

DRAFT FINAL
SUMMARY OF THE DREDGED MATERIAL MANAGEMENT PROGRAM
INNOVATIVE REUSE COMMITTEE MEETING

August 22, 2017, 5:30 PM
2200 Broening Highway
Baltimore, Maryland 21224

Attendees:

Innovative Reuse Committee (IRC) Members:

Baltimore County Department of Environmental Protection and Sustainability (EPS): David Riter

Baltimore Development Corporation (BDC): Patrick Terranova

Baltimore Port Alliance (BPA): Rupert Denney

Chesapeake Bay Foundation (CBF): Doug Myers

Northeast MD Waste Disposal Authority: Andrew Kays

Turner Station Conservation Team: Larry Bannerman

Rukert Terminals: Steve Landess

Stancills, Inc.: Terry Stancill

United States Army Corps of Engineers (USACE): Graham McAllister, Danielle Szimanski

IRC Support Staff and Observers:

Facilitator: Steve Pattison

Maryland Department of Transportation Maryland Port Administration (MDOT MPA): Chris Correale, Bertrand Djiki, Katrina Jones, Kristen Fidler

Greater Dundalk Alliance (GDA): Russell S. Donnelly

Johnson, Mirmiran & Thompson (JMT): Elisabeth McCollum

Mahan Rykiel Associates (MRA): Isaac Hametz, Jingting Li

Maryland Environmental Service (MES): Lauren Mentzer, Jeff Halka, Dallas Henson

Straughan Environmental: Jeff Nelson

Terracon: Nancy Straub

University of Maryland Center for Environmental Science (UMCES): Elizabeth Price

Harvest: Sladjana Prozo

Action Items:

No action items to report.

Welcome & Introductions

Steve Pattison, Facilitator

Mr. Pattison welcomed the meeting attendees and the attendees introduced themselves. Mr. Pattison informed the Committee of a change to the May 23, 2017 meeting summary to better reflect Mr. Denney's statement regarding the goal of the Maryland Department of Transportation Maryland Port Administration (MDOT MPA) to reuse 500,000 cubic yards (cy) of dredged material annually. The original language in the summary stated that "the goal to reuse 500,000 cubic yards of material annually was not aspirational" and has since been updated to state that "the goal to reuse 500,000 cubic yards of material annually was attainable." Mr. Pattison asked for any additional comments. No comments were shared and the Committee accepted the May 23, 2017 summary as final.

IBR Regulatory Workgroup

Kristen Fidler, MDOT MPA

Ms. Fidler stated that she would provide an update on the Innovative and Beneficial Use Regulatory Interagency Workgroup (Workgroup) and efforts that stemmed from the Workgroup and the Workgroup recommendations approved by the Dredged Material Management Program (DMMP) Executive Committee in June 2016.

Guidance Document and Technical Screening Criteria

Ms. Fidler informed the Committee that Maryland Department of the Environment (MDE) is currently finalizing the guidance document and technical screening criteria. MDE is developing responses to all the comments received during the public comment period and is updating the guidance document based on comments. The guidance document is expected to be finalized and posted to MDE's website by the end of August 2017.

Executive Order

Ms. Fidler discussed the completion of Workgroup Recommendation 3: The Governor should issue an Executive Order calling on State agencies to be a leader in the reuse of dredged material. In June 2017, Maryland Governor Lawrence J. Hogan Jr. issued Executive Order 01.01.2017.13, the Waste Reduction and Resource Recovery Plan for Maryland. This is a wide ranging Executive Order that will require MDE to develop strategic partnerships with a variety of agencies to develop solutions for materials that were previously thought of as waste. This executive order specifically recognizes dredged material as a resource with vast opportunities for reuse, a partnership between MDE and MDOT MPA to develop the guidance document and technical screening criteria, and calls on State agencies to be a leader in the reuse of dredged material where economically reasonable to do so and in conformance with all applicable environmental and public health regulations.

Outreach

Ms. Fidler provided an update regarding the Workgroup's Outreach subcommittee's 2017 photo contest. The contest ran from Earth Day to Memorial Day and received over 60 public photo submissions over social media that represent the Port. The winner of the contest was chosen and the winning photos will be printed in the Port of Baltimore magazine along with an interview with the photographer. Ms. Fidler shared Ms. Jones's suggestion to create a calendar using the photos that were submitted.

