# HASHAMOMUCK COVE COASTAL STORM RISK MANAGEMENT FEASIBILITY STUDY

## FEASIBILITY STUDY

DRAFT COST ENGINEERING APPENDIX

June 2016

## **APPENDIX E – COST ESTIMATES**

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## COST ENGINEERING

#### PROECT BACKGROUND

E1. Hashamomuck Coastal Storm Risk Management is located at Southold, NY in Suffolk County, see Figure E1 below. This area includes several businesses and private homes and is subject to substantial over-washing and erosion during coastal storms. The Study is focused primarily on reducing coastal storm and erosion risks to critical infrastructure, including County Road 48 which may be subject to undermining, and utilities along its corridor as well as other nearby structures. The project delivery team (PDT) looked at various alternatives during the evaluation/alternatives analysis phase and identified alternative 2 as the recommended plan that provide solutions to reduce risk of failure or disruption along Route 48.

- Alternative 2 Berms
  - (1) Alternative 2A East / West Berm / Beach Renourishment
    (2) Alternative 2C Central Berm / Beach Renourishment



#### **BASIS OF COST**

E2. The construction cost estimate was developed using Micro-Computer Aided Cost Estimating System (MCACES), Second Generation (MII) using the appropriate Work Breakdown Structure (WBS), based on current estimated quantities provided by the design engineers. Using the quantities, the cost estimate was developed utilizing cost resources such as RSMeans, MII Cost Libraries and vendor quotations. The project 1<sup>st</sup> cost for the alternative 2 is summarized in Table E1 on page E-2. The project contingencies for these alternatives were developed thru Abbreviated

Risk Analysis (ARA) tool provided by the Cost MCX. The project 1<sup>st</sup> Cost listed under Table E1 below includes the project contingencies.

	<b>Alternative 2A</b> West (25' Berm)	Alternative 2C Central (75'/25' Berm)	<b>Alternative 2A</b> East (25' Berm)
Initial Fill Volume (CY)	33,630	55,850	70,253
Total Nourishment in 50 yrs	27,916 cy	17,470 cy	19,875 cy
COST			
Initial Construction Cost	\$3,337,807	\$4,667,890	\$5,482,653

Table E1 – Alternative 2 First Cost Summar	ſy
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E3. The construction durations for Alternative 2 was estimated at 9 months as show in Figure E2 below. It is assumed that all works are done concurrently on all three coves with 32 trucks delivering beachfills to the site per workday at the 30 CY truck capacity.

-		0															
HASHAMOMUCK Alt #2																	
Item No.	em No. Title Duration Start Finish					2019											
item i toi		(days)			Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
	Schedule																
1	Mobilization	10	3/4/19	3/15/19													
2	Beachfill	166	3/18/19	11/12/19													
3	Demobilization	4	11/13/19	11/19/19													
4	<b>Project Closeout</b>	10	11/20/19	12/5/19													

#### **Figure E2 – Construction Schedule**

#### CONTINGENCIES

E4. As stated in ER 1110-2-1302, the goal in contingency development is to identify the uncertainties associated with an item of work or task, forecast the cost/risk relationship, and assign a value to this task that would limit the cost risk to an acceptable degree of confidence. Consideration must be given to the details available at each stage of planning, design, or construction for which a cost estimate is being prepared. Contingencies may vary throughout the cost estimate and could constitute significant portion of the overall costs when the lack of investigated data or design details are available. Final contingency development and assignment that describes the potential for cost growth is included in the cost estimate. During development of the cost estimates, sufficient contingencies developed via PDT discussions during Abbreviated Risk Analysis (ARA) were applied to develop the Total Project First Cost. The ARA for Alternative 2 Initial Construction and Renourishment are shown in Figure E5 on page E12. The contingency factors used in the Alternative 2 Beach Berm and Beach Renourishment are summarized in Tables E2 on page E-3.

Element	<b>Contingency Factor</b>
Beach Replenishment	18.81%
Beach Renourishment	14.73%
Lands & Damages	10.82%
Planning, Engineering, and Design	9.37%
Construction Management	8.90%

 Table E2 – Contingency Factors

### PLANNING, ENGINEERING AND DESIGN

E5. The costs were developed for all activities associated with the planning, engineering and design effort. The cost for this account includes the preparation of Design Documentation Reports and plans and specifications for each construction contract and engineering support during construction through project completion. It includes all the in-house labor based upon work-hour requirements, material and facility costs, travel and overhead. The percentage breakout in the Total Project Cost Summary (TPCS), was developed based on input from respective offices in accordance with the CWBS as well as historical prices.

