FINAL DRAFT
SUMMARY OF THE DREDGED MATERIAL MANAGEMENT PROGRAM
INNOVATIVE REUSE COMMITTEE MEETING
November 27, 2018, 5:30 PM
2200 Broening Highway
Baltimore, Maryland 21224

Attendees:

Innovative Reuse Committee (IRC) Members:
Anne Arundel County Department of Public Works (DPW): Chris Phipps
Baltimore County Department of Environmental Protection and Sustainability: David Riter
Baltimore Port Alliance: Rupert Denney
Maryland Department of Commerce (MDOC): Paul Spies
Maryland Department of the Environment (MDE): Matthew Rowe
Maryland Department of Natural Resources (DNR): Paul Petzrick
Northeast Maryland Waste Disposal Authority (NMWDA): Andrew Kays
Stancills, Inc: Chris Siciliano
United States Army Corps of Engineers (USACE): Kevin Brennan

IRC Support Staff and Observers:
Facilitator: Steve Pattison
BTS Bioenergy: Vinnie Bevivino
The Dutra Group: Mike Edde
HarborRock: Jeff Otto, Robin Otto
DNR: Jackie Specht
Maryland Department of Transportation Maryland Port Administration (MDOT MPA): Sergio Adantor, Chris Correale, Bertrand Djiki, Kristen Fidler, Jennifer Guthrie, Kristen Keene, Holly Miller, Gannon Price
Maryland Department of Transportation – The Secretary's Office (MDOT TSO): Eddie Lukemire
Maryland Environmental Service (MES): Jeff Halka, Benjamin Langer, Lauren Mentzer
North County Land Trust: Bill Jones, Laura Jones
Northgate Environmental Management (NGEM): Steve Bedosky, Deni Chambers, Darragh Donnelly
Ramboll: Mark Rockel
Straughan Environmental: Jeff Nelson
Terracon: Nancy Straub
Tradepoint Atlantic: Peter Haid
University of Maryland Center of Environmental Science (UMCES): Elizabeth Price

Action Items:
1. MDOT MPA will update the Innovative Reuse Strategy tracking sheet and distribute the tracking sheet to the Committee alongside the November IRC meeting summary. (COMPLETE)
2. Mr. Rowe requested that the Innovative Reuse Strategy be revisited and updated by the Committee to identify new strategies that could continue moving the innovative reuse program forward.

Welcome & Introductions **Steve Pattison, Facilitator**
Mr. Pattison welcomed the meeting attendees and the attendees introduced themselves. Mr. Pattison requested comments on the August meeting summary. The Committee did not raise any comments and they accepted the August 28, 2018 summary as final.

The United States Army Corps of Engineers **Kevin Brennan, USACE**
North Atlantic, Baltimore District (CENAB)
Section 1122 Water Resources Development Act (WRDA) 2018 – Beneficial Use Pilot Program

Mr. Brennan reminded the Committee of the 2016 WRDA, Section (§) 1122, Beneficial Use of Dredged Material Pilot Program, which requires the United States Army Corps of Engineers (USACE) to establish a program to conduct 10 pilot projects throughout the United States for the beneficial use of dredged material. Mr. Brennan stated that over 100 proposals were received nationwide and that there were 10 projects recommended and submitted to the USACE Headquarters for final approval. A final decision on which projects are selected for the North Atlantic Region is anticipated soon. Mr. Brennan stated that the Fleming Park restoration by Mahan Rykiel Associates (MRA) was one of the proposals submitted.

Mr. Brennan stated that WRDA 2018 was passed in late October 2018 and outlined specific language from the Act. First, WRDA 2018 doubled the number of pilot projects from WRDA 2016 §1122 from 10 to 20. Second, WRDA 2018, §1157 increased program limits for the USACE's Continuing Authorities Program for small-scale USACE projects, such as a wetland cell on Poplar Island. Mr. Pattison asked if this would increase the number of small-scale projects funded by the USACE. Mr. Brennan responded in the affirmative.

Mr. Brennan informed the Committee that there was a move at the USACE to change the Poplar Island project from the environmental business line (the business line under which it was authorized) to the navigation business line in the President's FY19 Budget. Historically, Poplar Island was funded from the Corps' Construction General appropriation in the environmental business line. Under the navigation business line, Poplar would be funded under the Corps' Operations and Maintenance appropriation. The issue that arose was the Operations and Maintenance budget would most likely not be increased, therefore the Poplar Island budget would have to be absorbed. Under WRDA 2018, a project budgeted under a different business line than the business line under which the project was originally authorized, still has to be carried out in accordance with any requirements that apply to the business line under which the project was originally authorized.

