SUMMARY OF THE DREDGED MATERIAL MANAGEMENT PROGRAM INNOVATIVE REUSE COMMITTEE (IRC) MEETING May 28, 2024, 5:30 PM In-Person and Virtual Meeting

Attendees:

Anchor QEA: Walter Dinicola, Chris Overcash, Billie-Jo Gauley*
Anne Arundel Community College Environmental Center: Tammy Domanski*
Anne Arundel Patapsco River Alliance: Thomas Marston
Baltimore Port Alliance: Rupert Denney
Chesapeake Bay Foundation (CBF): Gussie Maguire
CSI Environmental (CSIE): Nelly Ramirez, Craig Stevens, Craig Hebert
Cox Creek Citizens Oversight Committee Chairperson: Gary Gakenheimer
EA Engineering, Science, and Technology (EA, Engineering): Frank Barranco*, Kandice Sermon*, Cynthia Cheatwood
EcoLogix Group: Steve Pattison*
GEI Consultants: Nancy Straub, Reginald Graves
Island Breeze Marine, Inc: Darwin Peguese
Maryland Department of Natural Resources (DNR): Maggie Cavey, Jillian Seagraves
Maryland Environmental Service (MES): Dallas Henson, Christine Offerman*
Maryland Port Administration (MPA): Rachael Gilde, Joe Ross, Darren Swift
Northeast Maryland Waste Disposal Authority (NMWDA): Andrew Kays
Northgate Environmental Management: Sam Merrill*, Deni Chambers*
Remline: Michelle Puszcz
Rummel, Klepper and Kahl (RK&K): Sari Rothrock, Ed Tinney
Rock Creek Community: Ruth Sliviak
Stoney Beach Community: John Garofolo
The Nature Conservancy: Austin Bamford*
The Terrapin Institute: Marguerite Whilden*
Tradepoint Atlantic: Peter Haid
University of Maryland Center for Environmental Science (UMCES): Elizabeth Price*

*Denotes attendees that participated virtually

Action Items

- MPA will share the amount of dredged material used in projects to-date with interested IRC members, including Ms. Whilden.

1.0 Convene and Welcome — Sari Rothrock and Ed Tinney, RKK

Ms. Rothrock and Mr. Tinney welcomed attendees and called the meeting to order. Ms. Rothrock briefed participants on the agenda and housekeeping items and reviewed the list of virtual attendees. Mr. Tinney led introductions for in-person attendees. Ms. Gilde advised attendees that, in the future, meeting summaries will be approved at committee meetings before being uploaded to the website.

2.0 Innovative Reuse Program Updates Rachael Gilde, Darren Swift, and Joe Ross, MPA

Mr. Ross provided an update on the MPA Request for Proposal (RFP) research and development (R&D) projects, including MPA's aim to award an additional project in the near-term. Mr. Ross also shared that, separate from the RFP R&D projects, MPA is investigating dewatering with geotubes. A kickoff meeting for the project has been held and the project will focus on differences in geotextile fabrics and scalability. Mr. Swift provided an update on the Remedial Action Plans (RAPs) for the Cox Creek Sediment Technology and Reuse (STAR) facility and informed the group that MPA is drafting a Request for Information (RFI) to gather information from potential developers for large-scale innovative reuse and capacity recovery from the Cox Creek Dredged Material Containment Facility (DMCF). The RFI will be advertised in early fall. Mr. Swift also provided an update on the Federal Highway (FHWA) Climate Challenge Grant.

Question	Answer (from Mr. Swift)
Mr. Haid: What volumes of dredged material are you looking to recover and reuse?	The goal is to innovatively reuse 500,000 or more cubic yards annually.
Mr. Denney: Will there be development at Masonville to facilitate innovative reuse (IR)?	There are no plans to implement development at Masonville to facilitate IR. Once Masonville is at capacity the goal is for the site to be paved into a lot for roll on/roll off cargo.
Mr. Denney: How will MPA address company installed infrastructure on the STAR property in the event a business can no longer maintain operations?	MPA is investigating long-term lease options which include a clause requiring the tenant to return the property to a certain condition in the event they can no longer operate.

