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Hudson-Raritan Estuary Ecosystem Restoration Feasibility Study

Appendix I Cost Engineering

**Final Integrated Feasibility Report &
Environmental Assessment
March 2020**

**Prepared by the New York District
U.S. Army Corps of Engineers**



THE PORT AUTHORITY
OF NY & NJ

Hudson-Raritan Estuary Ecosystem Restoration Feasibility Study Final Integrated Feasibility Report & Environmental Assessment

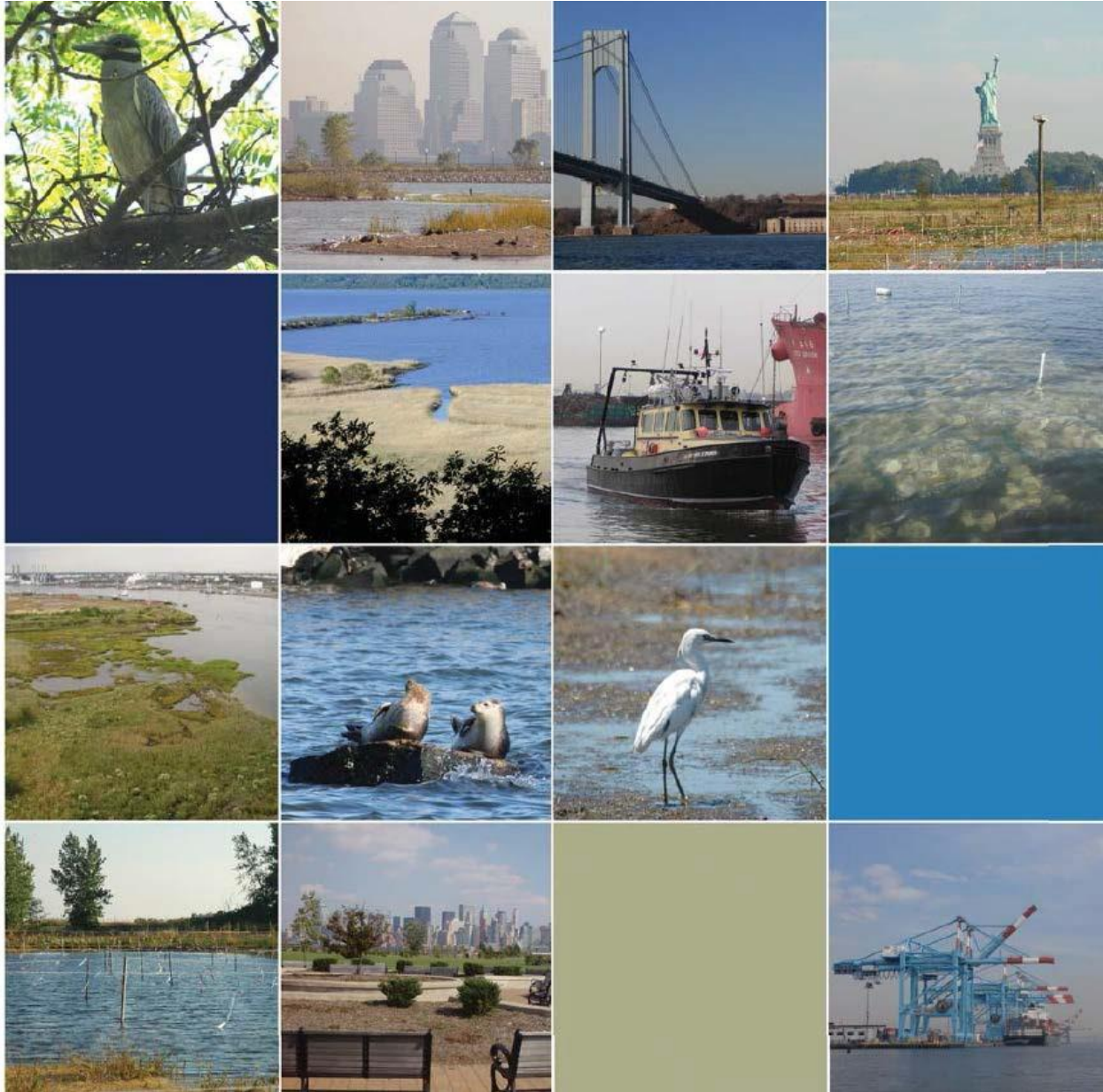




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Acronyms and Abbreviations

CSRA	Cost Schedule Risk Analysis
HRE	Hudson Raritan Estuary
MCACES	Micro-Computer Aided Cost Estimating System
USACE	United States Army Corps of Engineer



1. Introduction

Hudson Raritan Estuary (HRE) is an ecosystem restoration project located within the boundaries of the Port District of New York and New Jersey, and situated within a 25-mile radius of the Statue of Liberty National Monument. The Project Delivery Team (PDT) evaluated a total of 33 restoration sites that were identified as the initial array of sites (See Plan Formulation Appendix D). Three alternatives were typically developed for each site and the project first cost for each alternative is summarized in Table I-1 below. The project contingencies for these alternatives were developed thru Abbreviated Risk Analysis (ARA) tool provided by the Cost MCX. The project first cost listed under Table I-1 includes the project contingencies.

Table I-1. Alternative Phase First Cost Summary

Planning Region/ Habitat	Site	Alt	Sub-Total Project First Cost (\$)	Monitoring and Adaptive Management Cost (\$)	Project First Cost (\$)	Annualized OMRR&R Cost (\$)	Average Annual Economic Cost (\$)
Jamaica Bay Perimeter ¹	Dead Horse Bay	1	-	-	\$23,615,000	-	\$1,269,000
		2	-	-	\$26,197,000	-	\$1,407,000
		3	-	-	\$31,864,000	-	\$1,712,000
		4	\$82,697,602	\$1,848,360	\$84,545,962	\$80,000	\$3,330,851
	Fresh Creek	1	-	-	\$5,057,000	-	\$272,000
		2	-	-	\$5,231,000	-	\$281,000
		3	-	-	\$8,388,000	-	\$451,000
		4	-	-	\$8,259,000	-	\$444,000
		5	\$33,148,455	\$737,068	\$33,885,522	\$80,000	\$1,382,939
	Brant Point	1	-	-	\$2,091,000	-	\$112,000
		2	\$6,425,941	\$155,406	\$6,581,347	\$20,000	\$273,007
	Hawtree Point	1	\$1,981,636	\$150,000	\$2,131,636	\$20,000	\$101,510
	Bayswater State Park	1	-	-	\$1,007,000	-	\$54,000
		2	\$5,766,391	\$150,000	\$5,916,391	\$20,000	\$247,399
		3	-	-	\$3,751,000	-	\$202,000
		1	-	-	\$1,464,000	-	\$79,000

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Planning Region/ Habitat	Site	Alt	Sub-Total Project First Cost (\$)	Monitoring and Adaptive Management Cost (\$)	Project First Cost (\$)	Annualized OMRR&R Cost (\$)	Average Annual Economic Cost (\$)
	Dubos Point	2	-	-	\$2,192,000	-	\$118,000
		3	\$9,585,028	\$214,028	\$9,799,056	\$20,000	\$396,781
Jamaica Bay Marsh Islands	Duck Point	1	\$20,847,701	\$473,882	\$21,321,583	\$50,000	\$869,796
		2	\$23,408,019	\$532,104	\$23,940,123	\$50,000	\$970,476
		3	\$28,182,992	\$640,688	\$28,823,679	\$50,000	\$1,158,245
	Stony Creek	1	\$22,218,071	\$515,297	\$22,733,369	\$50,000	\$924,034
		2	\$17,973,727	\$416,821	\$18,390,547	\$50,000	\$757,065
		3	\$15,770,046	\$365,691	\$16,135,738	\$50,000	\$670,374
	Pumpkin Patch West	1	\$14,027,060	\$333,372	\$14,360,432	\$50,000	\$614,934
		2	\$20,504,279	\$487,409	\$20,991,688	\$50,000	\$875,808
		3	\$26,710,462	\$634,999	\$27,345,461	\$50,000	\$1,125,766
	Pumpkin Patch East	1	\$30,400,272	\$693,870	\$31,094,142	\$50,000	\$1,245,530
		2	\$17,068,819	\$389,499	\$17,458,318	\$50,000	\$721,250
		3	\$23,653,276	\$539,829	\$24,193,105	\$50,000	\$980,194
	Elders Center	1	\$14,516,762	\$347,914	\$14,864,676	\$50,000	\$621,457
		2	\$14,303,695	\$342,804	\$14,646,500	\$50,000	\$613,069
		3	\$20,411,448	\$489,273	\$20,900,721	\$50,000	\$853,506
Harlem River, East River and Western Long Island Sound	Flushing Creek	A	\$8,399,122	\$150,000	\$8,549,122	\$80,000	\$404,470
		B	\$13,204,697	\$309,022	\$13,513,719	\$80,000	\$592,618
		C	\$16,113,674	\$378,139	\$16,491,813	\$80,000	\$705,583
	Bronx Zoo and Dam	A	\$6,161,341	\$150,000	\$6,311,341	\$20,000	\$255,948
		B	\$4,784,598	\$150,000	\$4,934,598	\$20,000	\$204,371
		C	\$3,691,719	\$150,000	\$3,841,719	\$20,000	\$163,428



Planning Region/ Habitat	Site	Alt	Sub-Total Project First Cost (\$)	Monitoring and Adaptive Management Cost (\$)	Project First Cost (\$)	Annualized OMRR&R Cost (\$)	Average Annual Economic Cost (\$)
	Stone Mill Dam	A	\$779,827	\$150,000	\$929,827	\$20,000	\$54,241
		B	\$708,351	\$150,000	\$858,351	\$20,000	\$51,572
		C	\$540,223	\$150,000	\$690,223	\$20,000	\$45,295
	Shoelace Park	A	\$24,961,173	\$545,406	\$25,506,579	\$20,000	\$1,006,948
		B	\$18,530,516	\$404,768	\$18,935,284	\$20,000	\$760,408
		C	\$8,920,217	\$195,935	\$9,116,152	\$20,000	\$362,013
	Bronxville Lake	A	\$21,281,995	\$464,614	\$21,746,610	\$50,000	\$864,975
		B	\$14,381,709	\$313,706	\$14,695,415	\$50,000	\$600,726
		C	\$14,302,390	\$311,971	\$14,614,361	\$50,000	\$597,688
	Garth Harney	A	\$7,336,979	\$312,399	\$7,649,378	\$20,000	\$305,228
		B	\$6,547,824	\$300,000	\$6,847,824	\$20,000	\$275,274
		C	\$3,917,834	\$300,000	\$4,217,834	\$20,000	\$176,858
	River Park/ West Farm Rapids Park	A	\$4,114,139	\$150,000	\$4,264,139	\$20,000	\$179,079
		B	\$4,056,461	\$150,000	\$4,206,461	\$20,000	\$176,920
		C	\$2,670,590	\$150,000	\$2,820,590	\$20,000	\$125,060
	Muskrat Cove	A	\$7,942,235	\$179,193	\$8,121,428	\$20,000	\$348,155
		B	\$8,143,118	\$182,495	\$8,325,614	\$20,000	\$356,245
		C	\$4,186,585	\$150,000	\$4,336,585	\$20,000	\$202,470
	Crestwood Lake	A	\$27,452,116	\$599,718	\$28,051,834	\$50,000	\$1,123,787
		B	\$13,666,095	\$298,869	\$13,964,964	\$50,000	\$584,571
		C	\$12,807,222	\$279,436	\$13,086,658	\$50,000	\$550,928
		A	\$24,707,587	\$540,188	\$25,247,775	\$50,000	\$996,182
		B	\$14,692,572	\$321,161	\$15,013,732	\$50,000	\$612,653

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Planning Region/ Habitat	Site	Alt	Sub-Total Project First Cost (\$)	Monitoring and Adaptive Management Cost (\$)	Project First Cost (\$)	Annualized OMRR&R Cost (\$)	Average Annual Economic Cost (\$)
	Westchester County Center	C	\$13,695,728	\$299,360	\$13,995,088	\$50,000	\$574,478
Newark Bay, Hackensac k River and Passaic River	Oak Island Yards	A	\$18,173,963	\$397,189	\$18,571,152	\$50,000	\$753,781
		B	\$18,739,873	\$409,811	\$19,149,684	\$50,000	\$775,704
		C	\$17,702,790	\$387,130	\$18,089,921	\$50,000	\$735,543
	Branch Brook Park	A	\$71,649,492	\$1,566,145	\$73,215,637	\$80,000	\$2,857,716
		B	\$71,714,594	\$1,567,569	\$73,282,163	\$80,000	\$2,860,240
		C	\$22,130,218	\$483,165	\$22,613,383	\$80,000	\$937,928
		D	\$46,399,651	\$1,013,934	\$47,413,586	\$80,000	\$1,855,027
	Clifton Dundee Canal Green Acres	A	\$8,881,501	\$171,710	\$9,053,210	\$20,000	\$363,553
		B	\$8,270,796	\$161,671	\$8,432,467	\$20,000	\$339,990
		C	\$7,238,061	\$150,000	\$7,388,061	\$20,000	\$300,325
	Dundee Island Park	A	\$2,621,005	\$150,000	\$2,771,005	\$20,000	\$124,161
	Kearny Point	A	\$50,998,310	\$1,113,686	\$52,111,997	\$80,000	\$2,057,073
		B	\$46,128,926	\$1,007,194	\$47,136,120	\$80,000	\$1,868,294
		C	\$39,470,487	\$861,574	\$40,332,061	\$80,000	\$1,610,156
	Metromedia Tract	A	\$27,733,012	\$605,205	\$28,338,217	\$50,000	\$1,137,241
		B	\$45,413,789	\$991,882	\$46,405,671	\$80,000	\$1,860,425
		C	\$30,991,135	\$676,460	\$31,667,595	\$80,000	\$1,294,977
	Meadowlark Marsh	A	\$63,974,334	\$1,398,947	\$65,373,280	\$80,000	\$2,588,139
		B	\$58,407,208	\$1,277,194	\$59,684,403	\$80,000	\$2,369,877
		C	\$46,725,473	\$1,021,716	\$47,747,190	\$80,000	\$1,911,889



Planning Region/ Habitat	Site	Alt	Sub-Total Project First Cost (\$)	Monitoring and Adaptive Management Cost (\$)	Project First Cost (\$)	Annualized OMRR&R Cost (\$)	Average Annual Economic Cost (\$)
Oysters	Naval Weapons Station Earle	A	\$1,075,750	\$150,000	\$1,225,750	\$10,000	\$55,108
		B	\$2,099,310	\$150,000	\$2,249,310	\$10,000	\$93,239
		C	\$3,438,265	\$81,652	\$3,519,917	\$10,000	\$141,160
	Bush Terminal	A	\$3,105,071	\$118,328	\$3,223,398	\$10,000	\$129,449
		B	\$4,555,260	\$126,994	\$4,682,254	\$10,000	\$183,836
		C	\$8,960,603	\$153,319	\$9,113,921	\$10,000	\$350,169
	Head of Jamaica Bay	A	\$1,098,250	\$150,000	\$1,248,250	\$10,000	\$55,898
		B	\$2,115,129	\$150,000	\$2,265,129	\$10,000	\$93,738
		C	\$3,175,638	\$118,758	\$3,294,396	\$10,000	\$132,220

¹Cost estimates for Jamaica Bay Perimeter site alternatives in italics represent 2008 implementation costs and benefits used in the CE/ICA conducted to select the TSP approved at the 2010 Alternative Formulation Briefing. TSP alternative costs and benefits were then updated in 2018 for use in subsequent evaluations.

Table 1-2 below presents the Recommended Plan alternatives that resulted from the Cost Effectiveness/Incremental Cost Analysis (Appendix) that were optimized further. The optimized plan provides solutions to restore lost or degraded aquatic habitats within the HRE study area.

Table I-2. Selected Plans

Site	Alternative Selected
Jamaica Bay – Perimeter Sites	
Dead Horse Bay	4
Fresh Creek	5
Jamaica Bay – Marsh Islands	
Duck Point	2
Stony Creek	1
Pumpkin Patch West	2
Pumpkin Patch East	3
Elders Center	3
Flushing Creek	
Flushing Creek	B

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Site	Alternative Selected
Bronx River	
Bronx Zoo and Dam	A
Stone Mill Dam	A
Shoelace Park	B
Bronxville Lake	B
Garth Wood/Harney Road	A
Lower Passaic River	
Oak Island Yards	A
Essex County Branch Brook Park	D
Hackensack River	
Metromedia Tract	A
Meadowlark Marsh	C
Oyster Restoration	
Naval Weapons Station Earle	C
Bush Terminal	C
Head of Jamaica Bay	C

Table 1-3 below presents the Cost Estimate Packages assembled for the proposed restoration for the Recommended Plan. The Recommended Plan includes 20 different ecosystem restoration sites/projects spanning five (5) planning regions. These cost estimates have been prepared as five (5) separate cost estimate packages which address the following planning regions: Jamaica Bay, Flushing Creek, Bronx River, Hackensack River & Lower Passaic River, and Oyster Sites.

Table I-3. Cost Estimate Packages

Cost Estimate Package	Planning Region	Study Site Name
Jamaica Bay	Perimeter Sites	Dead Horse Bay
		Fresh Creek
	Marsh Islands	Duck Point
		Stony Creek
		Pumpkin Patch West
		Pumpkin Patch East
		Elders Center
Flushing Creek	Flushing Creek	Flushing Creek
Bronx River	Bronx River	Bronx Zoo and Dam
		Stone Mill Dam
		Shoelace Park
		Bronxville Lake
		Garth Woods/Harney Road
Hackensack River & Lower Passaic River	Lower Passaic River	Oak Island Yards
		Essex County Branch Brook Park
	Hackensack River River	Metromedia Tract



Cost Estimate Package	Planning Region	Study Site Name
		Meadowlark Marsh
Oyster Sites	Oyster Sites	Naval Weapons Station Earle
		Bush Terminal
		Head of Jamaica Bay

Each cost package is composed of the following items:

- Jamaica Bay costs and contingencies for the five (5) sites at the Marsh Islands and two (2) sites at the Perimeter Sites.
- Flushing Creek cost and contingency for a single site.
- Bronx River costs and contingencies for the five (5) sites.
- Hackensack River & Lower Passaic River costs and contingencies for the two (2) sites at the Hackensack River and two (2) sites at the Lower Passaic River.
- Oyster Sites costs and contingencies for the three (3) sites.

For all sites, the following cost accounts apply:

1.1. Price Levels

Costs were presented as current year (October 2019/FY2020) dollar values without escalation.

