FINAL

Appendix F – Alternative Development and Comparison

For the Feasibility Study of Rebuild by Design Meadowlands Flood Protection Project

May 2021



Boroughs of Little Ferry, Moonachie, Carlstadt, and Teterboro and the Township of South Hackensack, Bergen County, New Jersey

REBUILD BY DESIGN
MEADOWLANDS

Prepared by AECOM for the State of New Jersey Department of Environmental Protection

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Acronyms

BCR	Benefit to Cost Ratio
CAG	Citizen Advisory Group
CDBG-DR	Community Development Block Grant - Disaster Recovery
ESC	Executive Steering Committee
FR	Federal Register
HUD	Department of Housing and Urban Development
LMI	Low-and-moderate income
MRI	Marsh Resources, Inc.
NJDEP	New Jersey Department of Environmental Protection
RBD	Rebuild by Design

1.0 Introduction

This Appendix summarizes the development and screening process used to select the optimized plans for Alternative 1 that would provide protection from tidal/storm surge flooding in the Project Area and for Alternative 2 that would provide improvements to storm water drainage to reduce flooding from precipitation events.

2.0 Background

2.1 Description of the Proposed Project

In the summer of 2013, the Department of Housing and Urban Development (HUD) launched the Rebuild by Design (RBD) competition (July 29, 2013; 78 *Federal Register* [FR] 45551) to develop ideas to improve the physical, ecological, economic, and social resilience of regions affected by Hurricane Sandy. The competition sought to promote innovation by developing flexible solutions that would increase regional resilience. The Proposed Project was chosen as a winning concept and was developed with a primary goal of reducing flood risk in the Project Area (as described in **Section 2.2**). HUD allocated $150 million of Community Development Block Grant – Disaster Recovery (CDBG-DR) funding to the State of New Jersey for the planning, design, and implementation of the Proposed Project.

The RBD award-winning concept took a multi-faceted approach to address flooding from major storm surges and high tides, as well as from heavy rainfall events. The concept's integrated approach consisted of three components: *Protect, Connect, and Grow*.

1) **Protect.** Flood protection would be provided through a combination of hard infrastructure and soft landscaping features that act as barriers during high tide and/or storm surge events. The structures would be complemented with freshwater basins and expanded Meadowlands wetlands to increase flood storage capacity. A proposed "Meadowpark," a natural reserve, would offer additional flood protection and connection of surrounding developments to the Meadowlands.

2) **Connect.** Increased connectivity among Meadowlands District towns would be provided with a "Meadowband" (multi-use levee) that would include a new local street, recreational facilities, and a Bus Rapid Transit line that would provide improved connectivity and access within the Project Area.

3) **Grow.** Through improved flood control, an ancillary benefit of re-zoning and up-zoning newly protected areas could be realized. As a result of re-zoning, the local development pattern could transform from lower density, suburban-type development to a denser and better planned, multi-functional, and multi-level mixed use of industrial, commercial, and residential development.

Early in the planning process, the New Jersey Department of Environmental Protection (NJDEP) determined that the Proposed Project, in application, would focus primarily on reducing flood risk within the Project Area (e.g., the "Protect" component of the "Protect, Connect, Grow" concept), primarily due to the amount of CDBG-DR funding available, but also based on input provided by the public during key stakeholder meetings. As such, the Proposed Project focuses on providing an increased level of flood protection to the Project Area.

2.2 Description of the Project Area

The $150 million in CDBG-DR funding that HUD awarded to the State of New Jersey was specifically for the "Phase 1 Pilot Area," now referred to as the Project Area. The Project Area, a part of both the larger New York metropolitan area and the New Jersey Meadowlands District, includes the Boroughs of Little Ferry, Moonachie, Carlstadt, and Teterboro, as well as the Township of South Hackensack, all located in Bergen County, New Jersey. The 5,405-acre Project Area has the following approximate boundaries: the Hackensack River to the east; Paterson Plank Road (State Route 120) and the southern boundary of the Borough of Carlstadt to the South; State Route 17 to the west; and Interstate 80 (I-80) and the northern boundary of the Borough of Little Ferry to the north.