Following group questions and answers, Ms. Rothrock provided an update on the feedback obtained from the small group discussions at the February IRC meeting. Pursuant to the feedback, this meeting was limited to two presentations, one on the testing process and one on research updates, to maximize time for participant discussion.

3.0 MDE Risk Assessment: A Stoney Beach Case Study Cynthia Cheatwood, EA Engineering

Mr. Tinney introduced Ms. Cheatwood, who presented on the Maryland Department of the Environment (MDE) Risk Assessment process for dredged material reuse. Ms. Cheatwood introduced three MDE documents that contain information regarding processes for IR: the *Innovative Reuse and Beneficial Use Dredged Material Guidance Document*; the *Fill Material and Soil Management Document*; and the *Cleanup Standards for Soil and Groundwater* guidance. The U.S. Environmental Protection Agency (EPA) developed the risk assessment methodology included in the documents.

The MDE uses a Confirmation of Suitability (COS) form to track dredged material from the supplier to transporter to end user. The form is meant to be used by anyone planning to innovatively reuse dredged material. MDE approval is dependent upon data analysis and the end use of the material. MDE determines if the end user has shown that the use of the material is protective of human health and the environment.

The first step toward reusing dredged material is sampling the material. A Sampling and Analysis Plan is drafted and provided to MDE for concurrence on sampling numbers and analytical parameters, which are based on the proposed end use. The MDE has the discretion to modify the sampling requirements based on the specifics of a project. For example, if a user is planning to obtain dredged material for topsoil to grow grass, MDE would require testing on physical characteristics and nutrients of the dredged material. Generally, dredged material is tested for physical characteristics (i.e. grain size, specific gravity, and moisture content) and chemicals (i.e. metals, volatile organic compounds (VOCs), polychlorinated biphenyls (PCBs), Polycyclic aromatic hydrocarbons (PAHs), Pesticides, Nutrients, pH, Total Organic Carbon, oil and grease, total petroleum hydrocarbons, cyanide, and sulfides).

Question	**Answer (from Ms. Cheatwood)**
Mr. Kays: Have polyfluoroalkyl substances (PFAS) been added to the list for innovative reuse testing?	Currently, the EPA has determined maximum contaminate levels for six (6) PFAS associated with drinking water, but the toxicity values still need to be determined. MDE is still awaiting toxicity information related to PFAS to further implement standards related to the chemicals.

Once the sampling and analysis are complete, the results of the analysis are compared to screening levels. EPA screening levels offer guidelines for assessing risk. The most protective screening levels correspond to the MDE Category 1 classification for residential use, which considers long-term, high-contact exposure for both adults and children. This includes potential ingestion, dermal contact, and inhalation of large particulate matter over an assumed 26-year period for 350 days per year. The MDE Category 2 classification assumes use at non-residential and non-recreational sites. The MDE Category 3 classification assumes that the material will be placed beneath an engineered cap. The MDE Category 4 classification is not permissible in reuse projects and is also not accepted in the DMCFs.

Ms. Cheatwood discussed the screening process using the Stoney Beach Living Shoreline Project as a case study. First, results from testing the dredged material were received from an independent laboratory. The maximum detected concentration of chemicals from the sample results was recorded. This maximum is then compared to the appropriate screening level (for Category 1 or 2 classification, as necessary). If the maximum detected concentration of a metal exceeds the screening level, it is then compared to the Maryland background level. If the maximum detected concentration exceeds Maryland background levels, it is evaluated further. If there are no exceedances when comparing the sample data to screening levels, the material is acceptable for any use, including residential uses. If a chemical in the sample exceeds the screening levels, the chemical is evaluated further in a risk assessment that determines cancer risk levels and noncancer hazards. (A noncancer hazard can result in issues like liver or kidney damage.)

