

HARBOR TEAM
RECOMMENDATIONS FOR FURTHER STUDY:
COKE POINT BACKUP OPTIONS

Report to the Management Committee
And
Executive Committee of Maryland's
Dredged Material Management Program

September 15, 2011

HARBOR TEAM RECOMMENDATIONS FOR FURTHER STUDY
COKE POINT BACKUP OPTIONS
September 15, 2011

EXECUTIVE SUMMARY

The Harbor Team considered 23 potential options for backup to Coke Point over a period of one year.

The Harbor Team agreed to the following recommendations:

Strengthening the standards that apply to all dredged material management and community enhancement options;

Convening a committee to investigate and recommend innovative methods of funding community enhancement projects;

Pursuing a placement site with community enhancements at Coke Point as vigorously as possible – with Coke Point remaining the Harbor Team’s highest priority;

Conducting a feasibility study to assess innovative reuses already under consideration with a goal of innovatively reusing at least 500,000 cubic yards of dredged material per year by 2023 and answering questions necessary to determine if innovative reuse can become a viable part of the State’s Dredged Material Management Program;

Coordinating a plan to conduct a pilot test of Confined Aquatic Disposal (CAD) to determine if MPA could obtain the necessary permits to conduct a pilot test; conducting a pilot test if permits are issued; and, if pilot tests results are favorable, conducting a feasibility study of the use of CAD for harbor materials;

Ranking the Combined Cox Creek Millennium option as the highest priority of the land-based backup options to Coke Point for further study with two provisos:

1. Conducting community outreach to determine whether or not raising the dikes on the existing Cox Creek Dredged Material Containment Facility would be acceptable; if not, this feature would be dropped from further consideration.
2. Holding public information meetings in Anne Arundel County and Baltimore City as close to the zip code of the option as possible.

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INTRODUCTION AND BACKGROUND

In 2001, the Maryland General Assembly passed the Dredged Material Management Act of 2001 (DMMA). This act mandated a 20-year dredged material management plan. It also prioritized placement options in the following hierarchy:

- Beneficial use and innovative reuse
- Upland sites and other environmentally sound confined capacity
- Expansion of existing facilities
- Other options to meet long-term placement needs (excluding redeposition in an unconfined manner)

To meet the requirements of the act, the State's Dredged Material Management Program was organized as shown in Figure 1. The Harbor Team was established as part of the State of Maryland's Dredged Material Management Program (DMMP) in 2003. The purpose of the Harbor Team is to advise the State of Maryland on placement options for material dredged from Baltimore Harbor, which constitutes material that is dredged west of the Rock Point-North Point line.

In 2003, the Harbor Team made recommendations to the State of Maryland regarding dredged material placement and reuse of harbor materials. The recommendations included renovation of the Cox Creek Dredged Material Containment Facility (DMCF); study of new DMCFs at Masonville, BP/Fairfield and the Coke Point Peninsula of Sparrows Point; and study of innovative reuses of Dredged Material with a goal of innovatively reusing 500,000 cubic yards of dredged material a year within 20 years (2023).

The Maryland Port Administration (MPA) has made significant progress on several of the 2003 recommendations; one of the 2003 recommendations is no longer viable; and the Coke Point option became very uncertain. The Cox Creek DMCF went operational in 2006 and the Masonville DMCF became operational in 2010. The BP/Fairfield option was dropped from further consideration because it was purchased by a private entity for business use. Innovative reuse has become very promising from a technical point of view owing to a procurement by the MPA that resulted in three demonstration projects which are ongoing. Innovative reuse is still a challenge from a financial point of view, but less so than in 2003. From 2003 through 2010, the Coke Point option became increasingly uncertain due to repeated changes in ownership and differences in new owner positions regarding Coke Point. In October 2010, this uncertainty led the MPA to reconvene the Harbor Team to find a backup(s) to the Coke Point Option.

MPA charged the Harbor Team to find a backup(s) to Coke Point that meets the following requirements:

- Recommend one or more backups for dredged material placement in case Sparrows Point (Coke Point) is not available, including community enhancements.
- Total annual capacity of approximately 1.0 million cubic yards (mcy) per year, approximately 22 mcy total capacity, to meet the DMMA of 2001 requirement for a 20 year plan.
- Deliver report of recommendations to the Management Committee and MPA by June 2011 (date changed to September 2011 due to the large amount of information that needed to be provided to the Harbor Team for consideration).

The charge to the Harbor Team reflects “replacement” of capacity that would have been provided if the Coke Point Option were to move forward. The need for this capacity has become even more pressing since the Harbor Team’s 2003 effort for several reasons. Larger container ships will be coming to the Port of Baltimore with completion of the 50-foot berth at Seagirt in 2012 and additional larger container ships will call with completion of the Panama Canal expansion in 2014. The Port of Baltimore is currently one of two U.S. East Coast ports with a 50-foot navigation channel and it is critical to have dredged material placement capacity in order to maintain these channels and capitalize on cargo growth potential associated with the Canal expansion. Second, there is a need to conserve placement volume in each DMCF so that each will last as long as possible, given the continuous annual need for dredging. Placement volume is wasted if water is trapped in dredged materials in the placement sites. This occurs when annual “lifts” of dredged material larger than desirable for Maryland’s climate conditions and placement site surface areas are required, severely reducing dredged material drying and consolidation; this is referred to as overloading. Prevention of overloading led MPA to begin restricting private sector dredging and limiting new work public sector dredging in 2010. Lastly, there is a statutory need to ensure the availability of 20 years of dredged material placement capacity as per the DMMA of 2001.

PURPOSE

This report summarizes the Harbor Team’s search and recommendations for a backup option(s) to an MPA project at the Coke Point peninsula of Sparrows Point and updates the Harbor Team’s 2003 recommendations regarding placement and reuse of harbor materials.

HARBOR TEAM MEMBERSHIP AND PROCESS

With the effort to find a backup to the Coke Point option, more geographically wide-ranging alternatives came under consideration than in the 2003 effort. This resulted in many more organizations and individuals expressing interest in placement and reuse of harbor materials than in 2003. The email list (fewer than 5 participants do not have email) for the current effort grew to over 100 individuals, excluding consultants. With a desire to keep the Harbor Team membership to a manageable number, but still include interested individuals and organizations in the process, MPA decided to have a group of

voting members and a group of invitees to the Harbor Team. Collectively, the two groups are called Harbor Team participants. All participants were empowered to ask questions and express opinions, including asking voting members to consider motions. Voting members had the benefit of input by all participants in decision-making, but only voting members' opinions were counted for decisions. In addition, site visits were made to some of the options, and for logistical reasons, only voting members were invited to attend these site visits.

The voting members of the Harbor Team are shown in Appendix 1 and largely represent many of the same organizations as the 2003 effort. The Harbor Team invitees are shown in Appendix 2 and represent a wide range of organization types, as shown in the third column of Appendix 2. Efforts were made to ensure representation from the jurisdictions and citizens surrounding Baltimore Harbor to include Anne Arundel County, Baltimore City and Baltimore County.

The Harbor Team met monthly from October 2010 through September 2011 (except for December 2010 due to icy roads) to consider information, ask questions and develop this report. Additionally, the Harbor Team met at various locations to ensure that meetings were held in proximity to options under consideration. Meeting locations by month are shown in Appendix 3.

The Harbor Team heard presentations and/or received written technical information from technical experts from MPA, MPA consultants and from other organizations.

Using Maryland's existing DMMP procedure, the Harbor Team asked the Bay Enhancement Work Group (BEWG) to rank placement options on the basis of environmental and quality of life factors. BEWG members are technical experts on environmental issues from state and federal agencies and other organizations. BEWG membership is shown at Appendix 4. Appendix 5 contains the fact sheets that describe each option that was forwarded to the BEWG for evaluation. The fact sheets were prepared by MPA's technical team.

BEWG provided the Harbor Team with a technical matrix that assessed the environmental impacts and benefits for each option. The BEWG matrix included over 50 categories ranging from environmental factors to human use and beneficial attributes. The matrix was specifically tailored for harbor options, and included factors such as aesthetics and a heavy weighting for safety and human health impacts due to the proximity of population centers to these options. At the June 16, 2011, meeting, BEWG presented a completed environmental ranking of the options retained by the Harbor Team for consideration. BEWG also provided the Harbor Team with an environmental parameter scoring table, caveats to the environmental ranking, and resource scoring indices to help the Team evaluate the ranking (Appendix 6).

A summary of each Harbor Team meeting was produced and approved by the Harbor Team at a subsequent meeting. In addition, meeting summaries were posted on MPA's Safe Passage website (<http://www.mpasafepassage.org/dmmpHome.html>). Copies of technical information, presentations and meeting summaries were provided to Harbor Team participants for their Harbor Team binders. The Harbor Team was assisted by a facilitator.

OPTIONS CONSIDERED

At the October 18, 2010, Harbor Team meeting, MPA provided the following seed list of potential options as a starting point for discussion:

- Sparrows Point DMCF
- Innovative reuse
 - Shirley Plantation
- BP Fairfield
- Sollers Point
- Dead Ship Anchorage
- Thoms Cove
- Hawkins Point
- Hog Neck
- Ft. Howard
- Patapsco Ponds
- Cox Creek Expanded DMCF
- Other Upland Sites not yet identified
- Mid-Bay Island Uplands
- Others to be named by the Harbor Team

MPA made it clear at the October 2010 meeting that any recommendations that the Harbor Team may have for future sites are welcome to be evaluated through the Harbor Team process.

Upon review of the Harbor Team's 2003 report, two options from that report were added to the initial seed list for discussion:

- Key Bridge Southwest
- Key Bridge Pilings Containment Facility

Also, the Millennium property was added to the seed list in November 2010.

At the January 2011 Harbor Team meeting, the Team agreed that several sites do not have sufficient capacity to meet placement needs. These include:

- Hog Neck
- Ft. Howard
- Patapsco Ponds
- Key Bridge Southwest
- Key Bridge Pilings Containment Facility

The Team agreed that these five sites may be set aside for future consideration as mitigation projects, community enhancements or beneficial use sites.

Using maps prepared by MPA's consultants, the Harbor Team participants broke into small groups at the January 2011 meeting to review the maps and brainstorm possible dredged material placement options. There were no geographic constraints on what the Harbor Team could consider during the brainstorming process. The brainstorming process resulted in addition of the following options to the options list:

- Cox Creek – in water
- Sollers Point
- Innovative reuse at Cox Creek
- Cox Creek Uplands
- Hart-Miller Island II
- Hart-Miller Island Dike Raising
- Millennium
- Port Covington
- Fairfield (Interior Land)
- Poplar Island – Second Expansion
- Sparrows Point Shipyard
- Sparrows Point South – in-water between Ore Pier and Blast Furnace area
- Pooles Island
- Aberdeen Proving Ground
- Ordnance Depot (GSA)
- Confined Aquatic Disposal (CAD)
- Deep Trough E. side of Bay
- Landfill cover (site near USCG)

During the January 2011 meeting, the Team also decided to exclude the Dead Ship Anchorage and Thoms Cove because they are Designated Habitat Protection Areas (DHPA) under the City of Baltimore's Critical Area Management Plan.

The full list (in alphabetical order) of 23 options under consideration at the end of the January 2011 meeting was:

- Aberdeen Proving Ground (APG)
- BP Fairfield
- Coke Point (Sparrows Point) DMCF
- Confined Aquatic Disposal (CAD)
- Cox Creek Expanded (land only)
- Cox Creek Point (into water)
- Deep Trough, east side of Bay
- Fairfield (interior land)
- Hart Miller Island (HMI) II – between HMI and SSW of Pooles Island
- Hawkins Point
- HMI – Increase Height
- Innovative reuse at Cox Creek
- Innovative reuse at Shirley Plantation
- Landfill cover (site near USCG)

- Mid-Bay Island Uplands
- Millennium
- Ordnance Depot (GSA)
- Pooles Island
- Poplar Island – Second Expansion
- Port Covington
- Sollers Point
- Sparrows Point – Old Shipyard
- Sparrows Point – Ore Pier/Blast Furnace area

The locations of these options are shown in Appendix 7.

Between the January and February 2011 meetings, Harbor Team members were asked to provide the pros and cons of each option to the facilitator. The facilitator compiled the pros and cons of the options (Appendix 8) and this compilation was used to begin the discussion of each option at the February 2011 meeting. The objective of this meeting was to review the pros and cons submitted, add to the pros and cons, as desired by the Harbor Team, and then vote on which options would be carried forward to the MPA technical team for fact sheet preparation. During this meeting, Harbor Team members requested that consultants and agency representatives share their knowledge of the various options. Several did so and the additional pros and cons for each option are documented in the summary of the February 17, 2011, Harbor Team Meeting (Appendix 9). The Harbor Team voted to carry a total of eleven options forward for further study and fact sheet preparation by the technical team. These options are:

- Coke Point (Sparrows Point) DMCF
- Confined Aquatic Disposal (CAD)
- Cox Creek Expanded (Upland only)
- Deep Trough – East Side of Bay
- Fairfield (Interior)
- Hart-Miller Island II
- Innovative reuse at Cox Creek
- Innovative reuse at Shirley Plantation
- Landfill Cover at Quarantine Road (innovative reuse)
- Millennium
- Ordnance Depot (GSA)

During fact sheet preparation, the MPA's technical team suggested combining some options and made the observation that Coke Point cannot be a back up to itself. The innovative reuse options were combined under the heading, Innovative Reuse, and were expanded to include the ongoing innovative reuse demonstration projects and planning:

- Innovative Reuse
 - Shirley Plantation
 - Structural fill (embankments)
 - Light weight aggregate
 - Landfill cover – could be used at any landfill, not just at the Quarantine Road landfill
 - Innovative reuse processing facility at Cox Creek (dredged material could be processed there for several different end uses)

Two of the options included in the list for fact sheet preparation are adjacent to one another, the Millennium property and the Cox Creek property. As a result, the technical team suggested considering the following combinations of options for these properties:

- Cox Creek existing DMCF – raise dikes
- Cox Creek upland
- Combine raising dikes on Cox Creek existing DMCF and the Cox Creek upland
- Millennium
- Combine Millennium with Cox Creek upland
- Combine Millennium with Cox Creek upland and raising dikes on the Cox Creek existing DMCF

Between the February and March 2011 Harbor Team meetings, the Hart Miller Island II option became widely circulated outside of Harbor Team participants. This resulted in expressions of strong opposition to the Hart Miller Island II option by many members of the public and led to wider circulation of the entire list of options and expressions of concern about some of the other options as well. During this period, the Maryland Department of Transportation (MDOT) indicated that the GSA Ordnance Depot would not be considered as a placement site for dredged material as MDOT is considering it solely for use as a warehouse and distribution center.

At the April 2011 meeting, the Harbor Team voted to remove the following options from further consideration:

- Deep Trough – removed due to concerns about resuspension of dredged material and past vehement public opposition, which is likely to still be present
- Fairfield (Interior Land) – removed due to current and pending investment of public funds for development of the area
- Hart-Miller Island II – removed due to potential significant environmental impacts and strong public opposition
- Ordnance Depot (GSA) – removed due to MDOT indicating it would not be considered for dredged material placement and public opposition

At the time of the July 21, 2011, Harbor Team Meeting, the following back up options to Coke Point remained under consideration:

- Confined Aquatic Disposal (CAD)
- Innovative Reuse
 - Shirley Plantation
 - Structural fill (embankments)
 - Light weight aggregate
 - Landfill cover – could be used at any landfill, not just at the Quarantine Road landfill
 - Innovative reuse processing facility at Cox Creek (dredged material could be processed there for several different end uses)
- Cox Creek Options
 - Raise dikes on existing DMCF
 - Upland
 - Combine raising dikes on existing DMCF and upland
- Millennium
- Combined Cox Creek and Millennium Options
 - Millennium with Cox Creek upland
 - Millennium with Cox Creek upland and raising dikes on the Cox Creek existing DMCF

During the July 21, 2011, Harbor Team Meeting, an additional option involving Millennium and Cox Creek was suggested. The suggestion was to enclose the cove formed by the Millennium property and the existing Cox Creek dike by extending into the water. This option was added to the draft recommendations for consideration.

At the July 21, 2011, Harbor Team meeting, the Team requested that the chief obstacles to implementation of large-scale, successful innovative reuse be clearly articulated. As a result, MPA's innovative reuse technical team provided the information that follows for the Harbor Team.

MPA's innovative reuse technical team as well as the Innovative Reuse Committee has been overseeing three innovative reuse demonstration projects, some of which were started at the end of 2009. Two of these projects are nearing completion and will provide information that will allow MPA to decide which of the technologies should be pursued. MPA has also supported an independent analysis of sediment quality in Baltimore Harbor that resulted in an assessment of the suitability of harbor sediments for various end uses.

The results available to date on the innovative reuse demonstration projects suggest that certain harbor sediments are suitable for the reuse technologies being evaluated and that the reuse technologies can generally produce products that meet acceptability criteria for the end use markets. The potential for successful production and marketing of these products is dependent on a number of questions that have yet to be fully answered. These questions are listed below.

- *Environmental permits:* Will regulatory agencies permit both the operation of innovative reuse processing facilities and the use of recycled dredged material products in local construction and/or remediation projects?
- *Siting:* Can an adequate site adjacent to Baltimore Harbor on public or private property be dedicated to a dredged material processing facility without compromising other planned port expansion opportunities?
- *Contracting:* Can MPA successfully enter into acceptable long-term agreements/contracts/leases with companies that would be constructing and/or operating the processing facilities? How should these arrangements best be structured?
- *Local impacts:* Can issues associated with operation of dredged material processing facilities and transportation of raw materials/final products be worked out to the satisfaction of neighboring communities?
- *Marketability:* How possible is it to determine the sustainability of markets and prices for recycled dredged material products?
- *Economics:* Can innovative reuse of dredged material be achieved in a manner that is affordable to the State of Maryland? What financing strategies and opportunities are available that may make the required capital investment and long-term operation feasible? Are there potentials for public/private partnerships?
- *Dredged Material Management Plan:* Will the Port Commission and MDOT incorporate innovative reuse as part of the next 20-year DMMP?

CONCLUSIONS

Based on review of its 2003 recommendations and information gained during the October 2010 through September 2011 search for dredged material placement sites, the Harbor Team reiterates its 2003 belief that cost-effective innovative reuse techniques must become the primary method for managing harbor dredged material in the long term. Land-based options and available water areas in the harbor have become very limited, as demonstrated once again during the 2010-2011 search for new options. Although innovative reuses will require dewatering facilities, they are less land intensive than other upland placement options. The Harbor Team acknowledges that the costs associated with innovative reuse techniques remain relatively high, but believes that innovative reuses are more sustainable in the long-term and that technological improvements will continue to reduce the innovative reuse costs in the future. The Harbor Team is optimistic about the improving economic viability of innovative reuses of dredged materials and believes innovative reuses should be pursued vigorously, but concludes that one or more other options will be needed to bridge the “gap” until innovative reuses become more economically viable and the questions about innovative reuse, which are listed above, are answered.

RECOMMENDATIONS

The Harbor Team reiterates most of its 2003 General Policy Recommendations on Placement and Community Enhancement Options, revises some, and adds to those general policy recommendations.

The Harbor Team recommends that the following standards shall apply to all dredged material management and community enhancement options:

- During feasibility studies of dredged material placement options, a package of community enhancements will be developed in consultation with directly affected communities, appropriate governmental entities and the Harbor Team. Community enhancements provided in conjunction with a dredged material placement option shall be in the communities directly affected by the option.
- All projects shall be designed to protect human health and the environment at all times. No community is willing to sacrifice the health of its citizens or its natural resources, nor shall it ever be asked to.
- All options shall add value to all nearby communities.
- Wherever possible, public access to the water shall be provided as a component of any dredged material management project.
- All jurisdictions bordering the Harbor (Anne Arundel County, Baltimore City, and Baltimore County) shall be partners in the DMMP.
- Where placement options are combined with community enhancement options in the recommendations, the projects are to be considered comprehensively and not separately.
- If possible, placement projects shall be implemented in a way that maximizes local tax benefits.

- Community Enhancement projects shall, where appropriate, be designed to improve water quality and aquatic habitat.
- Community enhancements shall, where appropriate, be protected for public use through perpetual conservation easements or similar mechanisms.
- Community oversight committees or advisory committees shall be established to work with MPA and other port stakeholders in implementing any projects that move forward for consideration, including development of closure plans and closure timelines, and in recommending end uses.
- MPA shall continue to work openly and transparently with communities and other port stakeholders, as it has done with the Masonville Dredged Material Containment Facility, throughout the planning, development, construction, operation and maintenance of any projects that move forward.
- MPA shall ensure that commitments made to communities and other port stakeholders during project study, development, and construction are adhered to throughout the project life. If future circumstances, not reasonably foreseeable at the time of this writing, necessitate changes in commitments, MPA shall work with communities and other port stakeholders to ensure acceptability.
- MPA shall apply for all applicable environmental permits for a facility, including those necessary for any agreed upon community enhancements, at the appropriate time. This will ensure that any community enhancements agreed to will occur at the appropriate point in the process of developing the dredged material containment facility.

The Harbor Team recommends that the State of Maryland's DMMP:

GENERAL

Convene a committee to investigate and recommend innovative methods for funding community enhancement projects recommended in conjunction with placement options. This committee should have representation from local community associations represented on the Harbor Team and local government entities (Baltimore City, Baltimore County, Anne Arundel County) and should include appropriate assistance from MPA staff and consultants.

COKE POINT

Pursue a placement site with community enhancements at Coke Point as vigorously as possible. Coke Point is still the highest priority recommendation of the Harbor Team.

INNOVATIVE REUSE

Conduct a feasibility study to assess innovative reuses already under consideration with a goal of innovatively reusing at least 500,000 cubic yards per year of harbor dredged material by 2023. Remain open to other innovative reuses as technology and economic viability evolve. Develop the information necessary to answer the questions posed in this report in order to determine if innovative reuse of harbor dredged material can become a viable part of the State's DMMP. If it is determined that

innovative reuse can become a viable part of the State's DMMP, consider whether the goal of innovatively reusing at least 500,000 cubic yards per year by 2023 can be accelerated.

The recommendations that follow should not be interpreted as endorsing specific sites, configurations, or projects. Rather, the Harbor Team believes these options have enough merit to warrant additional investigation and coordination with local interests and governments to determine their feasibility as a backup option to an MPA project at Coke Point. The recommended options are shown in Figure 2.

CONFINED AQUATIC DISPOSAL (CAD)

Prepare and coordinate (with appropriate regulatory and resource agencies and the Harbor Team) a plan to conduct a pilot test of Confined Aquatic Disposal in Baltimore Harbor. The plan should include appropriate requirements to assess feasibility, short-term and long-term environmental impacts associated with the technique, and the effectiveness of various engineering controls in minimizing environmental impacts of the technique. Based on the results of the coordination, determine if MPA could obtain the permits necessary to conduct such a pilot test. If the necessary permits are issued, conduct the pilot test.

If a CAD pilot test is permitted and the results of the pilot test are favorable, conduct a feasibility study on the use of CAD for harbor materials. Consider future needs for deepening and widening navigation channels, replacement of existing tunnels and utility crossings under the harbor and construction of new harbor transportation and utility crossings. A feasibility study should also include the costs and feasibility of appropriately mitigating the environmental impacts associated with this disposal option in light of the total maximum daily loads (TMDLs) in place for Baltimore Harbor.

COX CREEK DIKE RAISING STIPULATION

This stipulation applies to all options in this report that include study of the possibility of raising the dikes at the existing Cox Creek DMCF.

The Harbor Team recognizes that the MPA, in response to community desires at the time, indicated to the community that they would not raise the elevation of the dikes at the existing Cox Creek DMCF above adjacent ground level. The Harbor Team feels strongly that previous commitments to communities should be kept. However, based on comments during the August 18, 2011, Harbor Team meeting, the Harbor Team recommends that community outreach be conducted with communities near Cox Creek to determine whether or not raising the dikes on the existing Cox Creek DMCF would be acceptable. The Harbor Team recognizes that this outreach will take some time to accomplish and that

providing a third option for harbor materials in the near future is imperative. The Harbor Team finds it acceptable to conduct community outreach on raising the dikes at the existing Cox Creek DMCF concurrent with feasibility studies of options that include raising the dikes. However, the Harbor Team expects that studies of raising the dikes at the existing Cox Creek DMCF will be terminated and raising the dikes at the existing Cox Creek DMCF will be dropped from further consideration if it becomes clear that raising the dikes is not acceptable to the communities.

PRIORITY RANKING OF LAND-BASED OPTIONS

The Harbor Team agreed that the highest priority for further study of the land-based options is the Combined Cox Creek and Millennium option. The Harbor Team also agreed that the remaining land-based options (Cox Creek and Millennium, individually) need not be prioritized as they could be considered in the feasibility study of the Combined Cox Creek and Millennium option.

COX CREEK

Conduct a feasibility study of combining raising the dikes on the existing DMCF with constructing a DMCF on the upland portion of the property, subject to the Cox Creek Dike Raising Stipulation above. Ensure no impacts to the Swan Creek wetland area.

MILLENNIUM

Conduct a feasibility study of constructing a DMCF on the Millennium property. Ensure no impacts to Baltimore City's Ft. Armistead Park.

COMBINED COX CREEK AND MILLENNIUM

Conduct a feasibility study of constructing a DMCF on the combined Millennium property and the upland portion of Cox Creek and raising the dikes on the Cox Creek existing DMCF subject to the Cox Creek Dike Raising Stipulation above. Ensure no impacts to the Swan Creek wetland area and no impacts to Baltimore City's Ft. Armistead Park.

PUBLIC INFORMATION MEETING REQUIREMENTS

Public information meetings will be held in Anne Arundel County and Baltimore City for any land-based backup options within those jurisdictions. These public information meetings will be held in a convenient venue as close to the zip code of the option as possible.