Mr. Brennan updated the Committee on the USACE's fiscal year 2019 (FY19) Work Plan that is used for additional projects not included in the President's Budget. Mr. Brennan stated that $4.259 million was approved for the design of the Mid-Chesapeake Bay Island Restoration (Mid-Bay) project in the USACE's FY19 budget on November 21, 2018. This funding is in addition to the $640,000 approved in the FY18 budget for the development of the Mid-Bay project workplan. Mr. Pattison informed the Committee that the Mid-Bay project would be the next large-scale beneficial use project in Maryland once Poplar Island is completed.

Northgate Environmental **Deni Chambers & Steve Bedosky, Northgate Environmental**
Mike Edde, The Dutra Group
Mark Rockel, Ramboll

Ms. Chambers introduced herself and the Northgate Team to the Committee. The Northgate Team includes Ms. Donnelly and Mr. Bedosky of Northgate Environmental, Mr. Edde of The Dutra Group, and Mr. Rockel of Ramboll. Ms. Chambers noted that members of the Northgate Team have been attendees of the

Innovative Reuse Committee (IRC) over the past 10 years. Ms. Chambers stated that during the presentation she and Mr. Edde would review the Northgate Team's background and domestic projects, Mr. Rockel would discuss international projects, and Mr. Bedosky would discuss project cost planning for reuse of sediment in building and construction materials.

Background

Ms. Chambers stated that Northgate Environmental Management Inc. (Northgate) is a 70% women-owned business that has delivered innovative solutions to environmental and engineering challenges since 1999. Northgate has offices on the East and West coasts of the United States (US). In partnership with The Dutra Group, Northgate is working on the Montezuma wetland restoration project, one of the largest sediment reuse projects in the US. Ms. Chambers explained that this project would be discussed later in the presentation. The Dutra Group is a family-owned dredging and construction company based in the San Francisco Bay Area that has been in business since 1904. The Dutra Group performs sediment reuse projects such as wetland construction and beach nourishment along the US coastal areas. Ramboll is an international environmental consultancy for sediment reuse. Northgate contracts with Ramboll for their international expertise, cost-benefit analyses, and supply and demand analyses for various sediment markets.

Ms. Chambers stated that public/private partnerships (P3) are beneficial to several of Northgate's projects. P3 structures allow capital investments to fund upfront costs which long term dredged sediment management solutions often require. These partnerships encourage more flexible interactions with the private sector and end use markets. This allows other private partners to accelerate beneficial use strategies and can reduce uncertainties, liability, and overall costs for the public-sector partner.

Domestic Projects

Ms. Chambers discussed the Montezuma wetland restoration project, which was established by a P3 with the Port of Oakland with the objective to perform a 50-foot (ft) deepening project and restoration of over 1,800 acres of wetlands over 30 years. The Montezuma area was once farmland that has since subsided due to geology consisting of mostly peat and the removal of groundwater from the area. The project is a phased approach designed to re-establish the original grade of the area using dredge sediment and levees, which will separate the phases. The project has undergone planning and design and is currently undergoing construction. The levees and groundwater extraction system have already been constructed. Currently, the separate phases are being filled with hydraulic dredged material using an off-loader. To date, the site has been filled with approximately 6 million cubic yards (mcy) of material at a tipping fee of $30 - $40/cy.

Ms. Chambers introduced Mr. Edde to provide specifics on the Montezuma wetland restoration project. Mr. Edde explained that the project was developed for the Port of Oakland in order to reuse material removed during the 50-ft deepening project; traditionally, the material is disposed of via open water placement. However, for this project the material was utilized for the creation of tidal wetlands. To date, 600 acres have been covered with 6 mcy of material. This facility is currently under the operation of The Dutra Group.

Mr. Edde shared an image of the Liberty off-loader with the Committee. The Liberty off-loader uses a 20-inch pump to liquefy and remove material from the scow at up to 25,000 gallons per minute (gpm). The material is then unloaded in 3,000 cy segments. Mr. Edde outlined the capital cost for the infrastructure including the scow landing, off-loader, and the construction of the original cells. This cost was approximately $10 million in 2003. The incremental cost of unloading for the Montezuma project was $5 to $15/cy more than open water disposal. The stakeholders and partners, such as the USACE San Francisco District, understood the environmental benefits of this project and found the extra cost acceptable. Mr.