Question	**Answer**
Mr. Garofolo: Does MDE prescribe a certain number of samples to be taken based on the amount of dredged material?	Ms. Cheatwood: Yes, there is a minimum number of samples including a minimum number of sample composite locations, based on the amount of material to be used.
Mr. Haid: Are both the cancerous and noncancerous risks that are assessed targeted to a specific organ?	Ms. Cheatwood: If the sample exceeds thresholds, then the risk is further reviewed by organ.
Mr. Denney: How does the process of obtaining dredged material, categorization and risk assessment	Mr. Swift: Using the Stoney Beach project as an example, MPA had a stockpile available at the Hawkins Point site and therefore coordinated closely with the project team to draft

work? What are the roles of MPA and the entity requesting the material?	and submit the sample and analysis plan to MDE, sample the material, and categorize and conduct a risk assessment of the material. Currently, the Stoney Beach project team is awaiting a response from MDE on material use.
Ms. Domanski: How is it possible that some of the screening levels are lower than the metal background level?	Ms. Cheatwood: Screening levels are based on health considerations, derived from toxicity testing to determine the lowest level at which no effects are observed. However, metals like arsenic often have natural background levels in soil that exceed these health-based screening values. This is true across the U.S., where no soil has arsenic below the health-based screening level. Similarly, well water arsenic levels can be higher than the health-based standard. Despite these exceedances, it doesn't necessarily mean there will be health problems. The toxicity values are calculated to be very protective, and their exceedance indicates potential rather than certain health risks. This precautionary approach ensures safety by considering the lowest observed adverse effect levels from various toxicity tests.

4.0 CSI Environmental Dredged Material Reuse and Management Craig Stevens, CSIE

For their RFP R&D project, CSIE placed dredged material in geotextile tubes and used advanced polymers for dewatering in order to create structures that could be used as berms to fortify coastal environments. CSIE is based in Millersville, MD, and their patented geotextile tubes and dewatering polymers are manufactured in the U.S.

Mr. Stevens began by introducing the project team, which included MPA, Anchor QEA, and Mahan Rykiel Associates. The project's purpose was to show that dredged material can be innovatively reused and beneficially deployed to enhance coastal resiliency and habitat. Early investigations for the project began in 2022, with a full pilot installed in May 2023. Monitoring efforts to test geotube condition and vegetation health are ongoing.

To begin the process, DMCF sediments were dredged into high-flow geotextile tubes. A geotextile tube or “geotube” is a special fabric created into a large cylinder-shape. The geotube captures sediment and allows water to freely flow through the fabric pores. CSIE’s high porosity geotube fabric is designed to maximize water flow rates. The CSIE geotubes typically release 85 percent of moisture.

An advanced polymer was added to the geotubes to enable rapid dewatering. The process uses a low polymer dose of 0.5 percent solution and approximately 180 parts per million (ppm) polymer, ensuring compliance with the site’s discharge permit requirements. The role of the polymer is to impart a charge to sediment particles, causing them to attract each other and form flocs. This process, called flocculation, happens quickly, such that by the time the mixture reaches the geotextile tube, the sediment has already separated. The flocs, which retain the sediment, stay within the tube, allowing clear water to exit.

The polymer rates are based on the results of a "hanging bag field test," where 40-50 gallons of dredged material are transferred to a hanging bag to check the composition of the geotube contents after the addition of the polymers. The objective for this effort was to achieve a moisture range that could sustain vegetation planted in the geotubes. During this process the team tweaked the mixture, optimizing it to sustain a certain level over time.

Once the geotubes were filled, monitoring occurred to assess the geotextile tube's effectiveness on water treatment. Once it was determined that no acrylamide (residual polymer) was coming from the geotubes, the temporarily detained water was drained back to the DMCF. Dewatering takes place over a period of time; in the case of the pilot project, the geotextile tubes dewatered for 39 days.