Maryland's DMMP Structure

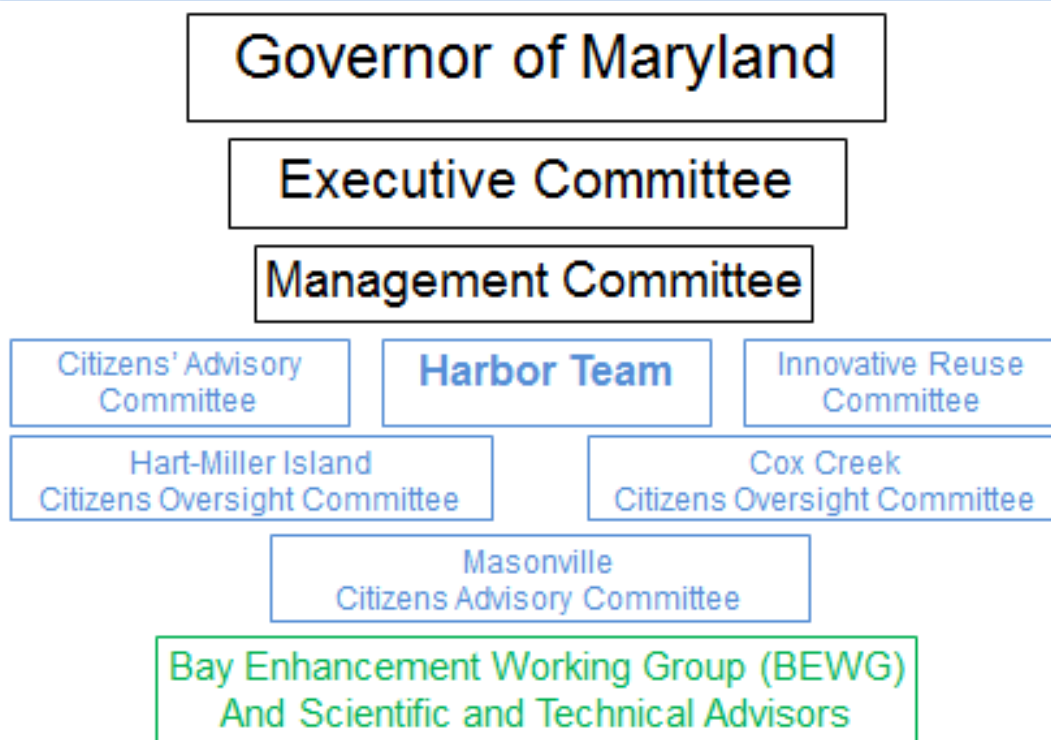
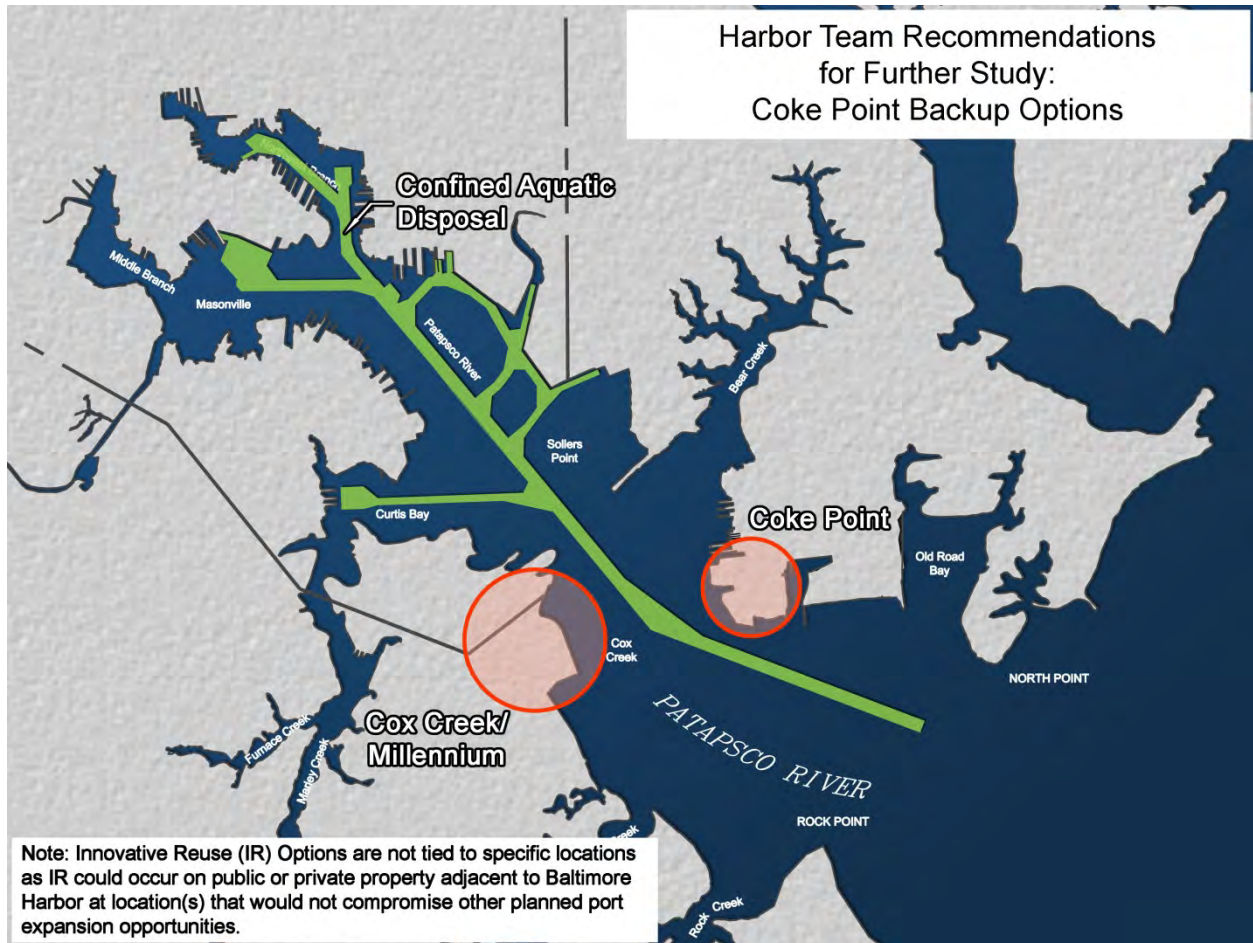


Figure 1 – Maryland's DMMP Structure

Figure 2 – Harbor Team Recommendations for Further Study



Appendix 1 – Voting Members of the Harbor Team

Advocate of Bear Creek

William Pribyl

Anne Arundel County Government

Brenda Reiber

Association of Maryland Pilots

Captain Eric Neilsen

Baltimore City Government

Thomas J. Stosur

Baltimore County Government

Vince Gardina

Baltimore Harbor Waterkeeper

Eliza Smith-Steinmeier

Blue Water Baltimore

Phillip Lee, P. E.

Baltimore Port Alliance

Rupert Denney

Bay Enhancement Work Group

Jeff Halka (DNR)

Brooklyn and Curtis Bay Coalition

Rob Catlin

Chesapeake Bay Foundation

Jenn Aiosa

Cianbro Corporation

Mike McGeady

Domino/The American Sugar Refining Company

Howard French

DMMP Citizens Advisory Committee

Fran Taylor

Dundalk Renaissance Corporation

Amy Menzer

Ed Parker

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Greater Dundalk Alliance

Carolyn Jones

Greater Dundalk Community Council

Thomas Kroen

Greater Pasadena Council

Rebecca Kolberg

Living Classrooms Foundation

Scott Raymond

Masonville Citizens Advisory Committee

Michael Sakowski

National Aquarium in Baltimore

Laura Bankey

North Point Peninsula Council

Harry Wujek

Pasadena Business Association

Mike Jacobs

Pasadena Sportfishing Group

Frederick C. Lohn

Patapsco Back Rivers Tributary Team

Jack Anderson

Rukert Terminal

Steve Landess, P.E.

RG Steel

Russ Becker

Turner Station Conservation Teams

Gloria Nelson

W. R. Grace & Co.

Mark Galloway

Appendix 2 - Harbor Team Participants		
First Name	Last Name	Representing
Mark	Adams	Association of Maryland Pilots
Jenn	Aiosa	CBF
Jack	Anderson	Patapsco Back Rivers Tributary Team
Lorraine	Andrews-Warnick	Living Classrooms
Kathy	Ash	DBED
Laura	Bankey	National Aquarium
Linda	Bardo	Community of Curtis Bay Association
Russ	Becker	RG Steel
Bob	Blama	Corps of Engineers
Ron	Bowen	Anne Arundel County Department of Public Works
Kevin	Brennan	USACE
Dunbar	Brooks	Turner Station / Baltimore Metropolitan Council
Edythe	Brooks	Turner Station Conservation Team
Rose	Brooks	Councilman John Grasso
Linda	Bryan	Baltimore Port Alliance
Ed	Carlson	Citizen
Robert	Catlin	BayBrook
Chris	Christensen	Vulcan Materials
Bob	Crandell	Citizen
Rupert	Denny	Baltimore Port Alliance
Steve	Dishon	GDA / DRC
Russ	Donnelly	Citizen
Jay	Doyle	Baltimore County
Carol	Eshelman	BayBrook
Jonathan	Essoka	EPA
Al	Foxx	Baltimore City DPW
Howard	French	Domino
Mark	Galloway	WR Grace
Vince	Gardina	Baltimore County Dept. of Env. Protection and Sustainability
Shirley	Gregory	St. Helena's Community Association (Baltimore City)
Denise	Haas	Millers Island Community Association
Fred	Habicht	Barrison Point Improvement Association
Jeff	Halka	DNR (BEWG Liaison)
Ray	Heil	Baltimore County
Scott	Holupka	JHU/DRC/GDCC (Pres. Of GDCC)
Nancy	Hubers	Bowleys Quarters Improvement Association
Mike	Jacobs	Pasadena Business Association
Ken	Jeffries	Upper Bay Charter Captains
Carolyn	Jones	Greater Dundalk Alliance

Appendix 2 -Harbor Team Participants		
First Name	Last Name	Representing
Terri	Kingeter	Baltimore County
Rebecca	Kolberg	Greater Pasadena Council
Tom	Kroen	GDCC/HMI Citizens Oversight Committee
Steve	Landess, P.E.	Rukert Terminal Corp.
Phil	Lee	Blue Water Baltimore
Larry	Lee	Back River Restoration Committee
Gail	Lehman	Concerned Citizens for a Better Brooklyn
Gary	Letteron	Baltimore City Dept. of Planning
Geraldine	Lippman	Cedar and Morris Hill Improvement Association
Fred	Lohn	Pasadena Sportfishing Group
Neil	Magness	Baltimore County
Amy	Mantay	Baltimore County
Don	Marani	Upper Bay Charter Captains and MD Watermen
Kate	Marks	DBED
Alice	Mason	Turner Station
Mike	McGeady	Cianbro, S. Baltimore Business Alliance, Sail Balto
Beth	McGee	CBF
Mark	Mendelsohn	USACE
Amy	Menzer	DRC
Wayne	Miskiewicz	Maryland Marina
Sherilyn	Morgan	USEPA Region III
Robert	Munroe	MPA
John	Murosko	Constellation Energy
Gloria	Nelson	Turner Station
Eric	Nielsen	Baltimore Port Alliance
Bob	Palmer	Baltimore County Marine Trades Association
Adam	Panarese	Millenium (Cristal Global)
Ed	Parker	DRC
David	Patro	North Point Village Civic Association
Patricia	Paul	Citizen
Will	Phillips	Under Armour
Ray	Porter	Porters Seneca Marina
Raymond	Porter, Jr.	Baltimore County Marine Trades Association
Bill	Pribyl	Citizen
Elizabeth	Price	Univ of MD-Chesapeake Biological Lab

Appendix 2 - Harbor Team Participants		
First Name	Last Name	Representing
Rennzellous	Ranson	Turner Station
Scott	Raymond	Living Classrooms
Brenda	Reiber	Anne Arundel Co. Constituent Svcs and Community Outreach
Anna Marie	Renault	Essex Patch.com
Connie	Reynolds	Point Pleasant Shoreland Improvement Association
David	Riter	Baltimore County - DEPRM
Matt	Rowe	MDE
Melissa	Sadowski	Baltimore County - Department of Economic Development
Mike	Sakowski	Cabcraft Engineering - Citizen (Masonville CAC)
Larysa	Salamacha	BDC
Fred	Scharmen	Education
Brian	Schilpp	Back River Restoration Committee
Brian	Schneider	Tradewinds Marina
Edie	Schuman	SNAP
Laurie	Schwartz	Baltimore Waterfront Partnership
Renee	Searfoss	USEPA Region III
Tom	Slenkamp	USEPA Region III
Eliza	Smith Steinmeier	Baltimore Harbor Keeper
Courtney	Speed	Turner Station
Stuart	Stainman	Patapsco Back Rivers Tributary Team
Darlene	Stauch	Greater Dundalk Alliance
Thomas	Stosur	Baltimore City - Director of Planning
Duncan	Stuart	Baltimore City - DPW
Cathy	Stump	Baltimore City DPW (COL Foxx' Administrator)
Fran	Taylor	CAC Liaison
Fred	Thiess	Senator Stone's Office
Mike	Trush	JHU Center for Urban Environmental Health
Steve	Verch	Back River Restoration Committee
Mike	Vivirito	Bowleys Quarters Improvement Association
Lisa	Wainger	Univ of MD-Chesapeake Biological Lab
Janet	Walper	Bowleys Quarters Community Association
Ron	Walper	Essex Middle River Civic Council
Harry	Wujek	North Point Community Council
CAPT Jerry	Ziemski	Back River Restoration Committee

Appendix 3 – Meeting Locations by Month, Harbor Team

October 2010 – 2200 Broening Highway, Baltimore

November 2010 – 2200 Broening Highway, Baltimore

December 2010 – Not applicable – meeting canceled due to icy roads

January 2011 – 2200 Broening Highway, Baltimore

February 2011 – 2200 Broening Highway, Baltimore

March 2011 – 2200 Broening Highway, Baltimore

April 2011 – Back River Wastewater Treatment Plant, Baltimore

May 2011 – George Fox Middle School, Pasadena

June 2011 – Back River Wastewater Treatment Plant, Baltimore

July 2011 – Orchard Beach Volunteer Fire Department, Glen Burnie

August 2011 – Brooklyn Park Library, Baltimore

September 2011 – George Fox Middle School, Pasadena

Appendix 4 – Bay Enhancement Working Group Membership

ARCADIS

Baltimore City Department of Planning

Baltimore Development Corporation

Baltimore Office of Sustainability

Chesapeake Bay Foundation

DMMP Citizens' Advisory Committee

Ducks Unlimited

EA Engineering, Science and Technology, Inc.

EcoLogix Group, Inc.

Environmental Protection Agency, Region III

Gahagan & Bryant Associates, Inc.

Maryland Board of Public Works

Maryland Charter Boat Association

Maryland Department of Natural Resources

Maryland Department of the Environment

Maryland Environmental Service

Maryland Geological Survey

Maryland Port Administration

Maryland Watermen's Association

Maryland Saltwater Sportsfishermen's Association

Moffatt & Nichol Engineers

National Oceanic and Atmospheric Administration (NOAA) -National Marine Fisheries Service

NOAA Chesapeake Bay Office

Phoenix Engineering, Inc.

University of Maryland Center for Environmental Science

United States Army Corps of Engineers, Baltimore District

United States Army Corps of Engineers, Philadelphia District

United States Fish & Wildlife Service

Upper Bay Charter Captains Association

Appendix 5 – Options Fact Sheets



Confined Aquatic Disposal

Purpose: The purpose of this sheet is to provide the Bay Enhancement Working Group (BEWG) with information on the options that the Harbor Team has forwarded for ranking. BEWG will then use this information sheet in its environmental scoring based upon the factors in the evaluation matrix and included in these sheets. BEWG's scoring will be reported back to the Harbor Team for use in developing recommendations about the options. This sheet was drafted using general as well as site specific information, when available, and may be subject to change based on further study.

Location: The Confined Aquatic Disposal (CAD) sites would be located within the Patapsco River in Baltimore Harbor. CAD sites would be targeted for existing channels and anchorages that have been dredged and where a relatively thin layer of silts and clays overly thick deposits of clean sand and gravel.

Site Characteristics: The Patapsco River and Baltimore Harbor are underlain by clean, natural sand and gravel deposits of the Patapsco Formation, which are over the Arundel Clay formation. The CAD concept is to excavate depressions in sand below the bottom of the channels to the limits of the dredging equipment or the top of the Arundel Clay formation; these pits would be used to laterally contain dredged material placed from the shipping channels (Figure 1).

CAD sites can be constructed in a relatively short time, on an as-needed basis, and located near dredging sites. CAD cells can be designed to accommodate a varied range of volumes, dependent on the dredging needs for the Harbor. Typical practical sizes for a CAD cell are on the order of 500,000 to 2,000,000 cubic yards (cy), or 10 to 50 acres.

One location that shows potential for a CAD site is the Seagirt Marine Terminal Berth IV Turning Basin, which is permitted to be dredged larger than existing, and sand deposits are present. Sand and gravel from this location was used for the construction of the Masonville Dredged Material Containment Facility (DMCF) dikes. Capacity for using this location is estimated to be between 2 to 4 million cubic yards (mcy); however, additional field investigations are needed to better evaluate the facility. Additional locations could be identified throughout the Harbor or Bay Channels with additional geological/geotechnical information.

CAD could provide supplemental placement capacity with another option, but likely not a solution on its own. The site life of a single CAD site would be on the order of one to two years. Identification of one CAD site would not meet the demand for the 20 year plan; however, if multiple sites are identified and used over time, they could make a significant contribution toward meeting long-term capacity requirements.

Methodology: The CAD cell would be constructed by first removing surficial sediments (unsuitable silts and clays) by clamshell, loading the material into scows, and placing them at the Masonville or Cox Creek DMCFs. Clean sand and gravel would then be removed by clamshell and transported by scow to a



beneficial use site. The CAD cell would be filled with maintenance dredged material from the Harbor shipping channels. This material could be placed into the CAD cell using two methods: 1) excavated by clamshell dredge and dumped into the cell by split-hull scow, or 2) excavated using pipeline dredge and pumped into the cell. The CAD cell would be capped with sand once it has been filled.

Water Quality

Existing Conditions

- Water quality is generally poor within Baltimore Harbor as a result of anthropogenic impacts, such as industrial discharges, runoff, and sewage outfalls.
- Existing water depths in the Harbor channels vary from 42 to 50 ft below MLLW, and are currently anoxic.
- The Patapsco River is listed as impaired for nutrients.
- Existing water in the area is generally turbid due to the presence of nutrients and suspended sediment. Sediment inflow from the tributaries and some shoreline erosion causes turbidity, particularly after major rain events.
- The salinity regime in the Harbor is mesohaline or oligohaline, depending on location. Salinity varies seasonally, with freshwater inflow and saltwater intrusion into the Harbor, and with distance from the mouth of the Patapsco. Three gauges occur near the possible locations of the CAD sites; Masonville Cove, Fort Smallwood, and Fort Armistead. At all three stations salinity levels increase from March until October. Deep channels allow salt penetration into the Harbor due to the presence of denser, higher salinity water.
- Groundwater is not used as a source of potable water in Baltimore City and other areas surrounding Baltimore Harbor. The Patapsco Formation aquifer is degraded due to past activities in the Harbor. The formation is underlain by an approximately 50 ft thick layer of the Arundel Clay, which is an impervious sediment that isolates the Patapsco Formation from the deeper Patuxent Formation aquifer.

Potential Impacts

- Existing conditions are anoxic and increasing depth to 80 to 100 ft below MLLW would be for a relatively short-term; water would likely be anoxic.
- Release of some nutrients and local, temporary increases in ammonia would be expected. There is not currently a permitting mechanism for this type of placement activity in the state of Maryland.
- Short-term impacts to turbidities in the area may occur during placement operations. Low current velocity in Baltimore Harbor minimizes transport of suspended sediment. Placement of dredged material into a CAD cell by split-hull scow can be controlled with turbidity curtains or with placement only during times of slack water. Alternatively, material can be placed using pipes or pumping to the bottom of CAD cells.
- Deepened channels have the potential to increase salt penetration into the Harbor; however, isolated deep areas with no connection to the deeper waters of the Bay would not be subject to



this increase. The salinity may be slightly greater towards the deeper waters of the CAD site due to density differences, but it is likely to be minimal.

- Potential for release of contaminants from the sediments into the water column exists. If most of the material placed consists of silts and clays, constituents that are not water soluble or that have low solubility are expected to be tightly bound to the sediment.
- Placement and sediment transport modeling would need to be completed.
- Geotechnical investigations would be needed to verify the presence and thickness of the Arundel Clay layer under any potential CAD site in order to prevent contact between the placed dredged material and the underlying Patuxent Formation aquifer.

Aquatic Habitat

Existing Conditions

- Benthic habitat in the bottom of the channels is degraded as a result seasonal hypoxia/anoxia and silty substrate found in the areas that are routinely maintenance dredged. The channels within the Harbor are regularly dredged and shoaling occurs within the channels. This results in regular disturbance to the benthic communities and prevents a high quality benthic community from developing.
- Poor foraging habitat exists within the channels; however, the channels may provide an area of thermal refuge in the warmer and cooler months.
- Channel areas do not include submerged aquatic vegetation (SAV) or shallow water habitat (SWH).
- Baltimore Harbor provides potential habitat for two Essential Fish Habitat (EFH) species; one species listed under the Endangered Species Act (shortnose sturgeon), and one candidate species under the Endangered Species Act (Atlantic sturgeon).

Potential Effects

- Sand or other coarse substrate used for capping of the CAD area would provide an improved substrate for benthic organisms; however, this area would still be subject to seasonal hypoxia/anoxia.
- The area of available water column for aquatic species is not expected to be impacted.
- There could be short term water column impacts from release of sediments and contaminants.

Wetlands

Existing Conditions

- The entire area is tidal open water, which is considered to be a wetland by the State of Maryland.

Potential Effects

- Impacts to open water as described under water quality and aquatic habitat.



Aquatic Biology – Finfish/Shellfish

Existing Conditions

- Both resident and migratory fish species are found within the channels and throughout Baltimore Harbor.
- In general, Baltimore Harbor has a relatively high occurrence of fish with diseases, primarily among resident species. Further evaluation would be needed to determine site-specific fish health.
- Anadromous fish species have historically used the Patapsco River (upstream of the Harbor in the freshwater portion of the River) for spawning. Some of the tributaries to the Patapsco River have fish ladders at blockages to fish migration (e.g., dams), which has improved the Baltimore Harbor as habitat for anadromous fish.
- Baltimore Harbor is not considered spawning habitat for anadromous fish, but shallow areas of the Harbor are considered to be a nursery area for migrating juvenile anadromous fish.
- There is no Habitat of Particular Concern (HAPC) for EFH species within the potential project area.
- All project depths are greater than 42 feet, which may provide areas of thermal refuge for fish.
- Commercial fishing and crabbing is conducted within Baltimore Harbor, but not within the federal navigation channels.
- Recreational fishing does occur within Baltimore Harbor, but generally occurs in shoreline areas or from bridges with pedestrian access. There is a fish consumption advisory for portions of the Patapsco River, including the potential project area. This advisory recommends limited consumption of specific species from some areas of the Patapsco River.

Potential Effects

- Area of water column disturbance would be temporary and would be limited to excavation of sand borrow and placement of dredged material and the sand cap.
- There would be no loss of available open water habitat.
- Substrate for shellfish (e.g., blue crabs) and benthic prey for benthic feeding fish would be improved by the sand cap.
- This area is not considered to be spawning habitat and hydrodynamics would not change after the site is complete; therefore larval transport would not be impacted.
- It is likely that permit conditions would require time-of-year restrictions to protect anadromous fish species (February 15 to June 15).

Special

Existing Conditions

- Shortnose sturgeon (*Acipenser brevirostrum*), a federally listed species, have been captured at the mouth of the Patapsco River. Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*), which is proposed for federal listing, have been captured within the Patapsco River between Sparrows Point and the Brandon Shores/Wagner Power Plants.



- Shortnose sturgeon and Atlantic sturgeon are considered rare transients to the Baltimore Harbor and are not anticipated to be found in the project area.
- Sea turtles (four listed species found in the Chesapeake Bay) are rare transients to Baltimore Harbor. The closest documented stranding of a sea turtle was at Gibson Island approximately 7 miles from the mouth of the Patapsco River.
- Two EFH species are found in Baltimore Harbor; summer flounder (*Paralichthys dentatus*) and bluefish (*Pomatomus saltatrix*).
- No HAPC exists within the potential project footprint.

Potential Effects

- Disturbance to the water column would displace mobile species, including any shortnose sturgeon, Atlantic sturgeon, sea turtles, bluefish, and summer flounder that may be in the project vicinity.
- It is likely that permit conditions would require time-of-year restrictions to protect anadromous fish, which is also the period when shortnose sturgeon and Atlantic sturgeon are most likely to be found in or near Baltimore Harbor.

Water Birds

Existing Conditions

- There are several waterfowl areas within Baltimore Harbor. Depending on the selected locations for the CAD site a waterfowl area may be affected.
- According to Maryland Department of Natural Resources online mapping, there are water bird colonies located at Fort Carroll, within the potential project areas, and nearby along the southern shoreline of the Sparrows Point Peninsula.

Potential Effects

- Depending on the proximity of the final CAD site, the noise and activity associated with construction and placement at the project site could potentially disturb nesting water birds and displace birds from the project area during periods of activity.

Terrestrial Resources

- The project area does not include any upland areas and would not affect any terrestrial resources.

Physical Parameters

Existing Conditions

- Existing water depths in the Harbor channels vary from 42 to 50 ft below MLLW.
- The bottom material of the Harbor is generally fine-grained silts and clays. Areas where a CAD site would be located would have a relatively thin layer of this material over a thick layer of sands and gravels.
- There is no fossil shell mining within the project area.



- The area is within open water and is permanently inundated with water; therefore, it is not part of the 100-year or 500-year floodplain.
- MEC are found throughout the Chesapeake Bay as a result of historic testing of munitions at several military sites around the Bay. MEC has been found within Baltimore Harbor in the past.
- The current velocity in Baltimore Harbor is relatively low.

Potential Impacts

- The CAD site would remain at or below authorized channel depths.
- Contaminated fine-grained sediment overlying the sand would be dredged and placed in an upland, confined DMCF. Following CAD site construction the substrate would be similar to existing conditions.
- Standard procedures for dealing with Munitions and Explosives of Concern (MEC) would be necessary during dredging operations for construction of the CAD site.
- Due to the relatively low current velocities in Baltimore Harbor, constructing the CAD site would cause a very small decrease in current velocity over the site. Current velocity within the CAD would be negligible. Numerical modeling would be performed to evaluate and predict the changes to the hydrodynamics of the area. As the CAD is planned to be a short-term temporary condition, hydrodynamics will return to existing conditions following completion of CAD usage.

Human Use Attributes

Existing Conditions

- Construction and operation of a CAD would need to be coordinated with existing ship traffic to the Port; however, this is standard practice that has been accomplished over the years when channel dredging has been performed.
- There are no mapped cultural resources listed on the National Registry in the Harbor Channels. Fort Carroll is listed on the Maryland registry of historical resources, but is not part of the maintained navigation channels.
- Air quality in the Baltimore region is heavily influenced by the urban and industrial environment within and around Baltimore City. Daily and seasonal variations in air quality also occur. The Baltimore region is currently in non-attainment for ozone and particulate matter (2.5).
- Primary recreational activities in the Harbor include fishing and boating.
- Noise in this area results from industrial activity, nearby road traffic, and maritime activity. Background noise occurs due to waves, wind, birds, and other wildlife.
- The land area surrounding the proposed CAD is predominantly industrial and commercial. Waterborne activities include movement of large ships into and out of port facilities.
- CAD is not a land-based dredged material placement option, and would be focused in areas relatively distant from residential, industrial and commercial areas. CAD would be consistent with current maritime activity on the Patapsco.

Potential Effects

- The CAD site would remain at or below authorized channel depths.



- There would be short-term impacts to air quality as a result of the operation of equipment during construction of the containment structure and placement of material in the site. Depending on the duration of construction and placement, a federal conformity analysis may be required.
- During placement operations, recreational boats could be displaced from limited areas but overall, minimal effects to recreational activities are anticipated.
- Activities related to CAD are in keeping with current maritime activities, as well as dredging efforts in the Patapsco; therefore, noise and visual impacts are not anticipated.
- Environmental justice issues are not expected to be a concern because the project is not expected to impact residential areas near the water.
- The proposed project is consistent with current use of the waterway, and is not expected to impact community assets.

Beneficial Attributes

- The existing substrate is dominated by silt and clay and would be replaced with a sand or gravel cap. Further, the sediment surface would be characterized by clean material rather than the potentially contaminated material currently found at the sediment surface in the channels.
- Material mined from a CAD area could be used for mitigation and enhancement projects including wetland construction, contaminated sediment capping, substrate enhancement, and shoreline stabilization as well as in the construction of dikes for DMCFs, or other activities that require large quantities of sand.