The Proposed Project is located within the Meadowlands District, which is an essential component of the New York/New Jersey Harbor Estuary and part of the largest wetland ecosystem in northern New Jersey (USFWS 1997). The Meadowlands District is located in a valley between the Palisades to the east and a parallel western ridge, both of which run in a southwest to northeast direction (NJSEA 2004). Elevations of the Meadowlands range from 0 to 10 feet above sea level (NAVD 88) (MERI 2014). The area is prone to chronic flooding due to the nature of the landscape, elevation above sea level, complexity of tidal influence, and inadequate stormwater management systems (NJSEA 2004). The majority of the Project Area (greater than 90 percent) is located within the 100-year floodplain of the Hackensack River.

The Project Area is comprised of both relatively dense suburban development and large natural areas. Residential areas are clustered mostly in the northeastern portion of the Project Area in the Borough of Little Ferry, eastern Borough of Moonachie, and the Township of South Hackensack. Approximately 22,400 people reside in the five municipalities that comprise the Project Area; the largest economic sector employing these residents includes educational services, health care, and social assistance services. Industrial and commercial land uses are concentrated primarily in the southern portion of the Project Area in the Boroughs of Carlstadt and Moonachie, and the Township of South Hackensack. Teterboro Airport and additional, primarily airport-related, industrial and commercial areas encompass much of the northwestern portion of the Project Area. Due to its proximity to New York City, the Project Area hosts a variety of businesses and warehouses that support the supply chain to New York City, located approximately 10 miles to the east.

The population of the Project Area is generally in the middle class, and has employment rates resembling those of Bergen County and New Jersey. Low-and-moderate income (LMI) persons are present in the Project Area, with the Borough of Little Ferry having the highest percentage of LMI persons at 42.9 percent, followed closely by the Borough of Moonachie at 40.1 percent. The Township of South Hackensack has the lowest percentage of LMI persons at 29 percent. Poverty rates within the municipalities in the Project Area from highest to lowest are as follows: Borough of Teterboro (16.1 percent), Township of South Hackensack (8.2 percent), Borough of Little Ferry (8.0 percent), Borough of Carlstadt (6.8 percent), and Borough of Moonachie (6.6 percent) (US Census Bureau 2014).

The southern and eastern portions of the Project Area, including portions of the Borough of Carlstadt, the Township of South Hackensack, and the Borough of Little Ferry, are largely dominated by wetlands associated with the Hackensack River, including the Marsh Resources, Inc. (MRI) Wetland Mitigation Bank and the Richard P. Kane Natural Areas and Wetland Mitigation Bank. These wetland-dominated areas include approximately 1,200 acres, or approximately 20 percent of the Project Area.

Historically, the Meadowlands District contained approximately 17,000 acres of waters and pristine wetlands; however, only an estimated 8,400 acres remain as a result of decades of human activity, including extensive land use changes and the creation of large areas of impervious surfaces (USFWS

1997, NJSEA 2004). In addition, the historical construction of dikes and tide gates—in an attempt to control and reduce flooding events—has affected the integrity and spatial configuration of the Meadowlands District and altered its biodiversity (NJSEA 2004). Despite its developed nature, the Meadowlands District provides an oasis of diverse habitats for plants and wildlife in the urban New York/New Jersey metropolitan region (USFWS 1997, NJSEA 2004).

Approximately 8,600 acres of the former wetlands, as noted above, have been developed and altered by human activity, including extensive land use and land cover changes, and the creation of large areas of impervious surfaces. As a result of these man-made changes throughout the Meadowlands District, development within the Project Area is vulnerable to both inland and coastal flooding.

2.3 Purpose, Need, and Objectives of Proposed Project

The purpose of the Proposed Project is to reduce flood risk and increase the resiliency of the communities and ecosystems in the Project Area, thereby protecting infrastructure, facilities, residences, businesses, and ecological resources from the more frequent and intense flood events anticipated to occur in the future. The ability of the Proposed Project to meet this purpose will be measured in terms of the following objectives:

1) **Contribute to Community Resiliency.** The Proposed Project would integrate a flood hazard risk reduction strategy with existing and proposed land uses and assets. It would reduce flood risks within the Project Area, leading to improved resiliency and the protection of accessibility and on-going operations of services, allowing these services to support emergency preparedness and community resiliency during and after flood events.