1.2. Contingencies

As stated in ER 1110-2-1302, the goal in contingency development is to identify the uncertainty associated with an item of work or task to an acceptable degree of confidence. Consideration must be given to the detail available at each stage of planning, design or construction for which a cost estimate is being prepared. Contingency may vary throughout the cost estimate and could constitute a significant portion of the overall costs when data or design details are unavailable. Final contingency development and assessment of the potential for cost growth is included in the cost estimate. To develop the Total Project First Cost, contingencies developed in the Cost Schedule Risk Analysis (CSRA) were applied. The CSRA report was developed for the risk findings and the recommended contingencies for the project. The construction cost contingency developed per CSRA for each ecosystem restoration type is shown in Table I-4. Note that the

Table I-4. Contingency Factors

Ecosystem Restoration Type	Contingency Factors
Jamaica Bay Marsh Islands	25%
Jamaica Bay Perimeter Sites	22%
Flushing Creek	23%
Bronx River	29%
Hackensack River	21%
Lower Passaic River	25%
Oyster Restoration Sites	37%

1.3. Lands and Damages (Account 01)

Site-specific real estate costs were developed for each component/site. Fee title and temporary easements will be acquired (no permanent easements will be acquired) per ER 1105-2-100 Sec. 3-5(b)(9) and ER 405-1-12. Real estate costs include land acquisition and incidental (i.e., appraisals, land surveys, title services, etc.) costs. Details related to the real estate costs can be found in the Real Estate Plan.

1.4. Cultural Resources Preservation (Account 18)

In accordance with the National Environmental Policy Act and the National Historic Preservation Act (54 USC 306108) federal agencies are to avoid, preserve, protect, minimize or compensate for impacts to National Register of Historic Places eligible or listed sites where an undertaking will result in adverse effect to the resource. Cultural Resources mitigation costs were developed for each recommended site alternative in accordance with ER 1105-2-100. Survey and mitigation estimates include archaeological investigations, architectural surveys, and data recovery. Estimates were developed using existing information and assumptions about the level of mitigation required at each site depending on the scale of the undertaking proposed in each alternative as well as the presence of historic properties and potential for buried archaeological sites within a given area, refer to the Cultural Resources Appendix for a detailed discussion of potential cultural resources impacts at each site.

1.5. Planning Engineering and Design (Account 30)

Planning, Engineering and Design account includes costs for the Pre-construction Engineering and Design (PED) Phase and engineering support during construction. Costs were developed for each site specific alternative including costs related to regulatory compliance, field data collection, and preparation of design plans, documentation, and specifications for all alternatives. It includes all the in-house labor based upon work-hour requirements, material and facility costs, travel, and overhead..

1.6. Construction Management (Account 31)

Costs were developed for all construction management activities from pre-award requirements through final contract closeout. This cost includes in-house labor based upon work-hour requirements, materials, facility costs, support contracts, travel, and overhead. The cost was developed based on input from the construction division in accordance with Civil Works Breakdown Structure and includes, but is not limited to, anticipated items such as the salaries of the resident engineer and staff, surveyors, inspectors, drafters, clerical, and custodial personnel; operation, maintenance, and fixed charges for transportation and for other field equipment; field supplies; construction management, general construction supervision; and project office administration, distributive cost of area office, and general overhead charged to the project. This account also includes engineering support during construction through project completion.



1.7. Monitoring

Monitoring costs are required by ER 1105-2-100 Sec. 3-5.b. (8). Implementation Guidance issued August 31, 2009 for Section 2039 of Water Resource Development Act (WRDA) 2007 (as amended by Section 1161 of WRDA 2016) directs the Secretary of the Army to ensure, when conducting a feasibility study for a project (or component of a project) under the USACE ecosystem restoration mission that the decision document include a monitoring plan to measure the success of the ecosystem restoration. Monitoring the success of a restoration project can be complex as restored wetlands can take a myriad of growing seasons to reach dynamic equilibrium conditions; therefore, the initial monitoring period of five years will ensure the site is on a trajectory toward ecological success. A detailed breakdown of the monitoring efforts required for each project site is provided in the Monitoring and Adaptive Management Plan.

1.8. Adaptive Management

Section 2039 of WRDA 2007 directs USACE to develop an adaptive management plan for all ecosystem restoration projects. A detailed breakdown of the assumed adaptive management efforts required for each project site is provided in the Monitoring and Adaptive Management Plan.

2. Total First Costs

The construction cost estimate was developed in MCACES, Second Generation (MII) using the appropriate Work Breakdown Structure (WBS) and based on current estimated quantities provided by the Hydraulics & Hydrology Engineers (Engineering Appendix). The cost estimate was developed from these quantities using cost resources such as RSMeans, historical data from similar construction features, and MII Cost Libraries. The contingencies were developed based on input to the Cost Schedule Risk Analysis (CSRA) (template provided by the Cost Mandatory Center of Expertise, MCX, Walla Walla District). These contingencies were applied to the construction cost estimates to develop the Total Project First Cost. The total project first cost for the entire HRE Recommended Plan is presented in Table I-5. The first costs for each ecosystem restoration project site is presented in Table I-6 thru Table I-25.

Table I-5. First Cost - Hudson Raritan Estuary Recommended Plan

Hudson Raritan Estuary

October 2019 Price Level

Feat. Acct.	Description	Subtotal	Cont. %	Cont \$\$	Total Cost
01	Lands & Damages	\$ 6,264,950	31%	\$ 1,943,070	\$ 8,208,020
	Total Lands & Damages	\$ 6,264,950		\$ 1,943,070	\$ 8,208,020
06	Fish and Wildlife Facilities	\$ 8,334,831	37%	\$ 3,083,887	\$ 11,418,718
	Total Fish and Wildlife Faciliti	\$ 8,334,831		\$ 3,083,887	\$ 11,418,718
16	Bank Stabilization	\$ 225,157,934	24%	\$ 54,374,825	\$ 279,532,759
	Total Bank Stabilization	\$ 225,157,934		\$ 54,374,825	\$ 279,532,759
18	Cultural Resource	\$ 1,855,000	27%	\$ 498,450	\$ 2,353,450
	Total Cultural Resource	\$ 1,855,000		\$ 498,450	\$ 2,353,450
30	Planning, Engineering & Design	\$ 37,925,000	26%	\$ 9,958,650	\$ 47,883,650
31	Construction Management	\$ 34,829,618	25%	\$ 8,695,908	\$ 43,525,526
Sub-Total First Cost		\$ 314,367,333		\$ 78,554,791	\$ 392,922,124
	Monitoring	\$ 2,360,392	26%	\$ 617,102	\$ 2,977,494
	Adaptive Management	\$ 10,252,855	26%	\$ 2,715,126	\$ 12,967,981
Total First Cost		\$ 326,980,580		\$ 81,887,019	\$ 408,867,599



Table I-6. First Cost – Dead Horse Bay
Hudson Raritan Estuary
Dead Horse Bay
 October 2019 Price Level

Feat. Acct.	Description	Subtotal	Cont. %	Cont \$\$	Total Cost
01	Lands & Damages	\$ 35,500	30%	\$ 10,650	\$ 46,150
	Total Lands & Damages	\$ 35,500		\$ 10,650	\$ 46,150
16	Bank Stabilization	\$ 27,038,481	22%	\$ 5,948,466	\$ 32,986,947
	Total Bank Stabilization	\$ 27,038,481		\$ 5,948,466	\$ 32,986,947
18	Cultural Resource	\$ 125,000	22%	\$ 27,500	\$ 152,500
	Total Cultural Resource	\$ 125,000		\$ 27,500	\$ 152,500
30	Planning, Engineering & Design	\$ 2,345,000	22%	\$ 515,900	\$ 2,860,900
31	Construction Management	\$ 3,516,348	22%	\$ 773,597	\$ 4,289,945
Sub-Total First Cost		\$ 33,060,329		\$ 7,276,112	\$ 40,336,442
	Monitoring	\$ 105,031	22%	\$ 23,107	\$ 128,137
	Adaptive Management	\$ 234,306	22%	\$ 51,547	\$ 285,853
Total First Cost		\$ 33,399,666		\$ 7,350,767	\$ 40,750,433

Table I-7. First Cost – Fresh Creek
Hudson Raritan Estuary
Fresh Creek
 October 2019 Price Level

Feat. Acct.	Description	Subtotal	Cont. %	Cont \$\$	Total Cost
01	Lands & Damages	\$ 1,616,500	30%	\$ 484,950	\$ 2,101,450
	Total Lands & Damages	\$ 1,616,500		\$ 484,950	\$ 2,101,450
16	Bank Stabilization	\$ 20,081,309	22%	\$ 4,417,888	\$ 24,499,196
	Total Bank Stabilization	\$ 20,081,309		\$ 4,417,888	\$ 24,499,196
18	Cultural Resource	\$ 125,000	22%	\$ 27,500	\$ 152,500
	Total Cultural Resource	\$ 125,000		\$ 27,500	\$ 152,500
30	Planning, Engineering & Design	\$ 2,625,000	22%	\$ 577,500	\$ 3,202,500
31	Construction Management	\$ 2,820,631	22%	\$ 620,539	\$ 3,441,170
Sub-Total First Cost		\$ 27,268,439		\$ 6,128,377	\$ 33,396,816
	Monitoring	\$ 200,513	22%	\$ 44,113	\$ 244,626
	Adaptive Management	\$ 223,823	22%	\$ 49,241	\$ 273,065
Total First Cost		\$ 27,692,776		\$ 6,221,731	\$ 33,914,507

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Table I-8. First Cost – Duck Point
Hudson Raritan Estuary
Duck Point
October 2019 Price Level

Feat. Acct.	Description	Subtotal	Cont. %	Cont \$\$	Total Cost
01	Lands & Damages	\$ 17,500	30%	\$ 5,250	\$ 22,750
	Total Lands & Damages	\$ 17,500		\$ 5,250	\$ 22,750
16	Bank Stabilization	\$ 13,026,095	25%	\$ 3,256,524	\$ 16,282,619
	Total Bank Stabilization	\$ 13,026,095		\$ 3,256,524	\$ 16,282,619
30	Planning, Engineering & Design	\$ 1,740,000	25%	\$ 435,000	\$ 2,175,000
31	Construction Management	\$ 1,888,610	25%	\$ 472,152	\$ 2,360,762
Sub-Total First Cost		\$ 16,672,205		\$ 4,168,926	\$ 20,841,131
	Monitoring	\$ 133,996	25%	\$ 33,498.88	\$ 167,494
	Adaptive Management	\$ 313,976	25%	\$ 78,493.98	\$ 392,470
Total First Cost		\$ 17,120,176		\$ 4,280,919	\$ 21,401,095

Table I-9. First Cost – Stony Creek
Hudson Raritan Estuary
Stony Creek
October 2019 Price Level

Feat. Acct.	Description	Subtotal	Cont. %	Cont \$\$	Total Cost
01	Lands & Damages	\$ 17,500	30%	\$ 5,250	\$ 22,750
	Total Lands & Damages	\$ 17,500		\$ 5,250	\$ 22,750
16	Bank Stabilization	\$ 14,053,642	25%	\$ 3,513,411	\$ 17,567,053
	Total Bank Stabilization	\$ 14,053,642		\$ 3,513,411	\$ 17,567,053
30	Planning, Engineering & Design	\$ 1,940,000	25%	\$ 485,000	\$ 2,425,000
31	Construction Management	\$ 1,991,364	25%	\$ 497,841	\$ 2,489,205
Sub-Total First Cost		\$ 18,002,506		\$ 4,501,502	\$ 22,504,008
	Monitoring	\$ 133,996	25%	\$ 33,499	\$ 167,494
	Adaptive Management	\$ 438,832	25%	\$ 109,708	\$ 548,540
Total First Cost		\$ 18,575,334		\$ 4,644,709	\$ 23,220,043



Table I-10. First Cost – Pumpkin Patch West
Hudson Raritan Estuary
Pumpkin Patch West
 October 2019 Price Level

Feat. Acct.	Description	Subtotal	Cont. %	Cont \$\$	Total Cost
01	Lands & Damages	\$ 17,500	30%	\$ 5,250	\$ 22,750
	Total Lands & Damages	\$ 17,500		\$ 5,250	\$ 22,750
16	Bank Stabilization	\$ 12,253,474	25%	\$ 3,063,369	\$ 15,316,843
	Total Bank Stabilization	\$ 12,253,474		\$ 3,063,369	\$ 15,316,843
30	Planning, Engineering & Design	\$ 1,690,000	25%	\$ 422,500	\$ 2,112,500
31	Construction Management	\$ 1,811,347	25%	\$ 452,837	\$ 2,264,184
Sub-Total First Cost		\$ 15,772,322		\$ 3,943,955	\$ 19,716,277
	Monitoring	\$ 108,310	25%	\$ 27,077	\$ 135,387
	Adaptive Management	\$ 218,136	25%	\$ 54,534	\$ 272,670
Total First Cost		\$ 16,098,767		\$ 4,025,567	\$ 20,124,334

Table I-11. First Cost – Pumpkin Patch East
Hudson Raritan Estuary
Pumpkin Patch East
 October 2019 Price Level

Feat. Acct.	Description	Subtotal	Cont. %	Cont \$\$	Total Cost
01	Lands & Damages	\$ 17,500	30%	\$ 5,250	\$ 22,750
	Total Lands & Damages	\$ 17,500		\$ 5,250	\$ 22,750
16	Bank Stabilization	\$ 13,289,825	25%	\$ 3,322,456	\$ 16,612,281
	Total Bank Stabilization	\$ 13,289,825		\$ 3,322,456	\$ 16,612,281
30	Planning, Engineering & Design	\$ 1,690,000	25%	\$ 422,500	\$ 2,112,500
31	Construction Management	\$ 1,914,982	25%	\$ 478,746	\$ 2,393,728
Sub-Total First Cost		\$ 16,912,307		\$ 4,228,952	\$ 21,141,259
	Monitoring	\$ 108,310	25%	\$ 27,077	\$ 135,387
	Adaptive Management	\$ 243,584	25%	\$ 60,896	\$ 304,480
Total First Cost		\$ 17,264,200		\$ 4,316,925	\$ 21,581,125

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Table I-12. First Cost – Elders Center
Hudson Raritan Estuary
Elders Center
October 2019 Price Level

Feat. Acct.	Description	Subtotal	Cont. %	Cont \$\$	Total Cost
01	Lands & Damages	\$ 17,500	30%	\$ 5,250	\$ 22,750
	Total Lands & Damages	\$ 17,500		\$ 5,250	\$ 22,750
16	Bank Stabilization	\$ 11,999,629	25%	\$ 2,999,907	\$ 14,999,536
	Total Bank Stabilization	\$ 11,999,629		\$ 2,999,907	\$ 14,999,536
30	Planning, Engineering & Design	\$ 1,520,000	25%	\$ 380,000	\$ 1,900,000
31	Construction Management	\$ 1,785,963	25%	\$ 446,491	\$ 2,232,454
Sub-Total First Cost		\$ 15,323,092		\$ 3,831,648	\$ 19,154,740
	Monitoring	\$ 108,310	25%	\$ 27,077.38	\$ 135,387
	Adaptive Management	\$ 234,011	25%	\$ 58,502.81	\$ 292,514
Total First Cost		\$ 15,665,412		\$ 3,917,228	\$ 19,582,641

Table I-13. First Cost – Flushing Creek
Hudson Raritan Estuary
Flushing Creek
October 2019 Price Level

Feat. Acct.	Description	Subtotal	Cont. %	Cont \$\$	Total Cost
01	Lands & Damages	\$ 133,750	30%	\$ 40,125	\$ 173,875
	Total Lands & Damages	\$ 133,750		\$ 40,125	\$ 173,875
16	Bank Stabilization	\$ 8,512,403	23%	\$ 1,957,853	\$ 10,470,256
	Total Bank Stabilization	\$ 8,512,403		\$ 1,957,853	\$ 10,470,256
18	Cultural Resource	\$ 250,000	23%	\$ 57,500	\$ 307,500
	Total Cultural Resource	\$ 250,000		\$ 57,500	\$ 307,500
30	Planning, Engineering & Design	\$ 2,595,000	23%	\$ 596,850	\$ 3,191,850
31	Construction Management	\$ 1,462,240	23%	\$ 336,315	\$ 1,798,556
Sub-Total First Cost		\$ 12,953,393		\$ 2,988,643	\$ 15,942,036
	Monitoring	\$ 105,031	23%	\$ 24,157	\$ 129,188
	Adaptive Management	\$ 65,559	23%	\$ 15,079	\$ 80,638
Total First Cost		\$ 13,123,983		\$ 3,027,879	\$ 16,151,862



Table I-14. First Cost – Bronx Zoo and Dam
Hudson Raritan Estuary
Bronx Zoo and Dam
 October 2019 Price Level

Feat. Acct.	Description	Subtotal	Cont. %	Cont \$\$	Total Cost
01	Lands & Damages	\$ 30,000	30%	\$ 9,000	\$ 39,000
	Total Lands & Damages	\$ 30,000		\$ 9,000	\$ 39,000
16	Bank Stabilization	\$ 5,164,184	29%	\$ 1,497,613	\$ 6,661,797
	Total Bank Stabilization	\$ 5,164,184		\$ 1,497,613	\$ 6,661,797
18	Cultural Resource	\$ 155,000	29%	\$ 44,950	\$ 199,950
	Total Cultural Resource	\$ 155,000		\$ 44,950	\$ 199,950
30	Planning, Engineering & Design	\$ 1,570,000	29%	\$ 455,300	\$ 2,025,300
31	Construction Management	\$ 977,918	29%	\$ 283,596	\$ 1,261,515
Sub-Total First Cost		\$ 7,897,102		\$ 2,290,460	\$ 10,187,562
	Monitoring	\$ 128,576	29%	\$ 37,287	\$ 165,863
	Adaptive Management	\$ 580,553	29%	\$ 168,360	\$ 748,913
Total First Cost		\$ 8,606,231		\$ 2,496,107	\$ 11,102,338

Table I-15. First Cost – Stone Mill Dam
Hudson Raritan Estuary
Stone Mill Dam
 October 2019 Price Level