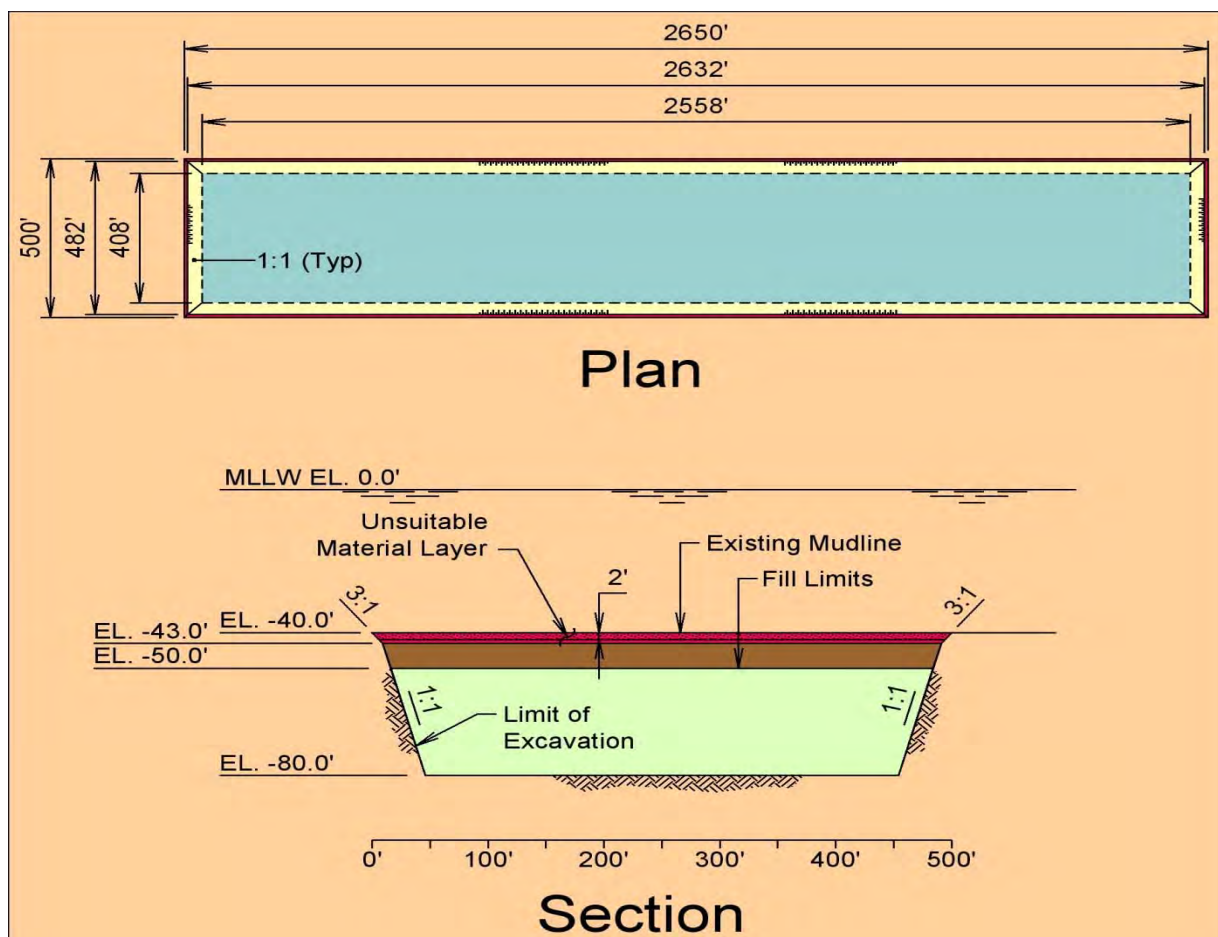


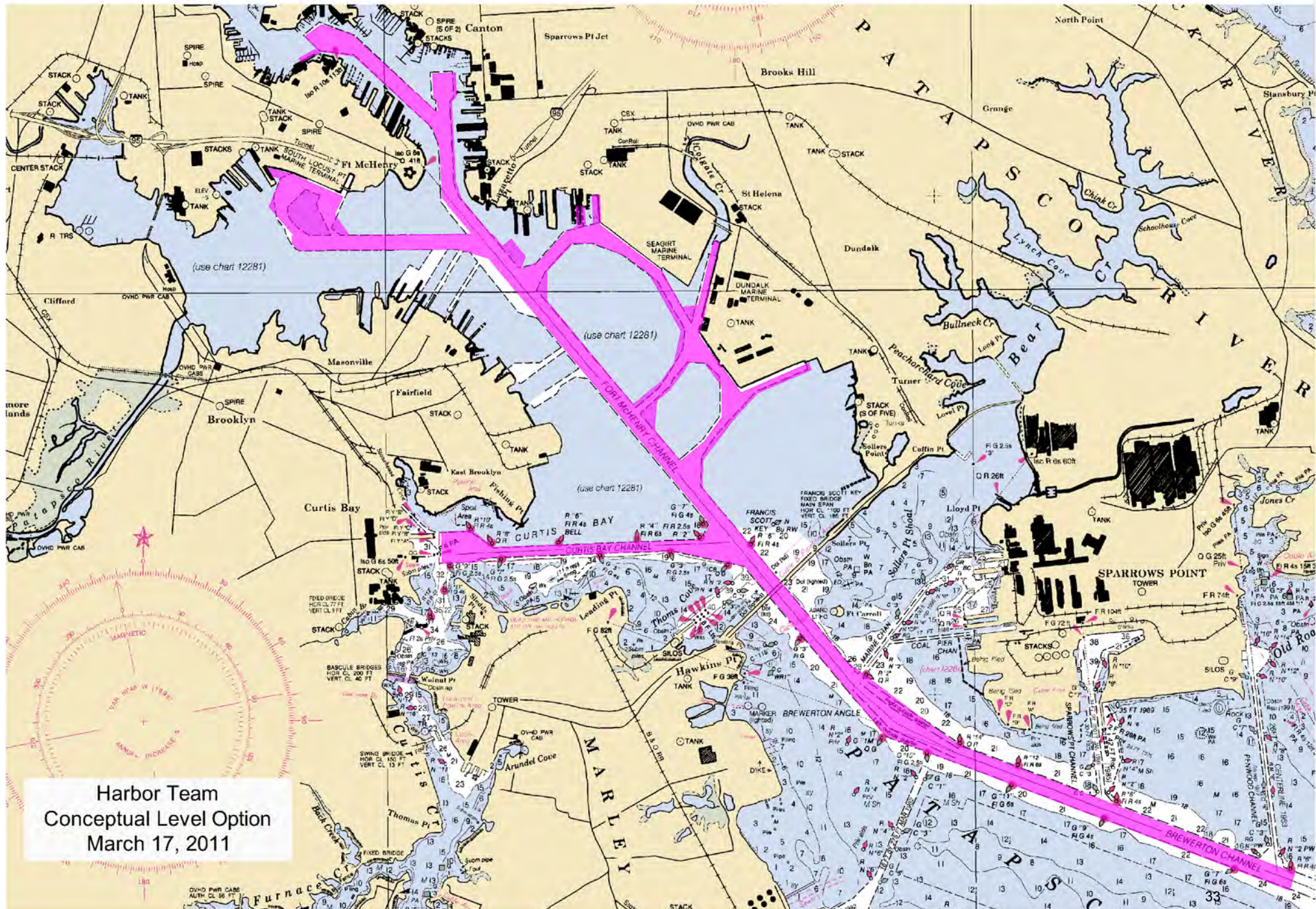
Figure 1. Typical CAD Plan & Section for 1.5 mcy Capacity



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Confined Aquatic Disposal (CAD)





Cox Creek Expanded

Purpose: The purpose of this sheet is to provide the Bay Enhancement Working Group (BEWG) with the information on the options that the Harbor Team has forwarded for ranking. BEWG will then use this information sheet in its environmental scoring based upon the factors in the evaluation matrix and included in these sheets. BEWG's scoring will be reported back to the Harbor Team for use in developing recommendations about the options. This sheet was drafted using general as well as site specific information, when available, and may be subject to change based on further study.

Location: The Cox Creek Dredged Material Containment Facility (DMCF) is located on the western shore of the Patapsco River, one mile south of the Francis Scott Key Bridge. The 100 acres proposed for upland expansion is immediately west of the existing DMCF.

Site Characteristics: The existing Cox Creek DMCF is approximately 100 acres. The facility on the additional 100 acre portion of the property is a former copper refinery and is comprised of numerous abandoned warehouses, pavement, and facilities to support dredged material Innovative Reuse pilot projects. The area to the south is under a conservation easement, held by the North County Land Trust, including the Swan Creek wetland, which was mitigation for the construction of the DMCF. To the north is an industrial area owned by Millennium Inorganic Chemicals.

Potential Options

One option may be to expand the existing DMCF, both vertically and laterally, into the upland area to create a larger area for placement. Data for this option below:

- o 200 acre total property area
- o DMCF lateral expansion to the upland and vertical expansion at the existing DMCF
- o Annual capacity of approximately 0.7 million cubic yards (mcy)
- o 5 to 15 mcy of capacity (in addition to existing 6 mcy capacity)

Another option may be to purchase the adjacent Millennium property and combine it with the existing Cox Creek DMCF and the proposed 100 acre upland expansion to form one DMCF. Data for this option below:

- o 300 acre total property area
- o DMCF lateral expansion to the upland and vertical expansion at the existing DMCF
- o Annual capacity of approximately 1.3 mcy
- o 10 to 20 mcy of capacity (in addition to existing 6 mcy capacity)

Range of capacities considers combined options for containment, Innovative Reuse, and future end use. Values for capacity and footprint area will vary by option.



Current Ownership: MPA owns the existing DMCF as well as the 100 acre upland property. The Millennium Property is owned by Millennium Inorganic Chemicals and would require property negotiations/transfer.

Water Quality

Existing Conditions

- There are no natural water bodies within the potential project footprint. The site is adjacent to the Patapsco River.
- The site was previously used as a copper refinery; contamination of groundwater at the site may need to be further investigated.
- Stormwater in the upland area is currently conveyed to a stormwater management pond located north of the DMCF.

Potential Effects

- All discharges from the facility into the Patapsco River would be managed in accordance with a National Pollutant Discharge Elimination System (NPDES) permit, as is currently done at the existing Cox Creek DMCF.
- Local subsurface investigations may be required to determine if any existing contamination of groundwater is present at the site.
- Following construction of a DMCF, precipitation that falls within the DMCF would be discharged and monitored through spillways. Stormwater that does not fall within the DMCF would be treated through existing or new stormwater Best Management Practices.

Aquatic Habitat

- No aquatic habitat occurs within the potential project footprint.

Wetlands

- There are no wetlands within the potential project footprint.
- The adjacent wetland that is part of a conservation area would not be affected.

Aquatic Biology – Finfish/Shellfish

- There is no habitat for finfish/shellfish within the potential project footprint.

Special

Existing Conditions

- There are no federally listed species known to occur within the potential project footprint.
- Portions of the site are within the Chesapeake Bay Critical Area. The expansion of the existing DMCF falls within the Chesapeake Bay Critical Area and a portion of the DMCF is within the Chesapeake Bay Critical Area buffer. The majority of the upland expansion area is outside the



Chesapeake Bay Critical Area and none of the upland expansion area is within the Chesapeake Bay Critical Area buffer.

- The portions of the site within the Chesapeake Bay Critical Area are within in a Resource Conservation Area (RCA) of the Critical Area.
- There is no Essential Fish Habitat (EFH) within the potential project footprint.

Potential Effects

- There would be no effects to federally listed species.
- The project would require approval from the Critical Area Commission, including appropriate mitigation measures for stormwater reduction.

Water Birds

Existing Conditions

- The open water area along the shoreline adjacent to the existing Cox Creek DMCF is considered to be a historic waterfowl concentration area.
- There is no avian habitat with unique or valuable characteristics in the potential project footprint.

Potential Effects

- The development of the site is not expected to improve or degrade potential water bird habitat in the area.

Terrestrial Resources

Existing Conditions

- The undeveloped areas at the site are mowed/maintained periodically and do not provide forested or other high quality habitat.
- There are no natural streams, ponds, or lakes at the site.
- There is no special or unique terrestrial habitat for birds or wildlife.
- Overall terrestrial habitat at the site is poor, and is consistent with the industrial development in the adjacent areas. The neighboring Millennium Inorganic Chemicals property is listed as a Toxic Release Inventory Site.
- A Phase I Environmental Assessment for hazardous materials is needed to fully evaluate existing conditions. There may be underground or aboveground storage tanks or other infrastructure of concern at the site.

Potential Effects

- All terrestrial habitat within the potential site footprint would be lost.



Physical Parameters

Existing Conditions

- Based on existing information, the upland portion of the site is expected to provide a foundation sufficient to support construction of a DMCF.
- The site is an upland area, so no fossil shell mining occurs in the area.
- Some portions of the site are within the 100-year and 500-year floodplains.
- Munitions and Explosives of Concern (MEC) are unlikely to be found in the potential project area.
- The site was previously used as a copper refinery; contamination of soils at the site may need to be further investigated.

Human Use Attributes

Existing Conditions

- The site is industrial and over half of the site is currently developed with buildings, pavement, or facilities to support dredged material Innovative Reuse pilot projects.
- There are approximately 30 buildings, totaling 660,000 square feet on the upland property owned by MPA. Portions of this property are being utilized for Innovative Reuse pilot projects, commercial/industrial operations and police training activities.
- Existing water, sewer and storm drain, rail and electric infrastructure support abandoned warehouses and buildings.
- There are no historic places or properties mapped by either the National or Maryland registry.
- Air quality in the Baltimore region is heavily influenced by the urban and industrial environment within and around Baltimore City. Daily and seasonal variations in air quality also occur. The Baltimore region is currently in non-attainment for ozone and particulate matter (2.5).
- Primary recreational activities in the Harbor include fishing and boating. Fort Armistead Park lies within about ½ mile and Solley Park falls about 1 mile from the proposed site.
- Noise in this area results from industrial activity, nearby road traffic, and maritime activity. Background noise occurs due to waves, wind, birds, and other wildlife.
- According to Census 2010, minorities make up a smaller proportion of the population in this area than in Anne Arundel County and Baltimore City as a whole. The 2000 per capita income of these block groups was comparable with the overall per capita income of Baltimore City, but considerably lower than the per capita income of Anne Arundel (2010 Census data on income are not yet available).
- The area around the proposed site falls within the Curtis Bay zip code (21226). In 2008, there were 367 business establishments in this zip code. The economic sectors with the most establishments in this zip code were construction, wholesale trade, transportation and warehousing, manufacturing, and other services (e.g., repair shops, personal services, etc.).
- The area within ½ mile of Cox Creek is a mix of industrial land, barren land, and forest. Land use data indicate that the closest residential area is about 3/4 mile from the proposed site. The two



Census Block Groups nearest the site had nearly 2,800 people in 2010 (although these block groups cover an area considerably larger than the area immediately around the site).

Potential Effects

- Site access would be restricted to site personnel during placement and operations.
- If the site is to be covered with dredged material, then existing infrastructure can be either abandoned in place or demolished and removed. The buildings would need to be demolished and removed. None of the infrastructure in the proposed area serves facilities outside of the site. Removal or abandonment of the infrastructure to allow construction of the DMCF would not pose an adverse impact to the area.
- There would be emissions of pollutants with thresholds identified in the Clean Air Act, as a result of the operation of equipment during construction of the containment structure and placement of material in the site. Based on the size of the facility and the amount of construction required, a federal conformity analysis may be required.
- Minimal effects to recreational activities are anticipated.
- Due to the industrial nature of the area at present, and the distance to sensitive receptors, noise impacts are anticipated to be minimal at this site.
- A proposed DMCF at this site would not occupy the foreground view of any nearby residences. The site would fall within the view of Fort Armistead Park, but would be consistent with the existing viewshed. Visual impacts are not expected to be significant.
- This project is not expected to disproportionately, adversely affect low-income or minority populations.
- The proposed project is not expected to alter commercial activities in the area.
- The proposed project is consistent with current land use, and is not expected to impact community assets.

Beneficial Attributes

- Based on the findings of an environmental assessment (Phase I), there may be opportunity to cap or remediate contamination at the site.
- Dike construction could be completed using either material from within the existing Cox Creek DMCF or material from the Innovative Reuse process.



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Cox Creek Expanded

Harbor Team
Conceptual Level Option
March 17, 2011



Cox Creek - Millennium Combined

Harbor Team
Conceptual Level Option
March 17, 2011

FORT ARMISTEAD

MILLENNIUM
100 AC

UPLAND
OWNED BY MPA
100 AC

EXISTING
DMCF
100 AC



Curtis Bay GSA Ordnance Depot

Purpose: The purpose of this sheet is to provide the Bay Enhancement Working Group (BEWG) with the information on the options that the Harbor Team has forwarded for ranking. BEWG will then use this information sheet in its environmental scoring based upon the factors in the evaluation matrix and included in these sheets. BEWG's scoring will be reported back to the Harbor Team for use in developing recommendations about the options. This sheet was drafted using general as well as site specific information, when available, and may be subject to change based on further study.

Location: The Curtis Bay Ordnance Depot is located at 700 East Ordnance Road in northern Anne Arundel County. It is on the western shore of Curtis Creek, one half mile south of the I-695 drawbridge over Curtis Creek.

Site Characteristics: The existing Ordnance Depot property is largely idle at this time. There is a 1,000 ft active ship berthing area along the Curtis Creek shoreline. To the northwest, a 50 acre area is used by the Army Reserve. Portions of the area to the west contain a detention center and a recreational area. The major portion of the site has been remediated for thorium contamination and is currently not being utilized. Approximately 300 acres in the middle of the property consists of open space with about 30 concrete pads, where ordnance warehouses once stood.

Potential Option

Create a DMCF on a portion of the 467 acre upland property:

- o 300 acre DMCF
- o Annual Capacity of 1 million cubic yards (mcy)
- o 15 to 20 mcy of capacity

Current Ownership: The 467 acre parcel is owned by the US Army. There is interest in developing the site for commercial use.

Water Quality

Existing Condition

- There is one natural stream running across the property that discharges into Curtis Creek. This area is not within the proposed project footprint.
- There are no other surface water features within the site.
- The site is adjacent to Curtis Creek, a tributary of the Patapsco River.
- No site specific groundwater data are available.
- The majority of the site is grass covered. Based on the age of the development it is unlikely that the impervious areas of the site have functioning stormwater Best Management Practices.



Potential Effects

- All surface water features have been avoided in the conceptual site footprint. There would be no effects to surface water features at the site.
- All discharges of the facility into Curtis Creek would be managed in accordance with a National Pollutant Discharge Elimination System (NPDES) permit.
- Local subsurface investigations may be required to determine if any existing contamination of groundwater is present at the site.

Aquatic Habitat

- There is no aquatic habitat within the potential project footprint.

Wetlands

Existing Conditions

- There are several wetlands identified at the site by the National Wetlands Inventory (NWI). It should be noted that the NWI wetlands are not ground-truthed and it is unlikely that wetlands exist on the site. The site was developed as an ordnance depot and has since been decommissioned.
- On-site wetland delineation would be required to confirm the presence or absence of wetlands at the site.

Potential Effects

- If wetlands are confirmed at the site, they would be filled as part of site development.

Aquatic Biology – Finfish/Shellfish

- There is no habitat for finfish/shellfish within the potential project footprint.

Special

Existing Conditions

- There has previously been a bald eagle nest documented approximately a ½ mile from the potential project footprint. This species is not listed in the State of Maryland, but is on a “watch list” for the Maryland Department of Natural Resources (MDNR).
- A portion of this site is located within the Chesapeake Bay Critical Area and the Chesapeake Bay Critical Area Buffer.
- The portion of the site within the Critical Area is within an intensely developed area (IDA).
- There is no Essential Fish Habitat (EFH) within the potential project footprint.

Potential Effects

- The project would require approval from the Critical Area Commission, including appropriate mitigation measures for storm water reduction.
- There would be no effects to federally or state listed species.



Water Birds

Existing Conditions

- There are no historic waterfowl concentration areas in the water surrounding the potential project footprint.
- There is no avian habitat with unique or valuable characteristics in the potential project footprint.

Potential Effects

- The development of the site is not expected to improve or degrade potential water bird habitat in the area.

Terrestrial Resources

Existing Conditions

- Most of the site currently consists of mowed/maintained areas with buildings, roads, and concrete building pads throughout the area. There are some small areas of trees.
- There are some trees at the site, but there are no forested plots or areas. Habitat at the site is fragmented.
- There are no lakes and ponds at the site.
- There was previously thorium contamination at the site. Remediation efforts were completed at the site in 2008. While remediation at the site is complete, a Phase I Environmental Assessment for potential hazardous materials and contamination is recommended prior to development of the site. There may be other legacy contaminants remaining in the soil or groundwater at the site.
- Terrestrial habitat at the site is highly disturbed and would only support species acclimated to an urban/suburban environment, such as squirrels, mice, and birds.

Potential Effects

- Any remaining structures would be disposed of in accordance with state and federal regulations. Any hazardous materials identified would be disposed of at an approved location.
- All habitat within the potential placement site footprint would be lost. The areas with the highest quality habitat on the site, on the western portion of the parcel, would be avoided by the DMCF footprint.

Physical Parameters

Existing Conditions

- Based on existing information, the upland portion of the site is expected to provide a foundation sufficient to support construction of a DMCF.
- Most of the site is outside the 100-year and 500-year floodplains. A small portion of the site is within either the 100-year or 500-year floodplain.
- The site is an upland area, so no fossil shell mining occurs in the area.



- Ordnance was previously stored at the site. During decommissioning of the site, all ordnance should have been removed from the property. There is a very low probability that any Munitions and Explosives of Concern (MEC) would be found at the site.
- There may be some legacy contamination in the soils at the site from historic storage of ordnance (munitions) at the site. All thorium contamination at the site was previously remediated.

Human Use Attributes

Existing Conditions

- The majority of the proposed site is currently idle. However, a ship berthing area along the Curtis Creek shoreline is actively used and a 50 acre area is used by the Army Reserve for training exercises.
- Limited information is available on existing infrastructure including water, sewer and storm drain, and electric. However, it is anticipated that some facilities exist to support previous and current operations.
- The Curtis Bay Ordnance Depot, Curtis Bay Defense National Stockpile Center is listed in the Maryland Historical Properties Inventory as AA-2198.
- Air Quality in the Baltimore region is heavily influenced by the urban and industrial environment within and around Baltimore City. Daily and seasonal variations in air quality also occur. The Baltimore region is currently in non-attainment for ozone and particulate matter (2.5).
- Primary recreational activities in the Harbor include fishing and boating. Two marinas, one in Marley Creek and one in Furnace Creek, lie upstream of the proposed site.
- Noise in this area results from industrial activity, nearby road traffic, and to some extent, maritime activity. Background noise occurs due to waves, wind, birds, and other wildlife.
- The site itself is mostly open with a forested buffer along the southern shoreline. Nearby industrial land is composed mostly of low buildings with a forested shoreline. Although close to industrial land uses, nearby residences enjoy water views with forested shorelines.
- Minorities make up a larger proportion of the population in this area than in Anne Arundel County as a whole. The 2000 per capita income of this area was somewhat lower than the overall per capita income of Anne Arundel County.
- The area around the proposed site falls primarily within the Glen Burnie zip code (21060). In 2008, there were 445 business establishments in this zip code. The economic sectors with the most establishments in this area were construction, retail trade, other services (e.g., repair shops, personal services, etc.), accommodation and food services, and professional, scientific and technical services.
- The area immediately surrounding the proposed site is primarily industrial with a small number of commercial properties, such as warehouses. A residential area on the peninsula of land between Furnace and Marley creeks also falls within 1/2 mile of the proposed site. According to Maryland property tax records, there are 267 residences within 1/2 mile of the site, of which, 78 are waterfront.



Potential Effects

- The entire project footprint would be filled by construction of the containment structure and placement of material at the site. All the open, maintained areas would be lost.
- If the site is to be covered with dredged material, then existing infrastructure can be either abandoned in place or demolished and removed. The building foundations would need to be demolished and removed. It is unknown if any existing infrastructure in the proposed area serves facilities outside of the site and if removal or abandonment of the infrastructure would pose an adverse impact to the area.
- Coordination with the State Historic Preservation Office would be required.
- There would be emissions of pollutants with thresholds identified in the Clean Air Act, as a result of the operation of equipment during construction of the containment structure and placement of material in the site. Based on the size of the facility and the amount of construction required, a federal conformity analysis may be required.
- Site access would continue to be restricted to site personnel during placement and operations.
- Minimal effects to recreational activities are anticipated, although recreational boaters will pass close to the proposed site as they travel from marinas in the creeks to the Patapsco River.
- Noise impacts in this area have the potential to be significant because a residential area lies as close as 500 feet across open water from the proposed site. Residences closest to the proposed site would likely experience sustained daytime noise impacts during construction and placement. Additional residences outside the zone of sustained noise may experience noise impacts at night, and still more residences are expected to be within the zone where periodic noise effects (e.g., backup beepers, rock placement) are anticipated.
- Visual impacts associated with this proposed site are expected to be significant. A DMCF in this location would represent a dominant feature in the foreground view for nearby residences. This type of facility would not be in keeping with the current landscape and landforms in the area.
- This project is not expected to disproportionately, adversely affect low-income or minority populations.
- The proposed project is not expected to alter the current commercial activities in the area.
- The project could be expected to have negative impacts on residential waterfront property values.

Beneficial Attributes

- Based on the findings of an environmental assessment (Phase I), there may be opportunity to cap or remediate contamination at the site.



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Curtis Bay Ordnance Depot

Harbor Team
Conceptual Level Option
March 17, 2011

ARMY
RESERVE

CONCEPTUAL
DIKE FOOTPRINT
300 ACRES

U.S. COAST
GUARD

LEGEND

- PROPERTY AREA
- CONCEPTUAL
DIKE FOOTPRINT

FURNACE CREEK

MARLEY CREEK

CURTIS CREEK 20 FT
DEPOT 16 FT



Deep Trough

Purpose: The purpose of this sheet is to provide the Bay Enhancement Working Group (BEWG) with the information on the options that the Harbor Team has forwarded for ranking. BEWG will then use this information sheet in its environmental scoring based upon the factors in the evaluation matrix and included in these sheets. BEWG's scoring will be reported back to the Harbor Team for use in developing recommendations about the options. This sheet was drafted using general as well as site specific information, when available, and may be subject to change based on further study.

Location: Deep Trough is comprised of four separate open water sites located in the Chesapeake Bay. The first site is located north of the Bay Bridge and covers approximately 1,500 acres. The next two are south of the Chesapeake Bay Bridge and west of Kent Island and are called Deep Trough north of Bloody Point; these areas are 400 and 700 acres in size. The third site is called Deep Trough south of Bloody point, and is due west of Poplar Island. It is approximately 600 acres in size.

Site Characteristics: The Deep Trough areas south of the Bridge range in depth from 60 to 100 feet and are deeper in some locations and the area north of the Bridge ranges in depth from 40 to 70 feet. For the sake of maintaining safe passage, ten to twenty vertical feet of placement is assumed.

Potential Option

Create an open water placement site at three locations south of the Bay Bridge:

- o 1,700 acres (assume 10 to 20 feet of placement)
- o Annual capacity of 5 million cubic yards (mcy)
- o 50 to 100 mcy of capacity

Current Ownership: State of Maryland

Water Quality

Existing Conditions

- From May to October, the sites are affected by hypoxic and anoxic conditions, with bottom concentrations of dissolved oxygen (DO) reaching 0 mg/L during the summer months. Areas at a depth greater than 60 feet are considered seasonally anoxic and areas below 30 feet are seasonally hypoxic. Areas with DO concentrations of 5 mg/L or less begin at a depth of 10 feet during the May to October period.
- The Chesapeake Bay is listed as impaired for nutrients.
- The northern portions of Deep Trough have slightly higher turbidity values than the southern portion. There are seasonally higher turbidity levels resulting from high plankton density in the summer months.
- Salinity varies seasonally with freshwater influx and saltwater incursion up the Chesapeake Bay. Salinity in the region ranges from 12 to 23 parts per thousand, recorded at the closest monitoring station for 2010 (Chesapeake Bay Segment 3-Bay Bridge Bottom).



- Stratification of the water column occurs as a result of salinity and temperature gradients within the water column, which results in poor water column mixing between May and October.