Next Steps

Ms. Fidler discussed the next steps and upcoming opportunities for innovative reuse and beneficial use of dredged material. MDOT MPA currently has stockpiles of dried dredged material at the Cox Creek Dredged Material Containment Facility (DMCF) and is looking internally and externally for opportunities to implement demonstration projects using this material. At least one demonstration project is expected to be implemented before 2018. MDOT MPA is preparing for long-term large-scale innovative reuse projects by investigating business plans and logistics. Given the new regulatory guidance, MDOT MPA hopes to make an announcement regarding these investigations by late 2017.

Mr. Denney congratulated the Harbor Team for efforts regarding innovative reuse, in particular the approval of the Executive Order and commented that the Executive Order would not have been approved several years ago. Mr. Denney also informed the Committee of the potential for innovative reuse projects at the Tradepoint Atlantic site. To raise the subgrade, Tradepoint Atlantic used imported select fill material under the loading dock during the construction of two warehouses, which measured 600,000 – 700,000 feet

squared (ft²), on the edge of River road in Sparrows Point, Maryland. Mr. Denney stated that there is an opportunity to use recycled dredged material for these types of projects. Mr. Donnelly commented that the subgrade of all buildings and construction at Tradepoint Atlantic in Sparrows Point must be raised five feet. Mr. Landess added that Tradepoint Atlantic is primarily using slag fill to raise the subgrade of the site during building development.

Ms. Fidler informed the Committee that the Interagency Regulatory Workgroup is coming to a close as recommendations have or are being implemented. Ms. Fidler thanked the Committee for the feedback that has been provided.

Innovative Reuse Communication Strategy AAPA Awards

Elisabeth McCollum, JMT

Ms. Fidler introduced Ms. McCollum and reminded the Committee of their suggestion that MDOT MPA hire a marketing firm to assist with outreach materials. Ms. McCollum stated that the Workgroup's Outreach Subcommittee was excited to provide an update regarding the newly created innovative reuse and beneficial use outreach materials, which includes the video and infographic. On April 1, 2017 MDOT MPA submitted the new innovative use and beneficial use outreach materials to the American Association of Port Authorities (AAPA) 2017 Communications Awards Program. MDOT MPA submitted the video, infographic, and video and infographic together as an overall campaign, as well as question and answer submittal package. The entries were judged by public relations professionals around the country who may not have any knowledge of port operations. The entries were judged on communication challenges and opportunities, how the communication complements the Port's overall mission, communication goals and objectives, target audience, and outcomes and evaluation methods. The video won an Award of Excellence and the infographic and the overall campaign won Awards of Distinction. MDOT MPA will be recognized for their awards at the AAPA Annual Convention in Long Beach, California, on October 1 - 4, 2017.

The outreach submittals received a variety of feedback from the judges, including: "Excellent campaign materials," "Overall, very well done . . . innovative approaches to an important challenge," "The video is a great awareness and educational tool," "The message of Sediment to Solutions is a good one, nicely done," "The infographic is really appealing. Nicely done. I found myself reading just about every word of it," "I like this very much! Eye-catching and packed full of good information about things that the community/stakeholders would likely have no understanding," and "Very thorough answers-thank you for taking the time to answer these questions for your submission."

Design with Dredge Summer Intern Program

Isaac Hametz, Mahan Rykiel Associates

Ms. Fidler reminded the Committee of the Design with Dredge summer internship program. This was a coordinated effort between MDOT MPA, Mahan Rykiel Associates, Professor Brian Davis a member of the Dredge Research Collaborative and a landscape architecture professor at Cornell University, and four graduate design students from schools around the country. The group worked closely to investigate uses of Baltimore Harbor channel maintenance dredged material around the harbor and how these uses can be better envisioned and communicated to the public. The goal of the internship was to develop design concepts that restore urban ecology, protect and enhance shorelines, promote climate change resilience, decrease the risk of flooding, lessen impacts from erosion, and provide public access to the water. The internship also brought a holistic approach to innovative reuse and beneficial use opportunities including new ways to use dredged material in conjunction with the sediment at the placement site, restoring or preserving Baltimore Harbor's natural landscapes and edge habitats, and embracing the role of the Port in these communities. Ms. Fidler informed the Committee that MDOT MPA is excited to share the outcome of this internship as it is a new

approach, should help to reach a broader audience, and build further support for the reuse of dredged material in the Baltimore area.