Feat. Acct.	Description	Subtotal	Cont. %	Cont \$\$	Total Cost
01	Lands & Damages	\$ 30,000	30%	\$ 9,000	\$ 39,000
	Total Lands & Damages	\$ 30,000		\$ 9,000	\$ 39,000
16	Bank Stabilization	\$ 1,142,561	29%	\$ 331,343	\$ 1,473,903
	Total Bank Stabilization	\$ 1,142,561		\$ 331,343	\$ 1,473,903
18	Cultural Resource	\$ 150,000	29%	\$ 43,500	\$ 193,500
	Total Cultural Resource	\$ 150,000		\$ 43,500	\$ 193,500
30	Planning, Engineering & Design	\$ 1,360,000	29%	\$ 394,400	\$ 1,754,400
31	Construction Management	\$ 748,000	29%	\$ 216,920	\$ 964,920
Sub-Total First Cost		\$ 3,430,561		\$ 995,163	\$ 4,425,723
	Monitoring	\$ 81,160	29%	\$ 23,536	\$ 104,696
	Adaptive Management	\$ 66,404	29%	\$ 19,257	\$ 85,661
Total First Cost		\$ 3,578,124		\$ 1,037,956	\$ 4,616,080

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Table I-16. First Cost – Shoelace Park
Hudson Raritan Estuary
Shoelace Park
October 2019 Price Level

Feat. Acct.	Description	Subtotal	Cont. %	Cont \$\$	Total Cost
01	Lands & Damages	\$ 45,000	30%	\$ 13,500	\$ 58,500
	Total Lands & Damages	\$ 45,000		\$ 13,500	\$ 58,500
16	Bank Stabilization	\$ 11,154,662	29%	\$ 3,234,852	\$ 14,389,514
	Total Bank Stabilization	\$ 11,154,662		\$ 3,234,852	\$ 14,389,514
18	Cultural Resource	\$ 150,000	29%	\$ 43,500	\$ 193,500
	Total Cultural Resource	\$ 150,000		\$ 43,500	\$ 193,500
30	Planning, Engineering & Design	\$ 2,420,000	29%	\$ 701,800	\$ 3,121,800
31	Construction Management	\$ 1,510,466	29%	\$ 438,035	\$ 1,948,501
Sub-Total First Cost		\$ 15,280,128		\$ 4,431,687	\$ 19,711,816
	Monitoring	\$ 128,576	29%	\$ 37,287	\$ 165,863
	Adaptive Management	\$ 1,331,207	29%	\$ 386,050	\$ 1,717,257
Total First Cost		\$ 16,739,911		\$ 4,855,024	\$ 21,594,936

Table I-17. First Cost – Bronxville Lake
Hudson Raritan Estuary
Bronxville Lake
October 2019 Price Level

Feat. Acct.	Description	Subtotal	Cont. %	Cont \$\$	Total Cost
01	Lands & Damages	\$ 75,000	30%	\$ 22,500	\$ 97,500
	Total Lands & Damages	\$ 75,000		\$ 22,500	\$ 97,500
16	Bank Stabilization	\$ 7,447,979	29%	\$ 2,159,914	\$ 9,607,892
	Total Bank Stabilization	\$ 7,447,979		\$ 2,159,914	\$ 9,607,892
18	Cultural Resource	\$ 200,000	29%	\$ 58,000	\$ 258,000
	Total Cultural Resource	\$ 200,000		\$ 58,000	\$ 258,000
30	Planning, Engineering & Design	\$ 2,190,000	29%	\$ 635,100	\$ 2,825,100
31	Construction Management	\$ 1,226,798	29%	\$ 355,771	\$ 1,582,569
Sub-Total First Cost		\$ 11,139,776		\$ 3,231,285	\$ 14,371,062
	Monitoring	\$ 128,576	29%	\$ 37,287	\$ 165,863
	Adaptive Management	\$ 669,065	29%	\$ 194,029	\$ 863,094
Total First Cost		\$ 11,937,417		\$ 3,462,601	\$ 15,400,018



Table I-18. First Cost – Garth Woods / Harney Road
Hudson Raritan Estuary
Garth Wood-Harney Road
 October 2019 Price Level

Feat. Acct.	Description	Subtotal	Cont. %	Cont \$\$	Total Cost
01	Lands & Damages	\$ 60,000	30%	\$ 18,000	\$ 78,000
	Total Lands & Damages	\$ 60,000		\$ 18,000	\$ 78,000
16	Bank Stabilization	\$ 4,389,235	29%	\$ 1,272,878	\$ 5,662,113
	Total Bank Stabilization	\$ 4,389,235		\$ 1,272,878	\$ 5,662,113
18	Cultural Resource	\$ 200,000	29%	\$ 58,000	\$ 258,000
	Total Cultural Resource	\$ 200,000		\$ 58,000	\$ 258,000
30	Planning, Engineering & Design	\$ 1,810,000	29%	\$ 524,900	\$ 2,334,900
31	Construction Management	\$ 838,923	29%	\$ 243,288	\$ 1,082,211
Sub-Total First Cost		\$ 7,298,158		\$ 2,117,066	\$ 9,415,224
	Monitoring	\$ 128,576	29%	\$ 37,287	\$ 165,863
	Adaptive Management	\$ 621,275	29%	\$ 180,170	\$ 801,445
Total First Cost		\$ 8,048,010		\$ 2,334,523	\$ 10,382,533

Table I-19. First Cost – Oak Island Yards
Hudson Raritan Estuary
Oak Island Yards
 October 2019 Price Level

Feat. Acct.	Description	Subtotal	Cont. %	Cont \$\$	Total Cost
01	Lands & Damages	\$ 2,730,000	30%	\$ 819,000	\$ 3,549,000
	Total Lands & Damages	\$ 2,730,000		\$ 819,000	\$ 3,549,000
16	Bank Stabilization	\$ 6,315,339	25%	\$ 1,578,835	\$ 7,894,173
	Total Bank Stabilization	\$ 6,315,339		\$ 1,578,835	\$ 7,894,173
18	Cultural Resource	\$ 25,000	25%	\$ 6,250	\$ 31,250
	Total Cultural Resource	\$ 25,000		\$ 6,250	\$ 31,250
30	Planning, Engineering & Design	\$ 1,790,000	25%	\$ 447,500	\$ 2,237,500
31	Construction Management	\$ 1,220,034	25%	\$ 305,008	\$ 1,525,042
Sub-Total First Cost		\$ 12,080,372		\$ 3,156,593	\$ 15,236,965
	Monitoring	\$ 80,835	25%	\$ 20,209	\$ 101,044
	Adaptive Management	\$ 82,208	25%	\$ 20,552	\$ 102,760
Total First Cost		\$ 12,243,415		\$ 3,197,354	\$ 15,440,769

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Table I-20. First Cost – Essex County Branch Brook Park
Hudson Raritan Estuary
Essex County Branch Brook Park
October 2019 Price Level

Feat. Acct.	Description	Subtotal	Cont. %	Cont \$\$	Total Cost
01	Lands & Damages	\$ 75,000	30%	\$ 22,500	\$ 97,500
	Total Lands & Damages	\$ 75,000		\$ 22,500	\$ 97,500
16	Bank Stabilization	\$ 31,720,092	25%	\$ 7,930,023	\$ 39,650,114
	Total Bank Stabilization	\$ 31,720,092		\$ 7,930,023	\$ 39,650,114
18	Cultural Resource	\$ 200,000	25%	\$ 50,000	\$ 250,000
	Total Cultural Resource	\$ 200,000		\$ 50,000	\$ 250,000
30	Planning, Engineering & Design	\$ 2,290,000	25%	\$ 572,500	\$ 2,862,500
31	Construction Management	\$ 3,992,009	25%	\$ 998,002	\$ 4,990,011
Sub-Total First Cost		\$ 38,277,101		\$ 9,573,025	\$ 47,850,126
	Monitoring	\$ 152,772	25%	\$ 38,193	\$ 190,965
	Adaptive Management	\$ 3,189,258	25%	\$ 797,315	\$ 3,986,573
Total First Cost		\$ 41,619,131		\$ 10,408,533	\$ 52,027,663

Table I-21. First Cost – Metromedia Tract
Hudson Raritan Estuary
Metromedia
October 2019 Price Level

Feat. Acct.	Description	Subtotal	Cont. %	Cont \$\$	Total Cost
01	Lands & Damages	\$ 490,500	35%	\$ 171,675	\$ 662,175
	Total Lands & Damages	\$ 490,500		\$ 171,675	\$ 662,175
16	Bank Stabilization	\$ 19,610,145	21%	\$ 4,118,130	\$ 23,728,275
	Total Bank Stabilization	\$ 19,610,145		\$ 4,118,130	\$ 23,728,275
30	Planning, Engineering & Design	\$ 1,925,000	21%	\$ 404,250	\$ 2,329,250
31	Construction Management	\$ 2,761,014	21%	\$ 579,813	\$ 3,340,828
Sub-Total First Cost		\$ 24,786,659		\$ 5,273,868	\$ 30,060,528
	Monitoring	\$ 152,772	21%	\$ 32,082	\$ 184,854
	Adaptive Management	\$ 711,321	21%	\$ 149,377	\$ 860,698
Total First Cost		\$ 25,650,752		\$ 5,455,328	\$ 31,106,080



Table I-22. First Cost – Meadowlark Marsh
Hudson Raritan Estuary
Meadowlark Marsh
 October 2019 Price Level

Feat. Acct.	Description	Subtotal	Cont. %	Cont \$\$	Total Cost
01	Lands & Damages	\$ 781,200	35%	\$ 273,420	\$ 1,054,620
	Total Lands & Damages	\$ 781,200		\$ 273,420	\$ 1,054,620
16	Bank Stabilization	\$ 17,958,881	21%	\$ 3,771,365	\$ 21,730,246
	Total Bank Stabilization	\$ 17,958,881		\$ 3,771,365	\$ 21,730,246
18	Cultural Resource	\$ 125,000	21%	\$ 26,250	\$ 151,250
	Total Cultural Resource	\$ 125,000		\$ 26,250	\$ 151,250
30	Planning, Engineering & Design	\$ 2,435,000	21%	\$ 511,350	\$ 2,946,350
31	Construction Management	\$ 2,608,388	21%	\$ 547,761	\$ 3,156,150
Sub-Total First Cost		\$ 23,908,469		\$ 5,130,146	\$ 29,038,615
	Monitoring	\$ 152,772	21%	\$ 32,082	\$ 184,854
	Adaptive Management	\$ 367,752	21%	\$ 77,228	\$ 444,980
Total First Cost		\$ 24,428,993		\$ 5,239,456	\$ 29,668,449

Table I-23. First Cost – Naval Weapons Station Earle
Hudson Raritan Estuary
Naval Weapons Station Earle
 October 2019 Price Level

Feat. Acct.	Description	Subtotal	Cont. %	Cont \$\$	Total Cost
01	Lands & Damages	\$ 15,000	30%	\$ 4,500	\$ 19,500
	Total Lands & Damages	\$ 15,000		\$ 4,500	\$ 19,500
06	Fish and Wildlife Facilities	\$ 3,814,084	37%	\$ 1,411,211	\$ 5,225,295
	Total Fish and Wildlife Facilities	\$ 3,814,084		\$ 1,411,211	\$ 5,225,295
18	Cultural Resource	\$ 75,000	37%	\$ 27,750	\$ 102,750
	Total Cultural Resource	\$ 75,000		\$ 27,750	\$ 102,750
30	Planning, Engineering & Design	\$ 1,255,000	37%	\$ 464,350	\$ 1,719,350
31	Construction Management	\$ 722,908	37%	\$ 267,476	\$ 990,385
Total First Cost		\$ 5,881,993		\$ 2,175,287	\$ 8,057,280
	Monitoring	\$ 57,137	37%	\$ 21,141	\$ 78,278
	Adaptive Management	\$ 272,096	37%	\$ 100,675	\$ 372,771
Total First Cost		\$ 6,211,225		\$ 2,297,103	\$ 8,508,329

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Table I-24. First Cost – Bush Terminal
Hudson Raritan Estuary
Bush Terminal
October 2019 Price Level

Feat. Acct.	Description	Subtotal	Cont. %	Cont \$\$	Total Cost
01	Lands & Damages	\$ 45,000	30%	\$ 13,500	\$ 58,500
	Total Lands & Damages	\$ 45,000		\$ 13,500	\$ 58,500
06	Fish and Wildlife Facilities	\$ 2,464,023	37%	\$ 911,689	\$ 3,375,712
	Total Fish and Wildlife Facilities	\$ 2,464,023		\$ 911,689	\$ 3,375,712
18	Cultural Resource	\$ 75,000	37%	\$ 27,750	\$ 102,750
	Total Cultural Resource	\$ 75,000		\$ 27,750	\$ 102,750
30	Planning, Engineering & Design	\$ 1,405,000	37%	\$ 519,850	\$ 1,924,850
31	Construction Management	\$ 626,000	37%	\$ 231,620	\$ 857,620
Sub-Total First Cost		\$ 4,615,023		\$ 1,704,409	\$ 6,319,432
	Monitoring	\$ 108,009	37%	\$ 39,963	\$ 147,972
	Adaptive Management	\$ 107,105	37%	\$ 39,629	\$ 146,734
Total First Cost		\$ 4,830,137		\$ 1,784,001	\$ 6,614,138

Table I-25. First Cost – Head of Jamaica Bay
Hudson Raritan Estuary
Head of Jamaica Bay
October 2019 Price Level

Feat. Acct.	Description	Subtotal	Cont. %	Cont \$\$	Total Cost
01	Lands & Damages	\$ 15,000	30%	\$ 4,500	\$ 19,500
	Total Lands & Damages	\$ 15,000		\$ 4,500	\$ 19,500
06	Fish and Wildlife Facilities	\$ 2,056,724	37%	\$ 760,988	\$ 2,817,712
	Total Fish and Wildlife Facilities	\$ 2,056,724		\$ 760,988	\$ 2,817,712
30	Planning, Engineering & Design	\$ 1,330,000	37%	\$ 492,100	\$ 1,822,100
31	Construction Management	\$ 405,672	37%	\$ 150,099	\$ 555,771
Sub-Total First Cost		\$ 3,807,396		\$ 1,407,687	\$ 5,215,083
	Monitoring	\$ 57,137	37%	\$ 21,141	\$ 78,278
	Adaptive Management	\$ 282,384	37%	\$ 104,482	\$ 386,866
Total First Cost		\$ 4,146,917		\$ 1,533,309	\$ 5,680,227



3. Construction Schedule and Windows

The construction duration for the entire HRE recommendation was estimated at 13.5 years, as shown in Figure I-26. The construction schedule for each one of the 20 ecosystem restoration sites was developed based on the crew outputs referenced from RSMeans with the assumption that multiple crews would work simultaneously.

The construction start year for each site are phased based on the HRE construction schedule budget, phased into seven (7) different groupings. The seven (7) groupings are show in Table I-2. The phasing for the construction activities have been developed in coordination with the non-federal sponsors based on sponsor readiness and priorities; as well as implementing restoration with geographic distribution among the planning regions.

3.1. July Mobilization

Project sites that are to perform mobilization in July in order to meet the Phragmites spraying window of between 15 August to 15 October are as follow:

- Dead Horse Bay
- Fresh Creek
- Flushing Creek
- Oak Island Yards
- Metromedia Tract
- Meadowlark Marsh

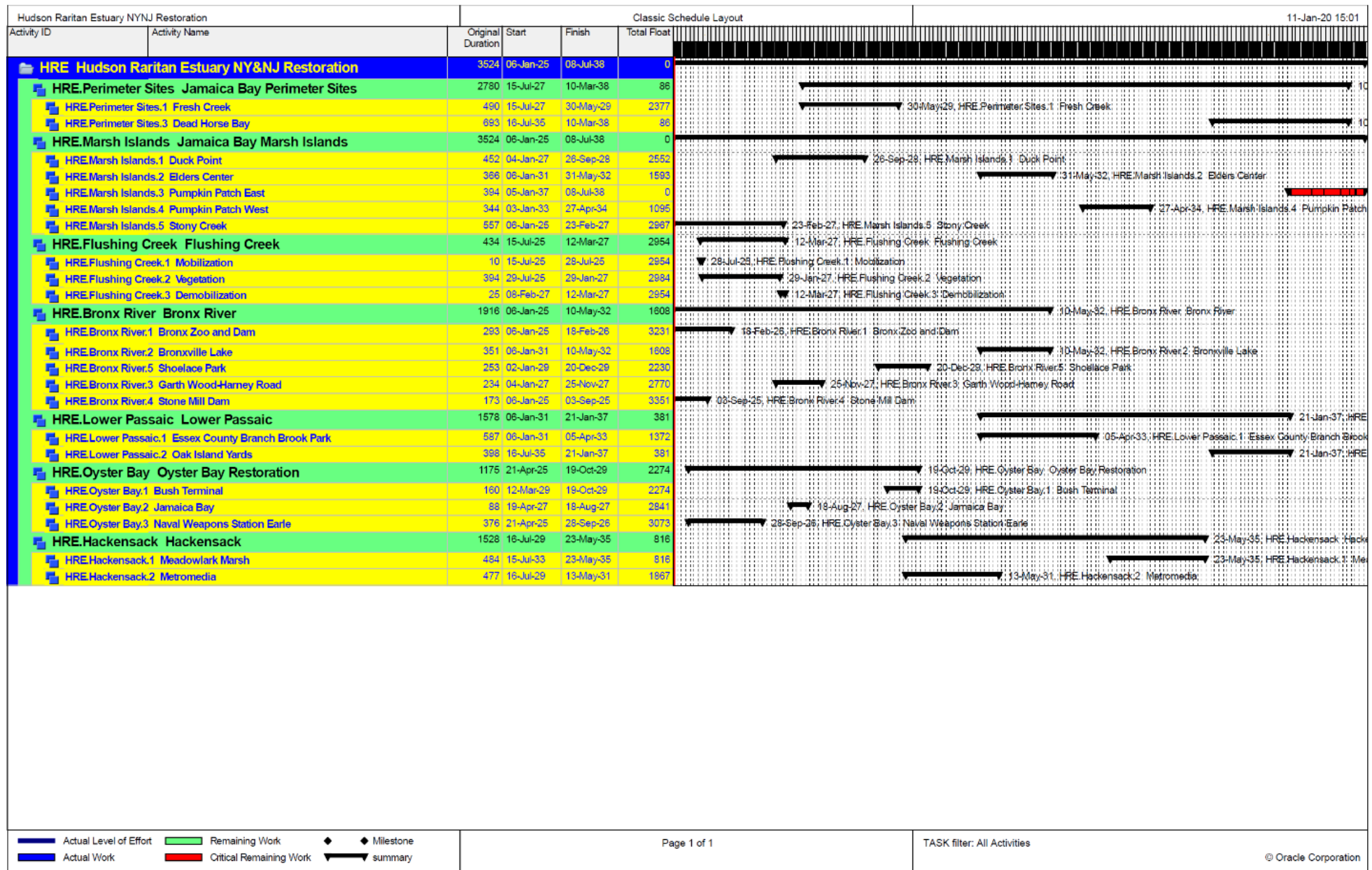
3.2. January Mobilization

Project sites that are to perform mobilization in January due to Earthwork/Placement requirement prior to planting are as follow:

- Duck Point
- Stony Creek
- Pumpkin Patch West
- Pumpkin Patch East
- Elders Center
- Bronx Zoo and Dam
- Stone Mill Dam
- Shoelace Park
- Bronxville Lake
- Garth Wood-Harney Road
- Essex County Branch Brook Park

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Table I-26. HRE Construction Schedule



**Table I-27. HRE Construction Schedule Budget**

Sites	Grouping 1 Construction: 2025-27	Grouping 2 Construction: 2027-29	Grouping 3 Construction: 2029-31	Grouping 4 Construction: 2031-33	Grouping 5 Construction: 2033-35	Grouping 6 Construction: 2035-37	Grouping 7 Construction: 2037-39
Jamaica Bay Planning Region - Perimeter Sites							
Fresh Creek		July 2027					
Dead Horse Bay						July 2035	
Jamaica Bay Planning Region - Marsh Islands							
Elders Center				January 2031			
Duck Point		January 2027					
Pumpkin Patch East							January 2037
Pumpkin Patch West					January 2033		
Stony Creek	January 2025						
Flushing Creek							
Flushing Creek	July 2025						
Bronx River							
Bronx Zoo and Dam	January 2025						
Stone Mill Dam	January 2025						
Shoelace Park			January 2029				
Bronxville Lake				January 2031			
Garth Woods - Harney Road		January 2027					
Hackensack							
Meadowlark Marsh					July 2033		
Metromedia Tract			July 2029				
Lower Passaic							
Essex County Branch Brook Park				January 2031			
Oak Island Yards						July 2035	
Oyster Bay Restoration							
Jamaica Bay - Head of Bay		April 2027					
Bush Terminal			March 2029				
Naval Weapons Station Earle	April 2025						

3.3. March/April Mobilization

Project sites that are to perform mobilization around March / April timeframe in order to meet the actual installation window between May to July are as follow:

- Naval Weapons Station Earle
- Bush Terminal
- Head of Jamaica Bay

3.4. Planting Windows

The general planting windows for the 20 ecosystem restoration sites are as follow:

- 01 March to 01 May – Spring Deciduous Woody Plants
- 01 April to 15 May – Spring Evergreen Woody Plants
- 15 May to 30 June – Herbaceous Plants
- 30 June to 15 September – No Planting
- 15 September to 01 December – Fall Deciduous Woody Plants
- 15 September to 15 October – Fall Evergreen Woody Plants

4. Cost Summary

The Recommended Plan has an estimated project first cost of \$408,868,000 which includes monitoring costs of \$2,977,000 and adaptive management costs of \$12,968,000 (October 2019/FY2020 price level). The Total Fully Funded Project cost is \$567,335,000 excluding the Monitoring and Adaptive Management cost of \$3,955,000 and \$17,455,000 respectively (for a total of \$588,745,000). The fully funded total project cost for the entire HRE Recommended Plan is presented in Table I-28. The costs for each ecosystem restoration project site is presented in Table I-29 thru Table I-48.



Table I-28. Total Project Cost Summary

PROJECT: Hudson Raritan Estuary
 PROJECT NO: P2 108384
 LOCATION: New York / New Jersey

DISTRICT: NAN
 POC: CHIEF, COST ENGINEERING, Mukesh Kumar

PREPARED: 11/19/2019

This Estimate reflects the scope and schedule in report;

Draft Feasibility Report

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)					TOTAL PROJECT COST (FULLY FUNDED)					
WBS NUMBER A	Civil Works Feature & Sub-Feature Description B	COST (\$K) C	CNTG (\$K) D	CNTG (%) E	TOTAL (\$K) F	ESC (%) G	COST (\$K) H	CNTG (\$K) I	TOTAL (\$K) J	Program Year (Budget EC): Effective Price Level Date:		TOTAL FIRST COST (\$K) K	INFLATED (%) L	COST (\$K) M	CNTG (\$K) N	FULL (\$K) O
										2020 1 OCT 19	Spent Thru: 1-Oct-19 (\$K)					
06	FISH & WILDLIFE FACILITIES	\$8,335	\$3,084	37.0%	\$11,419	0.0%	\$8,335	\$3,084	\$11,419	\$0	\$11,419	25.6%	\$10,465	\$3,872	\$14,338	
16	BANK STABILIZATION	\$225,158	\$54,375	24.1%	\$279,533	0.0%	\$225,158	\$54,375	\$279,533	\$0	\$279,533	43.0%	\$322,052	\$77,546	\$399,598	
18	CULTURAL RESOURCE PRESERVATION	\$1,855	\$498	26.9%	\$2,353	0.0%	\$1,855	\$498	\$2,353	\$0	\$2,353	33.3%	\$2,477	\$661	\$3,138	
CONSTRUCTION ESTIMATE TOTALS:		\$235,348	\$57,957		\$293,305	0.0%	\$235,348	\$57,957	\$293,305	\$0	\$293,305	42.2%	\$334,995	\$82,080	\$417,074	
01	LANDS AND DAMAGES	\$6,265	\$1,943	31.0%	\$8,208	0.0%	\$6,265	\$1,943	\$8,208	\$0	\$8,208	44.8%	\$9,074	\$2,814	\$11,888	
30	PLANNING, ENGINEERING & DESIGN	\$37,925	\$9,959	26.3%	\$47,884	0.0%	\$37,925	\$9,959	\$47,884	\$0	\$47,884	47.0%	\$55,845	\$14,531	\$70,376	
31	CONSTRUCTION MANAGEMENT	\$34,830	\$8,696	25.0%	\$43,526	0.0%	\$34,830	\$8,696	\$43,526	\$0	\$43,526	56.2%	\$54,498	\$13,498	\$67,996	
PROJECT COST SUB-TOTALS:		\$314,367	\$78,555	25.0%	\$392,922		\$314,367	\$78,555	\$392,922	\$0	\$392,922	44.4%	\$454,412	\$112,923	\$567,335	
MONITORING		\$2,360	\$617	26.1%	\$2,977	0.0%	\$2,360	\$617	\$2,977	\$0	\$2,977	32.8%	\$3,137	\$818	\$3,955	
ADAPATIVE MANAGEMENT		\$10,253	\$2,715	26.5%	\$12,968	0.0%	\$10,253	\$2,715	\$12,968	\$0	\$12,968	34.6%	\$13,813	\$3,643	\$17,455	
PROJECT COST TOTALS:		\$326,981	\$81,887		\$408,868		\$326,981	\$81,887	\$408,868		\$408,868		\$471,361	\$117,383	\$588,745	

CHIEF, COST ENGINEERING, Mukesh Kumar

PROJECT MANAGER, Lisa Baron

CHIEF, REAL ESTATE, Lydia Williams

ESTIMATED TOTAL PROJECT COST: \$567,335

ESTIMATED TOTAL MONITORING COST: \$3,955

ESTIMATED TOTAL ADAPTIVE MANAGEMENT COST: \$17,455

Hudson-Raritan Estuary Ecosystem Restoration Feasibility Study Final Integrated Feasibility Report & Environmental Assessment

Table I-29. Total Project Cost Summary – Dead Horse Bay

PROJECT: Hudson Raritan Estuary
LOCATION: New York / New Jersey
This Estimate reflects the scope and schedule in report;

Draft Feasibility Report

DISTRICT: NAN
POC: CHIEF, COST ENGINEERING, Mukesh Kumar

PREPARED: 11/19/2019

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: Effective Price Level:		19-Nov-19 1-Oct-19		Program Year (Budget EC): Effective Price Level Date:		2020 1 OCT 19		FULLY FUNDED PROJECT ESTIMATE				
WBS NUMBER A	Civil Works Feature & Sub-Feature Description B	COST (\$K) C	CNTG (\$K) D	CNTG (%) E	TOTAL (\$K) F	ESC (%) G	COST (\$K) H	CNTG (\$K) I	TOTAL (\$K) J	Mid-Point Date P	INFLATED (%) L	COST (\$K) M	CNTG (\$K) N	FULL (\$K) O
	Dead Horse Bay													
16	BANK STABILIZATION	\$27,038	\$5,948	22.0%	\$32,987	0.0%	\$27,038	\$5,948	\$32,987	2036Q4	64.4%	\$44,464	\$9,782	\$54,246
18	CULTURAL RESOURCE PRESERVATION	\$125	\$28	22.0%	\$153	0.0%	\$125	\$28	\$153	2036Q4	64.4%	\$206	\$45	\$251
	CONSTRUCTION ESTIMATE TOTALS:	\$27,163	\$5,976	22.0%	\$33,139		\$27,163	\$5,976	\$33,139			\$44,670	\$9,827	\$54,497
01	LANDS AND DAMAGES	\$36	\$11	30.0%	\$46	0.0%	\$36	\$11	\$46	2035Q4	59.7%	\$57	\$17	\$74
30	PLANNING, ENGINEERING & DESIGN													
	Project Management	\$400	\$88	22.0%	\$488	0.0%	\$400	\$88	\$488	2035Q4	83.4%	\$734	\$161	\$895
	Planning & Environmental Compliance	\$665	\$146	22.0%	\$811	0.0%	\$665	\$146	\$811	2035Q4	83.4%	\$1,220	\$268	\$1,488
	Engineering & Design	\$1,080	\$238	22.0%	\$1,318	0.0%	\$1,080	\$238	\$1,318	2035Q4	83.4%	\$1,981	\$436	\$2,416
	Reviews, ATRs, IEPRs, VE	\$150	\$33	22.0%	\$183	0.0%	\$150	\$33	\$183	2035Q4	83.4%	\$275	\$61	\$336
	Contracting & Reprographics	\$50	\$11	22.0%	\$61	0.0%	\$50	\$11	\$61	2035Q4	83.4%	\$92	\$20	\$112
31	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	\$2,716	\$598	22.0%	\$3,314	0.0%	\$2,716	\$598	\$3,314	2036Q4	90.9%	\$5,186	\$1,141	\$6,327
	Engineering During Construction	\$200	\$44	22.0%	\$244	0.0%	\$200	\$44	\$244	2036Q4	90.9%	\$382	\$84	\$466
	Planning During Construction	\$200	\$44	22.0%	\$244	0.0%	\$200	\$44	\$244	2036Q4	90.9%	\$382	\$84	\$466
	Project Management	\$400	\$88	22.0%	\$488	0.0%	\$400	\$88	\$488	2036Q4	90.9%	\$764	\$168	\$932
	CONTRACT COST SUB-TOTALS:	\$33,060	\$7,276		\$40,336		\$33,060	\$7,276	\$40,336			\$55,740	\$12,267	\$68,007
	Monitoring	\$105	\$23	22.0%	\$128	0.0%	\$105	\$23	\$128	2036Q4	64.4%	\$173	\$38	\$211
	Adaptive Management	\$234	\$52	22.0%	\$286	0.0%	\$234	\$52	\$286	2036Q4	64.4%	\$385	\$85	\$470
	CONTRACT COST TOTALS:	\$33,400	\$7,351		\$40,750		\$33,400	\$7,351	\$40,750			\$56,298	\$12,390	\$68,688



Table I-30. Total Project Cost Summary – Fresh Creek

PROJECT: Hudson Raritan Estuary
 LOCATION: New York / New Jersey
 This Estimate reflects the scope and schedule in report;

Draft Feasibility Report

DISTRICT: NAN
 POC: CHIEF, COST ENGINEERING, Mukesh Kumar

PREPARED: 11/19/2019

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: Effective Price Level:		19-Nov-19 1-Oct-19		Program Year (Budget EC): 2020 Effective Price Level Date: 1 OCT 19				FULLY FUNDED PROJECT ESTIMATE				
WBS NUMBER A	Civil Works Feature & Sub-Feature Description B	COST (\$K) C	CNTG (\$K) D	CNTG (%) E	TOTAL (\$K) F	ESC (%) G	COST (\$K) H	CNTG (\$K) I	TOTAL (\$K) J	Mid-Point Date P	INFLATED (%) L	COST (\$K) M	CNTG (\$K) N	FULL (\$K) O
	Fresh Creek													
16	BANK STABILIZATION	\$20,081	\$4,418	22.0%	\$24,499	0.0%	\$20,081	\$4,418	\$24,499	2028Q4	29.8%	\$26,069	\$5,735	\$31,804
18	CULTURAL RESOURCE PRESERVATION	\$125	\$28	22.0%	\$153	0.0%	\$125	\$28	\$153	2028Q4	29.8%	\$162	\$36	\$198
	CONSTRUCTION ESTIMATE TOTALS:	\$20,206	\$4,445	22.0%	\$24,652		\$20,206	\$4,445	\$24,652			\$26,231	\$5,771	\$32,002
01	LANDS AND DAMAGES	\$1,617	\$485	30.0%	\$2,101	0.0%	\$1,617	\$485	\$2,101	2027Q4	26.0%	\$2,037	\$611	\$2,649
30	PLANNING, ENGINEERING & DESIGN													
	Project Management	\$400	\$88	22.0%	\$488	0.0%	\$400	\$88	\$488	2027Q4	33.9%	\$536	\$118	\$653
	Planning & Environmental Compliance	\$715	\$157	22.0%	\$872	0.0%	\$715	\$157	\$872	2027Q4	33.9%	\$957	\$211	\$1,168
	Engineering & Design	\$1,310	\$288	22.0%	\$1,598	0.0%	\$1,310	\$288	\$1,598	2027Q4	33.9%	\$1,754	\$386	\$2,140
	Reviews, ATRs, IEPRs, VE	\$150	\$33	22.0%	\$183	0.0%	\$150	\$33	\$183	2027Q4	33.9%	\$201	\$44	\$245
	Contracting & Reprographics	\$50	\$11	22.0%	\$61	0.0%	\$50	\$11	\$61	2027Q4	33.9%	\$67	\$15	\$82
31	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	\$2,021	\$445	22.0%	\$2,465	0.0%	\$2,021	\$445	\$2,465	2028Q4	39.1%	\$2,811	\$618	\$3,429
	Engineering During Construction	\$200	\$44	22.0%	\$244	0.0%	\$200	\$44	\$244	2028Q4	39.1%	\$278	\$61	\$339
	Planning During Construction	\$200	\$44	22.0%	\$244	0.0%	\$200	\$44	\$244	2028Q4	39.1%	\$278	\$61	\$339
	Project Management	\$400	\$88	22.0%	\$488	0.0%	\$400	\$88	\$488	2028Q4	39.1%	\$556	\$122	\$679
	CONTRACT COST SUB-TOTALS:	\$27,268	\$6,128		\$33,397		\$27,268	\$6,128	\$33,397			\$35,706	\$8,018	\$43,724
	Monitoring	\$201	\$44	22.0%	\$245	0.0%	\$201	\$44	\$245	2028Q4	29.8%	\$260	\$57	\$318
	Adaptive Management	\$224	\$49	22.0%	\$273	0.0%	\$224	\$49	\$273	2028Q4	29.8%	\$291	\$64	\$354
	CONTRACT COST TOTALS:	\$27,693	\$6,222		\$33,915		\$27,693	\$6,222	\$33,915			\$36,257	\$8,139	\$44,396

Hudson-Raritan Estuary Ecosystem Restoration Feasibility Study

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Table I-31. Total Project Cost Summary – Duck Point

PROJECT: Hudson Raritan Estuary
 LOCATION: New York / New Jersey
 This Estimate reflects the scope and schedule in report;

Draft Feasibility Report

DISTRICT: NAN
 POC: CHIEF, COST ENGINEERING, Mukesh Kumar

PREPARED: 11/19/2019

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: Effective Price Level:		19-Nov-19 1-Oct-19		Program Year (Budget EC): Effective Price Level Date:		2020 1 OCT 19		FULLY FUNDED PROJECT ESTIMATE				
WBS NUMBER A	Civil Works Feature & Sub-Feature Description B	COST (\$K) C	CNTG (\$K) D	CNTG (%) E	TOTAL (\$K) F	ESC (%) G	COST (\$K) H	CNTG (\$K) I	TOTAL (\$K) J	Mid-Point Date P	INFLATED (%) L	COST (\$K) M	CNTG (\$K) N	FULL (\$K) O
16	Duck Point BANK STABILIZATION	\$13,026	\$3,257	25.0%	\$16,283	0.0%	\$13,026	\$3,257	\$16,283	2027Q4	26.0%	\$16,417	\$4,104	\$20,522
	CONSTRUCTION ESTIMATE TOTALS:	\$13,026	\$3,257	25.0%	\$16,283		\$13,026	\$3,257	\$16,283			\$16,417	\$4,104	\$20,522
01	LANDS AND DAMAGES	\$18	\$5	30.0%	\$23	0.0%	\$18	\$5	\$23	2027Q2	24.2%	\$22	\$7	\$28
30	PLANNING, ENGINEERING & DESIGN													
	Project Management	\$400	\$100	25.0%	\$500	0.0%	\$400	\$100	\$500	2027Q2	31.3%	\$525	\$131	\$657
	Planning & Environmental Compliance	\$230	\$58	25.0%	\$288	0.0%	\$230	\$58	\$288	2027Q2	31.3%	\$302	\$76	\$378
	Engineering & Design	\$940	\$235	25.0%	\$1,175	0.0%	\$940	\$235	\$1,175	2027Q2	31.3%	\$1,234	\$309	\$1,543
	Reviews, ATRs, IEPRs, VE	\$120	\$30	25.0%	\$150	0.0%	\$120	\$30	\$150	2027Q2	31.3%	\$158	\$39	\$197
	Contracting & Reprographics	\$50	\$13	25.0%	\$63	0.0%	\$50	\$13	\$63	2027Q2	31.3%	\$66	\$16	\$82
31	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	\$1,303	\$326	25.0%	\$1,628	0.0%	\$1,303	\$326	\$1,628	2027Q4	33.9%	\$1,744	\$436	\$2,180
	Engineering During Construction	\$136	\$34	25.0%	\$170	0.0%	\$136	\$34	\$170	2027Q4	33.9%	\$182	\$46	\$228
	Planning During Construction	\$150	\$38	25.0%	\$188	0.0%	\$150	\$38	\$188	2027Q4	33.9%	\$201	\$50	\$251
	Project Management	\$300	\$75	25.0%	\$375	0.0%	\$300	\$75	\$375	2027Q4	33.9%	\$402	\$100	\$502
	CONTRACT COST SUB-TOTALS:	\$16,672	\$4,169		\$20,841		\$16,672	\$4,169	\$20,841			\$21,252	\$5,314	\$26,567
	Monitoring	\$134	\$33	25.0%	\$167	0.0%	\$134	\$33	\$167	2027Q4	26.0%	\$169	\$42	\$211
	Adaptive Management	\$314	\$78	25.0%	\$392	0.0%	\$314	\$78	\$392	2027Q4	26.0%	\$396	\$99	\$495
	CONTRACT COST TOTALS:	\$17,120	\$4,281		\$21,401		\$17,120	\$4,281	\$21,401			\$21,817	\$5,455	\$27,272