Potential Effects

- Chemical oxygen demand (COD) of the dredged material may result in reduction of available dissolved oxygen during the placement period, which may exacerbate hypoxic/anoxic conditions if placement occurs between May and October.
- Release of some nutrients and local, temporary increases in ammonia would be expected. However, flushing and mixing at the site is expected to dilute ammonia concentrations to below water quality criteria within a short distance and period of time.
- Additional input of nutrients during the summer months may stimulate additional plankton blooms.
- Localized increases in turbidity within the water column from the point of placement (e.g., the opening on a split-hull barge) downward through the water column. Material is expected to settle out relatively quickly and increases in turbidity would be temporary and within the local area of placement.
- Potential for release of contaminants from the sediments into the water column exists. If most of the material placed consists of silts and clays, constituents that are not water soluble or that have low solubility are expected to be tightly bound to the sediment.
- Additional elutriate, toxicological, and sediment bioaccumulation analysis of Baltimore Harbor material could be required to obtain approval for open water placement from regulatory agencies.
- Placement and sediment transport modeling would need to be completed.

Aquatic Habitat

Existing Conditions

- Benthic community is seasonal. During the period of May to October benthic organisms are lost as a result of anoxic/hypoxic conditions. The benthic community begins recolonizing during November.
- During the period of November through April, the dominant benthic species are *Mulinia lateralis* (a clam) and *Nereis succinea* (a polychaete).
- Site is too deep to support submerged aquatic vegetation (SAV) and does not include shallow water habitat (SWH).
- Substrate within Deep Trough dominated by fine-grained material, similar in character to maintenance dredged sediments.

Potential Effects

- COD during placement of material may exacerbate hypoxic and anoxic conditions and increase the duration or areal extent where benthos are not present.
- Increased turbidity during placement activities would temporarily degrade the foraging habitat within the water column for sight-feeding fish.



- Sediment quality within Deep Trough could degrade as material from Baltimore Harbor is placed and the concentration of contaminants within substrate may increase. This may contribute to a degraded or lower quality benthic community.
- There would be a minor/negligible loss of water column as the area is made shallower by the placement of dredged material.
- Material placed may result in the potential for the clogging of gills in macroinvertebrates, particularly less mobile organisms, within the turbidity plume.

Wetlands

Existing Conditions

- The entire area is tidal open water, which is considered to be a wetland by the State of Maryland.

Potential Effects

- Impacts to open water as described under water quality and aquatic habitat.

Aquatic Biology – Finfish/Shellfish

Existing Conditions

- Deep Trough potentially provides a thermal refuge for fish during the beginning of the winter season.
- Blue crabs (*Callinectes sapidus*) are found within the area, but with a lower abundance than nearby, shallower reference areas. Blue crabs cannot survive in the area in hypoxic/anoxic conditions.
- Overwintering blue crabs may be located in the bottom sediments.
- Marine, estuarine, and diadromous fish species were found at the site during surveys. Surveys completed in 1982-83 resulted in the collection of 35 nekton species, including Essential Fish Habitat (EFH) species.
- Seasonal anoxic conditions prevent use of the area by demersal fish during the summer months.
- The area is used for spawning by estuarine species, such as bay anchovy (*Anchoa mitchilli*).
- There are twelve EFH species within the designation of the main-stem of the Chesapeake Bay. Depending on the salinity regime in any specific year or season, some of these species may not be found within Deep Trough.
- Project depths at Deep Trough range from 30 to 110 feet, which are all greater than 40 feet and therefore seasonally provide thermal refuge for fish.
- Commercial fishing and crabbing occurs throughout the main-stem of the Chesapeake Bay and both gillnets and pound nets are placed within the region. Recreational fishing and crabbing also occurs throughout the main-stem of the Chesapeake Bay, though no site specific attributes make this a unique or important recreational fishing or crabbing area.



Potential Effects

- Material placed would result in the potential for the clogging of gills in macroinvertebrates and finfish within the turbidity plume. Highly mobile species would be able to avoid this area.
- Increased turbidity would impair the ability of sight-feeding fish to forage during placement of material.
- Material placed would still provide overwintering habitat once placement ceases, but some crabs could be buried during the placement operation.
- Disturbance to the water column during placement would cause mobile organisms to avoid the area during placement activities.
- Increased COD during placement may result in increased areas of hypoxia/anoxia, which would further limit functional habitat for finfish/shellfish in the area from May to October.
- There may be a decrease in foraging habitat during the cooler months, until the placed sediments are recolonized by benthos.
- Potential displacement of EFH species during placement activities.

Special

Existing Conditions

- There are several federally listed species that may be found within the main-stem of the Chesapeake Bay, including shortnose sturgeon (*Acipenser brevirostrum*), sea turtles (four species), and whales.
- Shortnose sturgeon have been documented in the vicinity of Deep Trough. There are limited foraging opportunities for shortnose sturgeon within Deep Trough; however, shortnose sturgeon may use the area for thermal refuge during the cooler months. Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*), a candidate species for listing under the endangered species act, have also been documented in the vicinity of Deep Trough.
- There have been sea turtle strandings within the reach of the Chesapeake Bay that includes Deep Trough. The closest stranding was approximately five miles away, on the far side of Kent Island.
- Live whales have been documented as far north in the Chesapeake Bay as the Chesapeake Bay (US 50) Bridge, which is north of the project area. In 1995, a dead sei whale was found floating in the vicinity of Deep Trough.
- There is no Habitat of Particular Concern (HAPC) within the project area.

Potential Effects

- Most mobile species, including sturgeon, sea turtles, and whales, would avoid the area during placement activities. Disturbance to the water column would cause those organisms to move to other suitable nearby habitat.
- There is no critical habitat for listed species within the project area, so no critical habitat would be affected.



- Sea turtles are occasional, seasonal transients, in the reach of the Chesapeake Bay including Deep Trough and are unlikely to be in the project area during the cooler months.
- Whales are rare transients to the Maryland waters of the Chesapeake Bay and are unlikely to be affected by placement of material at Deep Trough.

Water Birds

Existing Conditions

- The Deep Trough area is not mapped as a waterfowl area but the northern extent north of the bridge may infringe on a waterfowl area if it is within 4,750 feet from the shoreline.
- There is no shoreline habitat within the project area and there would be no shorebirds using the project area.

Potential Effects

- There would be noise and disturbance in the project area during placement of dredged material, which would cause birds to avoid the area during placement.

Terrestrial Resources

- The project area does not include any upland areas and would not affect any terrestrial resources.

Physical Parameters

Existing Conditions

- There is no current site-specific information on sediment quality within the Deep Trough.
- There is no fossil shell mining within the project area.
- The area is within open water and is permanently inundated with water; therefore, it is not part of the 100-year or 500-year floodplain.
- Munitions and Explosives of Concern (MEC) are found throughout the Chesapeake Bay as a result of historic testing of munitions at several military sites around the Bay.
- Currents in the Deep Trough areas range from 0.5 to 1 knot.

Potential Effects

- Previous studies have shown that placement of material in deep channel/trough areas can cause minor increases to currents. However, these changes are minor and it is not anticipated that they would cause significant impacts to existing sedimentation patterns or water quality within the project area.



Human Use Attributes

Existing Conditions

- Operation of a placement area in the Deep Trough would need to be coordinated with existing ship traffic including large-draft vessels that utilize the deep water areas; however, this is standard practice that has been accomplished over the years when channel dredging has been performed.
- There are no mapped National or Maryland Registered cultural resources within the approximate Deep Trough footprint within the Chesapeake Bay.
- Recreational activities in this area include boating, fishing, swimming, and more passive activities such as wildlife viewing. Property tax records indicate that there are five marinas on the western shore of Kent Island, as well as dozens of marinas across the Bay in the Annapolis area, less than five miles from the proposed site. Matapeake public fishing pier and boat ramp lies about 1 mile from the site. Terrapin Nature Park lies just over a mile northeast of the proposed site.
- Noise in this area results from commercial and recreational boating. Background noise occurs due to waves, wind, birds, and other wildlife.
- Currently the view from shore near the concept site is open water. The Bay is roughly five miles wide at this point, so the view is currently unobstructed.
- Minorities make up a smaller proportion of the population in this area than in Queen Anne's County as a whole. The 2000 per capita income of this area was equivalent to the overall per capita income of Queen Anne's County.
- The area nearest the Deep Trough falls within the Stevensville zip code (21666). In 2008, there were 441 business establishments in this zip code. The economic sectors with the most establishments in this zip code were construction, professional, scientific and technical services, retail trade, other services (e.g., repair shops, personal services, etc.), and wholesale trade.
- The Deep Trough is roughly one mile offshore of Kent Island in Queen Anne's County. The shoreline of Kent Island is made up of medium and low density residential areas, forest, and agriculture. According to Maryland property tax records, there are more than 500 waterfront residences on Kent Island within two miles of the proposed site, although some of these residences are not on the Bay, but on smaller tributaries. In 2000, more than 9,600 people lived in the four Census block groups closest to the site (although these block groups cover an area larger than the area immediately around the site).

Potential Effects

- Placement would remain well below authorized channel depths.
- There would be short-term impacts to air quality as a result of the operation of equipment during placement of material in the site.
- The presence of equipment related to open water placement could displace boaters or fishers as several recreational fishing grounds lie east and south of the proposed site. People



recreating from shore (i.e., swimming, walking along the beach, etc.) should not be impacted by the proposed project.

- Noise impacts in this area are possible. Residences closest to the proposed site are likely outside the zone of sustained daytime noise impacts during placement; however, some nearby waterfront residences may experience noise impacts at night.
- Open water placement a mile offshore would be expected to have temporary visual impacts. When placement is occurring, boats would be in view, but would not be out of keeping with maritime traffic currently visible from shore.
- Environmental justice issues are not expected to be a concern because of the distance to nearby communities.
- The proposed project is not expected to alter commercial activities in the area.
- Many waterfront residences would likely be in view of open water placement operations, but the temporary and seasonal nature of this proposed project in an area that already sees regular ship traffic is not expected to negatively affect residential property values in the area.



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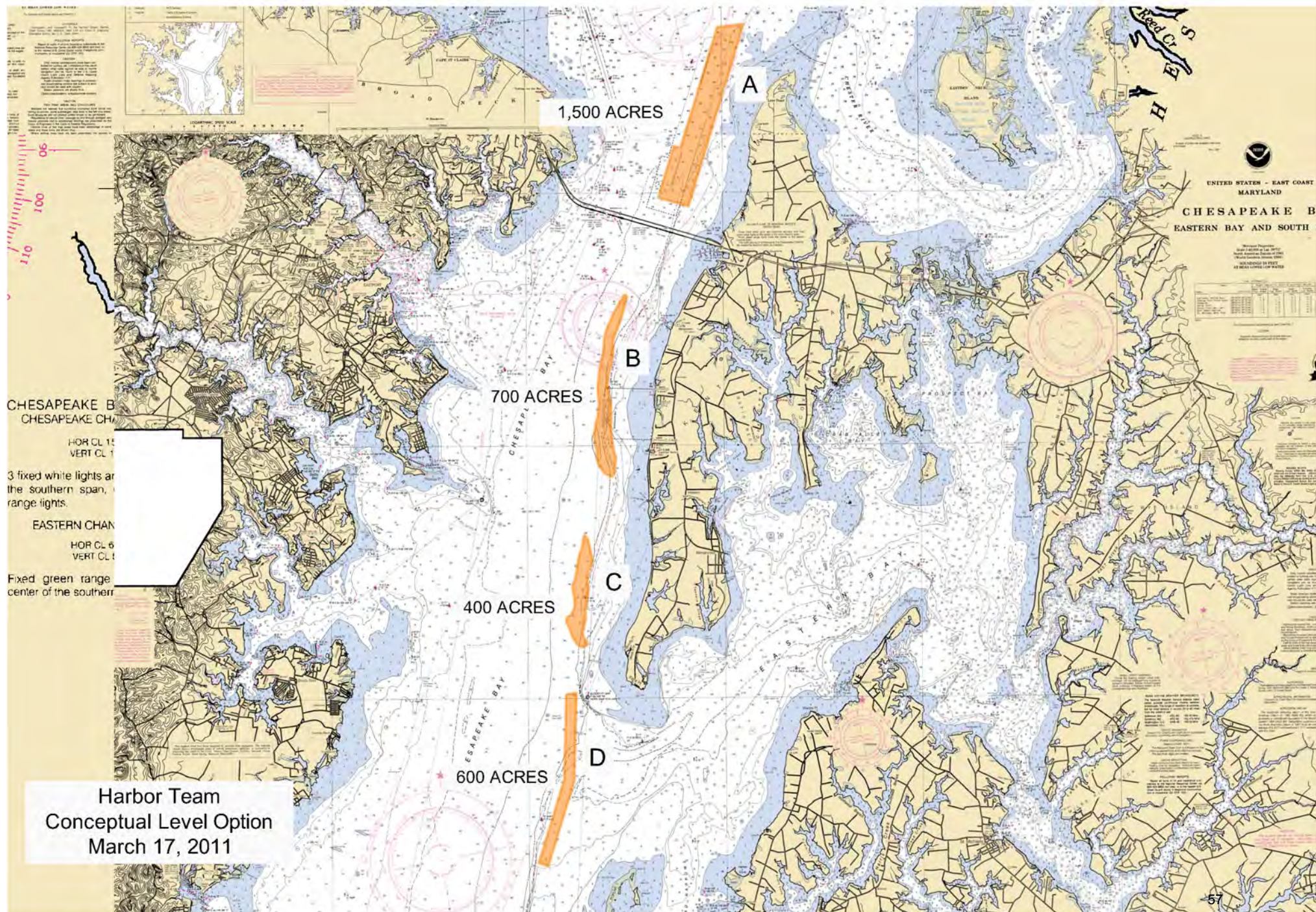
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Deep Trough





Fairfield Interior

Purpose: The purpose of this sheet is to provide the Bay Enhancement Working Group (BEWG) with the information on the options that the Harbor Team has forwarded for ranking. BEWG will then use this information sheet in its environmental scoring based upon the factors in the evaluation matrix and included in these sheets. BEWG's scoring will be reported back to the Harbor Team for use in developing recommendations about the options. This sheet was drafted using general as well as site specific information, when available, and may be subject to change based on further study.

Location: The Fairfield Interior area is located on the Fairfield Peninsula, just south of I-895. It is bound by Frankfur Avenue to the north, Asiatic Avenue to the east, Patapsco Avenue to the south and Sun Street to the west. It is comprised of more than 20 large parcels, and numerous small ones, including the Old Fairfield residential neighborhood, which is now abandoned.

Site Characteristics: The area, comprised of many parcels, is a mixture of idle properties and those still in use. The many parcels included in the area are owned by over 20 entities and include:

- A scrap metal operation, which has expanded into the Old Fairfield Neighborhood, where most of the houses have been demolished
- A 25 acre open lot owned by Chevron
- A 59 acre parcel owned by Sasol, a former refinery
- A 20 acre parcel owned by Motiva, containing large tanks believed to hold petroleum
- An 11 acre parcel owned and actively utilized by Waste Management
- A storage lot for trailers operated by Xtra Lease

Potential Option

Create a DMCF from a combination of multiple properties in the interior of Fairfield peninsula:

- o 280 acre property area
- o Annual capacity of 1 million cubic yards (mcy)
- o 15 to 20 mcy of capacity

Current Ownership: The 300 acre area is owned by more than 20 entities. These entities include: Baltimore City, Chevron, Fleet Properties, Energy Answers, Motiva, Waste Management, Sasol, Hobelman Port Services, etc. In October 2010, Energy Answers announced plans to construct a 140 megawatt renewable energy power plant on their property. The Baltimore City Department of Transportation has awarded a contract to make improvements to existing infrastructure to help spur development in the area. Some of the land in this area has been awarded to developers for future development.



Water Quality

Existing Conditions

- There are no natural water bodies within the potential project footprint. The Patapsco River is in the vicinity of the site.
- Groundwater contamination is documented at the Fairfield site and is believed to be associated with previous activities including storage of gasoline and kerosene, and oil refining processes for the production of asphalt and light-, medium-, and heavy-gas oils.
- A significant portion of the project area is impervious and it is unknown what portion of the study area, if any, has functioning stormwater Best Management Practices.

Potential Effects

- All discharges from the facility into the Patapsco River would be managed in accordance with a National Pollutant Discharge Elimination System (NPDES) permit.
- Local subsurface investigations may be required to determine if any existing contamination of groundwater is present at the site.

Aquatic Habitat

- No aquatic habitat occurs within the potential project footprint.

Wetlands

- There are no wetlands within the potential project footprint.

Aquatic Biology – Finfish/Shellfish

- There is no habitat for finfish/shellfish within the potential project footprint.

Special

Existing Conditions

- There are no federally listed species known to occur within the potential project footprint.
- Portions of the site are within the Chesapeake Bay Critical Area.
- The portions of the site within the Chesapeake Bay Critical Area are within in an Intense Development Area (IDA).
- There is no Essential Fish Habitat (EFH) within the potential project footprint.
- There is a Maryland DNR sensitive species review area within the project footprint; however, the review area is only for a species of interest to DNR, not for a species with an official status.

Potential Effects

- The project would require approval from the Critical Area Commission, including appropriate mitigation measures for stormwater reduction.
- There would be no effects to federally or state listed species.



Water Birds

Existing Conditions

- A portion of the open water area along the shoreline adjacent to the Fairfield Peninsula is considered to be a historic waterfowl concentration area.
- There is no avian habitat within the potential project footprint.

Potential Effects

- The development of the site is not expected to improve or degrade potential water bird habitat in the area.

Terrestrial Resources

Existing Conditions

- There is no natural habitat within the proposed project footprint.
- There are no natural streams, ponds, or lakes at the site.
- A Phase I Environmental Assessment for hazardous materials is needed to fully evaluate existing conditions. There may be underground or aboveground storage tanks or other infrastructure of concern at the site.
- There are four Toxic Release Inventory sites located on the Fairfield Peninsula:
 - Baltimore Terminal
 - Maryland Chemical Company, Inc.
 - Rhodia, Inc.
 - Delta Chemical Corporation

Physical Parameters

Existing Conditions

- Based on the upland nature of the site it is expected to provide a foundation sufficient to support construction of a DMCF. However, areas with existing infrastructure could require significant preparatory work to accommodate the DMCF.
- The site is an upland area, so no fossil shell mining occurs in the area.
- Some portions of the site are within the 100-year and 500-year floodplains.
- Munitions and Explosives of Concern (MEC) are unlikely to be found in the potential project area.

Human Use Attributes

Existing Conditions

- The site is industrial and consists predominantly of pavement and buildings, which is consistent with the surrounding area.



- There are over 20 property owners within the proposed site area. The current uses of the included parcels range from energy production and transportation storage, to idle sites.
- Existing water, sewer and storm drain, rail and electric infrastructure support the area.
- There are no mapped Maryland or National Registry historical places or property within the proposed location.
- Air quality in the Baltimore region is heavily influenced by the urban and industrial environment within and around Baltimore City. Daily and seasonal variations in air quality also occur. The Baltimore region is currently in non-attainment for ozone and particulate matter (2.5).
- Primary recreational activities in the Harbor include fishing and boating. Baybrook Park in Brooklyn lies within a mile of the proposed site.
- Noise in this area results from industrial activity, nearby road traffic, and to some extent, maritime activity. Background noise occurs due to waves, wind, birds, and other wildlife.
- Minorities make up a smaller proportion of the population in this area than in Baltimore City as a whole. The 2000 per capita income of this area was somewhat lower than the overall per capita income of Baltimore City.
- The area around the proposed site falls within the Curtis Bay zip code (21226). In 2008, there were 367 business establishments in this zip code. The economic sectors with the most establishments in this zip code were construction, wholesale trade, transportation and warehousing, manufacturing, and other services (e.g., repair shops, personal services, etc.).
- The area immediately surrounding the proposed site is primarily industrial with a small number of commercial properties, such as warehouses. In 2000, more than 5,000 people in more than 2,200 households lived within the Census block groups that fall within 1/2 mile of the site (although these block groups cover an area larger than the area immediately around the site). The residential areas closest to the proposed site are considered medium and high density residential.
- The Baltimore City Department of Transportation has awarded a contract for infrastructure improvements for the Fairfield area in order to spur economic development.

Potential Effects

- Site access would be restricted to site personnel during placement and operations.
- If the site is to be covered with dredged material, then existing infrastructure would have to be abandoned in place, demolished and removed, or relocated. The buildings, foundation and other facilities would also need to be demolished and removed.
- Minimal effects to recreational activities are anticipated.
- Sensitive receptors (i.e., residences) are not expected to be impacted by sustained or nighttime noises from this site, but some residences fall within a zone where loud, periodic noise (e.g., backup beepers, rock placement) may be heard.
- A proposed DMCF at this site would not occupy the foreground or middle-ground view of any nearby residences. Depending on its height, the site may be within view of Baybrook Park, but would be consistent with current land use. Visual impacts are not expected to be significant.



- This project is not expected to disproportionately, adversely affect low-income or minority populations.
- The proposed project is expected to preclude future commercial activities in the area.

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Fairfield Interior

Harbor Team
Conceptual Level Option
March 17, 2011





Hart-Miller Island II

Purpose: The purpose of this sheet is to provide the Bay Enhancement Working Group (BEWG) with the information on the options that the Harbor Team has forwarded for ranking. BEWG will then use this information sheet in its environmental scoring based upon the factors in the evaluation matrix and included in these sheets. BEWG's scoring will be reported back to the Harbor Team for use in developing recommendations about the options. This sheet was drafted using general as well as site specific information, when available, and may be subject to change based on further study.

Location: The proposed location of a second island creation containment facility, similar to the existing Hart-Miller Island (HMI) Dredged Material Containment Facility (DMCF) and referred to as HMI II, is northeast of existing HMI. HMI II would be parallel to the southern boundary (restricted water area) of Aberdeen Proving grounds (APG) and east of the mouth of the Middle River. The site is currently open water. A remnant/historic island, Spry Island, exists within the general project footprint. This area has eroded to the point that it consists of a permanently submerged shoal area.

Site Characteristics: This area of the Chesapeake Bay is between 5 and 25 feet deep. A potential island creation project could be constructed. This area is currently prohibited from placement of dredged material by state law because it is within 5-miles of the existing HMI DMCF (Annotated Code of Maryland, Environment 5-1102).

Potential Option

Island creation:

- o 2,000 acres (assume 20 to 40 feet of placement)
- o Annual capacity of 5 million cubic yards (mcy)
- o 100 to 200 mcy of capacity

Current Ownership: State of Maryland

Water Quality

Existing Conditions

- Water quality in the vicinity of the existing HMI DMCF is relatively good, particularly when compared to nearby Baltimore Harbor.
- The closest water quality monitoring station is Chesapeake Bay Segment 3-Fort Howard. At this station, the salinity ranges from approximately 1 ppt to 12 ppt. Salinity in this area typically increases from March until October.
- The Chesapeake Bay is listed as impaired for nutrients.
- The area currently has water quality that allows recreational contact with the water.



Potential Effects

- All discharges from the site would be managed in accordance with a National Pollutant Discharge Elimination System (NPDES).
- There would be temporary increases in turbidity during construction of the site.
- Groundwater flows into surface water in the region, and there is little potential for development of HMI II to affect groundwater quality.
- Following construction of a DMCF, precipitation that falls within the DMCF would be discharged and monitored through the spillways. Stormwater that does not fall within the DMCF would either infiltrate into vegetated areas or be treated through existing or new stormwater Best Management Practices.

Aquatic Habitat

Existing Conditions

- Water depths in the area range from approximately 5 feet to 25 feet, which is unlikely to be seasonally anoxic.
- No site specific sediment data exists for this area.
- There is no submerged aquatic vegetation (SAV) within the proposed project area. There are some shallow areas within the vicinity of historic Spry Island. A site specific bathymetric survey would be needed to confirm that water depths are as shallow as 5 feet within the project area.
- There is no site-specific benthic information available for the project area.
- There are no water depths greater than 40 feet in the project area, so there would be no thermal refuge area for fish species.

Potential Effects

- There would be a permanent loss of 2,000 acres of open water habitat, which would constitute a major loss of open water habitat. The area is unlikely to be subject to seasonal anoxic conditions thus, it provides year-round habitat for fish and shellfish species.
- The project area would be permanently converted to upland, which would eliminate any future benthic habitat or shallow water habitat in the project area.

Wetlands

Existing Conditions

- The entire area is tidal open water, which is considered to be a wetland by the State of Maryland.
- There are no vegetated wetlands within the project area.

Potential Effects

- Impacts to open water as described under water quality and aquatic habitat.



Aquatic Biology – Finfish/Shellfish

Existing Conditions

- The area currently supports an estuarine and diadromous fish species, which includes both resident and migratory species. Blue crabs are also found within the area.
- The area currently supports some estuarine spawning species, such as bay anchovy (*Anchoa mitchilli*).
- The site is within the main-stem of the Chesapeake Bay, which has been designated as Essential Fish Habitat (EFH) for 12 species. The closest tributary to the project area with specific designations is the Chester River, which provides EFH for seven species. It is likely that the seven species with EFH in the Chester River are the mostly likely species to have EFH in the project area. Salinities in the project area are unlikely to support all 12 species with EFH in the main-stem of the Bay.
- Commercial fishing and crabbing occurs throughout the main-stem of the Chesapeake Bay and gill nets and pound nets are found in the general area.
- Recreational fishing and crabbing also occurs throughout the main-stem of the Chesapeake Bay and the area is likely to be used by recreational visitors to nearby Hart-Miller Island.

Potential Effects

- There would be a loss of approximately 2,000 acres of open water area for commercial and recreational fishing and crabbing.
- Approximately 2,000 acres of open water habitat for fish and shellfish would be lost and these organisms would be displaced to other areas within the Chesapeake Bay.
- There would be a disturbance to the water column during construction of the facility, which would displace mobile species from the construction area.
- Disturbance to the Chesapeake Bay bottom in the project area would resuspend sediment, which would increase turbidity and temporarily impair the ability of some sight-feeding fish to feed.
- Settling of resuspended sediment and turbidity may clog the gills of macroinvertebrates and finfish within the turbidity plume.

Special

Existing Conditions

- There are several federally listed species that may be found within the project vicinity. These are: shortnose sturgeon (*Acipenser brevirostrum*) and sea turtles (four species). One additional species proposed for listing may also be found in the project vicinity: Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*).
- Both shortnose and Atlantic sturgeon have been captured in the vicinity of the proposed placement site. It is likely that these species are seasonally present within the area. Atlantic sturgeon are much more common south of the Bay Bridge and is less likely to be present in the project area. Shortnose sturgeon are more common north of the Bay Bridge.



- Sea turtles are rare in the upper Chesapeake Bay. The closest sea turtle stranding is on the eastern shoreline of the Bay near Rock Hall, Maryland, approximately 10 miles from the project site.
- There is no Habitat of Particular Concern for EFH species within the project area.
- The entire Chesapeake Bay, including the proposed site, is within the Chesapeake Bay Critical Area and would be subject to Maryland Critical Area regulations.

Potential Effects

- There would be a loss of 2,000 acres of open water that would be converted to upland. The existing open water may provide habitat to shortnose sturgeon and Atlantic sturgeon. While the area does not provide special or unique habitat for these species, the loss of potential habitat would be substantial.
- Sea turtles are rare, seasonal transients to the project area and are unlikely to be affected.
- There is no critical habitat for listed species within the project area; therefore, no critical habitat would be affected.

Water Birds

Existing Conditions

- There is a designated waterfowl area surrounding the existing HMI. If the proposed island is located greater than approximately 4,100 feet north of the existing island, it will not overlap with this waterfowl area.
- There is currently no shoreline habitat within the project area and there would be no shorebirds using the project area.

Potential Effects

- Island nesting habitat within the Chesapeake has been lost to erosion and there was a historic island, Spry Island, in the area. The site would provide an additional 2,000 acres of island habitat within the main-stem of the Chesapeake Bay.
- After construction and filling of the site, the area may provide nesting habitat for water birds.

Terrestrial Resources

Existing Conditions

- There is no terrestrial habitat within the project area.