Ms. Fidler thanked the stakeholders and partners who attended the DMMP Committee meetings at which Mr. Hametz presented and thanked those who participated in additional meetings with the interns throughout the program. Ms. Fidler specifically thanked Mr. Denney, Mr. Bannerman, Ms. Gloria Nelson, Ms. Edie Brooks, Mr. Fran Taylor, Mr. Stewart Stainman, Mr. Dave Riter, Mr. Chris Phipps, and many others for providing community tours, sharing reasons for their involvement in the DMMP, history of their engagement, and goals moving forward. Ms. Fidler stated that on behalf of MDOT MPA, she would like to thank everyone for their time, energy, and continued dedication on this project and specifically mentioned Maryland Environmental Service (MES), Maryland Department of Natural Resources (DNR), Maryland Geological Survey (MGS), and the United States Army Corps of Engineers (USACE).

Ms. Fidler informed the Committee that the Design with Dredge presentation will showcase design concepts with no guarantees that these projects would be approved, but were developed through a lens of analytical rigor including the science behind the sediments, water quality, and proposed project location/site factors. Ms. Fidler stated that one of the design concepts that would be presented is located at Turner Station, and is located on Baltimore County property. There would be numerous logistical approvals to move a project like this forward. Additionally, the intent of this piece of the program's design work was for this type of concept to be able to be generally replicated or applied elsewhere. However, for the purpose of this brief summer internship experience, the team needed to focus on a specific location; and so Ms. Fidler reiterated the fact that this is just one conceptual design.

Mr. Hametz thanked Ms. Fidler and the stakeholders, and he also thanked MDOT MPA for funding the Design with Dredge program. Mr. Hametz stated that the program looked at three different scales of innovative reuse and beneficial use of dredged material with a focus on innovative reuse: 1. System – Analyze the system of dredged material management within the Baltimore Harbor area of the Chesapeake Bay estuary to understand opportunities to enhance the resiliency of sediment management systems; 2. Site – Locate and develop concept designs for innovative reuse at a specific site that has potential to enhance coastal resiliency, climate adaptation, living shorelines, social value, ecological value, and economical value; 3. Public Art – Explore public art installations to engage the public and change the dialogue and perception of innovative reuse of dredged material.

Mr. Hametz moved forward with the Design with Dredge findings. The presentation was divided into three sections: volume, processing, and end use; as well as the life history of dredged material from dredging to placement to innovative reuse. The first section looked at potential shoreline sites in the Baltimore area that may require fill material to increase their elevation in response to sea level rise. The second section showed a concept design for Hart-Miller Island (HMI) as a recreational/ecological landscape where the processing of dredged material could apply to natural systems to stimulate ecological end uses that optimize ecologic and social performance while economizing construction. Since HMI is still actively processing dredged material but not actively receiving, innovative and exploratory techniques could be performed without interrupting the process. Mahan Rykiel updated the catalog of dredged material processing technologies used by MDOT MPA to include recognized threshold conditions for water quality and quantity, and soil quality that must be met prior to the determination of a particular end use. Mr. Hametz showed the Committee the conceptual future vision of HMI 10-15 years after implementation of the proposed techniques.

Mr. Hametz discussed the third section of the presentation and reviewed the design proposal for Fleming Park in Turner Station, which integrates historic shoreline structures with thin layer placement (TLP) of dredged material at a recreational facility. The proposal would utilize dredged material for public and environmental benefits. The proposed parameters of the project are: volume of material used, cost of project, visibility of project to the public, social value, stakeholder support and participation, and ecological value. The pre-identified end uses (landfill cover, brownfield remediation, road construction, island restoration and wetland creation/restoration) have high volume, ecological value, and stakeholder support, but are lacking in social value and visibility. The end uses that meet these missing needs include: urban park creation, coastal resilience, artwork sculpture, seed ball production, and floating island creation.