Denney requested additional information regarding the $5 to $15/cy additional cost. Mr. Edde responded that a consortium of stakeholders, including the Bay Conservation and Development Commission, the USACE San Francisco District, the Port of Oakland, and the Port of San Francisco, determined that the mitigation benefits were worth the premium. Mr. Haid inquired as to the owner of the Montezuma property. Ms. Chambers responded that the property is privately owned by Montezuma, LLC. Mr. Edde added that the restoration was included in Montezuma, LLC's business model when the property was purchased.

Mr. Edde briefly discussed other domestic projects completed by the Northgate Team. The Team completed a maintenance dredging project at Cape Henry and Thimble Shoal entrance channel. After Hurricane Sandy, the Northgate Team performed beach nourishments on Long Island, Fire Island, and along the New Jersey shoreline. Mr. Edde highlighted two additional domestic projects, the Upper Newport Bay Ecosystem Restoration project and the Hamilton Army Airfield Wetlands Restoration project. The Upper Newport Bay Ecosystem Restoration project involved the dredging of 1.5 mcy of accumulated sediment from the Upper Newport Bay using an amphibious excavator and a 12-inch portable hydraulic suction dredge. The dredged sediment was used to construct habitat islands within the Upper Bay for the endangered California Least Tern and other migratory waterfowl. The Hamilton Air Force/Army Airfield Wetlands Restoration project beneficially reused 6 mcy of dredged material from the Port of Oakland 50-ft deepening project on a 988-acre former army airfield, adjacent to the San Francisco Bay in Novato, CA. The material was transported via scows and inflowed up to seven miles throughout the site using a system of five high-powered pumps. The airfield was transformed into tidal wetlands, seasonal wetlands, upland ponds, upland grasslands, tidal ponds, a wildlife corridor, an intertidal channel, and a mudflat area.

Ms. Chambers briefly discussed the remaining domestic projects the Northgate Team has conducted. 1) The wetland at Sears Point. Sears Point was a former shooting range that contained lead and polycyclic aromatic hydrocarbon (PAH) impacted sediment. The impacted sediment was encapsulated in upland levees and other material was screened and reused as borrow material. 2) The Corte Madera Ecological Reserve. This was a 70-acre tidal marsh that was diked and used to contain dredged material in the 1970s. The property was sampled and analyzed prior to 33 acres of the property being returned to tidal marsh and the remainder of the property being developed for recreation and trail use. 3) The 39-acre India Basin. This property was a former shipyard that was purchased by a commercial developer and turned into commercial space, as well as public recreational space for shoreline and habitat restoration. 4) The wetland at the 34-acre Yosemite Slough. This wetland was restored with suitable dredged material after the sediment onsite was analyzed, treated, and capped. Ms. Chambers explained that the onsite material was treated and capped as a cost saving measure as it would have cost $300 million to remove the impacted sediment. 5) The 66-acre Selby Slag Superfund site. This upland site was turned into port facilities using 100,000 cy of lead impacted sediment, dredged from the San Pablo Bay, and then used as upland fill. The dredged material was moisture conditioned, graded, and capped with asphalt pavement. 6) Point Isabel. This coastal area was turned into a 22-acre Regional Shoreline Park using lead impacted dredged sediment as upland fill. The material was dewatered and encapsulated within levees and capped onsite. The shoreline was stabilized with geotextile and rip-rap and the shellfish bed habitat was restored with clean sediment. 7) The Oyster Point and Pillar Point Harbor dredging projects. These projects were performed to increase marina capacity, deepen the marina, and create a sand beach for recreational use.

<u>International Project</u>

Mr. Rockel reviewed the Northgate Team's international project, the Rio Doce Basin project in Brazil. This project was initiated when a dammed tailings pile on Rio Doce breached, releasing 32 million cubic meters of material that destroyed two villages and killed at least 17 people. The material was partially trapped by

a hydro-electric dam, but most of the material was released into the Atlantic Ocean 600 kilometers downstream. Ramboll was contracted by the Ministry of Justice to review the remediation plans developed by the potentially responsible party and to determine if the plans were feasible from a technical basis. A net ecosystem service analysis was performed to determine the ecosystem service benefits using a cost-benefit framework. The tailings were removed and used to create wetlands, parks and restored shorelines which improved the water quality.