Potential Effects

- Approximately 2,000 acres of upland habitat would be constructed after placement at the site is complete. This habitat would likely support a similar species assemblage to the existing HMI, which may include small mammals, birds, reptiles, and amphibians consistent with the region.
- Created upland habitat would not be available for a significant period of time after construction, based on the capacity of the site and annual placement needs for Baltimore Harbor.



Physical Parameters

Existing Conditions

- According to existing information, substrate in the vicinity of the proposed project ranges from hard to soft.
- There is no fossil oyster shell mining occurring with the Maryland waters of the Chesapeake Bay. Therefore, no fossil shell mining is occurring within the project area.
- The area is within open water and is permanently inundated with water; therefore, it is not part of the 100-year or 500-year floodplain.
- The site's proximity to Aberdeen Proving Ground (APG), where ordnance testing has historically occurred, indicates that there is a higher likelihood of encountering Munitions and Explosives of Concern (MEC) in the vicinity of this site relative to other areas within the Chesapeake Bay. While there is no shoreline within the project area for MEC to have washed up on, it is possible that MEC has settled to the Bay bottom in the project area.
- Currents in the vicinity of the project are up to approximately 1 knot.

Potential Effects

- Construction of dikes in areas with soft substrate is feasible but requires either removal of the soft materials or staged construction of wide dikes. Additional information would be required to determine what type of construction would be required.
- All sediments within the project footprint would be capped by the new placement site.
- The site would cover any potential MEC that are found within or on the sediment in the project footprint.
- Construction of a 2,000 acre island at the mouth of the Gunpowder River and Middle River poses potential impacts to hydrodynamics, sedimentation patterns and water quality. Though the project footprint has been oriented to minimize potential impacts, construction of the proposed HMI II in this location would likely have impacts on flushing within the Gunpowder River, Middle River, Back River, Seneca Creek, and Hawk Cove. Baltimore City operates a 180 million gallon per day sewage treatment plant in Back River; reduced tidal flushing in the area could have adverse affects on water quality in the rivers and Cove.

Human Use Attributes

Existing Conditions

- Navigation in the vicinity of the proposed project is generally limited to recreational boats and fisherman.
- There are no historic resources listed within the vicinity of the proposed island either by the Maryland or National Registry.
- Air quality in the Baltimore region is heavily influenced by the urban and industrial environment within and around Baltimore City. Daily and seasonal variations in air quality also occur. The Baltimore region is currently in non-attainment for ozone and particulate matter (2.5).



- Recreational activities in this area include boating, fishing, swimming, and more passive activities such as wildlife viewing. Property tax records indicate that there are dozens of marinas of varying sizes in the Middle River within five miles of the concept site. Additionally, there are three boat ramps within five miles of the site. Miami Beach County Park lies about 2 miles across open water from the proposed site.
- Noise in this area results from commercial and recreational boating. Background noise occurs due to waves, wind, birds, and other wildlife.
- Currently the view from shore near the concept site is open water. The Bay is about 8 miles wide at this point, so the view is largely unobstructed.
- Minorities make up a smaller proportion of the population in this area than in Baltimore and Harford counties as a whole. The 2000 per capita income of this area was slightly lower than the overall per capita income of Baltimore and Harford counties.
- The area nearest the concept area for the project falls within three zip codes: Middle River (21220), Gunpowder (21010), and Essex (21221). In 2008, there were a total of 1,311 business establishments in these three zip codes. The economic sectors with the most establishments in these zip codes were construction, retail trade, other services, and accommodations and food service.
- The concept location for the site is within a mile of the closest land; the land uses nearest the proposed site are primarily forest and low and medium density residential. The Census block groups closest to the site had over 5,400 people in 2000 (although these block groups cover an area larger than the area immediately around the site).

Potential Effects

- Site access would be restricted to site personnel during placement and operations.
- There would be emissions of pollutants with thresholds identified in the Clean Air Act, as a result of the operation of equipment during construction of the containment structure and placement of material in the site. Based on the size of the facility and the amount of construction required, a federal conformity analysis is likely to be required.
- Construction of a DMCF could displace boaters or fishers as recreational fishing grounds lie on all sides of the proposed site. Shore-based recreation (i.e., swimming, walking along the beach, etc.) should not be impacted by the proposed project.
- Construction of the project would force boaters outside of the footprint of the DMCF. However, the DMCF footprint was oriented and located to allow access southwest of the site, toward Hart-Miller Island and to the northeast outside of the APG restricted area.
- Sensitive receptors (i.e., residences) are not expected to be impacted by sustained or nighttime noises from this site, but some residences fall within a zone where loud, periodic noise (e.g., backup beepers, rock placement) may be heard.
- Construction of a DMCF at this location would be expected to have significant visual impacts. This facility would dominate the view from shore from some locations, and other locations would be in view of both existing Hart-Miller Island and HMI II.



- This project is not expected to disproportionately, adversely affect low-income or minority populations.
- The proposed project is not expected to alter the current commercial activities in the area.
- The proposed site is not consistent with the character of the area, and may have negative effects on residential property values in the area.

Beneficial Attributes

- There is the potential for the end use of the site for island creation or recreational use, similar to the existing Hart-Miller Island.

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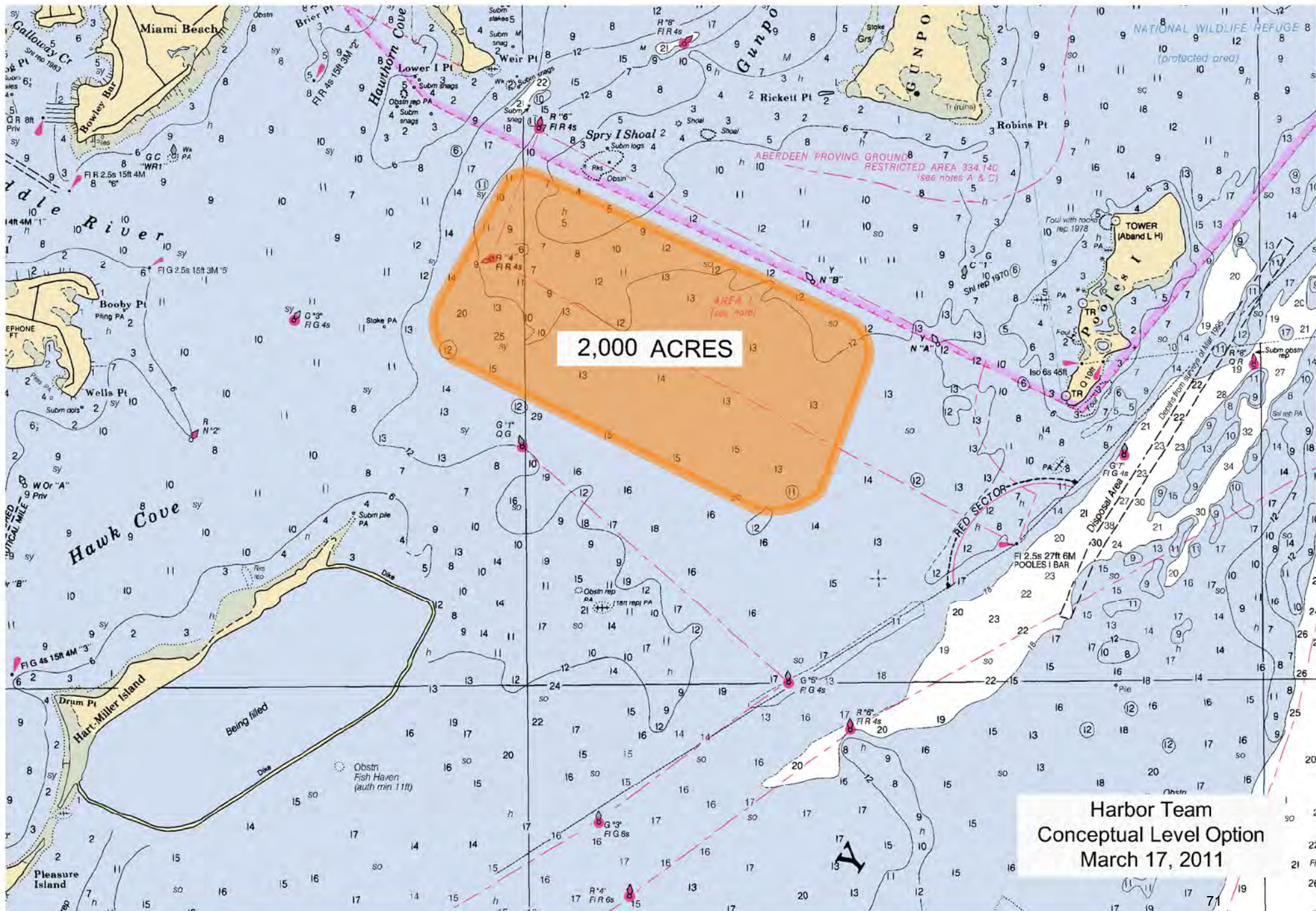
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HMI II





Millennium

Purpose: The purpose of this sheet is to provide the Bay Enhancement Working Group (BEWG) with the information on the options that the Harbor Team has forwarded for ranking. BEWG will then use this information sheet in its environmental scoring based upon the factors in the evaluation matrix and included in these sheets. BEWG's scoring will be reported back to the Harbor Team for use in developing recommendations about the options. This sheet was drafted using general as well as site specific information, when available, and may be subject to change based on further study.

Location: The Millennium site is located on the western shore of the Patapsco River, one half mile south of the Francis Scott Key Bridge. The site is immediately north of the Cox Creek Dredged Material Containment Facility (DMCF).

Site Characteristics: The existing Millennium property is largely idle at this time. There is a 10 acre parcel within the site, not owned by Millennium, which is being actively used. With only about 10% of the 100 acre site being grass and trees, the majority of the site consists of impervious surface of either warehouse or pavement. The property has about 2,000 linear feet of shoreline. To the northeast of the property is Fort Armistead Park. An existing landfill (also owned by Millennium) borders the property to the west.

Potential Options

One option may be to create a DMCF on the upland area of the Millennium property. Data for this option below:

- o 100 acre property area
- o Annual capacity of 0.4 million cubic yards (mcy)
- o 5 to 10 mcy of capacity

Another option may be to combine the Millennium property with the existing Cox Creek DMCF and the proposed 100 acre upland expansion to form one DMCF. Data for this option below:

- o 300 acre total property area
- o DMCF lateral expansion to the upland and vertical expansion at the existing DMCF
- o Annual capacity of approximately 1.3 mcy
- o 10 to 20 mcy of capacity (in addition to existing 6 mcy capacity)

Range of capacities considers combined options for containment, innovative reuse, and future end use. Values for capacity and footprint area will vary by option.

Current Ownership: The 100 acres proposed for upland DMCF option is comprised of four parcels. The largest parcel is the Millennium Inorganic Chemical plant, which is currently idle. In the middle of this parcel is an additional 10 acres owned by Kemira. Two other parcels along the City and County border are also owned by Millennium.



Water Quality

Existing Conditions

- There are no natural surface water features on the site. There are some man-made surface water features on the site that were associated with past industrial use of the area.
- The site is adjacent to the Patapsco River.
- Based on past activities at the site, investigations are required at the site to determine existing groundwater conditions.
- The majority of the site is impervious and it is unknown what portion of the study area, if any, has functioning stormwater Best Management Practices.

Potential Effects

- All discharges from the facility into the Patapsco River would be managed in accordance with a National Pollutant Discharge Elimination System (NPDES) permit.
- Local subsurface investigations may be required to determine if any existing contamination of groundwater is present at the site.

Aquatic Habitat

- No aquatic habitat occurs within the potential project footprint

Wetlands

- There are no wetlands within the potential project footprint.

Aquatic Biology – Finfish/Shellfish

- There is no habitat for finfish/shellfish within the potential project footprint.

Special

Existing Conditions

- There are no federally listed or state listed species known to occur within the potential project footprint.
- Portions of the site fall within the Chesapeake Bay Critical Area.
- The areas of the site within the Chesapeake Bay Critical Area are within an Intense Development Area (IDA).
- There is no Essential Fish Habitat within the potential project footprint.

Potential Effects

- There would be no effects to federally or state listed species.
- The project would require approval from the Critical Area Commission, including appropriate measures for stormwater reduction.



Water Birds

Existing Conditions

- The open water area along the shoreline adjacent to the site is considered to be a historic waterfowl concentration area.
- There is no avian habitat with unique or valuable characteristics in the potential project footprint.

Potential Effects

- The development of the site is not expected to improve or degrade potential water bird habitat in the area.

Terrestrial Resources

Existing Conditions

- There is no forest or other quality habitat at the site.
- There is no special or unique terrestrial habitat for birds or wildlife.
- There is potential for soil contamination at the site, based on historic use of the site.
- Overall, terrestrial habitat at the site is poor. Fort Armistead Park is located adjacent to the site to the northwest, which provides an area of green space in an otherwise industrial area around the project footprint.
- A Phase I Environmental Assessment for hazardous materials is needed to fully evaluate existing conditions. There may be underground or aboveground storage tanks or other infrastructure of concern at the site.
- The site is listed as a Toxic Release Inventory Site and in 2009 had air emissions of carbonyl sulfide, manganese compounds, and hydrochloric acid, as well as other compounds in smaller amounts.

Potential Effects

- If there is the potential for hazardous materials at the site or within the buildings, appropriate steps would be needed to dispose the materials in an approved manner.
- All terrestrial habitat within the potential site footprint would be lost.

Physical Parameters

Existing Conditions

- Based on existing information the upland portion of the site is expected to provide a foundation sufficient to support construction of a DMCF.
- A small portion of the site is within the 100-year and 500-year floodplains.
- The site is an upland area, so no fossil shell mining occurs in the area.
- Munitions and Explosives of Concern (MEC) are unlikely to be found in the potential project area.



- The site was previously used for chemical manufacturing, and there may be some legacy contamination or hazardous materials at the site. A Phase I Environmental Assessment would be needed to fully characterize the site.

Human Use Attributes

Existing Conditions

- The site is industrial and currently consists of manufacturing facilities, building, storage tanks, paved areas and vegetated areas. There are approximately 90 acres of buildings and pavement on the 150 acre property.
- Existing water, sewer and storm drain, rail and electric infrastructure support facilities on the site.
- There are no Maryland or National Registry mapped historical places or properties located on site.
- Air quality in the Baltimore region is heavily influenced by the urban and industrial environment within and around Baltimore City. Daily and seasonal variations in air quality also occur. The Baltimore region is currently in non-attainment for ozone and particulate matter (2.5).
- Primary recreational activities in the Harbor include fishing and boating. Fort Armistead Park is adjacent to the proposed site.
- Noise in this area results from industrial activity, nearby road traffic, and to some extent, maritime activity. Background noise occurs due to waves, wind, birds, and other wildlife.
- According to Census 2010, minorities make up a smaller proportion of the population in this area than in Anne Arundel County and Baltimore City as a whole. The 2000 per capita income of these block groups was comparable with the overall per capita income of Baltimore City, but considerably lower than the per capita income of Anne Arundel County (2010 Census data on income are not yet available).
- The area around the proposed site falls within the Curtis Bay zip code (21226). In 2008, there were 367 business establishments in this zip code. The economic sectors with the most establishments in this zip code were construction, wholesale trade, transportation and warehousing, manufacturing, and other services (e.g., repair shops, personal services, etc.).
- The area surrounding Millennium is a mix of industrial land, barren land, and forest. Land use data indicate that the closest residential area is about one mile from the proposed site. The two Census Block Groups nearest the site had nearly 2,800 people in 2010 (although these block groups cover an area considerably larger than the area immediately around the site).

Potential Effects

- The abandoned warehouses and manufacturing facilities would need to be demolished to make way for a DMCF. The 10 acre lot owned by Kemira, which is in use, would also need to be addressed; there are several utility easements crossing the property to this parcel. Chesapeake may also have access rights to other parts of the property.



- None of the infrastructure in the proposed area serves facilities outside of the site. Removal or abandonment of the infrastructure to allow construction of the DMCF would not pose an adverse impact to the area.
- There would be emissions of pollutants with thresholds identified in the Clean Air Act, as a result of the operation of equipment during construction of the containment structure and placement of material in the site. Based on the size of the facility and the amount of construction required, a federal conformity analysis may be required.
- Site access would be restricted to site personnel during placement and operations.
- Minimal effects to recreational activities are anticipated.
- Due to the industrial nature of the area at present, and the distance to sensitive receptors, noise impacts are anticipated to be minimal at this site.
- A proposed DMCF at this site would not occupy the foreground view of any nearby residences. The site would fall within the view of Fort Armistead Park, but would be consistent with the existing viewshed. Visual impacts are not expected to be significant.
- This project is not expected to disproportionately, adversely affect low-income or minority populations.
- The proposed project is not expected to alter the current commercial activities in the area.
- The proposed project is consistent with current land use, and is not expected to impact community assets.

Beneficial Attributes

- Based on the findings of an environmental assessment (Phase I), there may be opportunity to cap or remediate contamination at the site.
- Dike construction could be completed using either material from within the existing Cox Creek DMCF or material from the Innovative Reuse process.

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Federal Emergency Management Agency. 2011. *Map Service Center*. Online: <http://msc.fema.gov>
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Millennium

Harbor Team
Conceptual Level Option
March 17, 2011

FORT ARMISTEAD

100 AC
COMBINED
PROPERTY
AREA

UPLAND OWNED
BY MPA

EX. DMCF

Cox Creek - Millennium Combined

Harbor Team
Conceptual Level Option
March 17, 2011

FORT ARMISTEAD

MILLENNIUM
100 AC

UPLAND
OWNED BY MPA
100 AC

EXISTING
DMCF
100 AC

Appendix 6 – BEWG Materials

Harbor Sites
WORKING DRAFT

COL.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
ROW																																			
			WATER QUALITY					AQUATIC INV.			WETLANDS		AQUATIC BIOLOGY - FINFISH/SHELLFISH						SPECIAL		WATERBIRDS		TERRESTRIAL					PHYSICAL PARAMETERS							
	Weighting Factor		3	3	3	4	5	3	4	5	5	5	4	4	6	3	4	4	4	5	5	4	4	2	3	4	2	2	3	3	4	4	5	3	2
	Option No.		Dissolved Oxygen	Nutrient Enrichment	Turbidity	Salinity	Ground Water	Benthic Community	Shallow Water Habitat (Tier II & Tier III)	SAV	Tidal Wetlands	Non-tidal Wetlands	Finfish Spawning Habitat	Finfish Rearing Habitat	Larval Transport	Essential Fish Habitat	Commercially Harvested Species and Habitat	Thermal Refuge	Recreational Fishery	Protected Species (RTE) (SSPRA)	Habitat of Particular Concern	Waterfowl Use	Wading and Shorebird Use	Wildlife Habitat	Forests	Streams	Lakes & Ponds	Other Natural Avian Habitat	Prime or Unique Agricultural Land	Substrate/Soil Characteristics	Hydro-dynamics effects	Toxic Contaminants	CERCLA/MEC Potential	Fossil Shell Mining	Floodplains
		OPTION NAME																																	
		Placement Options																																	
	1	Confined Aquatic Disposal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2	Cox Creek Options	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3	Cox Creek Options and Millennium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4	Curtis Bay Depot																																	
	5	Deep Trough																																	
	6	Fairfield-Interior																																	
	7	Hart-Miller Island II																																	
	8	Millennium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Removed from list of Harbor Options for further study by the Harbor Team on 4/14/11.

Legend: +1 Potential protection or enhancement

0 No potential impacts expected

0 Not enough / inconclusive data

0 (shaded) Not applicable / not calculated

- 1 Potential negative impacts expected

RTE is the only parameter with a score >1 since each species impacted is counted

Options list is tentative. This matrix is a working draft compiled by the BEWG.
As new information is presented this document evolves and changes over time.

Harbor Sites
WORKING DRAFT

COL.	1	2	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	
ROW																												ROW
1			HUMAN USE ATTRIBUTES													BENEFICIAL ATTRIBUTES												1
2	Weighting Factor		2	2	2	3	3	3	3	4	4	4	5	5	3	4	2	2	2	2	2	3						2
3	Option No.		Recreational Value	Aesthetics	Noise	Cultural Resources	Air Quality	Infrastructure	Existing Land Use	Commercial Socioeconomics	Community Socioeconomics	Environmental Justice	Public Health	Public Safety	Navigation	Beneficial Use Wetlands	Beneficial Use Uplands	Beneficial Use - Adjacent Habitat Enhancement	Beneficial Use - Faunal	Beneficial Use - Recreational Enhancement	Shoreline Protection	Beneficial Use - Other	Total Environmental Score	Normalized		Overall Rank	Option No.	3
4		Placement Options																										4
5	1	Confined Aquatic Disposal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	0.0938	0.2538	1	1	5
6	2	Cox Creek Options	0	0	0	0	0	0	0	-1	0	0	0	0	0	0	0	0	0	0	0	0	-4	-0.1600	0.0000	3	2	6
7	3	Cox Creek Options and Millennium	0	0	-1	0	0	0	0	-1	0	0	1	0	0	0	0	0	0	0	0	0	-1	-0.0385	0.1215	2	3	7
8	4	Curtis Bay Depot																									4	8
	5	Deep Trough																									5	
9	6	Fairfield-Interior																									6	9
10	7	Hart-Miller Island II																									7	10
11	8	Millennium	0	0	-1	0	0	0	0	-1	0	0	1	0	0	0	0	0	0	0	0	0	-1	-0.0385	0.1215	2	8	17

Removed from list of Harbor Options for further study by the Harbor Team on 4/14/11.

Legend: +1 Potential protection or enhancement

0 No potential impacts expected

0 Not enough / inconclusive data

0 (shaded) Not applicable / not calculated

- 1 Potential negative impacts expected

RTE is the only parameter with a score >1

since each species impacted is counted

Options list is tentative. This matrix is a working draft compiled by the BEWG.
As new information is presented this document evolves and changes over time.

Dredged Material Management Program (DMMP) – Bay Enhancement Working Group

Supplemental Information for the Evaluation of the Preliminary Environmental Ranking of Harbor Options

June 2011 DRAFT

Purpose: The purpose of this document is to provide supplemental information for use during the review of the preliminary environmental ranking performed by the DMMP Bay Enhancement Working Group 2011. The caveats, limitations and conditions included in this document represent the basis of the assignment of the preliminary environmental scores. Furthermore, this document also details those agencies that stated an opinion contrary to the consensus of the group and the assigned score.

General

- All environmental scores are subject to change based on new information. Current scoring is based on the best available data and best professional judgment at this time.
- Scoring for most parameters considered the end result of the project in order to evaluate potential impacts. However, several parameters also considered the process of filling and managing a dredged material management site in the scoring. These included: aesthetics, noise, public health, & public safety.
- The environmental scores assigned to the options do not consider the potential negative impacts associated with the operation of a particular site or process. Scores reflect an assessment of the long-term conditions and do not acknowledge the potential for short-term (construction-phase) impacts from such things as toxics or nutrient releases. Dredging and water quality permits/certifications will manage the releases.
- The Bay Enhancement Working Group will consider alternative alignments in order to minimize negative environmental impacts.
- The SAV parameter includes both historic beds and those that are currently in existence.

Confined Aquatic Disposal

- Nutrients: (Score = 0) The National Marine Fisheries Service (NMFS) recommends that dredged material not be placed hydraulically into CAD cells, that use of a CAD cell not extend over more than a period of a year, and that CAD cells be capped with sand immediately upon being filled to capacity and monitored/remediated for cap resilience in order to reduce the release of fine-grained, nutrient-rich sediments. Otherwise, NMFS suggests that this parameter be scored -1.

- Turbidity: (Score = 0) NMFS applies the same recommendations for scoring of the Turbidity parameter as for the Nutrient parameter above; otherwise, NMFS suggests that this parameter be scored -1.
- Commercially Harvested Species and Habitat: (Score = 0) The Upper Bay Charter Captains Association believes that the construction phase of a CAD project could have a direct impact on commercial fisheries and that this parameter should be scored -1.
- Protected Species: (Score = 0) Upon consultation with NMFS, it was determined that the Baltimore Harbor channels are not considered a high use area for either Atlantic or shortnose sturgeon.
- Toxics: (Score = 0) NMFS recommends that CAD cells should be used for placement of maintenance material only and that the cells should be capped upon completion of filling; otherwise, NMFS suggests that this parameter be scored -1.
- Beneficial Use (Adjacent Habitat, Faunal, and Recreation, Scores = 0) NMFS believes that these uses could be adversely affected by a CAD project and would receive a score of -1 if the above recommendations for placement and operation of CAD cells are not performed, as this could increase the potential for escape of dredged material from filled or partially filled cells.

Cox Creek Options, Cox Creek Options and Millennium, Millennium

- NMFS recommends that these upland options be the primary focus of the DMMP for placement of Harbor material.

Curtis Bay Depot

- NMFS recommends reconsidering this site as a placement option because it could potentially provide significant capacity, has rail line access, and could be used as an innovative reuse staging area. This site is currently under consideration for commercial warehouse development, which would conflict with use of the site for dredged material placement.

HARBOR OPTIONS RESOURCE SCORING INDICES

Fifty-two parameters have been selected to evaluate the environmental suitability of the proposed options. These parameters are divided into 10 categories based upon similar attributes. A brief description of each resource parameter is presented below. Each parameter is assigned a raw score of +1, -1, or 0 for each option under consideration. The scores are presented in the environmental ranking matrix, and used to calculate the total weighted normalized score for each option. A description of the raw scores is described below.

A +1 will be assigned to a given parameter if the option is expected to protect or enhance *existing* resources of that type in or immediately adjacent to the option footprint. A -1 will be assigned if the resource is present and negative impacts (or further degradation) are expected as a result of option development. This is very carefully defined as long-term negative impacts to existing resources so options will not be scored negatively for potential short-term effects. A 0 will be assigned when no negative impacts are expected to existing resources at or immediately adjacent to an option. It will also be used in cases where there is not enough conclusive evidence to make a definitive evaluation, or evidence is ambiguous. In the later cases, the 0 will be underlined so that decision-makers will be able to discern those options that have less information. If the parameter is not applicable at a particular option because it could not possibly exist in that location, the box will be shaded. Scores that are bolded indicate a “caveat.” These “caveats” can be assumptions that the scores were based on or dissenting opinions from various BEWG voting members. These “caveats” are documented in the Supplemental Information for the Evaluation of the Preliminary Environmental Ranking of Harbor Options.

Raw values are assigned based upon consensus of the BEWG and are subject to change as new data or information become available. The raw evaluations are to be based upon existing data and historical information, as well as the collective experience and knowledge of the BEWG and the technical study team. It is expected that additional information will be required for some options as the process moves forward. The initial scoring and ranking will be accomplished with the information and knowledge at hand with some modifications and updates occurring over the course of the process.

Each parameter will be assigned a weighting factor based upon the consensus of the BEWG. The raw scores will be multiplied by the weighting factor and totaled in order to achieve a total weighted value for each option. The total scores will then be normalized by dividing by the number of applicable (unshaded) parameters for that option. In this way, options are not unduly (positively) weighted for resources that cannot exist at the option. The normalized scores are for relative comparison among the options, and a positive or negative score does not indicate that an option has an overall positive or negative impact. As an approach to emphasizing that the rank of the screened options is relative, a column was added and a correlation factor was added to the normalized score. This yields all positive scores.

CATEGORY 1: WATER QUALITY

Water quality is an important environmental parameter that can significantly influence the type of biota present at any particular option. A suite of water quality parameters will be described for each option, four of which will be considered for separate evaluation: dissolved oxygen, nutrients, turbidity, and salinity. These factors have demonstrated influences on distributions of aquatic organisms in the Bay. According to known habitat requirements for living Chesapeake Bay resources (Funderburk et al. 1991), naturally occurring TSS concentrations in the upper Bay do not exceed concentrations that would be detrimental to larval, juvenile, or adult life stages of commercially important species. Salinity will be considered separately because of its specific influence upon various life stages of aquatic organisms within the Bay. Each option will require a Water Quality Certification that will specify the discharge

limitations for that option. While the issue of TMDL's will be addressed under the certification, the evaluation of each option will be conducted using the above constituents as related to background conditions.