Mr. Hametz discussed the Masonville Cove site analysis performed by Mahan Rykiel. Masonville Cove is a practical site for the proposed end uses since it is a Port-owned facility and is adjacent to communities near the Port, the DMCF, an active terminal, and wetlands. Public access to the site and educational and recreational value were studied to develop a site proposal for a walkway to increase public access to the site using TLP. However, in further discussions with MDOT MPA, Masonville was found to already be designed and graded to a specific end use, so Mahan Rykiel performed a suitability analysis to determine other locations in the Baltimore Harbor that are adjacent to residential communities, green space, unprotected shoreline, and pre-existing shoreline structures. The Bear Creek/Turner Station area was chosen based on this criterion. This area's existing parks were then researched for this same criterion, resulting in the selection of Fleming Park, due to its community facilities, large unprotected shoreline, inability to buffer against storm surges, and vulnerability to sea-level rise. Fleming Park was studied for how the site was currently being used, amenities like basketball courts, tennis courts, baseball fields, and on-site facilities, and deficiencies like poor circulation (site usability/access). The climate of the site includes exposure to freezing winds in the winter and harsh sunlight in the summer. The vegetation of the site afforded little canopy cover and large quantities of invasive species along the edge of the site. Available bathymetry and topography of the site were analyzed to determine the intertidal zone and varying shoreline edge conditions. The historical pier structure was used for recreational purposes, but needs to be restored. Existing pilings at the site gauge the intertidal zone and afford TLP opportunities for marsh creation and containment, as well as integrating a recreational structure with a containment edge. These site specifics were used to develop a concept design proposal that would cap pollutants, protect/restore the shoreline, increase public engagement, and improve the ecology of the site. The design proposal involves beneficial use through TLP of dredged material along the edge of the site, innovative use for the construction of a playground area with dredged material landforms, increasing circulation and access to the shoreline, and potential plant mitigation in the critical areas. The design would reuse approximately 9,780 cy of dredged material within a 180,235 ft² area. TLP at the site would include two confined areas, one within the existing pier structure and one within the proposed boardwalk structure, and an unconfined area for beach nourishment.

Mr. Denney asked for the definition of TLP. Mr. Hametz responded that TLP is a technique used to restore coastal wetland environments through aerial spraying of dredged material in layers up to 6 to 12 inches thick. Ms. Szimanski added that the material could also be pipelined to the site, but the placement elevation must be 30 centimeters (cm) or less. Mr. Hametz discussed construction/enlargement of the existing pier structure and the creation of a boardwalk using the existing pilings, which would each be used to contain the TLP area with a silt curtain. Additional restorations within the site include tree plantings and improved circulation with access to the water. The edge of the site would be divided into different ecological zones, such as upland, shrub, high marsh, low marsh, and substrate marsh each with plant palates associated with those types of environments. The existing bathymetry accommodates these different thickness/depths of

TLP for each ecological zone. Playground landforms would be created using a rubberized cap with an interior core of dredged material. These designs incorporate innovative reuse on land as well as beneficial use in water to create an end use for Fleming Park that is both socially and ecologically valuable.

Mr. Donnelly asked if the proposal includes plantings in the zones higher in elevation to the marsh zones to restore buffering capacity. Mr. Hametz responded that the proposal does include plantings in the upland and shrub zones. This could possibly aid with total maximum daily load (TMDL) credits. Mr. Nelson asked if assumptions were made in the proposal regarding the quality and source of the dredged material. Mr. Hametz responded that the dredged material used in the proposal is Category 2 material currently stockpiled at the Cox Creek DMCF. Ms. Fidler informed the Committee that Category 2 material refers to MDE's Innovative Reuse and Beneficial Use of Dredged Material Guidance Document technical screening criteria for land application of dewatered dredged material, which is based on risk-based human health exposure limits. However, in-water applications of dredged material, such as TLP or wetland restoration, would be a "beneficial use" project and instead would use risk-based screening criteria for benthic and aquatic health receptors.

If this design concept proposal were to be advanced as a project it would be the first beneficial use project performed in the Baltimore Harbor using harbor channel maintenance dredged material. The dredged material would need to be analyzed according to MDE's Innovative Reuse and Beneficial Use of Dredged Material Guidance Document technical screening criteria for in-water uses to include physical characteristics, grain size analyses, and an ecological study of the receiving site. Mr. Hametz informed the Committee that the proposal is a conceptual design using geographic information systems, geo-spatial analyses, bathymetry, slope characterization, topography, and ecological zones of intertidal areas and that a further study would be required to determine if harbor channel maintenance material is suitable to use at the site. Mr. Donnelly informed the Committee that he believed the sediment would need to meet MDE's residential soil before approval. Mr. Denney inquired about the wetland walkway picture from the Masonville Cove and suggested that MDOT MPA construct an overlook with a walkway at the Cox Creek DMCF to increase public engagement. Mr. Meyers suggested that clean material be used in place of harbor channel maintenance dredged material for the first few intertidal restoration projects, including Fleming Park, due to possible permitting issues.