Dewatered geotextile tubes were then loaded onto flatbed trucks using equipment like excavators, and spreader bars. For the pilot project, dewatered geotextile tubes were unloaded at the BGE Spring Garden Site and were used to construct two berms: a shoreline berm and an upland berm. These berms can serve as protective barriers to manage sediment or containment structures for environmental remediation purposes.

Next, native vegetation was planted in the geotextile tubes. For the pilot project, vegetation was specially selected for both the shoreline and upland berms using native species that are adept at handling varying degrees of inundation and salt tolerance.

Following the planting, monitoring was completed to note the conditions of the geotextile tubes, the growth of vegetation, and evidence of coastal inundation. For the pilot project, seasonal changes and storm events were closely tracked during this period and soil moisture within the tubes at both berms were periodically measured. Throughout the year of monitoring the pilot project, there were no indications of damage, wear and tear, or fabric deterioration observed in the geotextile tubes.

The pilot project saw successful establishment of multiple native species, with grasses, rushes, and shrubs being the most successful. The geotubes created eco-habitat structures that handled a major storm event in January 2024 without any observed damage. Soil moisture stabilized at around 50 percent during the summer of 2023. There was extensive opportunistic vegetation growth in the berms which may need to be maintained long-term.

The sediment samples from the pre-pilot and pilot tests underwent analysis following the 2019 MDE IRBU Guidance Document. The sample results were screened against EPA Regional Screening Levels (RSLs). It was found that several constituents, including metals, volatile organics, semi-volatile organic compounds (SVOCs), pesticides, PCBs, and diesel range organics exceeded the Category 1 screening criteria. These results were then entered into an MDE-provided calculator tool. Based on the calculations and criteria outlined in the MDE Guidance Document, the material was classified as Category 2. This classification means that it was deemed acceptable for placement at the BGE facility.

Pilot test results confirm that dredged material can be rapidly dewatered using the CSIE process. Full scale implementation could be undertaken, with the understanding that full size geotextile tubes (approx. 100-200 feet long and 42 feet wide) are much larger than the pilot testing tubes.

Question	Answer
Ms. Maguire: Will geotextiles shed microplastics over time?	Mr. Stevens: A geotube left out in the elements will degrade over time. Therefore, geotubes intended to be used as berm in perpetuity, are recommended to be covered.
Mr. Haid: Is it the plan to remove the geotubes once the material is dry or has the project philosophy completely changed?	Mr. Stevens: The removal of the geotube post project depends on the application and criteria. In some cases, the geotube serves as a containment vehicle in addition to a dewatering device.
Mr. Barranco: How did the moisture content vary over time and does the polyacrylamide continue to act to dewater during precipitation and infiltration events? Does polyacrylamide eventually biodegrade?	Mr. Stevens: The polyacrylamide has a very short half-life, approximately 48 hours. Once at the BGE site, the sediment moisture was still in the low 50 percent range and seems to have stabilized.
Ms. Whilden: How much dredged material has been used in IR projects since the inception of the program?	Mr. Swift will look into this question and provide an answer after the meeting.
Ms. Whilden: Which category of dredged material is the most abundant and are there stockpiles of this material?	Mr. Swift: What is typically received at the Cox Creek DMCF and the most abundant is Category 2 dredged material. There are currently limited stockpiles of material, but given the new space associated with the Cox Creek STAR facility the team hopes to dry and stockpile material in the near term.
Mr. Garofolo: What were the lessons learned from the Stoney Creek project? How can people request dredged material?	Mr. Swift: Anyone can request material through the IRBU web tool. Regarding lessons learned, the lengthiest part of the process is sampling and regulatory review. All interested parties must follow the process by submitting the form, developing a sample analysis plan, getting the samples to the laboratory, then drafting a risk assessment memorandum. Therefore, it is recommended that communities reach out as soon as possible regarding material needs.

5.0 Announcements

The next IRC meeting will be on August 27, 2024.

6.0 Adjourn