2) **Reduce Risks to Public Health.** The flood risk reduction strategy would additionally reduce the adverse health impacts associated with large flood events, such as the spread of infectious diseases, compromised personal hygiene, mental health impacts, and contaminated water sources.

3) **Deliver Co-Benefits.** Where possible, the Proposed Project would integrate the flood hazard risk reduction strategy with civic, cultural, ecological, and recreational values. It would strive to incorporate active and passive recreational uses, multi-use facilities, and other design elements that would allow the Proposed Project to become part of the fabric of the community.

4) **Enhance and Improve Use of Public Space.** The Proposed Project would strive to include concepts and alternatives that reduce risks to private and public property from flood impacts, while also incorporating design elements that improve public and recreational spaces.

5) **Consider Impacts from Sea Level Change.** The Proposed Project would consider the projected impacts from sea level change, including impacts on the frequency and degree of flooding.

6) **Protect Ecological Resources.** The Proposed Project would work to protect and enhance ecological resources by protecting wetlands and other habitats that contribute to regional biodiversity and ecosystem resiliency.

7) **Improve Water Quality.** The Proposed Project would consider green infrastructure solutions as a part of the design and construction of the proposed flood risk reduction measures to manage stormwater runoff, reduce stormwater pollution, and improve water quality.

The Proposed Project is needed to address systemic inland flooding from high-intensity rainfall/runoff events and coastal flooding from storm surges and extreme high tides, as the interplay between the two forces contributes to the reoccurring flooding conditions throughout the Project Area. In addition to flood reduction, the Proposed Project is needed to directly protect life, public health, and property. It is further needed to restore property values, improve community resilience, protect ecological resources, and improve civic, cultural, and recreational values in the Project Area.

2.4 Proposed Project Alternatives

The Proposed Project includes the construction and operation of flood risk reduction measures designed to address the impacts of inland and coastal flooding on the quality of the human environment due to both storm hazards and sea level change within the Project Area. To achieve this, NJDEP developed a variety of potential solutions and concepts with varying degrees of hard infrastructure features (such as bulkheads and/or floodwalls), soft landscaping features (such as berms and/or levees), and/or a series of drainage improvements, aimed at maximizing benefits to the Project Area, while minimizing costs and adverse environmental effects.

Each of the three Build Alternatives seeks to reduce the risk of flooding within the Project Area and each varies by the type of infrastructure that is proposed. Each alternative is being evaluated through the on-going Feasibility Study and application of site-specific screening criteria; each will be further developed and modified as the process proceeds. As directed by HUD, alternatives must be implementable within the limits of the CDBG-DR funding available by September 30, 2022. As currently proposed, the three Build Alternatives are summarized below.

1) **Alternative 1**, or the **Structural Flood Reduction Alternative**, will analyze various structural and infrastructure-based solutions that would be constructed to provide protection from tidal/storm surge flooding. This alternative may utilize a range of structures including levees, berms, barriers, drainage structures, pump stations, floodgates, and/or other hard or soft infrastructure to achieve the required level of flood protection.

2) **Alternative 2**, or the **Stormwater Drainage Improvement Alternative**, will analyze a series of stormwater drainage projects aimed at reducing the occurrence of higher frequency, small- to medium-scale flooding events that impact the Project Area. This alternative may utilize a range of structures including drainage ditches, pipes, pump stations at strategic locations, increased roadway elevations, new green infrastructure (e.g., wetland drainage basins, bioswales), water storage areas and water control structures, cleaning and de-snagging of existing waterways, and increasing and enhancing public open space.

3) **Alternative 3**, or the **Hybrid Alternative**, will analyze a strategic and synergistic blend of new infrastructure and local drainage improvements to reduce flood risk in the Project Area. Components of Alternatives 1 and 2 will be combined to provide an integrated, hybrid solution that uses a combination of levees, berms, drainage structures, pump stations, and/or floodgates, together with local drainage improvements, to achieve the maximum amount of flood protection within the Project Area.

Each alternative is being designed to provide a holistic solution that would extend protection and benefits across the Project Area, while not inducing flooding elsewhere.