Mr. Hametz continued with a presentation for site and public art scale installation concepts using dredged material. In ecology, the "edge effect" describes an area of enhanced biodiversity where two habitats, such as land and water, meet. An abundance of these edges are found in city environments: spatial between man-made and natural areas, temporal between vacancy and use, and social between "me" and "you." Dredged material straddles both ecological and cultural lines because it is part land, water, natural, and man-made. The site and public art concept analyzed if dredged material could extend and enrich the multitude of urban edges to create a new and unexpected diversity of ecological and cultural possibilities by changing the perception of dredged material and by teaching what can be accomplished with it. In this way, dredged material could be a catalyst not only for healthier habitats, but for bringing people together by creating connections between dredged material and the community. Ideas for hands-on workshops were developed by investigating cultural anchors, such as Baltimore bricks, historic green spaces, and the Chesapeake Bay. The workshops would enable the community to come together to produce a product that can create or restore human, terrestrial, and aquatic habitats and public art pieces. The products researched were bricks, seed balls, and oyster balls. Some of the programs already in place include Maryland Terrapin programs, the Baltimore Mobile Community Brick Factory, and the Inner Harbor Sandlot.

Mr. Hametz discussed Mahan Rykiel's study on the production and germination rates of dredged material seed balls. The interns created the seed balls using different "recipes" of dredged material and Leafgro® at Cox Creek DMCF with wildflower seed mix. The seed balls were transported to Mahan Rykiel's office for continued study on maximizing the use of dredged material. The germination rate was determined to be high. Mr. Hametz informed the Committee that risk assessors determined that the material was safe to handle prior to the creation of the seed balls.

Mahan Rykiel performed a slump test on dredged material and cement mixture to determine the workability for use as potential structures to be placed in the water for oysters as well.

Mr. Pattison reinforced that the Mahan Rykiel design proposals are only conceptual at this time. Ms. Fidler asked Mr. Bannerman for his thoughts on the design proposal. Mr. Bannerman responded that he did not know what to expect before the internship began, but after the presentation he sees great potential for innovative reuse and beneficial use of dredged material that could be duplicated elsewhere. Ms. Fidler thanked Mr. Bannerman for the tour of Turner Station.

USACE Beneficial Use Activities

**Graham McAllister, USACE
Danielle Szimanski, USACE**

WRDA 2016 – Beneficial Use Projects

Mr. McAllister provided an update on Section 1122: Beneficial Use of Dredged Material from the 2016 Water Resources Development Act (WRDA). Section 1122 states that the Secretary shall establish a pilot program to carry out projects for the beneficial use of dredged material, including projects for the purposes of reducing storm damage to property and infrastructure; promoting public safety; protecting, restoring, and creating aquatic ecosystem habitats; stabilizing stream systems and enhancing shorelines; promoting recreation; supporting risk management adaptation strategies; and reducing the costs of dredging and dredged material placement or disposal, such as projects that use dredged material for construction or fill material, civic improvement objectives, and other innovative uses and placement alternatives that produce public economic or environmental benefits. Each Division of the USACE was asked to supply possible beneficial use project, ten of which will be selected for funding. The first item the Baltimore District proposed was in conjunction with the Norfolk District and involved using Baltimore Harbor Channel dredged material beneficially at Tangier Island. The Baltimore District's second and third proposed options involve USACE shallow draft projects Kent Narrows and the Ocean City Inlet.

Maryland Thin Layer Projects

Mr. McAllister introduced Ms. Szimanski to the Committee. Ms. Szimanski has been the project manager for the navigation section of the USACE, Baltimore District, since 2011 and is also the project manager for the shallow draft section. Ms. Szimanski is the resident biologist and the lead for the Regional Sediment Management Program organized by the Engineering Research and Design Center; she also manages the Wicomico River project and the small island restorations for the Ocean City dredging project. Ms. Szimanski is a part of the Blackwater National Wildlife Refuge Marsh Resiliency project, which was awarded runner-up in the 2017 American Society of Adaptation Professionals Prize for Progress in Adapting to Climate Change awards.