Project Cost Planning

Ms. Chambers stated that Northgate researches all end uses and works as a team to makes sure all aspects of the project are covered from a technical standpoint, which could include working with researchers from the Universities of Berkeley and Maryland. The Northgate team also performs cost-benefits analyses and explores potential investors.

Mr. Bedosky discussed project cost planning for different options for dredged material. Mr. Bedosky stated that it is important to match the material to the end use, and for construction product end use specifically, to make sure there is a market for that material. As the amount of available aggregate is diminishing overall, course-grained dredged material would have great market value, as long as the material meets the product specifications. Producing profitable construction products could offset the cost of dredging and be a long-term cost-effective solution. Near-shore beneficial use projects require significant coordination for permitting and management. In innovative reuse and beneficial use construction projects, the most important cost factor is transportation to and from the processing site.

Mr. Denney asked, in Northgate's experience, who typically purchases construction products made from dredged material. Mr. Bedosky responded that the private sector is an important partner and that the private sector is interested in using the material as long as it meets their specifications. Another important partner is the state Department of Transportation. Mr. Nelson inquired about the total price difference for the Montezuma project between open water placement and the restoration. Mr. Edde responded that the total price difference between open water placement and the Montezuma restoration was $5 - $15/cy depending on the quality of the material and transportation. The capital costs were $10 million, not including the land acquisition fees. Mr. Brennan asked if the wetland development costs were included in the $30 - $40/cy. Mr. Edde responded that the wetland development, unloading, and placement costs were built into the $30 - $40/cy. Mr. Brennan asked if the Montezuma project had planting costs or if the wetlands vegetation was naturally generated. Ms. Chambers responded that most of the projects are left to the natural vegetative succession processes.

HarborRock **Jeff Otto, HarborRock**

Mr. Otto initiated the HarborRock presentation by playing a video for the Committee that discussed HarborRock's history and gave background on the investigation into constructing a manufacturing plant at Cox Creek Dredged Material Containment Facility (DMCF).

After the video, Mr. Otto informed the Committee that HarborRock is prepared to begin construction and operation of a manufacturing facility on 15 acres at the Cox Creek DMCF to reuse 100% of the 1.5 mcy of material dredged annually from within the Baltimore Harbor. The key terms of the HarborRock proposal are: 1) No capital investment is required by Maryland Department of Transportation Maryland Port Administration (MDOT MPA) as the $100 million project will be privately financed; 2) MDOT MPA is not required to pay the "innovative reuse fee" until after the dredged material is converted into Leadership in

Energy and Environmental Design (LEED) lightweight aggregate (LWA); 3) A performance bond will always be in place should HarborRock breach contractual requirements to remove the manufacturing facility from the site and rebuild any relocated dikes; and 4) MDOT MPA is not required to guarantee a specific supply of material as the supply of material is already onsite. Other key benefits include: 1) The reuse and decontamination of all material removed from the Cox Creek DMCF; 2) Improvement of DMCF water quality; 3) Creation of over 65 new direct family wage jobs and over 200 in-direct jobs; 4) Generation of over $2 million per year in new Maryland taxes; 5) Spending of over $15 million per year on local goods and services; and 6) Elimination of spending greater than $400 million on new DMCFs over the next decade. Mr. Otto stated that HarborRock has received endorsements from community, environmental, and government groups for the construction and operation of this manufacturing facility. According to the Maryland Department of the Environment (MDE), the pollution control system has no regulatory impediments beyond permitting.

Mr. Otto stated that HarborRock is a consortium of companies with the skills, experience, and financial capability to build, own, and operate manufacturing facilities and can guarantee the performance of an innovative reuse LWA facility. The consortium companies include, but are not limited to, FLSmidth, Louis Berger Group, Morgan Stanley, and SIA Solutions. The combined annual revenues of the consortium are over $10 billion.

HarborRock is confident in their ability to make this offer to the State of Maryland as HarborRock is the only manufacturing-based firm to have participated in every innovative reuse study for Baltimore Harbor and Conowingo Dam sediments. HarborRock has successfully completed an innovative reuse demonstration project on Baltimore Harbor sediments at Cox Creek, and MDOT MPA has verified all aspects of the HarborRock innovative reuse technology, business plan, and regional LWA market.