2.5 Proposed Project Timeline and Lifespan

Per the HUD guidance, the recommended project is to be fully completed by September 2022. The estimated useful life of the Proposed Project is 50 years, or approximately 2022 through 2072.

3.0 Alternatives Development and Screening Process

Sections 6.0 and **7.0** of the Feasibility Report provide an overview of the Alternatives Development and Screening process used to identify the optimized Alternative 1 and Alternative 2 plans. This process is summarized below, and shown in **Figure 3-1**.

Concept Development: The Alternatives Development process included the identification of flooding sources, locations of flooding, and the crafting of potential flood risk reduction concepts separately for coastal storm surge events (Alternative 1) and systemic inland flooding from moderate to severe rainfall events (Alternative 2).

Initial Screening (Screening 1): Concurrent with the early stages of alternatives development, the NJDEP developed an Initial Concept Screening Criteria Matrix, shown in **Table 3-1**, to assist with the refinement (i.e., screening) of the various alternatives considered. Following its development, the Initial Concept Screening Criteria Matrix was presented to and reviewed by the Executive Steering Committee (ESC) and Citizen Advisory Group (CAG), and was subsequently revised to incorporate comments from these groups. This screening matrix included an array of criteria by which the various alternatives could be measured and compared. Individual screening criteria in the matrix were established based on the Proposed Project's purpose and need, including its goals and objectives; potential impacts to the natural environment and the community; and the Proposed Project's overall feasibility. Examples of screening criteria included were: performance criteria (such as flood risk reduction effectiveness); environmental constraints (including but not limited to cultural resources, hazardous waste, and environmental justice); community interests (such as access to the Hackensack River); and feasibility factors (such as constructability and construction cost). The matrix identified initial, broad levels of potential impact for each criterion by applying a Good-Fair-Poor-Fatal Flaw ranking and using both quantitative and qualitative metrics, as appropriate.

Alternative 1 and Alternative 2 Development: Detailed engineering and cost estimates were undertaken for the remaining concepts and alternative alignments that were not eliminated during the initial screening.

Secondary Screening (Screening 2): As the alternative development process progressed, the Screening 2 Criteria Matrix was used to identify which structural flood reduction and/or stormwater drainage improvement options best fulfilled the purpose of and need for the Proposed Project. These alternatives were advanced as the Proposed Project's Build Alternatives. A screening matrix was developed with input from stakeholder groups (including the CAG) informed by NJDEP Proposed Project Team Subject Matter Experts. As part of the engineering Feasibility Study, an integrated coastal and inland flooding model was developed to identify the locations of flooding and evaluate the effectiveness of various flood risk reduction alternatives to reduce flood impacts.

Alternative 3 Development: Alternative 3, the hybrid solution, is a combination of Alternatives 1 and 2. Five concepts were developed by integrating the components of Alternatives 1 and 2 and adding various additional measures to achieve the Proposed Project's objectives. A separate screening was completed in order to identify the optimum plan utilizing the screening criteria.

Build Plan Identified: In consultation with the public, the NJDEP identified among the 3 Build Alternatives a preferred alternative that best achieves the Proposed Project's objectives.

The Alternative 1, Alternative 2, and Alternative 3 Development and Screening Processes are described in Sub-Appendix F-1, Sub-Appendix F-2, and Sub-Appendix F-3, respectively. In addition, the Typical Sections and Kit of Parts are provided in Sub-Appendix F-4.