Ms. Szimanski began her presentation on TLP of dredged material by explaining that she would review TLP projects conducted by the Baltimore District as well as the Philadelphia District. TLP is the hydraulic placement of dredged material via aerial spray or pipeline at a maximum thickness of 30 centimeters. In the past, the USACE had varying definitions regarding depth of TLP; however, within the past two years

the USACE has generally agreed that the preferred height for TLP is 6 – 24 inches. TLP does not use a large volume of material, but instead covers a large area and can be used to raise the elevation of a site. TLP can help control the “Swiss-cheese-effect” or internal fragmenting of a marsh due to water intrusion by raising the existing ground level of the fragmented area and allowing new marsh to grow on top of it. Using TLP to restore the marsh helps to keep the marsh alive, increase coastal resiliency, and mitigate sea-level rise.

The thickness of the placement is controlled via the spraying as it is rained in and monitored for its precise elevation. The reasons for using TLP for marsh restoration of fragmented areas is that it allows the marsh to remain alive during placement of the material through a precise thickness which enables the covered vegetation to grow through without causing harm, it increases the tidal buffer for storm events by building-out the marsh to trap nutrients, slows run-off, and controls waves, and TLP reuses dredged material. Ms. Szimanski discussed combining regular dredging with either upland or general beneficial reuse of wetland or island restoration or beach re-nourishment with TLP in order to get the most “bang-for-your-buck.” The drawbacks of TLP include not being able to use contaminated dredged material unless the end site has similar contaminants, it enhances the natural sedimentation process, and there is a decreased rate of vegetation recovery depending on depth of applied material. Once application is complete the vegetation takes 1/2 to 1 growing season to return. Mr. Donnelly asked what is done to accommodate the animals in the areas of inflow. Ms. Szimanski responded that the larger animals are deterred by the noise, but benthic and smaller animals are likely covered.

Ms. Szimanski provided an overview of past TLP projects. The first projects described were at Blackwater National Wildlife Refuge. At Blackwater National Wildlife Refuge a TLP demonstration project was performed in 2003 that consisted of three, 1-2 acre(s) test sites (Shorter's Wharf, Observation Tower, and along Wildlife Drive) that were sprayed with 3-6 inches of dredged material from open-waters at Blackwater National Wildlife Refuge and wild rice seeds. The material was hydraulically dredged and placed via aerial spraying at 100-150 feet (ft.) Hay bales were used at each area to contain the material and native vegetation plugs were planted. The Observation Tower and Wildlife Drive test sites experienced abundant growth with no die back while Shorter's Wharf experienced a two year growth period, then had a 5 year die back period, but rebounded with abundant growth since 2010. The USACE suspects the die back was due to a lack of nutrients in the soil following the period of excessive growth.

In 2016, at Shorter's Wharf (across from the 2003 project), in partnership with National Fish and Wildlife Foundation (NFWF) and US Fish and Wildlife Service (USFWS), approximately 26,000 cy of dredged material was placed onto a 40 acre site to determine the best approach for future work and to restore fragmented areas. Using research from National Audubon Society regarding feeding elevation requirements for specific migratory bird species, the material was placed with three separate elevations (two sites with 20 cm, one site with 25 cm, and one site with 30 cm) to restore the native habitat. The aerial spraying method was utilized in the 20 cm areas, while the 25 and 30 cm areas utilized the pipeline method. The hand-planting of all four sites with *Spartina alterniflora* was completed in August 2017.

The next projects described were conducted in the USACE Philadelphia District in Pennsylvania. The projects were accomplished with funding from the Hurricane Sandy Fund. In 2014, 6,500 cy of sand was placed on Ring Island within a coir log containment area for the creation of shorebird habitat and 500 cy of sand via aerial spraying as a TLP demonstration project. Ms. Szimanski informed the Committee that, due to grain size/weight, sand TLP via aerial spraying will only travel 100-150 ft. while silt TLP via aerial spraying can travel up to 300 ft. Additional nutrients or material may need to be applied when using sand

depending on if the site will be a vegetated or beach habitat. Mr. Pattison asked for the location of Ring Island. Ms. Szimanski responded that Ring Island is located within the last 15 miles of the Jersey Shore peninsula near Avalon.