Table I-32. Total Project Cost Summary – Stony Creek

PROJECT: Hudson Raritan Estuary
 LOCATION: New York / New Jersey
 This Estimate reflects the scope and schedule in report;

Draft Feasibility Report

DISTRICT: NAN
 POC: CHIEF, COST ENGINEERING, Mukesh Kumar

PREPARED: 11/19/2019

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: Effective Price Level:		19-Nov-19 1-Oct-19		Program Year (Budget EC): 2020 Effective Price Level Date: 1 OCT 19					FULLY FUNDED PROJECT ESTIMATE			
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Mid-Point Date	INFLATED (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O
16	Stony Creek BANK STABILIZATION	\$14,054	\$3,513	25.0%	\$17,567	0.0%	\$14,054	\$3,513	\$17,567	2026Q1	19.6%	\$16,814	\$4,203	\$21,017
CONSTRUCTION ESTIMATE TOTALS:		\$14,054	\$3,513	25.0%	\$17,567		\$14,054	\$3,513	\$17,567			\$16,814	\$4,203	\$21,017
01	LANDS AND DAMAGES	\$18	\$5	30.0%	\$23	0.0%	\$18	\$5	\$23	2025Q2	17.0%	\$20	\$6	\$27
30	PLANNING, ENGINEERING & DESIGN													
	Project Management	\$400	\$100	25.0%	\$500	0.0%	\$400	\$100	\$500	2025Q2	21.9%	\$488	\$122	\$609
	Planning & Environmental Compliance	\$230	\$58	25.0%	\$288	0.0%	\$230	\$58	\$288	2025Q2	21.9%	\$280	\$70	\$350
	Engineering & Design	\$1,140	\$285	25.0%	\$1,425	0.0%	\$1,140	\$285	\$1,425	2025Q2	21.9%	\$1,389	\$347	\$1,737
	Reviews, ATRs, IEPRs, VE	\$120	\$30	25.0%	\$150	0.0%	\$120	\$30	\$150	2025Q2	21.9%	\$146	\$37	\$183
	Contracting & Reprographics	\$50	\$13	25.0%	\$63	0.0%	\$50	\$13	\$63	2025Q2	21.9%	\$61	\$15	\$76
31	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	\$1,405	\$351	25.0%	\$1,757	0.0%	\$1,405	\$351	\$1,757	2026Q1	25.3%	\$1,762	\$440	\$2,202
	Engineering During Construction	\$136	\$34	25.0%	\$170	0.0%	\$136	\$34	\$170	2026Q1	25.3%	\$170	\$43	\$213
	Planning During Construction	\$150	\$38	25.0%	\$188	0.0%	\$150	\$38	\$188	2026Q1	25.3%	\$188	\$47	\$235
2.5%	Project Management	\$300	\$75	25.0%	\$375	0.0%	\$300	\$75	\$375	2026Q1	25.3%	\$376	\$94	\$470
CONTRACT COST SUB-TOTALS:		\$18,003	\$4,502		\$22,504		\$18,003	\$4,502	\$22,504			\$21,695	\$5,425	\$27,120
	Monitoring	\$134	\$33	25.0%	\$167	0.0%	\$134	\$33	\$167	2026Q1	19.6%	\$160	\$40	\$200
	Adaptive Management	\$439	\$110	25.0%	\$549	0.0%	\$439	\$110	\$549	2026Q1	19.6%	\$525	\$131	\$656
CONTRACT COST TOTALS:		\$18,575	\$4,645		\$23,220		\$18,575	\$4,645	\$23,220			\$22,380	\$5,596	\$27,976

Hudson-Raritan Estuary Ecosystem Restoration Feasibility Study

Final Integrated Feasibility Report & Environmental Assessment

Table I-33. Total Project Cost Summary – Pumpkin Patch West

PROJECT: Hudson Raritan Estuary
 LOCATION: New York / New Jersey
 This Estimate reflects the scope and schedule in report;

Draft Feasibility Report

DISTRICT: NAN
 POC: CHIEF, COST ENGINEERING, Mukesh Kumar

PREPARED: 11/19/2019

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: Effective Price Level:		19-Nov-19 1-Oct-19		Program Year (Budget EC): Effective Price Level Date:		2020 1 OCT 19		FULLY FUNDED PROJECT ESTIMATE				
WBS NUMBER A	Civil Works Feature & Sub-Feature Description B	COST (\$K) C	CNTG (\$K) D	CNTG (%) E	TOTAL (\$K) F	ESC (%) G	COST (\$K) H	CNTG (\$K) I	TOTAL (\$K) J	Mid-Point Date P	INFLATED (%) L	COST (\$K) M	CNTG (\$K) N	FULL (\$K) O
16	Pumpkin Patch West BANK STABILIZATION	\$12,253	\$3,063	25.0%	\$15,317	0.0%	\$12,253	\$3,063	\$15,317	2034Q4	55.0%	\$18,994	\$4,748	\$23,742
CONSTRUCTION ESTIMATE TOTALS:		\$12,253	\$3,063	25.0%	\$15,317		\$12,253	\$3,063	\$15,317			\$18,994	\$4,748	\$23,742
01	LANDS AND DAMAGES	\$18	\$5	30.0%	\$23	0.0%	\$18	\$5	\$23	2033Q2	48.3%	\$26	\$8	\$34
30	PLANNING, ENGINEERING & DESIGN													
	Project Management	\$400	\$100	25.0%	\$500	0.0%	\$400	\$100	\$500	2033Q2	65.8%	\$663	\$166	\$829
	Planning & Environmental Compliance	\$230	\$58	25.0%	\$288	0.0%	\$230	\$58	\$288	2033Q2	65.8%	\$381	\$95	\$477
	Engineering & Design	\$890	\$223	25.0%	\$1,113	0.0%	\$890	\$223	\$1,113	2033Q2	65.8%	\$1,476	\$369	\$1,845
	Reviews, ATRs, IEPRs, VE	\$120	\$30	25.0%	\$150	0.0%	\$120	\$30	\$150	2033Q2	65.8%	\$199	\$50	\$249
	Contracting & Reprographics	\$50	\$13	25.0%	\$63	0.0%	\$50	\$13	\$63	2033Q2	65.8%	\$83	\$21	\$104
31	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	\$1,225	\$306	25.0%	\$1,532	0.0%	\$1,225	\$306	\$1,532	2034Q4	76.2%	\$2,159	\$540	\$2,698
	Engineering During Construction	\$136	\$34	25.0%	\$170	0.0%	\$136	\$34	\$170	2034Q4	76.2%	\$240	\$60	\$299
	Planning During Construction	\$150	\$38	25.0%	\$188	0.0%	\$150	\$38	\$188	2034Q4	76.2%	\$264	\$66	\$330
	Project Management	\$300	\$75	25.0%	\$375	0.0%	\$300	\$75	\$375	2034Q4	76.2%	\$529	\$132	\$661
CONTRACT COST SUB-TOTALS:		\$15,772	\$3,944		\$19,716		\$15,772	\$3,944	\$19,716			\$25,013	\$6,255	\$31,268
	Monitoring	\$108	\$27	25.0%	\$135	0.0%	\$108	\$27	\$135	2034Q4	55.0%	\$168	\$42	\$210
	Adaptive Management	\$218	\$55	25.0%	\$273	0.0%	\$218	\$55	\$273	2034Q4	55.0%	\$338	\$85	\$423
CONTRACT COST TOTALS:		\$16,099	\$4,026		\$20,124		\$16,099	\$4,026	\$20,124			\$25,519	\$6,381	\$31,901

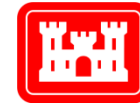


Table I-34. Total Project Cost Summary – Pumpkin Patch East

PROJECT: Hudson Raritan Estuary
 LOCATION: New York / New Jersey
 This Estimate reflects the scope and schedule in report;

Draft Feasibility Report

DISTRICT: NAN
 POC: CHIEF, COST ENGINEERING, Mukesh Kumar

PREPARED: 11/19/2019

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: Effective Price Level:		19-Nov-19 1-Oct-19		Program Year (Budget EC): 2020 Effective Price Level Date: 1 OCT 19				FULLY FUNDED PROJECT ESTIMATE				
WBS NUMBER A	Civil Works Feature & Sub-Feature Description B	COST (\$K) C	CNTG (\$K) D	CNTG (%) E	TOTAL (\$K) F	ESC (%) G	COST (\$K) H	CNTG (\$K) I	TOTAL (\$K) J	Mid-Point Date P	INFLATED (%) L	COST (\$K) M	CNTG (\$K) N	FULL (\$K) O
16	Pumpkin Patch East BANK STABILIZATION	\$13,290	\$3,322	25.0%	\$16,612	0.0%	\$13,290	\$3,322	\$16,612	2038Q4	74.5%	\$23,186	\$5,796	\$28,982
	CONSTRUCTION ESTIMATE TOTALS:	\$13,290	\$3,322	25.0%	\$16,612		\$13,290	\$3,322	\$16,612			\$23,186	\$5,796	\$28,982
01	LANDS AND DAMAGES	\$18	\$5	30.0%	\$23	0.0%	\$18	\$5	\$23	2037Q2	66.9%	\$29	\$9	\$38
30	PLANNING, ENGINEERING & DESIGN													
	Project Management	\$400	\$100	25.0%	\$500	0.0%	\$400	\$100	\$500	2037Q2	94.8%	\$779	\$195	\$974
	Planning & Environmental Compliance	\$230	\$58	25.0%	\$288	0.0%	\$230	\$58	\$288	2037Q2	94.8%	\$448	\$112	\$560
	Engineering & Design	\$890	\$223	25.0%	\$1,113	0.0%	\$890	\$223	\$1,113	2037Q2	94.8%	\$1,733	\$433	\$2,167
	Reviews, ATRs, IEPRs, VE	\$120	\$30	25.0%	\$150	0.0%	\$120	\$30	\$150	2037Q2	94.8%	\$234	\$58	\$292
	Contracting & Reprographics	\$50	\$13	25.0%	\$63	0.0%	\$50	\$13	\$63	2037Q2	94.8%	\$97	\$24	\$122
31	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	\$1,329	\$332	25.0%	\$1,661	0.0%	\$1,329	\$332	\$1,661	2038Q4	107.2%	\$2,754	\$688	\$3,442
	Engineering During Construction	\$136	\$34	25.0%	\$170	0.0%	\$136	\$34	\$170	2038Q4	107.2%	\$282	\$70	\$352
	Planning During Construction	\$150	\$38	25.0%	\$188	0.0%	\$150	\$38	\$188	2038Q4	107.2%	\$311	\$78	\$388
	Project Management	\$300	\$75	25.0%	\$375	0.0%	\$300	\$75	\$375	2038Q4	107.2%	\$622	\$155	\$777
	CONTRACT COST SUB-TOTALS:	\$16,912	\$4,229		\$21,141		\$16,912	\$4,229	\$21,141			\$30,474	\$7,620	\$38,094
	Monitoring	\$108	\$27	25.0%	\$135	0.0%	\$108	\$27	\$135	2038Q4	74.5%	\$189	\$47	\$236
	Adaptive Management	\$244	\$61	25.0%	\$304	0.0%	\$244	\$61	\$304	2038Q4	74.5%	\$425	\$106	\$531
	CONTRACT COST TOTALS:	\$17,264	\$4,317		\$21,581		\$17,264	\$4,317	\$21,581			\$31,088	\$7,773	\$38,861

Hudson-Raritan Estuary Ecosystem Restoration Feasibility Study Final Integrated Feasibility Report & Environmental Assessment

Table I-35. Total Project Cost Summary – Elders Center

PROJECT: Hudson Raritan Estuary
LOCATION: New York / New Jersey
This Estimate reflects the scope and schedule in report;

Draft Feasibility Report

DISTRICT: NAN
POC: CHIEF, COST ENGINEERING, Mukesh Kumar

PREPARED: 11/19/2019

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: Effective Price Level:		19-Nov-19 1-Oct-19		Program Year (Budget EC): 2020 Effective Price Level Date: 1 OCT 19		FULLY FUNDED PROJECT ESTIMATE						
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Mid-Point Date	INFLATED (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O
16	Elders Center BANK STABILIZATION	\$12,000	\$3,000	25.0%	\$15,000	0.0%	\$12,000	\$3,000	\$15,000	2031Q4	41.9%	\$17,022	\$4,255	\$21,277
CONSTRUCTION ESTIMATE TOTALS:		\$12,000	\$3,000	25.0%	\$15,000		\$12,000	\$3,000	\$15,000			\$17,022	\$4,255	\$21,277
01	LANDS AND DAMAGES	\$18	\$5	30.0%	\$23	0.0%	\$18	\$5	\$23	2031Q2	39.7%	\$24	\$7	\$32
30	PLANNING, ENGINEERING & DESIGN													
	Project Management	\$400	\$100	25.0%	\$500	0.0%	\$400	\$100	\$500	2031Q2	53.3%	\$613	\$153	\$767
	Planning & Environmental Compliance	\$230	\$58	25.0%	\$288	0.0%	\$230	\$58	\$288	2031Q2	53.3%	\$353	\$88	\$441
	Engineering & Design	\$720	\$180	25.0%	\$900	0.0%	\$720	\$180	\$900	2031Q2	53.3%	\$1,104	\$276	\$1,380
	Reviews, ATRs, IEPRs, VE	\$120	\$30	25.0%	\$150	0.0%	\$120	\$30	\$150	2031Q2	53.3%	\$184	\$46	\$230
	Contracting & Reprographics	\$50	\$13	25.0%	\$63	0.0%	\$50	\$13	\$63	2031Q2	53.3%	\$77	\$19	\$96
31	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	\$1,200	\$300	25.0%	\$1,500	0.0%	\$1,200	\$300	\$1,500	2031Q4	56.4%	\$1,877	\$469	\$2,346
	Engineering During Construction	\$136	\$34	25.0%	\$170	0.0%	\$136	\$34	\$170	2031Q4	56.4%	\$213	\$53	\$266
	Planning During Construction	\$150	\$38	25.0%	\$188	0.0%	\$150	\$38	\$188	2031Q4	56.4%	\$235	\$59	\$293
	Project Management	\$300	\$75	25.0%	\$375	0.0%	\$300	\$75	\$375	2031Q4	56.4%	\$469	\$117	\$586
CONTRACT COST SUB-TOTALS:		\$15,323	\$3,832		\$19,155		\$15,323	\$3,832	\$19,155			\$22,170	\$5,544	\$27,714
	Monitoring	\$108	\$27	25.0%	\$135	0.0%	\$108	\$27	\$135	2031Q4	41.9%	\$154	\$38	\$192
	Adapative Management	\$234	\$59	25.0%	\$293	0.0%	\$234	\$59	\$293	2031Q4	41.9%	\$332	\$83	\$415
CONTRACT COST TOTALS:		\$15,665	\$3,917		\$19,583		\$15,665	\$3,917	\$19,583			\$22,656	\$5,665	\$28,321



Table I-36. Total Project Cost Summary – Flushing Creek

PROJECT: Hudson Raritan Estuary
 LOCATION: New York / New Jersey
 This Estimate reflects the scope and schedule in report;

Draft Feasibility Report

DISTRICT: NAN
 POC: CHIEF, COST ENGINEERING, Mukesh Kumar

PREPARED: 11/19/2019

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: Effective Price Level:		19-Nov-19 1-Oct-19		Program Year (Budget EC): 2020 Effective Price Level Date: 1 OCT 19				FULLY FUNDED PROJECT ESTIMATE				
WBS NUMBER A	Civil Works Feature & Sub-Feature Description B	COST (\$K) C	CNTG (\$K) D	CNTG (%) E	TOTAL (\$K) F	ESC (%) G	COST (\$K) H	CNTG (\$K) I	TOTAL (\$K) J	Mid-Point Date P	INFLATED (%) L	COST (\$K) M	CNTG (\$K) N	FULL (\$K) O
	Flushing Creek													
16	BANK STABILIZATION	\$8,512	\$1,958	23.0%	\$10,470	0.0%	\$8,512	\$1,958	\$10,470	2026Q3	21.5%	\$10,339	\$2,378	\$12,717
18	CULTURAL RESOURCE PRESERVATION	\$250	\$58	23.0%	\$308	0.0%	\$250	\$58	\$308	2026Q3	21.5%	\$304	\$70	\$373
	CONSTRUCTION ESTIMATE TOTALS:	\$8,762	\$2,015	23.0%	\$10,778		\$8,762	\$2,015	\$10,778			\$10,643	\$2,448	\$13,090
01	LANDS AND DAMAGES	\$134	\$40	30.0%	\$174	0.0%	\$134	\$40	\$174	2025Q4	18.8%	\$159	\$48	\$207
30	PLANNING, ENGINEERING & DESIGN													
	Project Management	\$400	\$92	23.0%	\$492	0.0%	\$400	\$92	\$492	2025Q4	24.2%	\$497	\$114	\$611
	Planning & Environmental Compliance	\$915	\$210	23.0%	\$1,125	0.0%	\$915	\$210	\$1,125	2025Q4	24.2%	\$1,136	\$261	\$1,398
	Engineering & Design	\$1,080	\$248	23.0%	\$1,328	0.0%	\$1,080	\$248	\$1,328	2025Q4	24.2%	\$1,341	\$308	\$1,650
	Reviews, ATRs, IEPRs, VE	\$150	\$35	23.0%	\$185	0.0%	\$150	\$35	\$185	2025Q4	24.2%	\$186	\$43	\$229
	Contracting & Reprographics	\$50	\$12	23.0%	\$62	0.0%	\$50	\$12	\$62	2025Q4	24.2%	\$62	\$14	\$76
31	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	\$876	\$202	23.0%	\$1,078	0.0%	\$876	\$202	\$1,078	2026Q3	27.7%	\$1,119	\$257	\$1,376
	Engineering During Construction	\$136	\$31	23.0%	\$167	0.0%	\$136	\$31	\$167	2026Q3	27.7%	\$174	\$40	\$214
	Planning During Construction	\$150	\$35	23.0%	\$185	0.0%	\$150	\$35	\$185	2026Q3	27.7%	\$192	\$44	\$236
	Project Management	\$300	\$69	23.0%	\$369	0.0%	\$300	\$69	\$369	2026Q3	27.7%	\$383	\$88	\$471
	CONTRACT COST SUB-TOTALS:	\$12,953	\$2,989		\$15,942		\$12,953	\$2,989	\$15,942			\$15,892	\$3,666	\$19,558
	Monitoring	\$105	\$24	23.0%	\$129	0.0%	\$105	\$24	\$129	2026Q3	21.5%	\$128	\$29	\$157
	Adaptive Management	\$66	\$15	23.0%	\$81	0.0%	\$66	\$15	\$81	2026Q3	21.5%	\$80	\$18	\$98
	CONTRACT COST TOTALS:	\$13,124	\$3,028		\$16,152		\$13,124	\$3,028	\$16,152			\$16,099	\$3,714	\$19,813