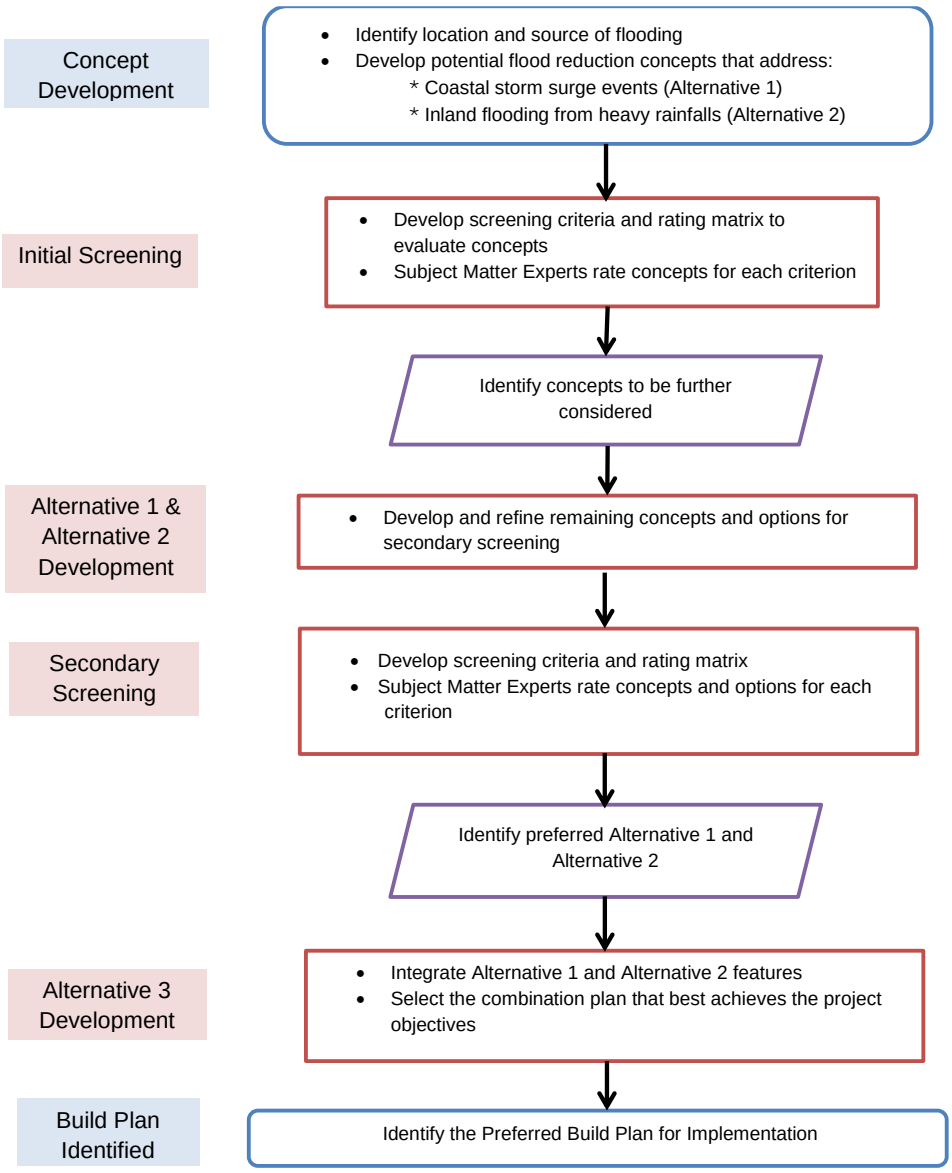

Figure 3-1: Alternatives Development and Screening Process

Table 3-1: Initial Concept Screening Criteria Matrix

Screening Criteria		Comparative Concept Screening Metrics[1]			
		Good	Fair	Poor	Fatal Flaw
FLOOD RISK REDUCTION	**Reduces Flood Risk from Coastal Storm Surge**	Provides the greatest relative reduction in future flood risk, as measured by annual flood damage reduction, from coastal storm surge risk.	Provides a moderate relative reduction in future flood risk, as measured by annual flood damage reduction, from coastal storm surge risk.	Provides the least relative reduction in future flood risk, as measured by annual flood damage reduction, from coastal storm surge risk.	Plan induces increased flooding from coastal storm surge in the Project Area or elsewhere.
	Reduces Flood Risk from Rainfall /Interior Drainage Challenges	Provides improved discharge corridors and/or natural storm water storage for most high priority inflow locations/localized flooding areas in the Project Area.	Provides improved discharge corridors and/or natural storm water storage for some high priority inflow locations/localized flooding areas in the Project Area.	Provides improved discharge corridors and/or natural storm water storage for few to none high priority inflow locations/localized flooding areas in the Project Area.	Plan may induce increased flooding from interior rainfall in the Project Area or elsewhere.
	Provides Protection to Vulnerable and Underserved Populations	Protects the greatest relative number of vulnerable and underserved populations as compared to other concepts.	Protects a moderate relative number of vulnerable and underserved populations as compared to other concepts.	Protects least relative number of vulnerable and underserved populations as compared to other concepts.	Plan provides no improved protection to vulnerable or underserved populations or increases the risk to these populations.
	Provides Protection to Critical Infrastructure (emergency services, hospitals, transit facilities)	Protects the greatest relative amount of critical infrastructure as compared to other concepts.	Protects a moderate relative amount of critical infrastructure as compared to other concepts.	Protects the least relative amount of critical infrastructure as compared to other concepts.	N/A