Mr. Otto continued that Towson University studied the suitability of Baltimore Harbor dredged material to make LWA and that the study results indicated Baltimore Harbor dredged material is perfect for making LWA. Additionally, Gahagan Bryant Associates (GBA) tested the chemical and physical properties of the dredged material at the Cox Creek DMCF and in the Federal channels and found that the dredged material in both locations have consistent and uniform properties suitable for making LWA. Baltimore Harbor sediment is approximately 95% silts and clays and, when analyzed for mineral content, falls within the acceptable range for making LWA; therefore, Baltimore Harbor sediment is a renewable quarry of superior quality for making LWA.

Mr. Otto discussed past verifications performed by MDOT MPA on the HarborRock business model. Environ, an engineering firm, performed a complete due diligence review of the process, design, and capital and operating costs of the HarborRock facility and found that the design is excellent with process redundancy and excess capacity. Environ's review also found the capital and operating cost estimates to be conservative with each including a large factor of safety. McCormick & Taylor and OA Systems (OAS) performed a LWA market study based on the Baltimore-region and found that HarborRock's LWA pricing was at the mid-point or less of the market price, and that the LWA market size and demand are robust. OAS also performed a mass and water balance study at Cox Creek DMCF. The study found that the HarborRock facility could improve the water quality within the DMCF and increase the annual amount of material that could be placed in Cox Creek DMCF by over 100%. Maryland Environmental Service (MES) completed an operation and maintenance cost review at Cox Creek DMCF with LWA reuse and found that HarborRock would lower operation and maintenance costs by $1.85 per cy, a 25% reduction. This lowered operations

and maintenance cost was due to crust management no longer being performed. The HarborRock facility could result in operation and maintenance savings that exceed $2 million per year.

Mr. Otto concluded that the HarborRock facility will provide: 1) A guaranteed and "all-inclusive" fee for the reuse of dredged material for the contract term; 2) Provide a cost-effective and permanent solution to the ongoing economic and environmental challenge of Baltimore Harbor sediment management; 3) Create significant economic development benefits while preserving irreplaceable waterfront sites for more productive uses than as DMCFs; and 4) Provide a sustainable supply of LEED, inert LWA for the regional construction industries. Mr. Otto quoted the 2017 Dredged Material Management Plan (DMMP), which states "Timely development of additional dredged material management options continues to be crucial to maintain the Port of Baltimore's marine highway/navigation channels. MDOT MPA has a 20-year plan for dredged material management, but some planned projects face property acquisition, funding, permitting, federal procedural requirements or other impediments to implementation…" Mr. Otto stated that every private, environmental, and state agency briefed on HarborRock's proposal has been supportive and has reached the same conclusion: "Why not, Maryland has nothing to lose." Mr. Otto asked what else the IRC and MDOT MPA needs in order to implement a full-scale HarborRock project given that HarborRock has been demonstrated, is universally supported, all aspects of the business model have been independently validated and is risk-free to the State of Maryland.

Mr. Phipps inquired as to the fuel source of the LWA kilns. Mr. Otto responded that the kilns would be powered by natural gas. Mr. Halka asked how water quality in the Cox Creek DMCF would be improved through the LWA process. Mr. Otto responded that the water removed from the DMCF through the LWA process would be treated prior to discharging back into the DMCF. Ms. Straub inquired as to the cost of the LWA for end users. Mr. Otto responded that there are two end uses for LWA; 2/3 of the LWA market creates masonry blocks and 15% to 20% creates construction concrete. Initially, HarborRock envisions selling the majority of the LWA at wholesale to one or two large buyers. Mr. Spies inquired as to the production price per cy. Mr. Otto responded the "innovative reuse fee" would be more competitive than what MDOT MPA is currently paying. Mr. Denney asked if the "innovative reuse fee" would be paid by MDOT MPA. Mr. Otto responded in the affirmative. Mr. Denney asked if private terminal operators would pay this "innovative reuse fee" to MDOT MPA. Mr. Otto responded that MDOT MPA would make that determination. Mr. Otto added that MDOT MPA would determine if private inflows could occur at Cox Creek DMCF if HarborRock met its contractual throughput capacity commitment to MDOT MPA and if the DMCF had excess capacity available; this was based on an older Term Sheet developed by MDOT MPA and HarborRock. Mr. Denney asked if HarborRock is guaranteeing to process a certain amount per year. Mr. Otto responded that HarborRock will process up to 1.5 mcy or 300 thousand tons per year, assuming the material is 25% solids. Mr. Otto stated that the LWA product would be sold within 50 to 70 miles of the Cox Creek DMCF. Mr. Phipps inquired as to the minimum amount of material that must be processed to remain profitable. Mr. Otto estimated that the minimum amount to remain profitable would be, nominally, 500,000 cy per year. Mr. Kays inquired as to the percentage of the market that dredged material LWA would displace. Mr. Otto responded that dredged material LWA would take approximately 1% of the LWA market in the Baltimore region. Mr. Spies asked if HarborRock had any purchase agreements and inquired about the estimated purchase price. Mr. Otto responded that HarborRock has previously worked with one company in the ready-mix concrete market and two companies in the concrete block market, and each company could take 100% of the LWA produced; agreements can be obtained if requested. Mr. Rowe inquired as to the risks involved to the business. Mr. Otto responded that only the traditional risks exist regarding construction and operation of a business. Mr. Rowe asked if HarborRock has any operating facilities. Mr. Otto responded that HarboRock has no facilities currently in operation. The first facility will