Hudson-Raritan Estuary Ecosystem Restoration Feasibility Study

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Table I-37. Total Project Cost Summary – Bronx Zoo and Dam

PROJECT: Hudson Raritan Estuary
 LOCATION: New York / New Jersey
 This Estimate reflects the scope and schedule in report;

Draft Feasibility Report

DISTRICT: NAN
 POC: CHIEF, COST ENGINEERING, Mukesh Kumar

PREPARED: 11/19/2019

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: Effective Price Level:		19-Nov-19 1-Oct-19			Program Year (Budget EC): Effective Price Level Date:		2020 1 OCT 19					
		RISK BASED												
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Mid-Point Date	INFLATED (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O
Bronx Zoo and Dam														
16	BANK STABILIZATION	\$5,164	\$1,498	29.0%	\$6,662	0.0%	\$5,164	\$1,498	\$6,662	2025Q4	18.8%	\$6,135	\$1,779	\$7,914
18	CULTURAL RESOURCE PRESERVATION	\$155	\$45	29.0%	\$200	0.0%	\$155	\$45	\$200	2025Q4	18.8%	\$184	\$53	\$238
CONSTRUCTION ESTIMATE TOTALS:		\$5,319	\$1,543	29.0%	\$6,862		\$5,319	\$1,543	\$6,862			\$6,319	\$1,833	\$8,152
01	LANDS AND DAMAGES	\$30	\$9	30.0%	\$39	0.0%	\$30	\$9	\$39	2025Q2	17.0%	\$35	\$11	\$46
30	PLANNING, ENGINEERING & DESIGN													
	Project Management	\$400	\$116	29.0%	\$516	0.0%	\$400	\$116	\$516	2025Q2	21.9%	\$488	\$141	\$629
	Planning & Environmental Compliance	\$335	\$97	29.0%	\$432	0.0%	\$335	\$97	\$432	2025Q2	21.9%	\$408	\$118	\$527
	Engineering & Design	\$705	\$204	29.0%	\$909	0.0%	\$705	\$204	\$909	2025Q2	21.9%	\$859	\$249	\$1,108
	Reviews, ATRs, IEPRs, VE	\$80	\$23	29.0%	\$103	0.0%	\$80	\$23	\$103	2025Q2	21.9%	\$98	\$28	\$126
	Contracting & Reprographics	\$50	\$15	29.0%	\$65	0.0%	\$50	\$15	\$65	2025Q2	21.9%	\$61	\$18	\$79
31	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	\$532	\$154	29.0%	\$686	0.0%	\$532	\$154	\$686	2025Q4	24.2%	\$661	\$192	\$852
	Engineering During Construction	\$96	\$28	29.0%	\$124	0.0%	\$96	\$28	\$124	2025Q4	24.2%	\$119	\$35	\$154
	Planning During Construction	\$150	\$44	29.0%	\$194	0.0%	\$150	\$44	\$194	2025Q4	24.2%	\$186	\$54	\$240
	Project Management	\$200	\$58	29.0%	\$258	0.0%	\$200	\$58	\$258	2025Q4	24.2%	\$248	\$72	\$320
CONTRACT COST SUB-TOTALS:		\$7,897	\$2,290		\$10,188		\$7,897	\$2,290	\$10,188			\$9,482	\$2,750	\$12,232
	Monitoring	\$129	\$37	29.0%	\$166	0.0%	\$129	\$37	\$166	2025Q4	0.0%	\$129	\$37	\$166
	Adaptive Management	\$581	\$168	29.0%	\$749	0.0%	\$581	\$168	\$749	2025Q4	0.0%	\$581	\$168	\$749
CONTRACT COST TOTALS:		\$8,606	\$2,496		\$11,102		\$8,606	\$2,496	\$11,102			\$10,191	\$2,956	\$13,147



Table I-38. Total Project Cost Summary – Stone Mill Dam

PROJECT: Hudson Raritan Estuary
 LOCATION: New York / New Jersey
 This Estimate reflects the scope and schedule in report;

Draft Feasibility Report

DISTRICT: NAN
 POC: CHIEF, COST ENGINEERING, Mukesh Kumar

PREPARED: 11/19/2019

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: Effective Price Level:		19-Nov-19 1-Oct-19		Program Year (Budget EC): 2020 Effective Price Level Date: 1 OCT 19				FULLY FUNDED PROJECT ESTIMATE				
WBS NUMBER A	Civil Works Feature & Sub-Feature Description B	COST (\$K) C	CNTG (\$K) D	CNTG (%) E	TOTAL (\$K) F	ESC (%) G	COST (\$K) H	CNTG (\$K) I	TOTAL (\$K) J	Mid-Point Date P	INFLATED (%) L	COST (\$K) M	CNTG (\$K) N	FULL (\$K) O
	Stone Mill Dam													
16	BANK STABILIZATION	\$1,143	\$331	29.0%	\$1,474	0.0%	\$1,143	\$331	\$1,474	2025Q3	17.9%	\$1,347	\$391	\$1,738
18	CULTURAL RESOURCE PRESERVATION	\$150	\$44	29.0%	\$194	0.0%	\$150	\$44	\$194	2025Q3	17.9%	\$177	\$51	\$228
	CONSTRUCTION ESTIMATE TOTALS:	\$1,293	\$375	29.0%	\$1,667		\$1,293	\$375	\$1,667			\$1,524	\$442	\$1,966
01	LANDS AND DAMAGES	\$30	\$9	30.0%	\$39	0.0%	\$30	\$9	\$39	2025Q2	17.0%	\$35	\$11	\$46
30	PLANNING, ENGINEERING & DESIGN													
	Project Management	\$400	\$116	29.0%	\$516	0.0%	\$400	\$116	\$516	2025Q2	21.9%	\$488	\$141	\$629
	Planning & Environmental Compliance	\$285	\$83	29.0%	\$368	0.0%	\$285	\$83	\$368	2025Q2	21.9%	\$347	\$101	\$448
	Engineering & Design	\$545	\$158	29.0%	\$703	0.0%	\$545	\$158	\$703	2025Q2	21.9%	\$664	\$193	\$857
	Reviews, ATRs, IEPRs, VE	\$80	\$23	29.0%	\$103	0.0%	\$80	\$23	\$103	2025Q2	21.9%	\$98	\$28	\$126
	Contracting & Reprographics	\$50	\$15	29.0%	\$65	0.0%	\$50	\$15	\$65	2025Q2	21.9%	\$61	\$18	\$79
31	CONSTRUCTION MANAGEMENT													
	Construction Management	\$384	\$111	29.0%	\$495	0.0%	\$384	\$111	\$495	2025Q3	23.0%	\$472	\$137	\$609
	Engineering During Construction	\$64	\$19	29.0%	\$83	0.0%	\$64	\$19	\$83	2025Q3	23.0%	\$79	\$23	\$102
	Planning During Construction	\$100	\$29	29.0%	\$129	0.0%	\$100	\$29	\$129	2025Q3	23.0%	\$123	\$36	\$159
	Project Management	\$200	\$58	29.0%	\$258	0.0%	\$200	\$58	\$258	2025Q3	23.0%	\$246	\$71	\$317
	CONTRACT COST SUB-TOTALS:	\$3,431	\$995		\$4,426		\$3,431	\$995	\$4,426			\$4,137	\$1,200	\$5,337
	Monitoring	\$81	\$24	29.0%	\$105	0.0%	\$81	\$24	\$105	2025Q3	17.9%	\$96	\$28	\$123
	Adaptive Management	\$66	\$19	29.0%	\$86	0.0%	\$66	\$19	\$86	2025Q3	17.9%	\$78	\$23	\$101
	CONTRACT COST TOTALS:	\$3,578	\$1,038		\$4,616		\$3,578	\$1,038	\$4,616			\$4,311	\$1,251	\$5,562

Hudson-Raritan Estuary Ecosystem Restoration Feasibility Study

Final Integrated Feasibility Report & Environmental Assessment

Table I-39. Total Project Cost Summary – Shoelace Park

PROJECT: Hudson Raritan Estuary
 LOCATION: New York / New Jersey
 This Estimate reflects the scope and schedule in report;

Draft Feasibility Report

DISTRICT: NAN
 POC: CHIEF, COST ENGINEERING, Mukesh Kumar

PREPARED: 11/19/2019

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: Effective Price Level:		19-Nov-19 1-Oct-19		Program Year (Budget EC): Effective Price Level Date:		2020 1 OCT 19						
WBS NUMBER A	Civil Works Feature & Sub-Feature Description B	COST (\$K) C	CNTG (\$K) D	CNTG (%) E	TOTAL (\$K) F	ESC (%) G	COST (\$K) H	CNTG (\$K) I	TOTAL (\$K) J	Mid-Point Date P	INFLATED (%) L	COST (\$K) M	CNTG (\$K) N	FULL (\$K) O
Shoelace Park														
16	BANK STABILIZATION	\$11,155	\$3,235	29.0%	\$14,390	0.0%	\$11,155	\$3,235	\$14,390	2029Q3	32.7%	\$14,804	\$4,293	\$19,098
18	CULTURAL RESOURCE PRESERVATION	\$150	\$44	29.0%	\$194	0.0%	\$150	\$44	\$194	2029Q3	32.7%	\$199	\$58	\$257
CONSTRUCTION ESTIMATE TOTALS:		\$11,305	\$3,278	29.0%	\$14,583		\$11,305	\$3,278	\$14,583			\$15,003	\$4,351	\$19,354
01	LANDS AND DAMAGES	\$45	\$14	30.0%	\$59	0.0%	\$45	\$14	\$59	2029Q2	31.7%	\$59	\$18	\$77
30	PLANNING, ENGINEERING & DESIGN													
	Project Management	\$400	\$116	29.0%	\$516	0.0%	\$400	\$116	\$516	2029Q2	41.8%	\$567	\$164	\$731
	Planning & Environmental Compliance	\$565	\$164	29.0%	\$729	0.0%	\$565	\$164	\$729	2029Q2	41.8%	\$801	\$232	\$1,033
	Engineering & Design	\$1,255	\$364	29.0%	\$1,619	0.0%	\$1,255	\$364	\$1,619	2029Q2	41.8%	\$1,779	\$516	\$2,295
	Reviews, ATRs, IEPRs, VE	\$150	\$44	29.0%	\$194	0.0%	\$150	\$44	\$194	2029Q2	41.8%	\$213	\$62	\$274
	Contracting & Reprographics	\$50	\$15	29.0%	\$65	0.0%	\$50	\$15	\$65	2029Q2	41.8%	\$71	\$21	\$91
31	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	\$1,130	\$328	29.0%	\$1,458	0.0%	\$1,130	\$328	\$1,458	2029Q3	43.2%	\$1,619	\$469	\$2,088
	Engineering During Construction	\$80	\$23	29.0%	\$103	0.0%	\$80	\$23	\$103	2029Q3	43.2%	\$115	\$33	\$148
	Planning During Construction	\$100	\$29	29.0%	\$129	0.0%	\$100	\$29	\$129	2029Q3	43.2%	\$143	\$42	\$185
	Project Management	\$200	\$58	29.0%	\$258	0.0%	\$200	\$58	\$258	2029Q3	43.2%	\$286	\$83	\$369
CONTRACT COST SUB-TOTALS:		\$15,280	\$4,432		\$19,712		\$15,280	\$4,432	\$19,712			\$20,656	\$5,991	\$26,647
	Monitoring	\$129	\$37	29.0%	\$166	0.0%	\$129	\$37	\$166	2029Q3	32.7%	\$171	\$49	\$220
	Adaptive Management	\$1,331	\$386	29.0%	\$1,717	0.0%	\$1,331	\$386	\$1,717	2029Q3	32.7%	\$1,767	\$512	\$2,279
CONTRACT COST TOTALS:		\$16,740	\$4,855		\$21,595		\$16,740	\$4,855	\$21,595			\$22,593		\$29,146



Table I-40. Total Project Cost Summary – Bronxville Lake

PROJECT: Hudson Raritan Estuary
 LOCATION: New York / New Jersey
 This Estimate reflects the scope and schedule in report;

Draft Feasibility Report

DISTRICT: NAN
 POC: CHIEF, COST ENGINEERING, Mukesh Kumar

PREPARED: 11/19/2019

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
WBS NUMBER A	Civil Works Feature & Sub-Feature Description B	Estimate Prepared: Effective Price Level:		19-Nov-19 1-Oct-19		Program Year (Budget EC): Effective Price Level Date:		2020 1 OCT 19		Mid-Point Date P	INFLATED (%) L	COST (\$K) M	CNTG (\$K) N	FULL (\$K) O
		COST (\$K) C	CNTG (\$K) D	CNTG (%) E	TOTAL (\$K) F	ESC (%) G	COST (\$K) H	CNTG (\$K) I	TOTAL (\$K) J					
	Bronxville Lake													
16	BANK STABILIZATION	\$7,448	\$2,160	29.0%	\$9,608	0.0%	\$7,448	\$2,160	\$9,608	2031Q4	41.9%	\$10,565	\$3,064	\$13,629
18	CULTURAL RESOURCE PRESERVATION	\$200	\$58	29.0%	\$258	0.0%	\$200	\$58	\$258	2031Q4	41.9%	\$284	\$82	\$366
	CONSTRUCTION ESTIMATE TOTALS:	\$7,648	\$2,218	29.0%	\$9,866		\$7,648	\$2,218	\$9,866			\$10,849	\$3,146	\$13,995
01	LANDS AND DAMAGES	\$75	\$23	30.0%	\$98	0.0%	\$75	\$23	\$98	2031Q2	39.7%	\$105	\$31	\$136
30	PLANNING, ENGINEERING & DESIGN													
	Project Management	\$400	\$116	29.0%	\$516	0.0%	\$400	\$116	\$516	2031Q2	53.3%	\$613	\$178	\$791
	Planning & Environmental Compliance	\$465	\$135	29.0%	\$600	0.0%	\$465	\$135	\$600	2031Q2	53.3%	\$713	\$207	\$920
	Engineering & Design	\$1,125	\$326	29.0%	\$1,451	0.0%	\$1,125	\$326	\$1,451	2031Q2	53.3%	\$1,725	\$500	\$2,225
	Reviews, ATRs, IEPRs, VE	\$150	\$44	29.0%	\$194	0.0%	\$150	\$44	\$194	2031Q2	53.3%	\$230	\$67	\$297
	Contracting & Reprographics	\$50	\$15	29.0%	\$65	0.0%	\$50	\$15	\$65	2031Q2	53.3%	\$77	\$22	\$99
31	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	\$765	\$222	29.0%	\$987	0.0%	\$765	\$222	\$987	2031Q4	56.4%	\$1,196	\$347	\$1,543
	Engineering During Construction	\$112	\$32	29.0%	\$144	0.0%	\$112	\$32	\$144	2031Q4	56.4%	\$175	\$51	\$226
	Planning During Construction	\$150	\$44	29.0%	\$194	0.0%	\$150	\$44	\$194	2031Q4	56.4%	\$235	\$68	\$303
	Project Management	\$200	\$58	29.0%	\$258	0.0%	\$200	\$58	\$258	2031Q4	56.4%	\$313	\$91	\$403
	CONTRACT COST SUB-TOTALS:	\$11,140	\$3,231		\$14,371		\$11,140	\$3,231	\$14,371			\$16,230	\$4,708	\$20,938
	Monitoring	\$129	\$37	29.0%	\$166	0.0%	\$129	\$37	\$166	2031Q4	41.9%	\$182	\$53	\$235
	Adaptive Management	\$669	\$194	29.0%	\$863	0.0%	\$669	\$194	\$863	2031Q4	41.9%	\$949	\$275	\$1,224
	CONTRACT COST TOTALS:	\$11,937	\$3,463		\$15,400		\$11,937	\$3,463	\$15,400			\$17,362	\$5,036	\$22,398

Hudson-Raritan Estuary Ecosystem Restoration Feasibility Study

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Table I-41. Total Project Cost Summary – Garth Woods/Harney Road

PROJECT: Hudson Raritan Estuary
 LOCATION: New York / New Jersey
 This Estimate reflects the scope and schedule in report;