Also in 2014 the New Jersey Industrial Workers of the World (NJIWW), in partnership with the New Jersey Department of Environmental Protection (NJDEP), performed a TLP demonstration pilot project in Avalon with fine-grained material contained by coir logs. The project consisted of filling six acres of pools and salt pannes with 5,000 cy of fine-grained material to restore fragmented marsh areas. In 2015, the USACE received a NFWF grant to create habitat on land managed by the New Jersey Department of Fish and Wildlife (NJDFW) in partnership with USFWS, NJDFW, Nature Conservancy and Wetlands Institute. The material used for the project was sandy/muddy material dredged from within the intercostal waterway by NJIWW with funding provided through the operations and maintenance emergency supplement. The Avalon project was continued between November 2015 and February 2016 with the placement of 4,500 cy over 35 acres and monitoring occurring into 2018. To ensure complete coverage of the site, the spray applicator was placed halfway through the marsh during placement. Since the material used and the placement site both contained dioxins there were no permitting issues because this was considered placing "like on like."

In 2017, 80,000 cy of Lower Wicomico River dredged material was used at Ellis Bay on the Eastern Shore to restore the wetland to its 1974 contour. The material was contained with coconut fiber logs and planted with *Spartina alterniflora* and *Spartina patens* in August 2017.

Ms. Szimanski discussed possible future projects. The first involves dredging Twitch Cove and Big Thorofare near Smith Island to restore Swan Island, the low and high marsh on the northern end of the upper jetty, and the beach south of the lower jetty, in order to reinforce the breakwaters created by USFWS that protect the Town of Ewell. The second potential project is the use of the USFWS's area and land to restore the southern wetlands of Barren Island on the Honga River in Dorchester County. The USFWS has previously restored the northern wetlands of Barren Island with material dredged from Tar Bay and the Honga River. For additional information follow the link to the USACE Engineering and Design Research Center TLP website: <https://tlp.el.erdc.dren.mil/>.

Mr. Denney asked how TLP projects are typically funded understanding that Hurricane Sandy fund was an unusual circumstance. Ms. Szimanski responded that typically TLP projects are funded by the USACE through the Baltimore District Operations and Maintenance funding, this is the same appropriation allotted for maintaining the federal channels. Mr. Nelson asked for the source of the material used for the Blackwater National Wildlife Refuge restoration. Ms. Szimanski responded that the material used for the Blackwater National Wildlife Refuge restoration was obtained from a small natural channel near Shorter's Wharf and that the material was silty and high in organics. Mr. Donnelly asked where dioxins in the material placed at the Avalon site originated. Ms. Szimanski responded that the dioxins originated from historical onshore residential construction. Mr. Pattison thanked Ms. Szimanski for the presentation and remarked that it was nice to see beneficial use of dredged material in the Bay.

Group Discussion

Mr. Myers informed the Committee that the Chesapeake Bay Foundation (CBF) has been researching the carbon sequestration potential of the Ellis Bay's restored wetlands. A similar study was conducted on the wetlands at the Blackwater National Wildlife Refuge, which showed potential for carbon sequestration due to its low salinity, however, the gains may be offset by the emission of methane from wetlands. Ellis Bay

salinity is at 14 parts per thousand (ppt), which is near the optimal salinity for carbon sequestration. CBF is collecting this new data as an additional cost benefit analysis of quantity for the beneficial use of dredged material. While most analyses use *Spartina alterniflora* marshes to research carbon sequestration potential it is the high marsh species that have better coastal resiliency, growth, wave attenuation, and carbon sequestration potential. TLP enables the creation of marshes at the elevation necessary to support the desired species. Ms. Genevieve Noyce is performing her second postdoctoral fellowship at the Smithsonian Environmental Research Center (SERC) and is studying the marsh at SERC for changes in carbon dioxide and temperature over time at different elevations and will be comparing that to marshes at beneficial use sites. Ms. Noyce is in contact with MES to analyze one such site at the Paul S. Sarbanes Ecosystem Restoration Project at Poplar Island and will incorporate the findings into the cost benefit analysis.

Ms. Correale asked for the optimal salinity for carbon sequestration. Mr. Myers responded that the optimal salinity for carbon sequestration is 18 ppt.

Upcoming Meetings

Steve Pattison, Facilitator

Mr. Pattison informed the Committee that the DMMP Annual Committee meeting is scheduled for November 3, 2017 at the Sollers Point Multi-Purpose Center and the next IRC meeting is scheduled for November 28, 2017.

Meeting adjourned at 7:05pm