[1] Use of the terms “relative” or “relatively” indicates that concepts are compared to each other.

Screening Criteria		Comparative Concept Screening Metrics[1]			
		Good	**Fair**	**Poor**	**Fatal Flaw**
BUILT ENVIRONMENT/HUMAN ENVIRONMENT	**Effects to Existing Utilities & Utility Infrastructure**	Requires no or only limited relocations of existing utility infrastructure.	Requires a moderate amount of relocations of existing utility infrastructure.	Requires a large amount of relocations of existing utility infrastructure. However, these impacts could be mitigated in concert with Proposed Project implementation.	N/A
	Effects to Existing Transportation Network, Local Traffic, and Connectivity	Includes features to improve connectivity (vehicles, bike, pedestrians) of the street system that would improve connections and traffic circulation. Would result in long-term benefits to transportation infrastructure, with no adverse impacts to transportation infrastructure.	Does not include features to improve connectivity (vehicles, bike, pedestrians) of the street system that would improve connections and traffic circulation. However, the concept would not adversely affect existing or future-planned connectivity. Would not result in any long-term transportation improvements. May result in neutral or minor adverse impacts to transportation infrastructure.	May decrease connectivity or traffic circulation at some locations and/or conflict with future opportunities to improve connectivity (vehicles, bike, pedestrians). Would not result in any long-term transportation improvements. Would result in mitigatable adverse impacts to transportation infrastructure during construction or operation.	Would result in significant adverse impacts to transportation infrastructure in the Project Area
	Effects on Land Acquisition / Housing Displacements	May result in land use improvements over the long term. Would not require land acquisitions / easements, housing demolition, or permanent relocations.	Would not result in land use improvements over the long term. Would require minimal land acquisitions / easements. No housing demolition or permanent relocations would be required.	Would not result in land use improvements over the long term. Would require numerous land acquisitions / easements, and minimal housing demolition or permanent relocations.	Would result in extensive land acquisitions/ easements, housing demolition, or permanent relocations.

Screening Criteria		Comparative Concept Screening Metrics[1]			
		Good	Fair	Poor	Fatal Flaw
BUILT ENVIRONMENT/HUMAN ENVIRONMENT	**Potential to Provide Increased Waterfront Access**	Includes features that would improve waterfront access within the Project Area.	Does not include features that would improve waterfront access within the Project Area.	Would result in a minor decrease in waterfront access within the Project Area.	Would result in a significant decrease in waterfront access within the Project Area and/or would significantly preclude future waterfront access within the Project Area.
	Effects to Recreational, Civic, and Cultural Amenities and Uses	Incorporates many new and/or improved amenities to support recreational, commercial, and cultural activities.	Incorporates few new and/or improved amenities to support recreational, commercial, and cultural activities.	Incorporates no new and/or improved amenities to support recreational, commercial, and cultural activities.	N/A
	Effects to Viewshed and Local Visual Quality	Includes features that would enhance views of water and other natural areas.	Does not include features that would enhance views of water and other natural resources.	Includes features that would result in any decrease in views of water and natural areas.	Would result in extensive impacts to local viewshed and/or preclude future viewshed enhancements within the Project Area.
	Effects to Air Traffic Safety at Teterboro Airport	Includes features that would result in no increased threat to air traffic at Teterboro Airport, such as from plane collisions with wildlife.	N/A	Includes features that may result in a minor, but mitigatable, increased threat to air traffic at Teterboro Airport.	Includes features that may result in a moderate or high increased threat to air traffic at Teterboro Airport.

