN will develop potential solutions to the identified barriers and will recommend areas for research and development.

CHALLENGE IDENTIFICATION: The Five-Whys process yielded the following themes from the USACE staff.

1. **Why do existing practices and policies generally not support BUDM?**

    a. They do not reward BUDM.
    b. There is a problem with existing BUDM practices not being counted.
    c. There is a lack of a knowledge base and transfer of knowledge within USACE for BUDM implementation through succession planning.
    d. There needs to be a leadership level directive to USACE regulatory groups to actively promote BUDM.

2. **Why do existing funding policies and practices not support BUDM?**

    a. Historical navigation funding levels are based on FS calculations that were made without consideration of the comprehensive costs and benefits resulting from BUDM.
    b. HQUSACE does not have a full understanding of navigation business cost increases that may result from updates to the FS.
    c. There is a lack of long-term dedicated funding for regional BUDM initiatives.
    d. The timing for requesting and receiving funds is prohibitive for BUDM projects, particularly those defined as discreet short-term projects.
    e. Budget package submittal processes do not clearly define how to support BUDM projects that are above the FS and require incremental cost sharing.
    f. Funding streams are prohibitive to the implementation of BUDM (e.g., Federal resource allocations are limited for some regions; research and development is blocked at the Office of Management and Budget level, etc.).

3. How does risk impede implementation of BUDM?

a. Current contracting strategies do not allow enough flexibility to implement BUDM and facilitate risk management.
b. Successful risk-mitigation strategies are not being shared among USACE Districts, and the appropriate approval level is not in place to support BUDM (i.e., risk aversion differs across the enterprise, with some Districts unwilling to support the consideration of comprehensive costs and benefits when calculating the FS).
c. Real estate policies do not universally support authorized projects that often benefit from BUDM.
d. The development and implementation of memoranda of agreement (MOAs) and memoranda of understanding (MOUs) for partnering agreements is often low priority and time-consuming, requiring coordination with entities beyond USACE.
e. The perceived legal risk associated with BUDM is challenging (primarily concerns about liability for the perceived release of contaminated sediments or material placed over previously contaminated locations), and there is a lack of consistency in the interpretation and management of risk between different District Offices of Counsel.
f. The implementation and monitoring of BUDM contracts are not standardized.
g. Property ownership results in liability transfer when material is placed.
h. It is unclear whether tracking of material may be required if it is under Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) liability.
i. The liability of providing material for alternate end use by other parties is unclear.
j. Ownership of material that could be reclaimed for BU once placed in a facility is unclear:

    i. If USACE owns it, USACE is responsible.
    ii. In some Districts, a sponsor owns it, and the sponsor takes responsibility.
    iii. But if a sponsor owns the facility, does it also own the liability for the placed material?

4. Why is there uncertainty in the environmental considerations associated with BUDM?

a. Existing federal resources and data are not known, shared, or easily accessible.
b. Environmental regulations are not structured to support BUDM.
c. The requirements between an AER project and the "environmental" benefits of BUDM are not clearly distinguished, when applicable.
d. Permitting for BUDM projects may be completed at the local level, which poses a challenge for regional approaches.
e. The amount of pre- and postproject monitoring and data gathering is unclear.

5. Why are there concerns associated with construction and maintenance of BUDM projects?

a. There are perceived increased risks for financial claims during construction due to changing site conditions or weather.
b. There are perceived constructability issues resulting from equipment, materials, methods, level of design, and overall performance measurements for project acceptance.
c. There are concerns about redistribution or release of materials, especially if they are contaminated.
d. BUDM projects attract public attention and interaction, which may have additional risk exposure and liability.
e. Coordination with nonfederal sponsors for land on which to place material is extensive, and it is unclear where the responsibility for maintenance and liability occurs when associated with BUDM projects.

6. Why is communication associated with BUDM projects limited?

a. Internal and external communications with stakeholders, nonfederal sponsors, and local agencies are cumbersome and challenging because BUDM is not clearly defined in most regulatory frameworks.
b. The interpretation and application of Federal, State, and local requirements is inconsistent.
c. Different agencies and stakeholders have different priorities and BUDM may not be a top priority.
d. Stakeholder engagement may be required earlier than in traditional processes.
e. Funding cycles vary for state and local entities, limiting the resources available for projects.
f. Multiple agencies and project partners increase the amount of coordination, effort, fiscal commitment, administrative challenges, and technological challenges for collaboration.
g. Public perception and expectations of BUDM projects need to be positively influenced.
h. Long-term planning to incorporate BUDM poses funding challenges over an extended period.

CAUSE-AND-EFFECT ANALYSIS: Using the input provided by USACE personnel, we conducted an initial evaluation of some of the key strategic enablers to further advance the practice of BUDM in navigation dredging projects (see Figure 2).