be built in Europe or in Maryland. Mr. Nelson asked how sensitive the LWA process is regarding the amount of clay, silt, and sand and is HarborRock confident that the material being placed at the Cox Creek DMCF will meet the LWA needs. Mr. Otto responded that the material is sorted prior to the LWA process; non-silts and clays will be cleaned and sold. Mr. Nelson asked if any material will be returned to the DMCF. Mr. Otto responded that no material will be returned. Mr. Haid inquired as to the length of commitment that HarborRock is requiring of MDOT MPA. Mr. Otto responded that the "innovative reuse fee" would be a function of the term of the debt, preferably 20 years or more. Mr. Otto stated that the kiln has a lifespan between 30 and 50 years.

Innovative Reuse and Beneficial Use Progress Report **Kristen Keene, MDOT MPA**

Innovative Reuse Demonstration Projects

Ms. Keene provided an update to the Committee regarding the four innovative reuse demonstration projects being performed by MDOT MPA and discussed at previous IRC meetings.

Dredged Material as Alternative Daily Cover (ADC) at Quarantine Road Landfill

The first demonstration project will utilize dried dredged material from the Cox Creek DMCF as alternative daily cover (ADC) at the Baltimore City Department of Public Works (DPW) Quarantine Road Landfill (QRL). The memorandum of understanding (MOU) between MDOT MPA and Baltimore City associated with transporting the material was finalized and erosion and sediment controls have been installed onsite at QRL. Hauling is expecting to begin within two weeks.

Hawkins Point South Cell Development

The second demonstration project will utilize dried dredged material from the Cox Creek DMCF as engineered fill material in the Hawkins Point DMCF South Cell to support the installation of an algal flow-way at the site. The hauling of material from Cox Creek DMCF to Hawkins Point is expected to be completed within one week. Photographs of the Cox Creek and Hawkins Point sites were shown to the Committee.

Test Nursery

The third project involves the test nursey planted at the Cox Creek DMCF to determine if dredged material could sustain grass growth. Ms. Keene shared the travel nursery with the Committee and explained that both the test nursey at Cox Creek and the travel nursey display similar results, with the dredged material with lime test plot having the highest percentage of vegetative coverage, 100% dredged material having the second highest coverage, and the 100% topsoil having the least coverage. Monitoring of the test Nursery was completed and sediment and grass samples were collected on October 30, 2018. The sediment samples will be comparatively analyzed to the initial sediment samples collected at the onset of the project and the grass samples will be evaluated for nutrient and metal uptake.

Hart-Miller Island North Cell Pilot Project

The fourth project is the Hart-Miller Island (HMI) North Cell habitat development, which was briefly discussed at the August 28, 2018 IRC meeting. The project began as a concept developed by interns participating in the Design with Dredge program, for which MDOT MPA partnered with MRA. MDOT MPA has advanced the project and MRA has completed the conceptual design. MDOT MPA and MES are currently developing a project monitoring plan and a construction schedule. Construction is expected to begin in early spring 2019 and will be followed by three years of monitoring and adaptive management. The pilot project will be approximately 23 acres and located in the northwest corner of the HMI North Cell. This area was selected as it has remained consistently dry over the years; will be readily accessible by the

public through the Maryland Department of Natural Resources (DNR) park; and will be large enough to create a viable habitat, but small enough to effectively manage and study. The project goals include creating diverse habitat, engaging and educating the public, and minimizing operational and maintenance costs in the North Cell.