Screening Criteria		Comparative Concept Screening Metrics[1]			
		Good	Fair	Poor	Fatal Flaw
CONSTRUCTION/ MAINTENANCE & OPERATIONS	**Constructability**	No need to relocate major infrastructure and minimal disruption to business operation/public access during construction.	Some need to relocate major infrastructure and/or some major disruption to business operation/public access during construction.	Need to relocate major infrastructure and/or would result in major disruption to business operation/public access during construction.	Construction could not be completed within the scope and budget of the Project.
	Minimizes Long-Term Maintenance & Operation Requirements for Overall System	Features include a large proportion of permanent, self-sustaining structures, with fewer deployable or high maintenance structures, that require a low, long-term operations and maintenance commitment. Few or no features with potential for human error are included.	Features include a moderate proportion of permanent, self-sustaining structures, with more deployable or high maintenance structures, that require a moderate, long-term operations and maintenance commitment. Features with potential for human error are included.	Features include a small proportion of permanent, self-sustaining structures, with a greater number of deployable or high maintenance structures, that require a high, long-term operations and maintenance commitment. Several features with potential for human error are included.	N/A
	Potential to Complete by September 2022	High probability that construction would meet Project temporal requirements. Permits required pose no/low risk to project schedule.	Moderate probability that construction would meet Project temporal requirements. Permits required pose a moderate risk to project schedule.	Low probability that construction would meet Project temporal requirements. Permits required pose a significant risk to project schedule.	Construction and initial operating condition could not be achieved by September 2022.

Screening Criteria		Comparative Concept Screening Metrics[1]			
		Good	**Fair**	**Poor**	**Fatal Flaw**
NATURAL ENVIRONMENT	**Effects to Existing Hazardous Waste Sites**	Features may facilitate the implementation of remedial investigation and remedial actions or reduce the potential to spread contamination, a long-term beneficial effect.	Features are primarily compatible with ongoing remedial investigations and remedial actions.	Features would interfere with ongoing remedial investigations or remedial actions, but not preclude such investigations or actions.	Significant impacts to hazardous waste sites, remedial investigations, and/or remedial actions, and/or results in potential to spread contamination in the environment.
	Effects to Berry's Creek Remediation	No potential for physical, hydrologic, or hydraulic impacts to Berry's Creek Study Area that may impact remediation plan.	Potential physical, hydrologic, or hydraulic impacts to Berry's Creek Study Area that may impact remediation plan.	Physical, hydrologic, or hydraulic impacts to Berry's Creek Study Area that may impact remediation plan.	Would result in significant impacts to Berry's Creek remedial activities, and/or result in potential to spread contamination in the environment.
	Effects on the Transport of Environmental Contaminants/ Sediments during Flood Events	In affected areas, would prevent the inadvertent transport of unsecured hazardous materials during flooding. Contaminated sediments would not be re-suspended. No increase in impacts in unaffected areas.	In affected areas, would reduce the inadvertent transport of unsecured hazardous materials during flooding. The resuspension of contaminated sediments may occur, but effects would be of short duration and could be mitigated using best management practices. No increase in impacts in unaffected areas.	In affected areas, unsecured hazardous materials would continue to be subject to transport by floodwaters as under current conditions. The ongoing resuspension of contaminated sediments would occur, as would the continued dispersion of same throughout the environment similar to existing levels.	Would increase transportation or resuspension of contamination and/or contaminated sediments during flood events as compared to current conditions.

Screening Criteria		Comparative Concept Screening Metrics[1]			
		Good	Fair	Poor	Fatal Flaw
NATURAL ENVIRONMENT	**Effects to Water Resources, including Water Quality, "Waters of the US," Wetlands, and Mitigation Banks**	Includes features that protect, enhance, and/or create water resources in the Project Area. Would result in long-term water resource and water quality improvements.	Does not include features that protect, enhance, and/or create water resources in the Project Area. Would result in no potential for long-term water resource or water quality improvements. May have neutral or minor adverse effects.	Does not include features that protect, enhance, and/or create water resources in the Project Area. Includes features that would result in adverse, but mitigatable, impacts to water resources or water quality over the long term. No adverse effects to wetland mitigation banks and ongoing wetlands restoration activities.	Would result in significant adverse impacts to water resources or water quality in the Project Area or elsewhere, and/or would adversely impact existing wetland mitigation banks and ongoing wetlands restoration activities.
	Effects to Fisheries and Essential Fish Habitat (EFH)	Includes features that protect and/or enhance connectivity of fisheries habitats and/or facilitate fish migration. Would result in long-term beneficial effects. No adverse impacts to EFH.	Does not include features that protect and/or enhance connectivity of fisheries habitats and/or facilitate fish migration. Would result in no potential for long-term beneficial effects. May have neutral or minor adverse impacts to EFH.	Does not include features that protect and/or enhance connectivity of fisheries habitats and/or facilitate fish migration. Potential adverse, but mitigatable, impacts to EFH (including the potential loss of EFH).	Would result in significant adverse impacts to EFH in the Project Area or elsewhere.