Parameters:

Dissolved Oxygen (DO) - Weight: 3

There are areas in the Bay where DO drops below 5 ppm (sometimes even to 0) during seasonal lows. These areas are less supportive of aquatic life than areas that are well oxygenated over the entire year. If option development is not expected to have any long-term negative impacts on DO, it would receive a score of 0. If option development can impact DO positively, by decreasing depths and raising the bottom of a deep area above the pycnocline; this circumstance would receive a +1. Current changes resulting from option development could also influence water cycling/retention times in an area and negatively affect DO. Excessive nutrient inputs resulting from option development could also negatively affect DO by increasing oxygen consumption from the stimulation/extinction of algal blooms. Either of these conditions would result in a -1.

Nutrients, particularly ammonia nitrogen and phosphorous - Weight: 3

Nutrients are natural components of any aquatic ecosystem and are typically balanced by natural processes. Increasing nutrient inputs over natural levels has been demonstrated to over-stimulate plant growth and can lead to problematic fluctuations in water quality, particularly DO. Nutrient releases can result from a variety of option development activities and those that are expected to potentially cause long-term nutrient enrichment would be scored with a -1. For example, newly excavated areas expose naturally nutrient rich sediments, allowing the nutrients to flux into the surrounding water. Also, discharges during dewatering activities after sediments are placed can be nutrient enriched. If option development is not expected to have any long-term negative impacts on nutrient enrichment, it would receive a score of 0. No +1 condition has been identified for this parameter.

Turbidity - Weight: 3

Many areas of the Bay experience naturally elevated turbidity due to tidal currents, river discharges, and other physical processes. Although natural turbidity has been shown to be important for the survival of some life stages of aquatic organisms, most organisms that occur in these areas are tolerant of a range of turbidity. Excessive long-term turbidity, however, can be detrimental, particularly to some planktonic and benthic organisms. If option development has the potential to increase turbidity levels beyond the natural ranges for the area on more than a short-term basis, the option would receive a score of -1. If option development is not expected to have any long-term increase in turbidity, it would receive a score of 0. If it has the potential to ameliorate existing high local turbidity, a +1 would be assigned.

Salinity - Weight: 4

Salinity has a significant influence on the distribution of aquatic organisms in estuaries. Preference for and tolerance of salinity dictates the types of organisms that can live in various areas, and therefore, dictates the structure of the aquatic community. Alterations in regional salinity ranges could influence the aquatic community structure significantly. Additionally, the saltier waters from the ocean travel up the Bay in a wedge near the bottom through deepest areas of the Bay. This salt wedge enables organisms from saltier areas of the Bay to disperse into fresher water feeding and nursery areas. The potential for significant alterations to near field and regional salinity will be evaluated at each option. A 0 will be assigned if no negative impact is expected and a -1 if the construction of the option would affect

hydrodynamics such that a change in salinity or an effect to the salt wedge would likely occur. No +1 condition has been identified for this parameter.

Ground Water - Weight: 5

Some of the proposed options may have a potential influence upon groundwater through the migration of constituents through the underlying soils and would be scored with a +1. This is a particular concern at upland options where potable water resources exist and where sulfur compounds in dredged material are oxidized and acidified by exposure to the atmosphere. The potential for groundwater contamination will be evaluated and a value of 0 will be assigned if no negative groundwater impact is anticipated. Conversely a -1 would be assigned if a negative impact is probable.

CATEGORY 2: AQUATIC HABITATS

Parameters:

Benthic Community - Weight: 3

Benthic communities are an important component of the Chesapeake Bay ecosystem. Benthic organisms provide a trophic link from phytoplankton to higher trophic levels, serve as a food source for commercially important fish and shellfish, and play a role in nutrient cycling. Salinity and substrate are natural characteristics that influence the structure of the benthic community. Sediment composition will be evaluated based on option-specific data. Benthic assemblages are often used as indicators of environmental or anthropogenic stress in aquatic systems. An estuarine Benthic Index of Biotic Integrity (B-IBI) has been developed for Chesapeake Bay benthic communities (Weisberg et al. 1997). The B-IBI is salinity- and substrate-specific and evaluates attributes of the benthic community such as diversity, abundance, biomass, proportions of pollution-sensitive and pollution-tolerant species, and trophic feeding guilds to determine the relative condition (or environmental health) of an option. Options where there is no potential for further long-term benthic degradation within or immediately adjacent to the option from option development will receive a score of 0. Options that will be permanently negatively impact the benthic community would receive a -1. In cases where the benthic habitat could be improved from option development (ex. elevating the bottom above the pycnocline or capping contaminated material) would receive a +1.

Shallow Water Habitat - Weight: 4

Shallow water habitat (SWH) is considered a high value resource in the Bay to support potential SAV re-growth, fish nursery habitat, and avian (particularly waterfowl/wading bird) feeding areas. In this case we are using the SWH descriptor to be protective of Tier II and Tier III SAV habitat (see below) and the depths considered would be 6.6 feet or less. The existing condition of SWH will be evaluated to define the potential for significant impacts related to placement option development. If SWH exists within the option or immediately adjacent and could be negatively impacted by option development, a -1 will be assigned. If no negative impact is expected, a 0 will be assigned. If development of the option will protect or enhance existing SWH, the option would receive a +1 score.

SAV - Weight: 5

Submerged Aquatic Vegetation (SAV) has historically declined over most of the upper Bay. These declines are thought to be due, in part, to high turbidity and nutrient loading. *Myriophyllum spicatum* (Eurasian water milfoil), *Hydrilla verticillata* (hydrilla), and *Potamogeton perfoliatus* (clasping weed

pondweed) are currently among the most common species of SAV in the Chesapeake Bay, while others are undergoing slow recovery.

The Chesapeake Bay Program has issued guidance for protecting SAV in the Chesapeake Bay and its tributaries (CBP 1995). The Chesapeake Bay Program's Executive Council established a SAV Policy in 1989 and committed to an implementation plan in 1990, to achieve the goal of "a net gain in SAV distribution, abundance, and species diversity in the Chesapeake Bay and its tidal tributaries" (CEC 1990). This policy is meant to protect SAV "from further losses due to increased degradation of water quality, physical damage to the plants, or disruption to the local sedimentary environment" (CBP 1995). The Chesapeake Bay Program developed a three-tiered framework of SAV restoration goals or targets:

Tier I: restoration or establishment of SAV in areas of historic (1971 - present) distribution

Tier II: restoration or establishment of SAV in potential habitat to a depth of one meter

Tier III: restoration or establishment of SAV in potential habitat to a depth of two meters

Unvegetated potential habitat areas are protected by the Chesapeake Bay Program's three-tiered SAV restoration goals.

Several state and federal agencies have SAV regulations and policies; however, many of these regulations and policies apply specifically to SAV and not necessarily to potential, unvegetated SAV habitat (CBP 1995). In order for the goals of the Chesapeake Bay Program to be attained, the policies and regulations of these agencies must be considered in all shallow water areas providing SAV habitat.

Recommended SAV protection guidance by the Chesapeake Bay Program includes avoiding dredging activities in Tier I, Tier II, and Tier III areas. Additional guidance includes avoiding dredging, filling, or construction activities that create additional turbidity in or near SAV beds during the growing season; establishing buffers around SAV beds to minimize direct and indirect impacts on SAV during activities that significantly increase turbidity; preserving natural shorelines and stabilizing shorelines when needed; and educating the public about the negative effects of recreational and commercial boating on SAV, and ways to avoid or reduce these effects (CBP 1995).

Maps of SAV distribution in recent years will be examined to determine if SAV has been present within the proposed options. Additionally, shallow water habitat is valuable for many ecological reasons, even in the absence of SAV. Both will be considered together in evaluating this parameter.

Only Tier I SAV Habitat is considered here because the SWH parameter is designed to be protective of Tier II and Tier III habitat. If no Tier I SAV habitat occurs within or immediately adjacent to an option and no permanent negative impacts to SAV are expected, the option will receive a score of 0. If option development would protect or enhance Tier I habitat, the option would score a +1. If SAV is known to occur within an option and permanent negative impacts are expected, the option would score a -1.

CATEGORY 3: WETLANDS

Parameters:

Tidal Wetlands - *Weight: 5*

This category is limited to locations where the possibility of affecting naturally occurring vegetated tidal wetlands exists. Options containing naturally occurring, vegetated, functional tidal wetlands will be

considered less suitable for the construction of a dredged material placement option. In addition, options that may cause erosional impacts to this resource will be also considered less suitable for construction. If option development is expected to negatively impact natural wetlands, it will be assigned a -1. A 0 will be assigned if no negative impacts to existing wetlands are anticipated and a +1 if option development will result in the protection or enhancement of existing natural tidal wetlands.

Non-tidal Wetlands - *Weight: 5*

This category is limited to locations where the possibility of affecting naturally functioning non-tidal wetlands exists. Options containing such wetlands will be considered less suitable for the construction of a dredged material placement option. If option development is expected to negatively impact natural non-wetlands, it will be assigned a -1. A 0 will be assigned if no negative impacts to existing wetlands are anticipated and a +1 if option development will result in the protection or enhancement of existing natural non-tidal wetlands.

CATEGORY 4: AQUATIC BIOLOGY - FINFISH/SHELLFISH ATTRIBUTES

Parameters:

Finfish Spawning Habitat - *Weight: 4*

Portions of the upper Bay and the upper portions of the major riverine systems of the Bay are known to be crucial spawning and/or nursery areas for anadromous fish species that occur throughout the Chesapeake Bay. This is particularly the case in shallow water areas, or areas that have significant amounts of underwater structure or other cover, or that lie within critical (low) salinities. Because anadromous finfish spawning areas have received legislative protection, these spawning areas will be considered separately from other fish resource and habitat issues. Anadromous species, such as striped bass, American shad, blueback herring, and alewives migrate up-Bay to freshwater and oligohaline areas to spawn. The same areas are utilized by a variety of species resident to those salinities for spawning (including such important species as white perch). Each option will be scored based upon the presence (-1) or absence (0) of known or potential spawning within the footprint or immediate vicinity of the proposed placement area. If option development has the potential to protect or enhance existing anadromous fish spawning areas, it will receive a +1.

Finfish Rearing Habitat - *Weight: 4*

Immediately downstream of the anadromous finfish spawning areas lay larger areas that are known to be critical to the success of early life stages of anadromous finfish species. These are generally termed rearing habitat and are of equal importance to year class success as the spawning grounds. Suitable rearing habitat (in terms of salinities and other water quality parameters) can occur over large areas within the Bay, but the most important areas for anadromous fish generally lie within shallow water (or the shore zone) in warmer months. (Winter refuge habitat is scored separately). These areas are also known to be utilized by the early life stages of species that spawn in much higher salinities and that are important forage for young anadromous fishes. Each option will be scored based upon the presence (-1) or absence (0) of known or potential anadromous fish (or forage) rearing habitat within the footprint or immediate vicinity of the proposed placement area. If option development has the potential to protect or enhance existing anadromous fish rearing areas, it will receive a +1.

Larval Transport - Weight: 6

Discharge from the Susquehanna River and other upper and mid Bay rivers transports the early life stages of species that are spawned in the rivers to feeding and nursery areas further south (down-Bay). In contrast, the salt wedge and tidal currents help to transport young of fish that are spawned in saltier areas to feeding areas up-Bay. Significant alterations to the currents that influence these larval transport mechanisms could have detrimental effects on fish populations. Residence time modeling was conducted to attempt to predict significant alterations in water mass distribution and suspended particulate (e.g., larval fish) transport. The extent to which larval transport could be influenced by alterations in hydrodynamics will be examined at each option, to the extent possible. A 0 will be assigned if no negative impact is expected and a -1 assigned if negative effects are anticipated. No +1 condition has been identified for this parameter.

Essential Fish Habitat (EFH) - Weight: 3

The Magnuson-Stevens Act provides protection to habitats designated as essential for the success of marine fish species that are managed by the NMFS as harvestable resources. The species of concern are particular to a region and the habitats essential to the success of their early life stages are defined in the EFH guidance for the region. The Chesapeake Bay generally provides EFH for seven species of regional concern, although only two species typically occur in the middle and upper portions of the Bay (bluefish and summer flounder). If the option lies within the general area designated as EFH but the species of concern are not present (or the option would otherwise not impact EFH) it will be scored with a 0. If an option is known to support the species of concern and there is a potential for negative impact, it will be assigned a -1. EFH areas will be defined from existing information and consultation with the NMFS. If option development has the potential to protect or enhance existing EFH, it will receive a +1.

Potential EFH at the Ocean Placement Option is significantly different than that of the Chesapeake Bay and will be scored based upon assessment made during siting and permitting of the option.

Commercial Fish and Shellfish - Weight: 4

For the majority of options, the fish species to be used for the screening will include those typically harvested within the Bay, including: *Morone americana* (white perch), *Morone saxatilis* (striped bass), herring (*Alosa*) species, *Alosa aestivalis* (blueback herring), *Alosa mediocris* (hickory shad), *Alosa sapidissima* (American shad) and various species in the family *Sciaenidae* (spot, croaker, etc.). Shellfish considered include *Callinectes sapidus* (blue crab), *Crassostrea virginica* (oysters), and *Mya arenaria* (soft clams) and hard clams (*Mercenaria mercenaria*). These species will be selected because of their historical commercial importance, and in some cases, because of population declines that have caused the imposition of state or federal restrictions on the taking of these species. Each of these species uses the Bay during at least one life stage and all of these species are typically used in evaluating the value of the fishery resources of the Chesapeake Bay (MES 1997b). Commercial shellfish and crabbing areas are limited (by regulations) within the Bay. Each option will be evaluated based upon current/existing commercial shellfish harvesting areas, existence of natural or historical oyster beds, and crabbing areas within or immediately adjacent to the area. Potential negative impacts to existing harvesting areas will receive a -1. If no negative impact potential exists, a 0 will be assigned. The commercial harvest potential of the Ocean Placement Option will be based upon previous assessments of commercial fish/shellfish distributions made during the permitting of the option. If option development has the potential to protect or enhance existing commercial harvesting areas, it will receive a +1.

Thermal Refuge - Weight: 4

Within the Chesapeake Bay and its major tributaries, deeper areas provide overwintering habitat and refuge for young of the year finfish species and blue crabs. These areas can remain a few degrees warmer than the overlying (surficial) waters and provide refuge for young fish. This can be critical to the survival of some species because large percentages of some finfish populations may overwinter in the Bay and rely on these winter refugia. Also, within many areas of the Bay, deeper waters are known to be critical habitat for blue crabs, which burrow into the bottom to lie dormant for the winter. Each option will be evaluated relative to its potential to provide overwintering habitat for finfish or blue crabs. A 0 will be assigned if such areas are not present or affected by the construction of a given option, and a -1 will be assigned if negative impacts to or altering of known thermal refuges are anticipated to occur. If option development has the potential to protect or enhance existing thermal refuge areas, it will receive a +1.

Recreational Fishery - Weight: 4

The recreational fishery in the Chesapeake Bay is among one of the most valued resources in the state of Maryland. The Bay supports a tremendous number of fish and diversity of species sought by recreational anglers. Charter boat captains favor some areas of the Bay, while individual recreational anglers favor other areas. In some areas, recreational anglers consume and subsist on their catches and the resource is highly valued locally. Options in these areas that are expected to negatively impact fishing activity will receive a -1 for this parameter. If none or only occasional use is determined, and no negative impacts are expected a 0 will be assigned. If option development has the potential to protect or enhance existing recreational fishing, it will receive a +1. The potential for each area to be utilized by recreational species and the actual use of each area by recreational anglers will be evaluated in the context of the regional fishery.

CATEGORY 5: SPECIAL REGULATORY ATTRIBUTES**Parameters:****Protected Species (RTE) - Weight: 5**

The distribution of both state (DNR designated SSPRA) and federally protected (i.e., Rare, Threatened, and Endangered [RTE]) species relative to the potential placement options will be determined through review of existing information and/or correspondence with both state and federal resource agencies. If option development has the potential to negatively impact RTE or SSPRA habitats, it will be assigned a -1. For this parameter, the colonial waterbird, waterfowl areas, and special non-tidal wetland habitats under SSPRA are not being considered because they are scored separately elsewhere. If no RTE or applicable SSPRA are determined to be in the vicinity and no negative impact is expected, a 0 will be assigned. If option development has the potential to protect or enhance existing RTE habitat, it will receive a +1. The occurrence of shortnose sturgeon, the proximity to bald eagle nesting areas, and the potential occurrence of least tern, black skimmer, or piping plover nesting options will be evaluated for each option within the Bay. A positive or negative score will result for each species identified at a particular site. For example, if 3 RTE species were identified at an option and negative impacts were anticipated, a score of -3 would result.

The RTE species potentially present near the Ocean Placement option are significantly different than those that utilize the Bay (in most cases). Potential for the Ocean Placement option to support RTE will be based upon previous assessments made during the permitting of the option.

Habitat of Particular Concern (HAPC) - Weight: 5

Within areas that provide EFH for fish species protected under the Magnuson-Stevens Act, some areas are considered to be of particular concern. These are generally areas of unique habitat features that have been shown to be critical to the survival of the early life stages of particular fish species. HAPC for most regionally important species occurs within the lower Bay, the Coastal Bays, or over the continental shelf. However, SAV (particularly the SAV bed boundaries) are considered HAPC for summer flounder, particularly south of the Bay Bridge. The presence of HAPC or proximity to HAPC will be evaluated to define the potential impacts from construction or operation of a dredged material placement option or beneficial use option. HAPC areas will be defined from existing information and consultation with the NMFS. The presence of or negative impacts to HAPC will result in the assignment of a -1. A 0 will be assigned if no HAPC occur in the area, or if no negative impact is anticipated. If option development has the potential to protect or enhance existing HAPC, it will receive a +1.

Potential HAPC at the Ocean Placement Option is significantly different than that of the Chesapeake Bay and will be scored based upon assessment made during siting and permitting of the option.

CATEGORY 6: WATERBIRD ATTRIBUTES**Parameters:****Waterfowl Use - Weight: 4**

The Chesapeake Bay is utilized as breeding and feeding habitat for many species of waterfowl. Shallows are used for feeding and /or rearing of young. Deeper areas are also important for resting and staging (or flocking). The Bay is used by both migratory waterfowl and residents, and serves as a significant staging area for some species along the Atlantic flyway. For this assessment, the definition of waterfowl is limited to the harvestable resources (ducks/geese). The potential impacts upon existing areas of waterfowl utilization will be evaluated, with particular attention to duck and goose habitat. Options with a potential for long-term negative impacts to waterfowl staging or concentration areas will receive a score of -1. A 0 will be assigned to options where no negative waterfowl habitat impacts are expected. If option development has the potential to protect or enhance existing waterfowl habitat, it will receive a +1.

Wading and Shorebird Use - Weight: 4

Shore zone and shallow water areas within the Chesapeake Bay are important foraging habitats for shorebird and wading bird feeding areas. Remote forested and natural beaches have been identified as critical nesting habitats for the survival of many wading and shorebird species. Each option will be evaluated for the potential of providing these habitat functions for wading or shorebirds and will receive a -1 if any long-term negative impacts can be expected, and a 0 if negative impacts are not expected or wading and shorebirds habitat is not present. If option development has the potential to protect or enhance existing wading or shorebird habitat, it will receive a +1.

CATEGORY 7: TERRESTRIAL HABITAT ATTRIBUTES**Parameters:****Wildlife Habitat - Weight: 2**

This category is limited to locations where the possibility of impacting sensitive natural terrestrial (upland) habitat and wildlife or nesting/forage areas exists. It will also include the potential for impacts to

sensitive upland plant communities (other than forests and wetlands, which are scored separately). Options that will be developed in upland areas, will potentially abut shorelines, or which may negatively impact existing island remnants that provide habitat may have the potential for negative impacts to this parameter. In addition, options that may cause erosional impacts to terrestrial habitats will be also considered less suitable for construction. Any of these conditions would be assigned a -1. A 0 will be assigned if no negative impact is anticipated. If option development has the potential to protect or enhance existing terrestrial wildlife habitat, it will receive a +1.

Forests - Weight: 3

This category includes natural forested areas that are of sufficient extent and density to provide forage and cover for sensitive terrestrial species. In general that means mature or mostly-mature forest stands of sufficient width (1000+ foot diameter) to provide habitat for species that dwell in forest interiors. Options that could potentially negatively impact such forested areas would receive a -1 and a 0 would be assigned if no potential negative impact is expected. If the option has the potential to protect or enhance existing forested areas, it will receive a +1.

Streams - Weight: 4

Freshwater streams are an important resource for both wildlife habitat and recreation within the State of Maryland. Construction near streams, or options that could potentially alter the hydraulics of a stream have the potential to alter the physical character of the stream channel which, in turn, impacts the habitat value of the stream. Alterations in stream character can negatively impact the aquatic communities that the stream supports and can have lesser impacts on other terrestrial resources. An option that has the potential to negatively alter the physical character of a stream or stream channel will be scored -1. (Potential impacts to surface water quality are scored elsewhere). If streams existing within or immediately adjacent to an option, but there is no potential for impacts to the streams, the option would score a 0. If the option has the potential to protect or enhance existing natural streams, it will receive a +1.

Lakes & Ponds - Weight: 2

Some of the proposed options may have a potential influence upon natural fresh surface water lakes and ponds. This potential will be evaluated and a value of -1 will be assigned if the physical character or hydraulics of the lake or pond would be potentially negatively impacted by option development. (Potential impacts to surface water quality are scored elsewhere). If no negative impact is anticipated, the site would receive a 0. If the option has the potential to protect or enhance existing natural lakes or ponds, it will receive a +1.

Other Avian Habitat - Weight: 2

Upland areas provide habitat for a variety of avian species that differs considerably from those that are considered under the waterbird/shorebird and waterfowl categories. Specifically, uplands provide habitat for a wide variety of resident species but are also critical to sensitive groups such neotropical migrants and those that dwell in forest interiors. This category focuses on potential impacts to these habitats with particular attention to areas that would support sensitive species. Options with a potential to negatively impact these other avian habitats would be scored with a -1. A 0 would be assigned to options that are not expected to negatively impact avian habitats. If the option has the potential to protect or enhance existing natural avian habitats, it will receive a +1.

High Quality Agriculture - Weight: 3

Prime and unique farmland has been vanishing at a tremendous rate in some areas. Highly productive farmlands with rich soil composition that have been farmed for generations are recognized as a non-renewable resource by Executive Order. Development of or infringement upon these farmlands would be considered a negative impact and scored with a -1. A 0 would be assigned to options that are not expected to negatively impact prime or unique farmland. If the option has the potential to protect or enhance existing prime or unique farmlands, it will receive a +1.

CATEGORY 8: PHYSICAL ATTRIBUTES**Parameters:****Substrate Characteristics - Weight: 3**

Substrate characteristics are known to be a significant habitat feature that influences the distribution of benthic and other aquatic organisms within the Bay. The substrate composition of the benthic environment within the proposed placement option provides important information that will be used to characterize the relative condition of the option, the quality of habitat available to higher trophic levels at the option (such as fish), and the suitability of the option for construction. In the same manner, soil characteristics influence the type and productivity of terrestrial areas. Significant alterations in substrate/soil characteristics could negatively impact the habitat and biotic communities within an area particularly if a substrate is limited. This is the case with sand bottom in the Harbor. Conversion of sandy bottoms to finer-grained substrates would be considered a negative impact and assigned a value of -1. A 0 will be assigned if negative changes to substrate/soil composition are not expected from the option. If the option has the potential to enhance existing substrate or soil characteristics by adding or improving limited substrates, it will receive a +1.

Hydrodynamic Effects - Weight: 4

Wind-driven currents and tidal currents affect the distribution of biological organisms and nutrients, sedimentation patterns, and rates of erosion. Large structures can alter the flow velocity to the point that significant changes in sedimentation, erosion, and potentially the distribution of biological organisms could occur. Hydrodynamic two-dimensional modeling will be conducted, examining the hydrodynamic effects of dredged material placement for water based options. Option-specific variations of facility size and orientation will be evaluated for hydrodynamic properties. Results of preliminary hydrodynamic modeling will be incorporated into the environmental analysis. More comprehensive hydrodynamic modeling, including use of a three-dimensional model, may be needed to more fully characterize prospective hydrodynamic effects of the selected options as they progress through the study process.

Alterations in hydrodynamics that could increase erosion potential or alter currents over critical areas such as oyster bays would be considered as -1. However, options that would have no effect will be scored as 0. Options that may decrease erosion over sensitive areas or otherwise protect/enhance resources would be assigned a +1 for a positive effect.

For this evaluation, the physical effects of hydrodynamics (erosion/sedimentation and increased currents in shallow or critical areas) are considered separately from the potential effects on larval fish distributions or navigation.

Toxic Contaminants - Weight: 4

This category applies to the effects of toxic contaminants on flora and fauna. The effects of toxic contaminants on human health are to be considered under the Public Health category. Sediments/substrates can contain a variety of toxic contaminants introduced from both natural and anthropogenic sources. Sediment toxicants can limit the organisms that are able to utilize the area and can also be mobilized into the food chain (becoming bioavailable to other organisms and food fish). Sediment quality will be evaluated for each of the options based on known sediment quality data.

Harbor options and dredged materials within the Harbor are generally considered “contaminated” and material removed from them would remain in the Harbor or be placed in contained facilities. Generally, these facilities would be assigned a 0 for this parameter because there would be no change/impact relative to the existing conditions. Some Harbor options may include a “capping” component whereby materials of poorer quality will be buried or capped with materials of better quality. A +1 would be assigned if there were a potential for capping toxic contaminated sediments with sediments of better quality. A -1 would be assigned if there were a potential that an option could degrade the sediment quality in the area.

Hazardous, Toxic, Radioactive Substances (HTRS) and Munitions and Explosives of Concern (MEC) - Weight: 5

As part of its mission, the military currently tests, and has historically tested, weapons in portions of the Chesapeake Bay around Pooles Island (APG firing range), Sharps Island and at Bloodsworth Island (immediately north of Holland Island) in the central Bay (Navy firing/bombing range). This includes the firing of live rounds and stray shells are known to have landed outside the designated restricted areas. The Controlled Areas of the Bay are believed to contain shells that did not explode during testing. The presence of or potential for munitions and explosives of concern (MEC) could significantly complicate the construction of a dredged material placement area, and would result in the assignment of a -1. Any option without such potential would receive a 0. Also, any option that is known to have the potential for existing pollutants (HTRS) or Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) liabilities would be a poor choice for a dredged material placement area if construction would potentially remobilize contaminants into the environment. With respect to MEC, there is no approved remediation policy. There is also no specific federal policy regarding the liability of potential responsible parties. These are institutional issues, which would need to be addressed in addition to the potential environmental and safety implications associated with MEC, and in relationship to technical difficulties associated with cleanup. No +1 condition was identified for this parameter.

Fossil Shell Mining - Weight: 3

In portions of the upper Chesapeake Bay, fossil oyster shell beds and buried shell resources are mined for MDNR to provide cultch for oyster replenishment in the middle and lower portions of the Bay. Fossil shell mining is viewed as an important resource for the continued production of oysters from the Bay and the presence of mining areas within or adjacent to a proposed option footprint would be assigned a -1. The absence of such beds would result in the assignment of a 0. No +1 condition was identified for this parameter.

Floodplains - Weight: 2

In addition to providing natural flood control, floodplains are important buffer and wildlife areas. Floodplains are recognized as a non-renewable resource by Executive Order. Further development of or infringement upon natural floodplains could decrease the water storage capacity of an area and increase

the potential for localized flooding. This would be considered a negative impact and scored with a -1. A 0 would be assigned to options that are not expected to negatively impact floodplain storage capacity or flood potential. If the option has the potential to protect or enhance existing floodplains (i.e. increase flood storage capacity or decrease flooding), it will receive a +1.