Draft Feasibility Report

DISTRICT: NAN
 POC: CHIEF, COST ENGINEERING, Mukesh Kumar

PREPARED: 11/19/2019

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: Effective Price Level:		19-Nov-19 1-Oct-19		Program Year (Budget EC): 2020 Effective Price Level Date: 1 OCT 19				FULLY FUNDED PROJECT ESTIMATE				
WBS NUMBER A	Civil Works Feature & Sub-Feature Description B	COST (\$K) C	CNTG (\$K) D	CNTG (%) E	TOTAL (\$K) F	ESC (%) G	COST (\$K) H	CNTG (\$K) I	TOTAL (\$K) J	Mid-Point Date P	INFLATED (%) L	COST (\$K) M	CNTG (\$K) N	FULL (\$K) O
16	BANK STABILIZATION	\$4,389	\$1,273	29.0%	\$5,662	0.0%	\$4,389	\$1,273	\$5,662	2027Q3	25.1%	\$5,491	\$1,592	\$7,083
18	CULTURAL RESOURCE PRESERVATION	\$200	\$58	29.0%	\$258	0.0%	\$200	\$58	\$258	2027Q3	25.1%	\$250	\$73	\$323
CONSTRUCTION ESTIMATE TOTALS:		\$4,589	\$1,331	29.0%	\$5,920		\$4,589	\$1,331	\$5,920			\$5,741	\$1,665	\$7,406
01	LANDS AND DAMAGES	\$60	\$18	30.0%	\$78	0.0%	\$60	\$18	\$78	2027Q2	24.2%	\$74	\$22	\$97
30	PLANNING, ENGINEERING & DESIGN													
	Project Management	\$400	\$116	29.0%	\$516	0.0%	\$400	\$116	\$516	2027Q2	31.3%	\$525	\$152	\$678
	Planning & Environmental Compliance	\$335	\$97	29.0%	\$432	0.0%	\$335	\$97	\$432	2027Q2	31.3%	\$440	\$128	\$567
	Engineering & Design	\$925	\$268	29.0%	\$1,193	0.0%	\$925	\$268	\$1,193	2027Q2	31.3%	\$1,215	\$352	\$1,567
	Reviews, ATRs, IEPRs, VE	\$100	\$29	29.0%	\$129	0.0%	\$100	\$29	\$129	2027Q2	31.3%	\$131	\$38	\$169
	Contracting & Reprographics	\$50	\$15	29.0%	\$65	0.0%	\$50	\$15	\$65	2027Q2	31.3%	\$66	\$19	\$85
31	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	\$459	\$133	29.0%	\$592	0.0%	\$459	\$133	\$592	2027Q3	32.6%	\$609	\$176	\$785
	Engineering During Construction	\$80	\$23	29.0%	\$103	0.0%	\$80	\$23	\$103	2027Q3	32.6%	\$106	\$31	\$137
	Planning During Construction	\$100	\$29	29.0%	\$129	0.0%	\$100	\$29	\$129	2027Q3	32.6%	\$133	\$38	\$171
	Project Management	\$200	\$58	29.0%	\$258	0.0%	\$200	\$58	\$258	2027Q3	32.6%	\$265	\$77	\$342
CONTRACT COST SUB-TOTALS:		\$7,298	\$2,117		\$9,415		\$7,298	\$2,117	\$9,415			\$9,305	\$2,699	\$12,004
	Monitoring	\$129	\$37	29.0%	\$166	0.0%	\$129	\$37	\$166	2027Q3	25.1%	\$161	\$47	\$207
	Adaptive Management	\$621	\$180	29.0%	\$801	0.0%	\$621	\$180	\$801	2027Q3	25.1%	\$777	\$225	\$1,003
CONTRACT COST TOTALS:		\$8,048	\$2,335		\$10,383		\$8,048	\$2,335	\$10,383			\$10,243	\$2,971	\$13,214



Table I-42. Total Project Cost Summary – Oak Island Yards

PROJECT: Hudson Raritan Estuary
 LOCATION: New York / New Jersey
 This Estimate reflects the scope and schedule in report;

Draft Feasibility Report

DISTRICT: NAN
 POC: CHIEF, COST ENGINEERING, Mukesh Kumar

PREPARED: 11/19/2019

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: Effective Price Level:		19-Nov-19 1-Oct-19		Program Year (Budget EC): 2020 Effective Price Level Date: 1 OCT 19				FULLY FUNDED PROJECT ESTIMATE				
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Mid-Point Date	INFLATED (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O
	Oak Island Yards													
16	BANK STABILIZATION	\$6,315	\$1,579	25.0%	\$7,894	0.0%	\$6,315	\$1,579	\$7,894	2036Q3	63.2%	\$10,308	\$2,577	\$12,885
18	CULTURAL RESOURCE PRESERVATION	\$25	\$6	25.0%	\$31	0.0%	\$25	\$6	\$31	2036Q3	63.2%	\$41	\$10	\$51
	CONSTRUCTION ESTIMATE TOTALS:	\$6,340	\$1,585	25.0%	\$7,925		\$6,340	\$1,585	\$7,925			\$10,349	\$2,587	\$12,936
01	LANDS AND DAMAGES	\$2,730	\$819	30.0%	\$3,549	0.0%	\$2,730	\$819	\$3,549	2035Q4	59.7%	\$4,359	\$1,308	\$5,666
30	PLANNING, ENGINEERING & DESIGN													
	Project Management	\$400	\$100	25.0%	\$500	0.0%	\$400	\$100	\$500	2035Q4	83.4%	\$734	\$183	\$917
	Planning & Environmental Compliance	\$535	\$134	25.0%	\$669	0.0%	\$535	\$134	\$669	2035Q4	83.4%	\$981	\$245	\$1,226
	Engineering & Design	\$705	\$176	25.0%	\$881	0.0%	\$705	\$176	\$881	2035Q4	83.4%	\$1,293	\$323	\$1,616
	Reviews, ATRs, IEPRs, VE	\$100	\$25	25.0%	\$125	0.0%	\$100	\$25	\$125	2035Q4	83.4%	\$183	\$46	\$229
	Contracting & Reprographics	\$50	\$13	25.0%	\$63	0.0%	\$50	\$13	\$63	2035Q4	83.4%	\$92	\$23	\$115
31	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	\$634	\$159	25.0%	\$793	0.0%	\$634	\$159	\$793	2036Q3	89.0%	\$1,198	\$300	\$1,498
	Engineering During Construction	\$136	\$34	25.0%	\$170	0.0%	\$136	\$34	\$170	2036Q3	89.0%	\$257	\$64	\$321
	Planning During Construction	\$150	\$38	25.0%	\$188	0.0%	\$150	\$38	\$188	2036Q3	89.0%	\$283	\$71	\$354
	Project Management	\$300	\$75	25.0%	\$375	0.0%	\$300	\$75	\$375	2036Q3	89.0%	\$567	\$142	\$709
	CONTRACT COST SUB-TOTALS:	\$12,080	\$3,157		\$15,237		\$12,080	\$3,157	\$15,237			\$20,296	\$5,292	\$25,588
	Monitoring	\$81	\$20	25.0%	\$101	0.0%	\$81	\$20	\$101	2036Q3	63.2%	\$132	\$33	\$165
	Adaptive Management	\$82	\$21	25.0%	\$103	0.0%	\$82	\$21	\$103	2036Q3	63.2%	\$134	\$34	\$168
	CONTRACT COST TOTALS:	\$12,243	\$3,197		\$15,441		\$12,243	\$3,197	\$15,441			\$20,563	\$5,359	\$25,921

Hudson-Raritan Estuary Ecosystem Restoration Feasibility Study Final Integrated Feasibility Report & Environmental Assessment

Table I-43. Total Project Cost Summary – Essex County Branch Brook Park

PROJECT: Hudson Raritan Estuary
LOCATION: New York / New Jersey
This Estimate reflects the scope and schedule in report;

Draft Feasibility Report

DISTRICT: NAN
POC: CHIEF, COST ENGINEERING, Mukesh Kumar

PREPARED: 11/19/2019

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: Effective Price Level:		19-Nov-19 1-Oct-19		Program Year (Budget EC): Effective Price Level Date:		2020 1 OCT 19		FULLY FUNDED PROJECT ESTIMATE				
WBS NUMBER A	Civil Works Feature & Sub-Feature Description B	COST (\$K) C	CNTG (\$K) D	CNTG (%) E	TOTAL (\$K) F	ESC (%) G	COST (\$K) H	CNTG (\$K) I	TOTAL (\$K) J	Mid-Point Date P	INFLATED (%) L	COST (\$K) M	CNTG (\$K) N	FULL (\$K) O
Essex County Branch Brook Park														
16	BANK STABILIZATION	\$31,720	\$7,930	25.0%	\$39,650	0.0%	\$31,720	\$7,930	\$39,650	2032Q2	43.9%	\$45,658	\$11,415	\$57,073
18	CULTURAL RESOURCE PRESERVATION	\$200	\$50	25.0%	\$250	0.0%	\$200	\$50	\$250	2032Q2	43.9%	\$288	\$72	\$360
CONSTRUCTION ESTIMATE TOTALS:		\$31,920	\$7,980	25.0%	\$39,900		\$31,920	\$7,980	\$39,900			\$45,946	\$11,487	\$57,433
01	LANDS AND DAMAGES	\$75	\$23	30.0%	\$98	0.0%	\$75	\$23	\$98	2031Q2	39.7%	\$105	\$31	\$136
30	PLANNING, ENGINEERING & DESIGN													
	Project Management	\$400	\$100	25.0%	\$500	0.0%	\$400	\$100	\$500	2031Q2	53.3%	\$613	\$153	\$767
	Planning & Environmental Compliance	\$440	\$110	25.0%	\$550	0.0%	\$440	\$110	\$550	2031Q2	53.3%	\$675	\$169	\$843
	Engineering & Design	\$1,250	\$313	25.0%	\$1,563	0.0%	\$1,250	\$313	\$1,563	2031Q2	53.3%	\$1,917	\$479	\$2,396
	Reviews, ATRs, IEPRs, VE	\$150	\$38	25.0%	\$188	0.0%	\$150	\$38	\$188	2031Q2	53.3%	\$230	\$57	\$287
	Contracting & Reprographics	\$50	\$13	25.0%	\$63	0.0%	\$50	\$13	\$63	2031Q2	53.3%	\$77	\$19	\$96
31	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	\$3,192	\$798	25.0%	\$3,990	0.0%	\$3,192	\$798	\$3,990	2032Q2	59.5%	\$5,090	\$1,272	\$6,362
	Engineering During Construction	\$200	\$50	25.0%	\$250	0.0%	\$200	\$50	\$250	2032Q2	59.5%	\$319	\$80	\$399
	Planning During Construction	\$200	\$50	25.0%	\$250	0.0%	\$200	\$50	\$250	2032Q2	59.5%	\$319	\$80	\$399
	Project Management	\$400	\$100	25.0%	\$500	0.0%	\$400	\$100	\$500	2032Q2	59.5%	\$638	\$159	\$797
CONTRACT COST SUB-TOTALS:		\$38,277	\$9,573		\$47,850		\$38,277	\$9,573	\$47,850			\$55,928	\$13,987	\$69,915
	Monitoring	\$153	\$38	25.0%	\$191	0.0%	\$153	\$38	\$191	2032Q2	43.9%	\$220	\$55	\$275
	Adaptive Management	\$3,189	\$797	25.0%	\$3,987	0.0%	\$3,189	\$797	\$3,987	2032Q2	43.9%	\$4,591	\$1,148	\$5,738
CONTRACT COST TOTALS:		\$41,619	\$10,409		\$52,028		\$41,619	\$10,409	\$52,028			\$60,738	\$15,190	\$75,928



Table I-44. Total Project Cost Summary – Metromedia Tract

PROJECT: Hudson Raritan Estuary
 LOCATION: New York / New Jersey
 This Estimate reflects the scope and schedule in report;

Draft Feasibility Report

DISTRICT: NAN
 POC: CHIEF, COST ENGINEERING, Mukesh Kumar

PREPARED: 11/19/2019

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: Effective Price Level:		19-Nov-19 1-Oct-19		Program Year (Budget EC): 2020 Effective Price Level Date: 1 OCT 19				FULLY FUNDED PROJECT ESTIMATE				
WBS NUMBER A	Civil Works Feature & Sub-Feature Description B	COST (\$K) C	CNTG (\$K) D	CNTG (%) E	TOTAL (\$K) F	ESC (%) G	COST (\$K) H	CNTG (\$K) I	TOTAL (\$K) J	Mid-Point Date P	INFLATED (%) L	COST (\$K) M	CNTG (\$K) N	FULL (\$K) O
16	Metromedia BANK STABILIZATION	\$19,610	\$4,118	21.0%	\$23,728	0.0%	\$19,610	\$4,118	\$23,728	2030Q3	36.7%	\$26,807	\$5,629	\$32,437
	CONSTRUCTION ESTIMATE TOTALS:	\$19,610	\$4,118	21.0%	\$23,728		\$19,610	\$4,118	\$23,728			\$26,807	\$5,629	\$32,437
01	LANDS AND DAMAGES	\$491	\$172	35.0%	\$662	0.0%	\$491	\$172	\$662	2029Q4	33.7%	\$656	\$230	\$885
30	PLANNING, ENGINEERING & DESIGN													
	Project Management	\$400	\$84	21.0%	\$484	0.0%	\$400	\$84	\$484	2029Q4	44.6%	\$578	\$121	\$700
	Planning & Environmental Compliance	\$465	\$98	21.0%	\$563	0.0%	\$465	\$98	\$563	2029Q4	44.6%	\$672	\$141	\$814
	Engineering & Design	\$860	\$181	21.0%	\$1,041	0.0%	\$860	\$181	\$1,041	2029Q4	44.6%	\$1,243	\$261	\$1,505
	Reviews, ATRs, IEPRs, VE	\$150	\$32	21.0%	\$182	0.0%	\$150	\$32	\$182	2029Q4	44.6%	\$217	\$46	\$262
	Contracting & Reprographics	\$50	\$11	21.0%	\$61	0.0%	\$50	\$11	\$61	2029Q4	44.6%	\$72	\$15	\$87
31	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	\$1,961	\$412	21.0%	2,373	0.0%	\$1,961	\$412	\$2,373	2030Q3	48.9%	\$2,920	\$613	\$3,533
	Engineering During Construction	\$200	\$42	21.0%	242	0.0%	\$200	\$42	\$242	2030Q3	48.9%	\$298	\$63	\$360
	Planning During Construction	\$200	\$42	21.0%	242	0.0%	\$200	\$42	\$242	2030Q3	48.9%	\$298	\$63	\$360
	Project Management	\$400	\$84	21.0%	484	0.0%	\$400	\$84	\$484	2030Q3	48.9%	\$596	\$125	\$721
	CONTRACT COST SUB-TOTALS:	\$24,787	\$5,274		\$30,061		\$24,787	\$5,274	\$30,061			\$34,358	\$7,307	\$41,664
	Monitoring	\$153	\$32	21.0%	\$185	0.0%	\$153	\$32	\$185	2030Q3	36.7%	\$209	\$44	\$253
	Adaptive Management	\$711	\$149	21.0%	\$861	0.0%	\$711	\$149	\$861	2030Q3	36.7%	\$972	\$204	\$1,177
	CONTRACT COST TOTALS:	\$25,651	\$5,455		\$31,106		\$25,651	\$5,455	\$31,106			\$35,539	\$7,555	\$43,094

Hudson-Raritan Estuary Ecosystem Restoration Feasibility Study Final Integrated Feasibility Report & Environmental Assessment

Table I-45. Total Project Cost Summary – Meadowlark Marsh

PROJECT: Hudson Raritan Estuary
LOCATION: New York / New Jersey
This Estimate reflects the scope and schedule in report;

Draft Feasibility Report

DISTRICT: NAN
POC: CHIEF, COST ENGINEERING, Mukesh Kumar

PREPARED: 11/19/2019

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: Effective Price Level:		19-Nov-19 1-Oct-19		Program Year (Budget EC): Effective Price Level Date:		2020 1 OCT 19		FULLY FUNDED PROJECT ESTIMATE				
WBS NUMBER A	Civil Works Feature & Sub-Feature Description B	COST (\$K) C	CNTG (\$K) D	CNTG (%) E	TOTAL (\$K) F	ESC (%) G	COST (\$K) H	CNTG (\$K) I	TOTAL (\$K) J	Mid-Point Date P	INFLATED (%) L	COST (\$K) M	CNTG (\$K) N	FULL (\$K) O
	Meadowlark Marsh													
16	BANK STABILIZATION	\$17,959	\$3,771	21.0%	\$21,730	0.0%	\$17,959	\$3,771	\$21,730	2034Q3	53.9%	\$27,631	\$5,803	\$33,434
18	CULTURAL RESOURCE PRESERVATION	\$125	\$26	21.0%	\$151	0.0%	\$125	\$26	\$151	2034Q3	53.9%	\$192	\$40	\$233
	CONSTRUCTION ESTIMATE TOTALS:	\$18,084	\$3,798	21.0%	\$21,881		\$18,084	\$3,798	\$21,881			\$27,823	\$5,843	\$33,666
01	LANDS AND DAMAGES	\$781	\$273	35.0%	\$1,055	0.0%	\$781	\$273	\$1,055	2033Q4	50.5%	\$1,176	\$411	\$1,587
30	PLANNING, ENGINEERING & DESIGN													
	Project Management	\$400	\$84	21.0%	\$484	0.0%	\$400	\$84	\$484	2033Q4	69.2%	\$677	\$142	\$819
	Planning & Environmental Compliance	\$515	\$108	21.0%	\$623	0.0%	\$515	\$108	\$623	2033Q4	69.2%	\$872	\$183	\$1,055
	Engineering & Design	\$1,320	\$277	21.0%	\$1,597	0.0%	\$1,320	\$277	\$1,597	2033Q4	69.2%	\$2,234	\$469	\$2,703
	Reviews, ATRs, IEPRs, VE	\$150	\$32	21.0%	\$182	0.0%	\$150	\$32	\$182	2033Q4	69.2%	\$254	\$53	\$307
	Contracting & Reprographics	\$50	\$11	21.0%	\$61	0.0%	\$50	\$11	\$61	2033Q4	69.2%	\$85	\$18	\$102
31	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	\$1,808	\$380	21.0%	\$2,188	0.0%	\$1,808	\$380	\$2,188	2034Q3	74.4%	\$3,154	\$662	\$3,816
	Project Operation:	\$200	\$42	21.0%	\$242	0.0%	\$200	\$42	\$242	2034Q3	74.4%	\$349	\$73	\$422
	Project Management	\$200	\$42	21.0%	\$242	0.0%	\$200	\$42	\$242	2034Q3	74.4%	\$349	\$73	\$422
	Project Management	\$400	\$84	21.0%	\$484	0.0%	\$400	\$84	\$484	2034Q3	74.4%	\$698	\$146	\$844
	CONTRACT COST SUB-TOTALS:	\$23,908	\$5,130		\$29,039		\$23,908	\$5,130	\$29,039			\$37,669	\$8,075	\$45,744
	Monitoring	\$153	\$32	21.0%	\$185	0.0%	\$153	\$32	\$185	2034Q3	0.0%	\$153	\$32	\$185
	Adaptive Management	\$368	\$77	21.0%	\$445	0.0%	\$368	\$77	\$445	2034Q3	0.0%	\$368	\$77	\$445
	CONTRACT COST TOTALS:	\$24,429	\$5,239		\$29,668		\$24,429	\$5,239	\$29,668			\$38,190	\$8,184	\$46,374



Table I-46. Total Project Cost Summary – Naval Weapons Station Earle

PROJECT: Hudson Raritan Estuary
 LOCATION: New York / New Jersey
 This Estimate reflects the scope and schedule in report;