Three landform typologies were developed for this project, each of which will be reproduced seven times (one control and six treatments for each type) for a total of 21 landforms. 1) Basic Mound: a simple landform consisting of a single large mound. 2) Surface Mound: a simple landform consisting of multiple mounds of varying sizes to increase surface area. 3) Habitat Mound: consisting of readily available habitat features, such as rock structures and interior vernal pools. These three distinct mounds were developed to 1) accelerate sediment ripening, which is the transformation of marine sediments to terrestrial soil; 2) create a diverse habitat; and 3) mitigate or reduce the invasion of *Phragmites australis*. To study the effectiveness and cost of habitat establishment in each of these landform types over time, a control and treatment options for each landform type will be conducted. Each of these three landforms would have one control and six treatment mounds. These treatments would be applied at initiation, one year, and two years. The treatment options include soil amendments such as lime, biochar, compost, and vegetation planting. A diagram of the proposed mounds was showed to the Committee.

The mounds will be monitored and adaptively managed over a three year period for 1) Soil Ripening: visual assessment of the soil for the presence of cracks and color, pH sampling, and core collection to test for the presence of microbes and roots; 2) Habitat: survey of plant diversity and abundance, survey of animal diversity and abundance, and survey of *Phragmites australis* presence and abundance; and 3) Structure: assessment of mound structure/stability via annual topographic surveys.

<u>MDOT SHA Coordination</u>

Ms. Keene stated that MDOT MPA has been working with the MDOT State Highway Administration (SHA) regarding the revision of their 920 - Furnished Topsoil Specification. The harmful materials provision of the 920 Specification states, "Topsoil shall not contain substances in concentrations that are harmful to human health, water quality, or plant growth. Industrial waste such as ash, slag, raw sludge, dredge spoil, or similar materials shall not be soil components." MDOT SHA will be updating the 920 - Furnished Topsoil Specification by removing the words "dredge spoil" from the harmful materials provision. By removing the term "dredge spoils" it detaches the long-standing stigma associated with dredged material and sends a positive signal to industry and other state agencies. The revision contributes to Governor Hogan's Waste Reduction and Resource Recovery Executive Order, which specifically calls for the reuse of dredged material. Additionally, the revision allows for the reuse of dredged material from all sources, including sediment from behind Conowingo Dam and freshwater lakes. MDOT SHA specifications are the gold standard used across the state not only by MDOT SHA, but by local and county road departments and contractors/developers on a myriad of development projects. This change thereby allows for vast reuse potential.

<u>Future IR Opportunities</u>

Ms. Keene discussed future opportunities that MDOT MPA has been exploring for innovatively reusing dredged material.

1) Morgan State University - Ms. Keene informed the Committee that MDOT MPA and MRA participated in a fall lecture series at Morgan State University that included a discussion on 'Dredging the Future.' Participation in the fall lecture series led to a tour with staff and students of Morgan State at both HMI and Masonville. MDOT MPA is in coordination with the landscape

architecture professor to use an MDOT MPA site for a spring semester studio course; students will develop landscape renderings that will incorporate the use of dredged material.

2) Pilot Project with MDOT SHA - Ms. Keene stated that the "Amended Baltimore Harbor Dredged Material as Potential Highway Embankment Material" study with the University of Maryland is being finalized and the "Environmental Behavior of Dredged Sediments in Highway Slope Applications" study is expected to be completed in early 2019. MDOT MPA hopes that that the positive results from these studies will enable MDOT MPA and MDOT SHA to partner on a pilot project.

3) Brownfield Reclamation Pilot Project - Ms. Keene informed the Committee that MDOT MPA has received interest to use dredged material as fill for brownfield reclamation projects.

4) Bioretention Swales (bioswales) - Ms. Keene informed the Committee that MDOT SHA partnered with a private consulting firm to evaluate the implementation of bioswales in MDOT SHA projects. The study concluded by recommending that further studies be conducted, and one recommended study involved the use of soil mixes that would be useful in bioswales. MDOT MPA is encouraged by the study recommendations and the potential to incorporate dredged material in a future study.

5) Anaerobic Digestion - Ms. Keene informed the Committee that MDOT MPA has been in discussions with a local entity to determine if dredged material could be used in the anaerobic digestion process; testing is underway.