Screening Criteria		Comparative Concept Screening Metrics[1]			
		Good	Fair	Poor	Fatal Flaw
NATURAL ENVIRONMENT	**Effects on Protected Species and their Habitats**	Includes features that protect and/or enhance protected species habitats. Would result in long-term beneficial effects and no adverse effects to protected species or their habitats.	Does not include features that protect and/or enhance protected species habitats, but may afford opportunities for further habitat enhancements. No adverse effects to protected species or their habitats.	Does not include features that protect and/or enhance protected species habitats, and does not afford opportunities for further habitat enhancements. Potential adverse, but mitigatable, effects to protected species or their habitats.	Would result in significant adverse effects to protected species or their habitats.
	Effects on Other Sensitive Ecological Resources, including Biodiversity, Habitat, and Migration/Movement Corridors	Includes features that protect, enhance, and/or create wildlife habitat and/or connectivity of existing habitat. Would result in long-term beneficial effects and **no** adverse effects to sensitive ecological resources in the Project Area.	Does not include features that protect, enhance, and/or create wildlife habitat and/or connectivity of existing habitat. Would result in no potential for long-term beneficial effects. Overall, neutral or minor adverse effects to sensitive ecological resources in the Project Area.	Does not include features that protect, enhance, and/or create wildlife habitat and/or connectivity of existing habitat. Potential adverse, but mitigatable, effects to sensitive ecological resources in the Project Area.	Would result in significant adverse effects to sensitive ecological resources, including biodiversity, habitat, and migration corridors in the Project Area or elsewhere.
	Effects to Historic and Prehistoric Cultural Resources	Includes features that protect and/or enhance cultural resources management in the Project Area. No effects to cultural resources listed on or potentially eligible for listing on the National Register of Historic Places.	Does not include features that protect and/or enhance cultural resources management in the Project Area. No adverse effects to cultural resources listed on or potentially eligible for listing on the National Register of Historic Places.	Does not include features that protect and/or enhance cultural resources management in Project Area. Would result in adverse effects to cultural resources listed on or potentially eligible for listing on the National Register of Historic Places.	Would result in significant adverse impacts to cultural resources in the Project Area or elsewhere.

Screening Criteria		Comparative Concept Screening Metrics[1]			
		Good	**Fair**	**Poor**	**Fatal Flaw**
COSTS & BENEFITS	**Provides Benefits to the Project Area and Community**	Concept has a relatively high potential to achieve maximum monetary benefits, including flood risk reduction, co-benefits, and others.	Concept has a relatively moderate potential to achieve monetary benefits, including flood risk reduction, co-benefits, and others.	Concept has a relatively low potential to achieve monetary benefits, including flood risk reduction, co-benefits, and others.	Concept has no potential to achieve monetary benefits, including flood risk reduction, co-benefits, and others.
	Can be Implemented within Available Funding Limits	Concept could be implemented within available funding limits.	N/A	Cost to implement concept exceeds available or other identified funds, but a subset of the concept's features that achieve independent utility could be implemented within available funding limits.	Concept could not be implemented within available or other identified funding limits.
	Has a Positive Benefit/Cost Ratio (BCR)	Concept has a relatively high potential to have a BCR > 1.0.	Concept has a relatively moderate potential to have a BCR > 1.0.	Concept has a relatively low potential to have a BCR > 1.0.	Concept has no potential to have a BCR > 1.0.

4.0 References

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