Draft Feasibility Report

DISTRICT: NAN
 POC: CHIEF, COST ENGINEERING, Mukesh Kumar

PREPARED: 11/19/2019

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: Effective Price Level:		19-Nov-19 1-Oct-19		Program Year (Budget EC): 2020 Effective Price Level Date: 1 OCT 19				FULLY FUNDED PROJECT ESTIMATE				
WBS NUMBER A	Civil Works Feature & Sub-Feature Description B	COST (\$K) C	CNTG (\$K) D	CNTG (%) E	TOTAL (\$K) F	ESC (%) G	COST (\$K) H	CNTG (\$K) I	TOTAL (\$K) J	Mid-Point Date P	INFLATED (%) L	COST (\$K) M	CNTG (\$K) N	FULL (\$K) O
06	Naval Weapons Station Earle	\$3,814	\$1,411	37.0%	\$5,225	0.0%	\$3,814	\$1,411	\$5,225	2026Q2	20.5%	\$4,598	\$1,701	\$6,299
18	CULTURAL RESOURCE PRESERVATION	\$75	\$28	37.0%	\$103	0.0%	\$75	\$28	\$103	2026Q2	20.5%	\$90	\$33	\$124
CONSTRUCTION ESTIMATE TOTALS:		\$3,889	\$1,439	37.0%	\$5,328		\$3,889	\$1,439	\$5,328			\$4,688	\$1,735	\$6,423
01	LANDS AND DAMAGES	\$15	\$5	30.0%	\$20	0.0%	\$15	\$5	\$20	2025Q3	17.9%	\$18	\$5	\$23
30	PLANNING, ENGINEERING & DESIGN													
	Project Management	\$300	\$111	37.0%	\$411	0.0%	\$300	\$111	\$411	2025Q3	23.0%	\$369	\$137	\$506
	Planning & Environmental Compliance	\$180	\$67	37.0%	\$247	0.0%	\$180	\$67	\$247	2025Q3	23.0%	\$221	\$82	\$303
	Engineering & Design	\$645	\$239	37.0%	\$884	0.0%	\$645	\$239	\$884	2025Q3	23.0%	\$794	\$294	\$1,087
	Reviews, ATRs, IEPRs, VE	\$80	\$30	37.0%	\$110	0.0%	\$80	\$30	\$110	2025Q3	23.0%	\$98	\$36	\$135
	Contracting & Reprographics	\$50	\$19	37.0%	\$69	0.0%	\$50	\$19	\$69	2025Q3	23.0%	\$62	\$23	\$84
31	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	\$389	\$144	37.0%	\$533	0.0%	\$389	\$144	\$533	2026Q2	26.5%	\$492	\$182	\$674
	Engineering During Construction	\$64	\$24	37.0%	\$88	0.0%	\$64	\$24	\$88	2026Q2	26.5%	\$81	\$30	\$111
	Planning During Construction	\$70	\$26	37.0%	\$96	0.0%	\$70	\$26	\$96	2026Q2	26.5%	\$89	\$33	\$121
	Project Management	\$200	\$74	37.0%	\$274	0.0%	\$200	\$74	\$274	2026Q2	26.5%	\$253	\$94	\$347
CONTRACT COST SUB-TOTALS:		\$5,882	\$2,175		\$8,057		\$5,882	\$2,175	\$8,057			\$7,165	\$2,650	\$9,814
	Monitoring	\$57	\$21	37.0%	\$78	0.0%	\$57	\$21	\$78	2026Q2	20.5%	\$69	\$25	\$94
	Adaptive Management	\$272	\$101	37.0%	\$373	0.0%	\$272	\$101	\$373	2026Q2	20.5%	\$328	\$121	\$449
CONTRACT COST TOTALS:		\$6,211	\$3,234		\$8,508		\$6,211	\$2,297	\$8,508			\$7,561	\$2,796	\$10,358

Hudson-Raritan Estuary Ecosystem Restoration Feasibility Study

Final Integrated Feasibility Report & Environmental Assessment

Table I-47. Total Project Cost Summary – Bush Terminal

PROJECT: Hudson Raritan Estuary
 LOCATION: New York / New Jersey
 This Estimate reflects the scope and schedule in report;

Draft Feasibility Report

DISTRICT: NAN
 POC: CHIEF, COST ENGINEERING, Mukesh Kumar

PREPARED: 11/19/2019

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: Effective Price Level:		19-Nov-19 1-Oct-19		Program Year (Budget EC): Effective Price Level Date:		2020 1 OCT 19		FULLY FUNDED PROJECT ESTIMATE				
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Mid-Point Date	INFLATED (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O
	Bush Terminal													
06	FISH & WILDLIFE FACILITIES	\$2,464	\$912	37.0%	\$3,376	0.0%	\$2,464	\$912	\$3,376	2029Q4	33.7%	\$3,295	\$1,219	\$4,514
18	CULTURAL RESOURCE PRESERVATION	\$75	\$28	37.0%	\$103	0.0%	\$75	\$28	\$103	2029Q4	33.7%	\$100	\$37	\$137
	CONSTRUCTION ESTIMATE TOTALS:	\$2,539	\$939	37.0%	\$3,478		\$2,539	\$939	\$3,478			\$3,395	\$1,256	\$4,651
01	LANDS AND DAMAGES	\$45	\$14	30.0%	\$59	0.0%	\$45	\$14	\$59	2029Q2	31.7%	\$59	\$18	\$77
30	PLANNING, ENGINEERING & DESIGN													
	Project Management	\$300	\$111	37.0%	\$411	0.0%	\$300	\$111	\$411	2029Q2	41.8%	\$425	\$157	\$583
	Planning & Environmental Compliance	\$180	\$67	37.0%	\$247	0.0%	\$180	\$67	\$247	2029Q2	41.8%	\$255	\$94	\$350
	Engineering & Design	\$795	\$294	37.0%	\$1,089	0.0%	\$795	\$294	\$1,089	2029Q2	41.8%	\$1,127	\$417	\$1,544
	Reviews, ATRs, IEPRs, VE	\$80	\$30	37.0%	\$110	0.0%	\$80	\$30	\$110	2029Q2	41.8%	\$113	\$42	\$155
	Contracting & Reprographics	\$50	\$19	37.0%	\$69	0.0%	\$50	\$19	\$69	2029Q2	41.8%	\$71	\$26	\$97
31	CONSTRUCTION MANAGEMENT													
	Construction Management	\$310	\$115	37.0%	\$425	0.0%	\$310	\$115	\$425	2029Q4	44.6%	\$448	\$166	\$614
	Engineering During Construction	\$56	\$21	37.0%	\$77	0.0%	\$56	\$21	\$77	2029Q4	44.6%	\$81	\$30	\$111
	Planning During Construction	\$60	\$22	37.0%	\$82	0.0%	\$60	\$22	\$82	2029Q4	44.6%	\$87	\$32	\$119
	Project Management	\$200	\$74	37.0%	\$274	0.0%	\$200	\$74	\$274	2029Q4	44.6%	\$289	\$107	\$396
	CONTRACT COST SUB-TOTALS:	\$4,615	\$1,704		\$6,319		\$4,615	\$1,704	\$6,319			\$6,351	\$2,346	\$8,697
	Monitoring	\$108	\$40	37.0%	\$148	0.0%	\$108	\$40	\$148	2029Q4	33.7%	\$144	\$53	\$198
	Adaptive Management	\$107	\$40	37.0%	\$147	0.0%	\$107	\$40	\$147	2029Q4	33.7%	\$143	\$53	\$196
	CONTRACT COST TOTALS:	\$4,830	\$1,784		\$6,614		\$4,830	\$1,784	\$6,614			\$6,639	\$2,452	\$9,091



Table I-48. Total Project Cost Summary – Head of Jamaica Bay

PROJECT: Hudson Raritan Estuary
 LOCATION: New York / New Jersey
 This Estimate reflects the scope and schedule in report;

Draft Feasibility Report

DISTRICT: NAN
 POC: CHIEF, COST ENGINEERING, Mukesh Kumar

PREPARED: 11/19/2019

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: Effective Price Level:		19-Nov-19 1-Oct-19		Program Year (Budget EC): Effective Price Level Date:		2020 1 OCT 19		FULLY FUNDED PROJECT ESTIMATE				
WBS NUMBER A	Civil Works Feature & Sub-Feature Description B	COST (\$K) C	CNTG (\$K) D	CNTG (%) E	TOTAL (\$K) F	ESC (%) G	COST (\$K) H	CNTG (\$K) I	TOTAL (\$K) J	Mid-Point Date P	INFLATED (%) L	COST (\$K) M	CNTG (\$K) N	FULL (\$K) O
06	Head of Jamaica Bay FISH & WILDLIFE FACILITIES	\$2,057	\$761	37.0%	\$2,818	0.0%	\$2,057	\$761	\$2,818	2027Q3	25.1%	\$2,573	\$952	\$3,525
CONSTRUCTION ESTIMATE TOTALS:		\$2,057	\$761	37.0%	\$2,818		\$2,057	\$761	\$2,818			\$2,573	\$952	\$3,525
01	LANDS AND DAMAGES	\$15	\$5	30.0%	\$20	0.0%	\$15	\$5	\$20	2027Q3	25.1%	\$19	\$6	\$24
30	PLANNING, ENGINEERING & DESIGN													
	Project Management	\$300	\$111	37.0%	\$411	0.0%	\$300	\$111	\$411	2027Q3	32.6%	\$398	\$147	\$545
	Planning & Environmental Compliance	\$255	\$94	37.0%	\$349	0.0%	\$255	\$94	\$349	2027Q3	32.6%	\$338	\$125	\$463
	Engineering & Design	\$645	\$239	37.0%	\$884	0.0%	\$645	\$239	\$884	2027Q3	32.6%	\$855	\$316	\$1,172
	Reviews, ATRs, IEPRs, VE	\$80	\$30	37.0%	\$110	0.0%	\$80	\$30	\$110	2027Q3	32.6%	\$106	\$39	\$145
	Contracting & Reprographics	\$50	\$19	37.0%	\$69	0.0%	\$50	\$19	\$69	2027Q3	32.6%	\$66	\$25	\$91
31	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	\$206	\$76	37.0%	\$282	0.0%	\$206	\$76	\$282	2027Q3	32.6%	\$273	\$101	\$374
	Engineering During Construction	\$50	\$19	37.0%	\$69	0.0%	\$50	\$19	\$69	2027Q3	32.6%	\$66	\$25	\$91
	Planning During Construction	\$50	\$19	37.0%	\$69	0.0%	\$50	\$19	\$69	2027Q3	32.6%	\$66	\$25	\$91
	Project Management	\$100	\$37	37.0%	\$137	0.0%	\$100	\$37	\$137	2027Q3	32.6%	\$133	\$49	\$182
CONTRACT COST SUB-TOTALS:		\$3,807	\$1,408		\$5,215		\$3,807	\$1,408	\$5,215			\$4,893	\$1,809	\$6,702
	Monitoring	\$57	\$21	37.0%	\$78	0.0%	\$57	\$21	\$78	2027Q3	25.1%	\$71	\$26	\$98
	Adaptive Management	\$282	\$104	37.0%	\$387	0.0%	\$282	\$104	\$387	2027Q3	25.1%	\$353	\$131	\$484
CONTRACT COST TOTALS:		\$4,147	\$3,234		\$5,680		\$4,147	\$1,533	\$5,680			\$5,318	\$1,966	\$7,284

Hudson-Raritan Estuary Ecosystem Restoration Feasibility Study Final Integrated Feasibility Report & Environmental Assessment

Attachment A: MII Reports

Print Date Fri 7 February 2020
Eff. Date 10/10/2019

U.S. Army Corps of Engineers
Project : HRE - Hudson Raritan Estuary
Hudson River Estuary

Time 15:30:07

Summary Page 1

Description	Quantity	UOM	ProjectCost
Summary			30,153,620.13
HRE - BRONX RIVERS	1.0000	EA	30,153,620.13
Bronx Zoo and Dam	1.0000	EA	5,319,183.72
16 Bank Stabilization	1.0000	EA	5,164,183.72
18 Cultural Resource	1.0000	EA	155,000.00
Bronxville Lake	560.0000	TON	7,647,978.52
16 Bank Stabilization	1.0000	EA	7,447,978.52
18 Cultural Resource	1.0000	EA	200,000.00
Shoelace Park	1.0000	EA	11,304,662.25
16 Bank Stabilization	1.0000	EA	11,154,662.25
18 Cultural Resource	1.0000	EA	150,000.00
Garth Wood-Harney Road	1.0000	EA	4,589,234.93
16 Bank Stabilization	1.0000	EA	4,389,234.93
18 Cultural Resource	1.0000	EA	200,000.00
Stone Mill Dam	1.0000	EA	1,292,560.72
16 Bank Stabilization	1.0000	EA	1,142,560.72
18 Cultural Resource	1.0000	EA	150,000.00

Labor ID: NLS2016 EQ ID: EP18R01

Currency in US dollars

TRACES MII Version 4.4

March 2020



Print Date Fri 7 February 2020
Eff. Date 10/9/2019

U.S. Army Corps of Engineers
Project : HRE - Hudson Raritan Estuary
Hudson River Estuary

Time 15:35:14

Summary Page 1

<u>Description</u>	<u>Quantity</u>	<u>UOM</u>	<u>ProjectCost</u>
Summary			8,762,403.09
FLUSHING CREEK	1.0000	EA	8,762,403.09
16 Bank Stabilization	1.0000	EA	8,512,403.09
18 Cultural Resource	1.0000	EA	250,000.00

Labor ID: NLS2016 EQ ID: EP18R01

Currency in US dollars

TRACES MII Version 4.4

Hudson-Raritan Estuary Ecosystem Restoration Feasibility Study

Final Integrated Feasibility Report & Environmental Assessment

Print Date Fri 7 February 2020
Eff. Date 10/10/2019

U.S. Army Corps of Engineers
Project : HRE - Hudson Raritan Estuary
Hudson River Estuary

Time 15:54:25

Summary Page 1

Description	Quantity	UOM	ProjectCost
Summary			37,694,025.60
HRE - HACKENSACK RIVER	1.0000	EA	37,694,025.60
MEADOWLARK MARSH (Updated) 7.31.2019	1.0000	LS	18,083,880.68
16 Bank Stabilization	1.0000	EA	17,958,880.68
18 Cultural Resource	1.0000	EA	125,000.00
METROMEDIA	1.0000	LS	19,610,144.92
16 Bank Stabilization	1.0000	EA	19,610,144.92

Labor ID: NLS2016 EQ ID: EP18R01

Currency in US dollars

TRACES MII Version 4.4

March 2020



Print Date Fri 7 February 2020
Eff. Date 10/10/2019

U.S. Army Corps of Engineers
Project : HRE - Jamaica Bay Marsh Islands
Hudson River Estuary

Time 15:58:18

Summary Page 1

Description	Quantity	UOM	ProjectCost
Summary			64,622,664.94
Jamaica Bay - Marsh Islands	1.0000	EA	64,622,664.94
Duck Point	1.0000	EA	13,026,095.30
16 Bank Stabilization	1.0000	EA	13,026,095.30
Elders Center	1.0000	EA	11,999,628.82
16 Bank Stabilization	1.0000	EA	11,999,628.82
Pumpkin Patch East	1.0000	EA	13,289,824.55
16 Bank Stabilization	1.0000	EA	13,289,824.55
Pumpkin Patch West	1.0000	EA	12,253,474.13
16 Bank Stabilization	1.0000	EA	12,253,474.13
Stony Creek	1.0000	EA	14,053,642.15
16 Bank Stabilization	1.0000	EA	14,053,642.15

Labor ID: NLS2016 EQ ID: EP18R01

Currency in US dollars

TRACES MII Version 4.4

Hudson-Raritan Estuary Ecosystem Restoration Feasibility Study

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U.S. Army Corps of Engineers
Project : HRE - Hudson Raritan Estuary
Hudson River Estuary

Time 16:03:41

Summary Page 1

Description	Quantity	UOM	ProjectCost
Summary			8,484,830.97
Oyster Bay Restoration	1.0000	EA	8,484,830.97
Bush Terminal	1.0000	EA	2,539,023.03
06 Fish and Wildlife	1.0000	EA	2,464,023.03
18 Cultural Resource	1.0000	EA	75,000.00
Head of Jamaica Bay	1.0000	EA	2,056,723.83
06 Fish and Wildlife	1.0000	EA	2,056,723.83
Naval Weapons Station Earle	1.0000	EA	3,889,084.10
06 Fish and Wildlife	1.0000	EA	3,814,084.10
18 Cultural Resource	1.0000	EA	75,000.00

Labor ID: NLS2016 EQ ID: EP18R01

Currency in US dollars

TRACES MII Version 4.4

March 2020



Print Date Fri 7 February 2020
Eff. Date 10/10/2019

U.S. Army Corps of Engineers
Project : HRE - Hudson Raritan Estuary
Hudson River Estuary

Time 16:11:40

Summary Page 1

<u>Description</u>	<u>Quantity</u>	<u>UOM</u>	<u>ProjectCost</u>
Summary			38,260,430.09
HRE - Lower Passaic River	1.0000	EA	38,260,430.09
Essex County Branch Brook Park	1.0000	EA	31,920,091.57
16 Bank Stabilization	1.0000	EA	31,720,091.57
18 Cultural Resource	1.0000	EA	200,000.00
Oak Island Yards	1.0000	EA	6,340,338.53
16 Bank Stabilization	1.0000	EA	6,315,338.53
18 Cultural Resource	1.0000	EA	25,000.00

Labor ID: NLS2016 EQ ID: EP18R01

Currency in US dollars

TRACES MII Version 4.4

Hudson-Raritan Estuary Ecosystem Restoration Feasibility Study

Final Integrated Feasibility Report & Environmental Assessment

Print Date Fri 7 February 2020
Eff. Date 10/10/2019

U.S. Army Corps of Engineers
Project : HRE - Hudson Raritan Estuary
Hudson River Estuary

Time 16:19:43

Summary Page 1

<u>Description</u>	<u>Quantity</u>	<u>UOM</u>	<u>ProjectCost</u>
Summary			47,370,418.48
HRE - Jamaica Bay Perimeter Sites	1.0000	EA	47,370,418.48
Fresh Creek	1.0000	EA	20,206,308.54
16 Bank Stabilization	1.0000	EA	20,081,308.54
18 Cultural Resource	1.0000	EA	125,000.00
Dead Horse Bay	1.0000	EA	27,164,109.94
16 Bank Stabilization	1.0000	EA	27,039,109.94
18 Cultural Resource	1.0000	EA	125,000.00

Labor ID: NLS2016 EQ ID: EP18R01

Currency in US dollars

TRACES MII Version 4.4