CATEGORY 9: OTHER NON-BIOLOGICAL ATTRIBUTES

Parameters:

Recreational Value - *Weight: 2*

Parts of the Chesapeake Bay watershed are heavily used as recreational areas. The diverse recreational activities include bird watching, boating, swimming, fishing, hunting, etc. For this evaluation, recreational fishing is already evaluated elsewhere, so it will not be included with this parameter. If an option is known to provide recreational resources or facilities currently and option development will permanently disrupt these activities, option development will be assigned a -1. The absence of such resources or use would result in the assignment of a 0. If the option has the potential to protect or enhance existing recreational resources, it will receive a +1.

Aesthetics - *Weight: 2*

Aesthetics impacts from the construction and operation of a dredged material placement facility can be a negative impact if the option is near a neighborhood, tourist/recreation area, or natural areas where there is a potential for wildlife disturbance. If an option is located within approximately 0.5 mi of a population center, dwellings, or managed natural area and will not include mitigating a site of existing poor aesthetic value, it will be considered to have the potential to have a negative impact on aesthetics, and will be assigned a -1. Although some options lie within the city limits of Baltimore, if they lie within existing industrial areas and will not negatively impact residential or recreational areas, they will be given a score of 0. If the option has the potential to improve aesthetics, it will receive a +1.

Noise - *Weight: 2*

Noise impacts from the construction and operation of a dredged material placement facility can be a negative impact if the option is near a neighborhood, tourist/recreation area, or natural areas where there is a potential for wildlife disturbance. If an option is located within approximately 0.5 mi of a population center, dwellings, or managed natural area and the project will have potential noise impacts associated with construction and operation, it will be considered to have a negative impact and will be assigned a -1. Although some options lie within the city limits of Baltimore, if they lie within existing industrial areas and will not negatively impact dwelling or recreational areas, they will be given a score of 0. If the option has the potential to reduce existing noise levels, it will receive a +1.

Cultural Resources - *Weight: 3*

This parameter is used to describe the potential for archaeological and historic options at each option. The potential presence of shipwrecks and other historical features as well as any archaeological resources known to occur (from existing reports) will be assigned a value of -1. Known resources that have been deemed to have no archaeological value (due to previous disturbance) will not be considered negatively relative to option development, and will be assigned a 0. Determinations that no known resources exist will be assigned a 0 also. If the option has the potential to protect or enhance existing cultural resources, it will receive a +1.

Air Quality - Weight: 3

This parameter refers to the current status of the local air quality: In attainment or out of attainment based the federal standards set by EPA. It also includes the health risks associated with entry of particulate material or irritant substances into the airways affecting air quality that can may be associated with dredged material placement projects. If the project area is in attainment and building the project will put it out of attainment or the project could introduce long-term particulate/irritant emissions, the parameter would be assigned a score of -1. If there will be in impact to the current air quality or increase of particulates/irritants (whether the area is in or out of attainment) the score will be 0. If the project area is not in attainment and the project will improve the air quality or particulate/irritant conditions OR if the project area is in attainment and the air quality will be further improved the project will be scored +1.

Infrastructure - Weight: 3

This parameter refers to the current status of the local infrastructure. This includes but may not be limited to roads, railroads, gas, sewer or electrical lines, business building and employment opportunities. Existing traffic and traffic patterns are also considered as part of this parameter. If the project has the potential to damage or impede the local infrastructure or negatively impact traffic volume or patterns the score is -1. If the project will have no impact on the local infrastructure the score is 0. If the project has the potential to improve, protect or provide opportunities to expand, enhance or benefit the local infrastructure or traffic the score is +1.

Existing Land Use - Weight: 3

The existing land use in the vicinity of proposed dredged material placement sites in the Harbor includes commercial uses, recreational facilities, residential uses, and even some open/green space. Development of a dredged material placement site has the potential to enhance or perhaps even disrupt the current land use. If a project has the potential to enhance or has high potential to cleanup existing shoreline areas (improve eroded bulk heading, remove trash, etc.), the project would receive a score of +1. If a project is consistent with the current land use but provides no benefits or enhancements to an area, it will receive a score of 0. If the project has the potential to negatively alter or impact existing land use or community development/revitalization plans, it will receive a -1.

Socioeconomics: Commercial Income & Assets - Weight: 4

The existing commercial ventures in an area or neighborhood help to define the character of the area and contribute significantly to the economic base. Development of a dredged material placement site has the potential to either enhance or disrupt the existing commercial activities within an area. Addition/improvement of recreation facilities, improvements to infrastructure, improvements to maritime use, or availability of more commercial space as a result of a project could bring more commercial income into an area or neighborhood. Such enhancements would be considered positive and receive a score of +1. If a project is consistent with the current commercial usage but provides no benefits or enhancements to an area, it will receive a score of 0. If the project has the potential to negatively alter or impact existing commercial ventures or income, it will receive a -1.

Socioeconomics: Community Assets - Weight: 4

The existing community structure and economic character of an area is driven by a variety of factors. Employment potential and quality of education and recreational/commercial opportunities help to dictate property values and the average income of the families within a community. Communities that thrive economically have less turn over in residents and more improvements to individual properties, which

maintain and improve the economic base. Development of a dredged material placement site has the potential to either enhance or disrupt the existing community socioeconomics of an area. Addition/improvement of recreation facilities, improvements to infrastructure, or availability of more residential land and small business ventures will tend to improve property values and average residential income within a community. Such enhancements would be considered positive and receive a score of +1. If a project is consistent with the current community usage but provides no benefits or enhancements to an area, it will receive a score of 0. If the project has the potential to negatively impact existing residential socioeconomics (e.g. decrease property values, impact economic character of the area), it will receive a -1.

Environmental Justice - Weight: 4

Executive Order 12898 was established to protect low-income and minority populations, because it was recognized that some actions might disproportionately favor higher-income populations or put lower-income populations at higher health and safety risks. Development of a dredged material placement site could positively or negatively impact these types of populations. Addition/improvement of recreation facilities or other community amenities, improvement of property values or decreases of environmental health risks as a result of a project would be considered positive and scored as +1. If the project is consistent with EO 12898 but does not provide any improvements/enhancements, it will receive a score of 0. If the project has the potential to negatively impact or displace a minority or low-income community (e.g. increasing health risks, decreasing property values or income potential), it will receive a -1.

Public Health - Weight: 5

Continuing good health of citizens is a paramount concern of most individuals, families and community leaders. Development of a dredged material placement site has the potential to improve public health in many ways. Capping of contaminated materials, reducing the leaching of toxic material which might enter the human food chain are considered under this category. Limiting the entry of particulate material or irritant substances into the airways affecting air quality may be one of the outcomes of a dredged material placement project are considered under air quality. Improvements to public health would be considered positive and would receive a score of +1. If a site development would not appreciably mitigate any public health concerns, it will receive a neutral score of 0. Although state and federal resource agencies would not knowingly support any project that would potentially increase the risk to public health, there are some potential mitigation projects that could pose increased public health risks during site evaluation and cleanup. If this arises as a potential for development of any site, and the potential health risk exceeds the potential benefit, the site should receive a score of -1.

Public Safety - Weight: 5

This category refers to those situations affecting recreational, occupational and general public safety issues concerned with dredged material placement options. Some options may include chemical processing of dredged material prior to its final disposition. These options may result in occupational safety concerns. Other options may suggest long-term safety issues such as increases in industrial accidents or significant contributions to traffic accidents (from trucking of dredged material to upland sites). Some options may also have the potential to convert current recreational fishing/boating areas for dredged material placement, which may increase recreational boat traffic in/near shipping channels. If a site has the potential to create any of these potential hazards or otherwise increases public safety concerns, it will receive a score of -1. Improvements to any of these conditions, particularly safer access to public recreation, would be considered positive and would receive a score of +1. No appreciable change to public safety would receive a score of 0.

Navigation - Weight: 3

Safe and effective navigation is essential to the vitality of the Port of Baltimore and the commerce of the region. Due to the large volume of barge, ship, and container traffic in the Bay, the potential effects of the proposed options on local navigation will be evaluated. Options that lie partially or wholly within navigation channels could be considered hazards to navigation. Additionally, options adjacent to channels could have an impact on navigation due to increased currents from altered hydrodynamics. A structure that may hinder navigation can also pose a potential environmental threat from potential ship collisions and groundings and will be assigned a -1. If no such potential exists, a 0 will be assigned. If the option has the potential to protect or enhance existing navigation on or immediately adjacent to the site, it will receive a +1.

CATEGORY 10: BENEFICIAL ATTRIBUTES**Parameters:****Beneficial Use – Wetland - Weight: 4**

Many of the proposed options will be converted, in part, to wetland habitat to enhance regional habitat resources. If an option is not designed to create wetland habitat, then it will receive 0 raw score. If wetland habitat will be created, the option will receive a +1. This parameter does not specifically relate to impairment or impact evaluation, but gives a positive score for creation of habitat. No -1 condition was identified for this parameter.

Beneficial Use – Upland - Weight: 2

Many of the proposed options will be converted, in part, to upland habitat to enhance regional habitat resources (particularly for bird nesting habitat). If an option is not designed to create upland habitat, then it will receive a 0 score. If upland habitat will be created, the option will receive a +1. This parameter does not specifically relate to impairment or impact evaluation, but gives a positive score for creation of habitat. No -1 condition was identified for this parameter.

Beneficial Use – Adjacent Habitat Enhancement - Weight: 2

Some options may have the potential to restore or enhance adjacent habitat after construction. For example, protection of an eroding shoreline may allow for natural propagation of tidal marsh plants or SAV adjacent to an option. Stabilization of certain beaches could also improve the nesting habitat for terrapins or colonial ground nesting birds (terns/skimers). Restoration of forested uplands could provide isolated (adjacent) fringe habitat or provide enough density of adjacent forests to support forested interior dwelling species (FIDS). Another upland example would be the potential for stream improvements from the cessation of acid mine drainage. Habitat enhancements adjacent to the proposed option will be considered as positive effects of option development and will be assigned a raw score of +1. If no benefit is to be derived a 0 will be assigned. No -1 condition was identified for this parameter.

Beneficial Use – Faunal Enhancement - Weight: 2

Some options may have the potential to restore or enhance populations of wildlife species of concern. For example, protection of some shoreline areas or isolated islands could have a positive effect on sensitive bird species. Wildlife enhancements within or immediately adjacent to the proposed option will be

considered as positive effects of option development and will be assigned a raw score of +1. If no benefit is to be derived a 0 will be assigned. No -1 condition was identified for this parameter.

Beneficial Use –Recreational Enhancement - *Weight: 2*

Some options may have the potential to create recreational facilities as part of the project. Impacts and improvements to existing recreational facilities are captured under the recreational category. This parameter is established to acknowledge projects that will create recreational opportunities as an integral part of the project plan. Recreational facilities developed as part of the proposed option will be considered as positive effects of option development and will be assigned a raw score of +1. If no benefit is derived a 0 will be assigned. No -1 condition was identified for this parameter.

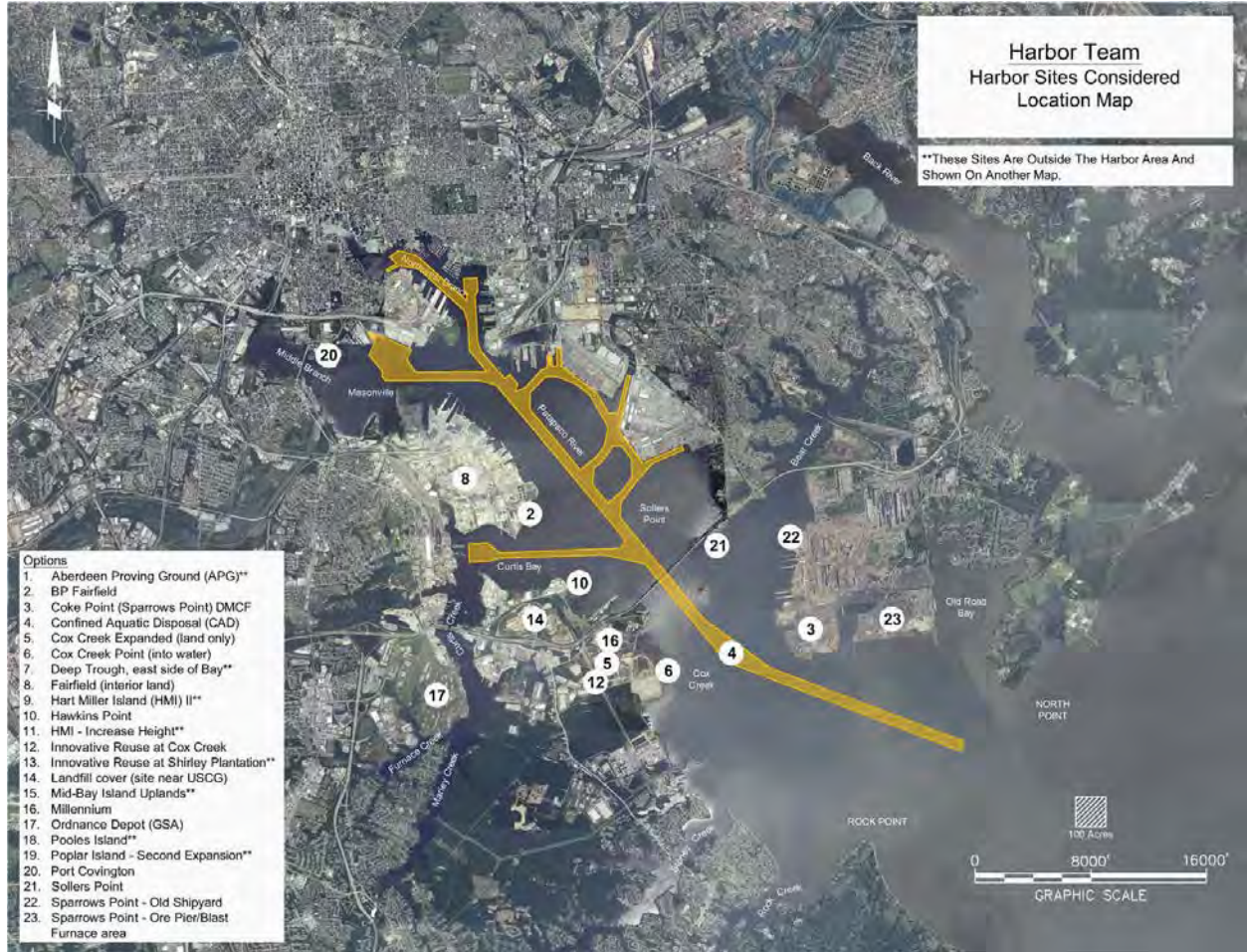
Shoreline Protection - *Weight: 2*

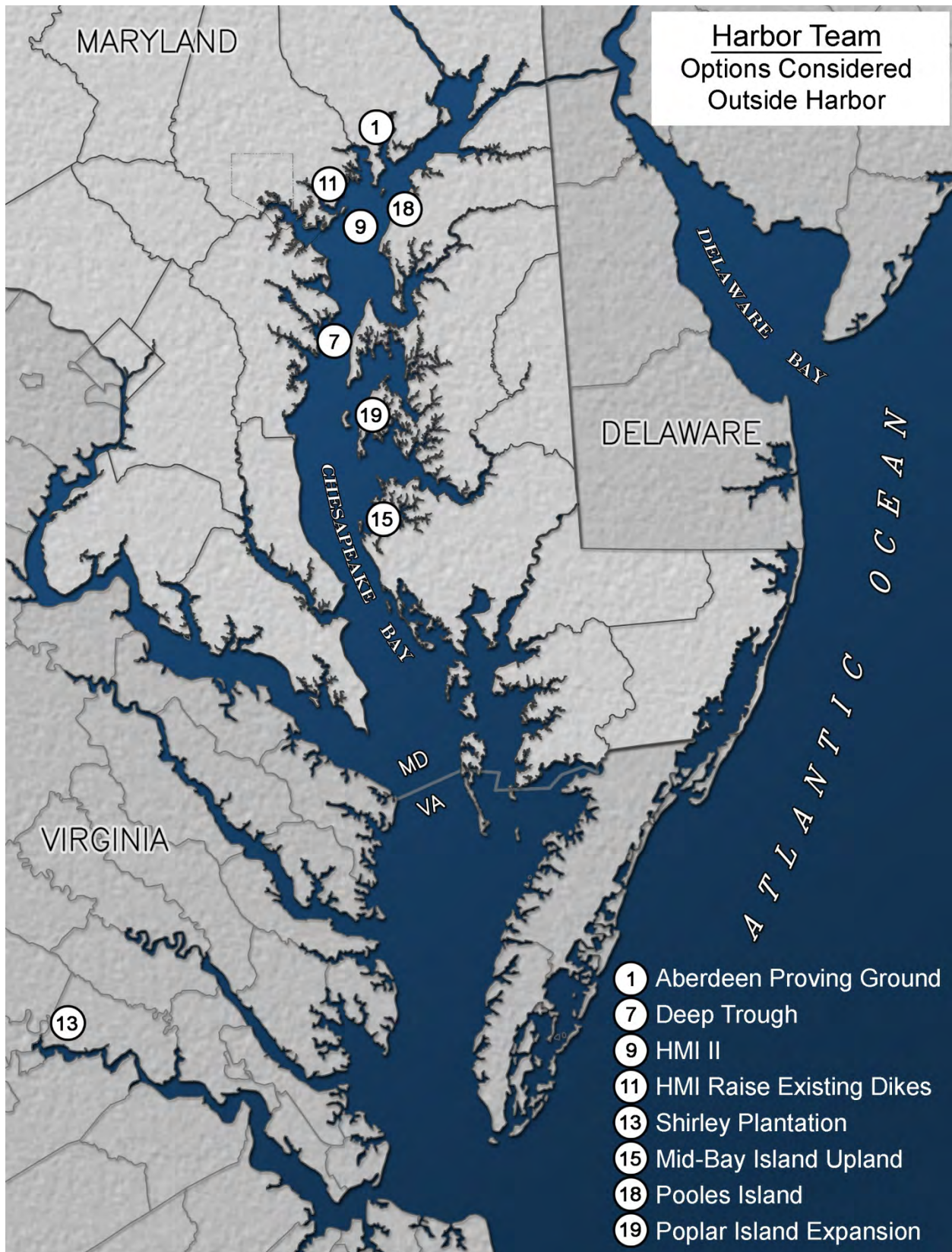
Several options have the potential to provide shoreline stabilization that will protect not only wildlife habitat but also dwellings and other man-made properties/structures. These options may provide a benefit that needs to be measured separately from the protection of natural resources. Shoreline stabilization for protection of property would be considered a positive effect of option development under this parameter, and a +1 will be assigned if it is part of the site design. If the option has no designed shoreline protection value, it will receive a 0. No -1 condition was identified for this parameter. Shoreline stabilization for the purpose of habitat protection and enhancement is considered separately under other parameters.

Beneficial Use – Other – *Weight: 3*

Some options may have the potential to provide a beneficial use other than habitat creation, such as the use of project-related sand or other material as structural fill for construction projects or shoreline stabilization. A variety of potential beneficial uses associated with an option may clearly exist but the specific beneficial use design may not be known at the time of scoring. Options providing a beneficial use not defined by the other beneficial use parameters or that could clearly provide beneficial uses as part of option development but the design is unknown at the time of scoring would be assigned a +1. If no benefit is derived by option development a 0 will be assigned. No -1 condition was identified for this parameter.

Appendix 7 – Options Considered





Appendix 8 – List of Pros and Cons for Options Developed at January 2011 Harbor Team Meeting

HARBOR TEAM COMBINED LIST OF OPTIONS FROM REVIEW OF INITIAL SEED LIST AND BRAINSTORMING JANUARY 19, 2011		
OPTION	PROS	CONS
Aberdeen Proving Ground (APG)	Cost; Convenience; Large waterfront site; Limited impact to residential communities; Ultimately provide a recreational area for local residents??; Public ownership; Possible environmental improvements; Large area; Close proximity to dredging sites; Lower dredging costs; Lower transport costs; Community acceptance; Ultimate solution to eventual problem (unexploded ordnance) resolution;	Unexploded munitions- Large numbers of UXO create future liability issues similar in nature to Superfund Sites, (ie the state, MPA and any contractor working on the project would be liable in perpetuity should UXO be identified after placement of dredged sediment).; Other possible contamination; Difficulty/timeline of negotiating w/federal government (owns property); Impact on valuable wildlife habitat; Out of the Inner Harbor (law); Long way to go with dredge barge from Patapsco; Chemical weapon deposits; Hard sell – relinquishing testing grounds; Community acceptance;
BP Fairfield	Good synergy for future Port use as a potential terminal (transportation and docking facilities available); Convenience; Potentially large site if built into water; Limited impact to residential communities; Close to dredged areas – reduced	Privately owned; Already has a new shipping/rail terminal; Negotiating w/private landowner; Would reduce bottom acreage; Maybe the return on initial investment (preparation) not worth the gain in terms of capacity?;

HARBOR TEAM COMBINED LIST OF OPTIONS FROM REVIEW OF INITIAL SEED LIST AND BRAINSTORMING JANUARY 19, 2011		
OPTION	PROS	CONS
	transportation costs; Ultimately provide jobs and/or recreational opportunities in a so-called distressed area; City/BDC interested in continued redevelopment of the site;	Probable limited capacity unless created in water; If in water, permitting and federal agencies have expressed opposition to future in water placement; Possible lack of adequate acreage for dredge material; Dredge material placement could remove waterfront industrial land from economic development;
Coke Point (Sparrows Point) DMCF	Surrounding community approval; Logical use and an improvement; Adjacent to deep water – ideal location for future marine terminal; Convenience; Constitutes highest and best use of this now vacant land; Potential to speed and improve cleanup of existing contamination; Extensive studies/design work already done by MPA; Large volume; Close to dredged areas – reduced transportation costs; Catalyst for development that will never otherwise happen if left to owners of Mill.; Location on Patapsco; Future Port related job opportunities; 1000+ acres; Lower dredging costs;	Legal-ownership changes; Contaminated; Negotiating w/private landowner; Need to clean up or have landowner clean up contamination; Legislative restrictions on confined disposal w/in 5 miles of HMI (whole site or part of site); Modification of existing legislation required; None; High cost of remediation to state agencies and ultimately taxpayers; Filling in more open water in an area that has previously lost thousands of acres of waterways, creeks and wetlands; Possible short-term detrimental consequences to surrounding waters; Bigger footprint in water – watermen opposition;

HARBOR TEAM COMBINED LIST OF OPTIONS FROM REVIEW OF INITIAL SEED LIST AND BRAINSTORMING JANUARY 19, 2011		
OPTION	PROS	CONS
Confined Aquatic Disposal (CAD)	Should mine and let deep channels fill on its own – this would buy decades of time; I don't understand this well enough to make an assessment. Recommend MPA investigate the pros further; Could start immediately; Relatively inexpensive; Not sure; Convenient; Construction material; Successful in other states/countries with a reasonably documented track record; Large area can be created;	Does not add to MPA terminal space; Concerns about how CADS would be monitored for release/discharge of potential contaminants into surface and groundwater, and how any such releases would be contained/remediated.; Recommend MDE investigate the cons further.; Not sure; Possible short-term detrimental consequences to surrounding waters; Hasn't been done in MD, could be permitting issues; Could be perception problems with the public; Concern about vulnerability to loss of sediments during placement into cell(s) and during consolidation period prior to placing capping material in the cell(s) – effects on nutrient TMDL?; Many questions need to be answered; Fills open water/habitat degradation issues;
Cox Creek Expanded (land only)	Good location for future marine terminal; Convenience of being located adjacent to existing dredge disposal site;	Elimination of a strong site for innovative use projects (has excellent rail and interstate access; Site is built/graded for industrial

HARBOR TEAM COMBINED LIST OF OPTIONS FROM REVIEW OF INITIAL SEED LIST AND BRAINSTORMING JANUARY 19, 2011		
OPTION	PROS	CONS
	Cost--site already owned by MPA; Opportunity for additional community enhancements to protect and improve wildlife habitat in the immediate area; Relatively small volume, but combined with water could be doable.; Economic transit costs for dredged material; Site improvement; Allows expansion of existing site and economies of scale;	development); Potential community opposition because during the MDE/Army Corps permitting process for expansion of existing dredge disposal site, community was told by MPA that the site could not be expanded because of its dike design; Would be extremely high elevation and change the contours of landscape; Site would be adjacent to Constellation's new fly ash landfill -- questions of how acidic dredge material/runoff might interact with fly ash laden w/heavy metals, selenium, etc. and what that impact would be on surface water, groundwater, wetlands, and aquatic life.; Not sure; Community concerns; Fills open water/habitat degradation issues;
Cox Creek Point (into water)	Size of site; Cost; Convenience because of location adjacent to existing dredge disposal site; Relatively small volume, but combined with water could be doable.; Could become a potential terminal at an ideal location; Close to dredged areas – reduced transportation costs; Expand the port outside the Key Bridge with less dredging needed to get to 'deep' water for ships. ;	Loss of open water/aquatic habitat in the Patapsco; Impact on navigational safety-- both commercial and recreational; Potential impacts on mitigated wetlands/Swan Creek conservation area; Potential impacts on Fort Armistead park habitat and view shed; Potential impacts on Fort Carroll historic site/island; Potential impact on oyster bar near Fort Carroll historic site;

HARBOR TEAM COMBINED LIST OF OPTIONS FROM REVIEW OF INITIAL SEED LIST AND BRAINSTORMING JANUARY 19, 2011		
OPTION	PROS	CONS
	Better rail connection via CSX – double stack for containers. (Howard St Tunnel will never get raised / lowered!); Provide work for citizens in Curtis Bay / AA County.; Great highway connections removing trucks from neighborhoods.; Existing site; Potential for reasonably large capacity;	Would reduce bottom acreage; Compared to HMI or Poplar, less natural habitat creation; Permitting and federal agencies have expressed opposition to future in water placement;
Deep Trough, east side of Bay	Convenience; Cost; Perhaps this site may have fewer environmental impacts than upland or shallow water confined disposal sites; Would hold spoil for an extended period; Would increase aerobic bottom acreage; Inexpensive; Not sure; Little or no site preparation; Existing site will still be usable for fishing and crabbing after filling; Previously vetted through the science and permitting communities and found to be generally acceptable; None;	Environmentally unfriendly; Legislative prohibition on open-water dumping - illegal; May ignite unreasoned pushback in Annapolis thereby jeopardizing other slightly less contentious projects; Modification of existing legislation; Use of clean material; Watermen acceptance; Large public opposition in the past; Fills open water/habitat degradation issues; Proposed 8-10 years ago and shelved due to environmental concerns;
Fairfield (interior land)	Logistics; Potentially large area; Little impact on residential communities; Not sure; Probable low capacity; None;	Height limitations; Cannot be a future marine terminal because no water frontage; Negotiating w/multiple private landowners; Potential contamination;

HARBOR TEAM COMBINED LIST OF OPTIONS FROM REVIEW OF INITIAL SEED LIST AND BRAINSTORMING JANUARY 19, 2011		
OPTION	PROS	CONS
		Not sure; Not available?; Ownership of the land; Concerns on limiting expansion of new and/or existing businesses; Likely no parcel large enough for dredge material;
Hart Miller Island (HMI) II – between HMI and SSW of Pooles Island	Convenience; Cost; Large area; Could mirror success of existing HMI. Proven success for community and habitat restoration; Future needs met; Possible beneficial uses; Site could be anchor for second Bay Bridge; HMI I experience – cost savings; Destination for recreational activities; Commercial applications; Allows further expansion of the habitat sanctuary created by Hart Miller I; Recreation, habitat, and Bay benefits substantial;	Filling open waters – need law to be changed; Legislative restrictions on confined disposal w/in 5 miles of HMI; Legislative and Army Corps stipulations that any future island construction be a beneficial use, which generally means that it needs to be a restoration of a previously existing island.; Likely strong opposition from the Baltimore County waterfront communities nearest to the island.; Outside harbor limits; Longer transit distance than other options – relatively expensive; Does not allow for the port to expand its footprint or move from neighborhoods; Fishing ground loss; Too close to existing HMI; Permitting and federal agencies have expressed opposition to future in water placement, island creation in the upper Bay was opposed by permitting agencies and fishing groups (?) in the past;