6) Permeable Pavers - Ms. Keene reminded the Committee of the presentation by Belden Eco-products which discussed using dredged material as a feedstock to produce permeable pavers.

7) Development of an Alternative Concrete Product - Ms. Keene informed the Committee that MDOT MPA has received interest to use dredged material as a source material for an alternative concrete product; testing will soon be underway.

8) Fill Material Requests - Ms. Keene informed the Committee that MDOT MPA has received interest from Baltimore Development Corporation to use dredged material as potential fill material for the construction of Top Golf and the restoration of Ridgely's Cove.

9) Exploring Business Plans for Large Scale innovative reuse/material processing - Ms. Keene stated that MDOT MPA is exploring business plans for large scale innovative reuse and evaluating ways to most effectively utilize the little space available at the Cox Creek site. Additionally, MDOT MPA is actively pursuing the acquisition of the property to the north of the Cox Creek site.

Group Discussion

Fleming Park

Mr. Pattison informed the Committee, on behalf of Doug Myers of Chesapeake Bay Foundation (CBF), and Larry Bannerman of Turner Station Conservation Team, that Turner Station was provided funding for the design portion of the Fleming Park project with a commitment for the pursuit of funds to implement the project. Mr. Pattison added that the conceptual design of the Fleming Park project was developed through the Design with Dredge Partnership between MDOT MPA and MRA.

2018 IRC Review

Mr. Pattison directed the Committee to locate the 2018 IRC review sheet provided with the printed meeting materials. The review summarizes the activity that the IRC accomplished in 2018. Mr. Pattison commented that a lot of progress was made this past year and attributed it to the diverse information being presented to the Committee; such as making permeable pavers out of dredged material and how innovative reuse is conducted in other states. This has created an awareness of all the potential uses of dredged material and allowed the IRC to better advise MDOT MPA regarding innovative reuse. Mr. Pattison stated he feels as though there has been a real shift regarding the perception of dredged material, which has been an asset for furthering the innovative reuse program. Mr. Pattison added that he has seen a tremendous amount of facilitation and collaboration between the Committee members. For instance, the Fleming Park project progress was a product of several Committee members working together.

Innovative Reuse Strategy

Mr. Rowe stated that the Innovative Reuse (IR) Strategy helped to accelerate some of the recent demonstration projects. Mr. Rowe requested that the IR Strategy be revisited and updated by the Committee to identify new strategies that could continue moving the innovative reuse program forward. Mr. Pattison added that the IR Strategy was last revised in 2014 by the DMMP Executive Committee and MDOT MPA has been diligently implementing the strategy components. Ms. Fidler informed the Committee that the MDOT MPA keeps an updated internal tracking sheet for each of the nine items laid out in the IR Strategy. Ms. Fidler stated that the tracking sheet will be provided to the Committee alongside the summary for this meeting.

Mr. Denney stated that since the regulatory and private sector perceptions of dredged material have changed, the public/end user perceptions now need to be discussed.

Upcoming Meetings

Ms. Keene informed the Committee of upcoming meetings and events. An innovative reuse update will be provided at the November 28, 2018 DMMP Executive Committee meeting. An innovative reuse presentation will be given at the MDE December 3, 2018 House Bill (HB) 171 Organics Workgroup meeting; MDOT MPA will use this meeting to determine if opportunities exist for the use of dredged material with other attendees' programs. MDOT MPA and MES are co-hosting the December 14, 2018 Sustainable Materials Management Maryland (SM3) meeting to discuss dredged material and possible collaborations with other waste streams. The University of Maryland Center for Environmental Science (UMCES) and MDOT MPA are holding a workshop on January 23 and 24, 2019 to discuss the use of dredged material to protect low-lying areas of the Chesapeake Bay. The workshop will focus on the current understanding of problems and areas of vulnerability in the Bay, dredging and placement activity in the Bay, State technology in using dredged material to protect low-lying areas, and understanding impacts, limitations, and opportunities for restoration. The MDOT SHA led Maryland Quality Initiative (MdQI) Conference will be held on January 31, 2019. The MdQI brings together all sectors of the transportation industry to discuss transportation related topics. MDOT MPA will be attending to discuss the innovative reuse program and ongoing demonstration projects.

Mr. Pattison informed the Committee that the **next IRC meeting will be held on February 26, 2019** with a snow date of March 5, 2019.

Meeting adjourned at 7:00pm