A close examination of Figure 2 shows that communication and collaboration are key to advancing the practice of BUDM within USACE and among stakeholders and other industrial partners. There is a need to complete a comprehensive assessment of all federal regulations and policies related to BUDM, including the National Marine Fisheries Service, US Fish and Wildlife Service, US Environmental Protection Agency, and Bureau of Ocean and Energy Management. In conjunction, a comprehensive assessment of internal USACE policy and guidance needs to be completed. These

policy reviews will not only identify obstacles to implementing BUDM but also inform efforts to clarify, rescind, and streamline policy.

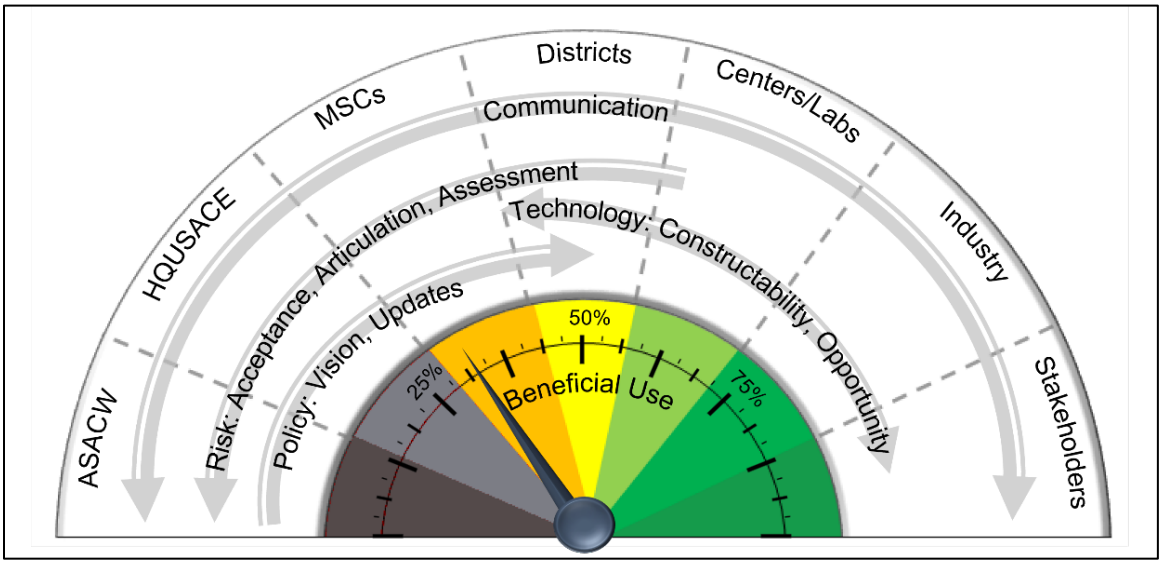

Figure 2. Current strategic enablers for USACE beneficial use of dredged material.* (Illustration from USACE and Anchor QEA, LLC. Public domain.)

*Many enablers remain only partially fulfilled, serving as impediments to advancing the needle of BUDM practice; ASACW: Assistant Secretary of the Army, Civil Works; MSC: Major Subordinate Commands.

Defining and allocating risk is inherently challenging and requires further study, especially to investigate how risks can be shared equitably among parties to promote more sustainable projects. Risks can get more complicated if the sediments are slightly contaminated, which may limit BUDM. Adaptive management is a good tool to address field variability during construction. Technology's many gaps and needs can make it challenging to promote given the highly competitive nature of the domestic dredging industry. Although the dredging industry has been able to construct all requested projects to date, technological innovations could facilitate cost reductions and higher quality BUDM outcomes. Databases that connect the material source (the Federal navigation channel) to the placement site (the landowner) also can be instrumental in promoting BUDM and should be evaluated further. And tools and frameworks that consider the monetary and nonmonetary costs and benefits of placement alternatives will also enable more BUDM. All these topics will continue to be studied by HQUSACE and the Dredging Operations and Environmental Research Program (DOER).

SUMMARY: The Chief's Command Philosophy Notice challenges every USACE district and employee to find creative ways to more than double BUDM in the next seven years (70/30 goal). To do this, USACE and its partners and collaborators need to do the following: (1) find safe, reliable, cost-effective, and sustainable means of promoting BUDM in current and new USACE dredging projects; (2) quantify and document navigation best practices and opportunities to increase BUDM; (3) develop innovative BUDM solutions and further stakeholder partnerships; (4) review and update USACE authorities and policies to promote BUDM (including outreach and collaboration with resource [regulatory] agencies outside the USACE); and (5) identify and address challenges. Whereas this TN has identified the challenges, HQUSACE and DOER plan to implement these steps in the next phase of study.

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