HARBOR TEAM COMBINED LIST OF OPTIONS FROM REVIEW OF INITIAL SEED LIST AND BRAINSTORMING JANUARY 19, 2011		
OPTION	PROS	CONS
Hawkins Point	Cost; Convenience; It could be combined with Cox Creek; Close to dredged areas – reduced transportation costs; Could become a potential terminal; Not sure; Sites selected may or may not have adequate capacity compared to dike construction;	If this is Thom's Cove, loss of designated habitat protect area; Loss of natural shoreline along the Patapsco; Impact to aquatic and waterfowl life; If in the water: loss of open water/shallow water habitat.; If this is W.R. Grace property, difficult of negotiating w/private landowner; Regulatory issues related to federal FUSRAP clean-up of thorium contamination; High existing elevation of site; Not sure; Environmental concerns and more filling of Baltimore Harbor;
HMI – Increase Height	Most economical alternative; Cost; convenience; Perhaps this site may have fewer environmental impacts than upland or shallow water confined disposal sites; Wouldn't be noticeable; Proven success for community and habitat restoration; Has the least environmental impacts of all the options; Allows further expansion of the habitat sanctuary created by Hart Miller #1; Recreation, habitat, and Bay benefits substantial;	Local community resistance; Increased height may not be desirable; Need to change law; Legislative prohibition – it is closed; Strong community opposition; Destruction of previous restoration efforts/what has become good avian habitat; May disturb recreational activity already existing; Relatively expensive for dredge material transit; Does not allow for the port to expand its footprint or move from neighborhoods.;

HARBOR TEAM COMBINED LIST OF OPTIONS FROM REVIEW OF INITIAL SEED LIST AND BRAINSTORMING JANUARY 19, 2011		
OPTION	PROS	CONS
		Existing 5 mile limit impact; Band-aid on long term solution; Community acceptance; No commercialization permitted; Doesn't need elaboration;
Innovative Reuse at Cox Creek	Would eliminate need for future DMCFs; Strong support of Harbor Team; Potentially a very long useful life; Potential to create jobs for local residents; Positive for reuse work; OK in principal; Future requirements for innovative reuse met; Not sure how this differs from current operations, procedures, plans; Reuse of any kind has the highest recommendation;	Currently not economical vs. DMCF; Potential traffic impact/diesel air pollution impact on Anne Arundel residents living along or near Fort Smallwood Road; Will the end product even be economically sustainable and throughput keeps up with annual dredging requirement or even a percentage of it?; None;
Innovative Reuse at Shirley Plantation	Would eliminate need for future DMCFs; Potentially large volume; Positive for reuse work; OK in principal;	Currently not economical vs. DMCF; Questions about whether this site really can accept large volumes of dredge material; Too distant - high transportation costs; Not certain that a viable product will result;
Landfill cover (site near USCG) This is QUARANTINE ROAD LANDFILL, it is located at least a mile from the USCG.	Large area; Limited volume; Local use; Transportation reasonably	Negotiating with the City of Baltimore/timeline; I believe the landfill is still actively receiving household

HARBOR TEAM COMBINED LIST OF OPTIONS FROM REVIEW OF INITIAL SEED LIST AND BRAINSTORMING JANUARY 19, 2011		
OPTION	PROS	CONS
	inexpensive; OK in principal; Convenient; Must fit with the City's Solid Waste Master Plan, policies, and logistics;	waste; Impact on methane supply and pipeline that is used to fuel the U.S. Coast Guard's new power plant; Environmental considerations related to mixing household waste w/dredge material; Elevation of the site is already very high; I do not believe the site has waterfront access; Enough capacity?; Will throughput keep up with annual dredging requirement or even a percentage of it?; Landfill is, I believe, no longer operational, thus question need for cover; Fill is being "mined" for methane; Logistics and timing of coverage/booms/dredge pipes and pumps could be difficult;
Mid-Bay Island Uplands – This is James Island restoration.	Strong community support; Potentially large size; Restoration project always good; Create wildlife habitat; Restoration of eroded islands; Shoreline protection; OK if environmental restoration and habitat creation are the main components of dredge fill;	Too distant – high cost of transporting dredge material; Inner Harbor material; Does not allow for the port to expand its footprint or move from neighborhoods; Environmental degradation/habitat loss;
Millennium	Economically located and future Port potential; Potentially medium to large size	Probably would meet with community resistance; Difficulty/timeline of negotiating

HARBOR TEAM COMBINED LIST OF OPTIONS FROM REVIEW OF INITIAL SEED LIST AND BRAINSTORMING JANUARY 19, 2011		
OPTION	PROS	CONS
	depending on design; Proximity to existing Cox Creek dredge disposal site; Not sure; Close to water;	with private landowner; Contamination; Cost of demolition of many industrial buildings, including power plant and water treatment facility; Impact on Fort Armistead Park and related woodlands/wetlands; City of Baltimore's land use vision for the site; Not sure; Believe that the property has just been sold, new buyer may not be favorably inclined; May be difficult as the City needs to expand the Quarantine Road Landfill-will reduce the size of what is available for those expansions.;
Ordnance Depot (GSA)	Would offer advantages to both Fed and local government. Logical and economically located. Large area; Not sure; Seems isolated; Provides cap for likely contaminated site and possible habitat restoration / recreational use for the community.;	Possible community resistance; Large impact on Glen Burnie residential communities across the creek--and likely strong community opposition because a dredge disposal site does not mesh with their or Anne Arundel County's land-use vision for that site/their community; Potential impact on water quality and aquatic habitat of Curtis, Furnace, Marley Creeks, potential contamination (thorium at site), Difficulty/timeline of negotiating with the federal government; Site is pretty far upstream in the creek system so dredging

HARBOR TEAM COMBINED LIST OF OPTIONS FROM REVIEW OF INITIAL SEED LIST AND BRAINSTORMING JANUARY 19, 2011		
OPTION	PROS	CONS
		operations may pose navigational hazard to recreational, USCG watercraft ; Not sure; Federal property;
Pooles Island	Distant to residential areas Future wildlife sanctuary(?); Cost; Convenience; Restoration project; Create wildlife habitat; Prior usage – this could be an extension; OK if environmental restoration and habitat creation are main components of dredge fill;	For both artificial island and open water dumping: legislative restrictions; Impact on aquatic life; Likely opposition from recreational and commercial fishermen; Inner Harbor material; Unexploded ordnance in the area; Relatively expensive for dredge material transit; Does not allow for the port to expand its footprint or move from neighborhoods; No apparent community opposition; Within APG boundary with similar UXO issues to uplands; Likely to be significant opposition from the fishing community; None;
Poplar Island – Second Expansion	Logical use and ease of implementation; Probably no community resistance; Cost; Convenience; Create wildlife habitat; Environmental benefit; Build on success of initial and first expansion; Preservation of islands;	Environmental issues with contaminated Harbor dredge material; Likely community opposition; Legislative restrictions for use of Harbor dredged material in unconfined areas such as wetlands; Too distant – high cost of transporting dredge material; Does not allow for the port to

HARBOR TEAM COMBINED LIST OF OPTIONS FROM REVIEW OF INITIAL SEED LIST AND BRAINSTORMING JANUARY 19, 2011		
OPTION	PROS	CONS
	Educational, recreational, commercial possibilities; OK if environmental restoration and habitat creation are main components of dredge fill;	expand its footprint or move from neighborhoods; Community acceptance; Original island concept was to restore to mid-1880's acreage, further expansion would greatly exceed that size.; Federal agencies are not inclined to approve additional usurpation of natural bay bottom habitat; Environmental degradation/ habitat loss;
Port Covington	Deep-water location once prized by the port; Contamination issues mainly resolved; Currently underutilized tract of land; Reasonable capacity if fill in slips; Infrastructure (I-95, rail, etc.) already in place – contiguous with existing marine terminals (Tyco / SSLP).; Not disturbing residential neighborhoods; None;	Probable community resistance; Not industrial land use; Not as large as some sites; Difficulty of negotiating with private landowner; Dooms potential use as terminal; May need more fast land to marshal freight and trucks – Sunpaper property would mitigate this problem; The Baltimore City Port Covington Masterplan and Urban Renewal Plan redefined the zoning for that area as mixed use and mixed use residential. Port Covington and the Middle Branch will be Baltimore City's next big development areas, bringing new residents into the City and providing increased economic activities. ;
Sollers Point	Convenience; MPA has done considerable site evaluation/design work; Fairly large area; Limited population; Close to dredged areas – reduced transportation costs;	Community resistance likely; Environmental justice issues; Possibly limited size; Some designs involve construction in open water which would lead to loss of open water; Would reduce bottom acreage;

HARBOR TEAM COMBINED LIST OF OPTIONS FROM REVIEW OF INITIAL SEED LIST AND BRAINSTORMING JANUARY 19, 2011		
OPTION	PROS	CONS
	Not sure; Best location; Possible future community, marina, shops, etc.; Possible marine terminal expansion; Economic development;	Not sure; Land ownership challenges; Access;
Sparrows Point – Old Shipyard	Logistics for dredging more economical than other options; Future use potential for port or other industry; Minimal local public resistance; If combined w/Coke Point, may create an even bigger dredge disposal site; May help to address environmental cleanup concerns more rapidly than current landowner; Catalyst for development industrial or recreational that will never otherwise happen if left to owners of Mill; ?; Very large site-adequate room for material for many years;	Contamination issues; Potential difficulty in negotiating w/ landowner; Some litigation issues between Sparrows Point Shipyard LLC and Severstal/steel plant owner; Value of a shipyard site to MPA; May impact use as marine terminal; Community concern (Bear Creek neighborhoods); Sediment contamination issues may be difficult to overcome; Legal / ownership/ financial issues;

Sparrows Point – Ore Pier/Blast Furnace area	Logistics for dredging more economical than other options; Future use potential for port or other industry; Minimal local public resistance; Acceptable site; Catalyst for development industrial or recreational that will never otherwise happen if left to owners of Mill; Very large site-adequate room for material for many years;	Likely strong community/union opposition; Baltimore County's land use vision for the site; Plus all of the other cons associated with Coke Point.; Privately owned with possible uses internally; None; Not available; Needed for import of raw materials for steelmaking; Basic steelmaking would need to cease; Water footprint – watermen acceptance; Legal / ownership/ financial issues;
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NOTES:

1. Dead Ship Anchorage and Thoms Cove excluded because they are Designated Habitat Protection Areas (DHPAs) under the City of Baltimore's Critical Area Management Plan.
2. Hog Neck, Ft. Howard, Patapsco Ponds, Key Bridge Southwest and Key Bridge Pilings Containment Facility excluded as potential placement options because they were intended to be small capacity, beneficial use sites. Some or all of these sites may be considered later for potential mitigation projects, beneficial use projects and/or community enhancement projects.

Appendix 9 – Summary of February 17, 2011, Harbor Team Meeting

**Meeting Summary for the Harbor Team Meeting
February 17, 2011; 5:30 to 8:00 pm
Point Breeze Conference Room
Baltimore, MD**

Meeting Attendees:

Advocate of Bear Creek: William Pribyl
Anne Arundel County Department of Public Works: Ron Bowen
Baltimore City: Gary Letteron
Baltimore County Department of Environmental Protection and Sustainability: David Riter
Baltimore County Department of Planning: Jay Doyle
Baltimore County Parks and Recreation: Neil Magness
Baltimore Port Alliance: Rupert Denney
Blue Water Baltimore: Phil Lee
Cristal Global (Millennium): Adam Panarese
Dredged Material Management Program Citizens Advisory Committee (DMMP CAC):
 Fran Flanigan
Dundalk Renaissance Corp: Amy Menzer
EA Engineering, Inc. (EA): Peggy Derrick
EcoLogix Group: Chris Correale
EPA Region III: Renee Searfoss
Gahagan and Bryant Associates (GBA): Carter Stinchcomb
Greater Dundalk Alliance: Russell Donnelly
Greater Dundalk Community Council: Thomas Kroen
Johns Hopkins Center for Urban Environmental Health: Michael Trush
Living Classrooms Foundation: Lorraine Andrews Warnick
Maryland Department of the Environment (MDE): Matt Rowe
Maryland Environmental Service (MES): Lauren Franke, Melissa Slatnick
Maryland Geological Survey (MGS): Jeff Halka
Maryland Port Administration (MPA): Frank Hamons, John Vasina, Steve Storms, Dave
 Bibo, Katrina Jones, Bill Lear, Nat Brown
Moffatt and Nichol (M&N): Kristen Piggott
National Aquarium in Baltimore: David Nemerson
North Point Peninsula Community Council: Francis Taylor, Harry Wujek
OA Systems: Doug Thompson, Norman Francingues, Blaine Leidy
Phoenix Engineering: George Harman
Severstal: Russ Becker
Stanbrook-Eastfield Community: Patricia Paul
Turner Station: Gloria Nelson
University of Maryland Center for Environmental Science: Elizabeth Price
US Army Corps of Engineers Baltimore District: Bob Blama

2/17/11 Action Items:

- The technical team will begin preparing fact sheets on the sites recommended by the Harbor Team for further study at tonight's meeting.

Welcome and Introductions

Chris Correale, EcoLogix

Ms. Correale welcomed the attendees and all those present introduced themselves.

Administrative Matters

Chris Correale, EcoLogix

The Harbor Team was provided a draft of the January 19th meeting summary for review. The group accepted the draft as written. The final meeting summary of the January 19th meeting will be provided to the team at the March 17th meeting.

Review of Harbor Options Maps

Dan Wilson, Wilson Engineering

Mr. Wilson provided an updated Land Use Screening Tool map of the Harbor and an additional map that indicates the options outside of the Harbor; there is a total of 23 options previously identified by the Harbor Team. Mr. Wilson reminded the team that a boundary was placed around the Harbor for screening potential placement options that indicates a 1.5 mile radius and 15 ft water depth; this boundary indicates a reasonable distance and depth to pump dredged material without potential ownership issues or logistical concerns.

Compiled Pros and Cons of Harbor Options

Chris Correale, EcoLogix

Ms. Correale thanked those Harbor Team members who submitted pros and cons on the list of Harbor options. Ms. Correale stated that the goal for tonight's meeting is for the Harbor Team to review the pros and cons list and allow any additional comments, followed by a vote on what options will be carried forward to the technical team for fact sheet preparation. Ms. Correale noted that currently, there is not a limit as to the number of options that can move forward. She informed the Harbor Team that she had not made any changes to the submissions of pros and cons with the exception of placing an item on the list only once if that item was submitted by multiple members, for readability purposes.

Each organization on the Harbor Team will vote yes or no for each option to move forward for fact sheet preparation. Consultants, MPA staff, and regulatory agencies are not eligible to vote, but are in attendance as an information resource. Mr. Pribyl suggested that the consultants and agencies be allowed to vote on the options because of their expertise. Mr. Rowe stated that he believes it is appropriate for the consultants and agencies to abstain from voting as their presence is more for technical support to the Harbor Team. Mr. Hamons agreed and stated that these groups are in attendance as a resource.

Mr. Taylor stated that the item "community acceptance" could be interpreted as either a pro or a con. Ms. Correale agreed and stated that the Harbor Team may need to make some assumptions;

where this item appears on the list it is likely in reference to acceptance by the community where the option is located. Mr. Wujek added that a similar issue with the item “cost” could be present; it is not specified in this list which type of costs this refers to.

Ms. Correale stated that the consultants will take the list from tonight’s meeting and prepare fact sheets that contain such information as capacities, costs, potential alignments, and environmental and community impacts. Ms. Correale reiterated that the purpose of the meeting is not to pick an option, but rather chose an option for further analysis. Mr. Becker asked if any of these options had gone through a fatal flaw analysis; Ms. Correale responded that they had not. Mr. Becker suggested having this information before tonight’s voting begins.

Mr. Letteron stated that Baltimore City would not be in support of an in-water placement option. Mr. Letteron also strongly recommended that the team be provided with detailed information on each of the sites to allow for committee members to make a more educated decision.

Mr. Donnelly stated that he believes there should be more analysis of the 23 options before voting begins. Mr. Denney agreed and stated that the temptation may exist to vote for everything, considering that the number of areas for dredged material placement is becoming limited. He added that a potential problem is that options may not be chosen as a result of a lack of information. Mr. Wujek suggested screening out smaller sites and moving forward those sites with the greatest capacities; Mr. Donnelly agreed. Mr. Wilson stated that there has not yet been any detailed engineering analysis on capacity of these options; this and other information will be developed for those sites that are selected tonight.

Mr. Halka suggested that it may be beneficial for the resource agencies and consultants to provide any information about the 23 sites that would assist the Harbor Team in voting on which sites to move forward for fact sheet preparation. Ms. Menzer agreed that this would be helpful to the process. Mr. Hamons agreed and added that even though the Harbor Team is starting this process with less information, the purpose is to determine what the stakeholders are willing to consider for placement options. He reiterated that the purpose of tonight’s voting is not to pick the placement option but rather recommend options for more information and that this is the same process that was followed when Sparrows Point was ultimately chosen as an option for MPA to pursue.

Dr. Trush suggested preliminary screening criteria such as costs, community opposition, etc. Mr. Kroen stated that tonight’s voting should focus on if an option is viable and not solely based on screening criteria such as cost effectiveness or community acceptance as these items may not necessarily help to determine the best options for consideration. He added that after tonight’s voting, further investigation into those options would be provided, as was done in the past.

Ms. Correale stated that it is up to the Harbor Team to decide if they are comfortable with voting on these options at tonight’s meeting and reminded the group that this process has been laid out in order to progress towards making a recommendation to MPA by June 2011. The Harbor Team agreed that tonight’s voting process would be more effective if the consultants and resource agency staff provide any relevant information on these options. After which, the Harbor Team will vote on which sites to send to the technical team for fact sheet preparation.

Aberdeen Proving Grounds- Mr. Halka stated that there would likely be significant cleanup costs associated with this option; access for barges will be limited to nights and weekends due to the site being an active firing range, and the water is shallow. Mr. Halka added that the US Army is has previously opposed such a project at APG. The Harbor Team voted to remove this option from further study.

BP Fairfield- Mr. Wilson stated that approximately 40 acres of this property has been purchased and is being developed as a terminal; the remaining capacity would be in the water. He added that the capacity of this site would be approximately 8 million cubic yards (mcy) and that the dikes may be difficult to construct due to the presence of fairly deep soft sediments. Mr. Wilson stated that an in-water option would also restrict water access by the private land owner.

Mr. Donnelly stated that he recalls from the Masonville effort that regulators would be opposed to an in-water placement option. Mr. Halka stated that it would likely be difficult to site another in-water placement option. Mr. Rowe added that if an in-water placement option were approved by regulators, mitigation for the site would be expensive. The Harbor Team voted to remove this option from further study.

Coke Point at Sparrows Point- the Harbor Team continues to support an MPA project on Coke Point.

Confined Aquatic Disposal (CAD) – Mr. Storms stated that an issue with the CAD option is that it may be perceived as similar to open water placement. Mr. Wilson added that CAD has a high capacity potential with a relatively low cost. The Harbor Team voted to retain this option for further study.

Cox Creek expanded (Upland) - Mr. Rowe stated that plans for use of Cox Creek as the site of Innovative Reuse may conflict with this option; Mr. Donnelly agreed. Mr. Stinchcomb stated that this option may provide about 8 mcy of capacity. The Harbor Team voted to retain this option for further study.

Cox Creek Point (In-water) - Ms. Derrick stated that this option presents the same issue with the taking of open water habitat. Ms. Slatnick added that water access from the landside may be limited by this option. The Harbor Team voted to remove this option from further study.

Deep Trough- Mr. Kroen stated that the largest roadblock to this option in the past has been political; Mr. Hamons agreed. Mr. Halka added that there are viable arguments in the scientific community that would suggest that this is a reasonable option. Mr. Denney stated that since this option has been so politically contentious in the past, it may be best to not move it forward at the risk of jeopardizing the environmentally beneficial work that MPA has accomplished on projects such as Poplar Island, Hart-Miller Island, and Masonville. However, he added, since there is much pride taken in these projects, it may also work in MPA's favor to help move this option forward for consideration.

Mr. Donnelly asked what the community benefit of filling in the Deep Trough would be; consultants agreed that the benefit of placement in the Deep Trough would be not having to place a site that would take open water habitat in other areas of the Harbor or Bay. Ms. Derrick reminded the committee that when this option was previously considered, it was considered for placement of Upper Bay material and not Harbor material. The Harbor Team voted to retain this option for further study.

Fairfield Interior Land- Mr. Wilson stated that the potential capacity depends on how much of the area can be obtained from the current landowners. Visual impacts may also be a concern at this site. Mr. Letteron stated that the nearby cove is a Designated Habitat Protection Area. The Harbor Team voted to retain this option for further study.

HMI II- Mr. Halka stated that the issue of taking open water exists with this option as removing viable habitat in shallow water would be likely. Mr. Wilson stated that the site location is within the 5-mile radius of HMI; the law against the placement of dredged material within this radius would need to be changed. Ms. Piggott stated that in terms of hydrodynamics, placing a second island in this area would affect the tidal flow of Back River and disturb the sediments. The Harbor Team voted to retain this option for further study.

Hawkins Point- Mr. Wilson stated that the site area is approximately 18 acres at the existing DMCF; therefore, the total capacity is very small if land placement is the only option. Mr. Wilson added that the adjacent Thoms Cove is a Designated Habitat Protection Area. Mr. Letteron stated that the site location is within the Baltimore City boundary; therefore an in-water option would not be supported by the City. Mr. Donnelly stated that there are significant amounts of contamination from the existing Hawkins Point Landfill. Mr. Rowe suggested that the landfill could be capped; however, further study would be required. The Harbor Team voted to remove this option from further study.

HMI, increased dike height- Mr. Wilson stated that there is extensive capacity for this option and that it is cost-effective. The committee noted that this option includes a broken political promise. The Harbor Team voted to remove this option from further study.

Innovative Reuse at Cox Creek- The committee supports the development of this and other Innovative Reuse options.

Innovative Reuse at Shirley Plantation- The committee noted that the taxpayers would be supplying costs for the transportation of the dredged material.

Landfill cover at Quarantine Road (IR) – Mr. Letteron stated that there are currently a few issues with the landfill; EPA is in contact with Baltimore City regarding these issues. Mr. Wilson noted that the site capacity is fairly limited. Mr. Lee questioned why this site is differentiated from other Innovative Reuse options; landfill cover is a general reuse for dredged material. The Harbor Team voted to retain this option for further study as part of Innovative Reuse.

Mid-Bay Uplands- Mr. Wilson stated that the support of the surrounding communities should be considered as this option would involve the placement of Harbor material at the Mid-Bay

Islands. He added that the distance to transport Harbor dredged material to this site may be cost-prohibitive. Mr. Wilson stated that the site capacity is about 1,000 acres of upland. This option would also put Harbor material placement in competition with placement of material outside of the Harbor. Ms. Menzer suggested that this option could be a stop-gap measure if another option for placement of Harbor material is not identified soon enough. Mr. Wilson stated that placement of dredged material from channels not previously authorized for placement at this option would have to be authorized by Congress. The Harbor Team voted to remove this option from further study.

Millennium Property- Mr. Hamons stated that this option may serve dual purposes: a site for dredged material placement and the opportunity for clean up, since there are some existing contamination issues; Mr. Rowe agreed. Ms. Searfoss questioned if Brownfields redevelopment funds could be used. Mr. Hamons responded that such assistance was not obtained for Masonville but that the MPA is certainly interested in funding assistance, where applicable. Mr. Panarese noted that there is a 3 million gallons per day waste water treatment plant on site that could aid in dewatering dredged material. Mr. Harman added that the site is also located adjacent to Cox Creek, which provides the potential for expansion. The Harbor Team voted to retain this option for further study.

Ordinance Depot- Mr. Bowen stated there is recent indication of development potential on this site for commercial uses. He added that the site also has rail lines that access the property. Mr. Wilson stated that this option has the potential for a substantial amount of capacity. The Harbor Team voted to retain this option for further study.

Pooles Island- Mr. Wilson stated that the site was recently legally closed as an open water placement option. Mr. Halka added that if this site is an island project, open water habitat would be taken and if this project were to occur inside of Pooles Island, it should be considered that this is part of APG and would have similar issues as previously discussed.

Mr. Rowe suggested that the committee reconsider open water placement in Maryland before the open water placement sites are eliminated from the list of possible options; Mr. Denney agreed and added that the technical and economic feasibility should be considered before these options are eliminated based solely on the current legality. Ms. Menzer suggested that because of the limited amount of time, that specific sites be considered. Mr. Hamons stated that a distinction needs to be made between the taking of open water habitat and open water placement of dredged material. The Harbor Team voted to remove this option from further study.

Poplar Island 2nd expansion- Mr. Wilson stated that the currently proposed expansion has a capacity of about 28 mcy and is authorized by Congress for placement of Bay material and dredged material from the C&D Canal Approaches at a rate of 3.2 mcy per year; authorization for Harbor material placement would be needed. He added that this site should be online within the next 5 years. Mr. Hamons stated that the committee should consider that a 2nd additional expansion of Poplar Island would significantly interrupt the existing productive oyster beds. Ms. Derrick stated that when the current expansion was developed, it was designed within the existing environmental constraints for the maximum footprint without further degradation of environmental resources. The Harbor Team voted to remove this option from further study.

Port Covington- Mr. Letteron stated that this site is zoned as mixed-use residential. Ms. Menzer asked if residential development could occur after placement of dredged material. Mr. Letteron responded that he believed the material would have to meet residential use standards. Mr. Wilson noted that the capacity is relatively small. Mr. Denney noted that this option has deepwater access, which is becoming a limited asset in the Harbor and cautioned against removing this option too quickly. The Harbor Team voted to remove this option from further study.

Sollers Point- Ms. Menzer noted that there is a lot of community opposition to this option; Ms. Nelson and Mr. Doyle agreed. The Harbor Team voted to remove this option for further study.

Sparrows Point Old Shipyard- Mr. Donnelly stated that currently this option on the Land Use Screening Tool map indicates Lloyd's Point rather than the Old Shipyard. Mr. Wilson stated that this area is less than 100 acres so there is not significant capacity at this site.

Mr. Becker questioned if there has been any thought given to filling the entire shipyard of Sparrows Point. Ms. Correale responded that this has not been evaluated. Some committee members abstained from voting and expressed that they do not believe they have adequate information to vote at this time. The Harbor Team voted to remove this option from further study.

Sparrows Point Ore Pier/Blast Furnace area - Mr. Donnelly stated that there may be ownership issues regarding this portion of the Sparrows Point property. Mr. Becker added that this option would entail shutting down operations at the steel mill and therefore is not a viable option. Mr. Denney stated that this assumes that the steel mill will continue in business. The Harbor Team voted to remove this option from further study.

The Harbor Team voted to move forward a total of eleven options for further study and fact sheet preparation by the technical team. These options are:

- Coke Point (Sparrows Point) DMCF
- Confined Aquatic Disposal (CAD)
- Cox Creek Expanded (Upland only)
- Deep Trough – East Side of Bay
- Fairfield (Interior)
- Hart-Miller Island II
- Innovative Reuse at Cox Creek
- Innovative Reuse at Shirley Plantation
- Landfill Cover at Quarantine Road (Innovative Reuse)
- Millennium
- Ordnance Depot (GSA)

Other Items for Discussion

The meeting was adjourned at 8:00 pm. The next meeting is scheduled for March 17th at the Point Breeze Center, 2200 Broening Highway.