#### CONSTRUCTION MANAGEMENT

E6. The costs were developed for all construction management activities from pre-award requirements through final contract closeout. These costs include the in-house labor based upon work-hour requirements, materials, facility costs, support contracts, travel and overhead. Costs were developed based on the input from the construction division in accordance with the CWBS and include but are not limited to anticipated items such as the salaries of the resident engineer and staff, survey men, inspectors, draftsmen, clerical, and custodial personnel; operation, maintenance and fixed charges for transportation and for other field equipment; field supplies; construction management, general construction supervision; project office administration, distributive cost of area office and general overhead charged to the project. The work items and activities would include, but not be limited to the salaries of all supervisory, engineering (including resident geologist and geological staff), office and safety field personnel; all on site expenses.

#### INTEREST DURING CONSTRUCTION

E7. Interest during construction (IDC) is the cost of construction money invested before the beginning of the period of economic analysis and before the accumulation of benefits by the project. IDC costs have been added to the project cost to determine investment costs. Average annual costs were determined based on investment costs which include IDC. The pre-base year costs were estimated using the Federal interest rate of 3.125 percent (FY16).

#### **RENOURISHMENT COSTS**

E8. The Renourishment costs for Alternative 2 are based on a renourishment cycle of 7,251 CY of beach fill placed every 5 years for 50 years.

#### COASTAL AND ENVIRONMENTAL MONITORING

E9. Coastal monitoring and environmental monitoring costs have been provided by the PPMD, coastal and the environmental section PDT members, and represent the annualized costs for the monitoring of piping plover during construction. The physical monitoring will be conducted to assess project performance and ensures that project functionality is maintained throughout the 50-year project life. The cost for this post-construction monitoring will be included in the cost-shared total project cost.

#### **OPERATION AND MAINTENANCE**

E10. Operation, maintenance, repair, replacement, and rehabilitation (OMRR&R) requirements of the sponsors would consist of project surveillance and maintenance. Surveillance included identification of unusual conditions such as escarpment formation or excessive erosion. Maintenance includes reshaping of any minor damage to the beach and grading any large escarpments.

#### ESTIMATED ANNUAL CHARGES

E11. Annual costs are based on an economic project life of 50 year and an interest rate of 3.125%. The annual charges include the annualized investment costs along with annual coastal and environmental monitoring costs. A detailed breakdown of annual costs for the TSP is presented in Table E3 below.

	TOTAL ANNUAL COST: \$	624,587
Annualized Berm Maintenance (d)	\$	8,800
OMRR&R		
Annualized Monitoring Cost (c)	\$	500
Annualized Beach Nourishment Cost (b)	\$	73,000
Continuing Construction		
Annualized Investment Cost (a)	\$	542,287
Total Investment Cost	S	13,627,715
Interest During Construction	\$	139,364
Total First Cost	S	13,488,351

 Table E3 – Estimated Annual Charges

Notes: \* OCT 2015 PL

a. i = 0.03125 n = 50 yrs

b. From Annualized Renourishment Tablec. Coastal & Environmental Monitoring for piping plover

c. Coastal & Environmental Monitoring for piping plover
 d. Based on 2 equipment operators to move sand around 6 times a year with 3 each 140 hp dozer

#### COST SUMMARY

The Total Fully Funded Project cost for the TSP Alternative 2 is \$14,519,000 for initial nourishment and \$8,918,000 for renourishment over a 50 year time period. The costs are to be 65% federally funded and 35% non-federally funded for the initial construction and 50% federally funded for the beach nourishment. Table E4 below provides the First Cost Table for Alternative 2, which includes contingencies and escalation.

Ha	Hashamomuck Coastal Storm Risk Management Feasibility Study - Alt. 2 October 2015 Price Level												
	Feasibility Cost Estimate Summary												
Feat. Acct.	Description	Qty UoM		Subtotal	Cont. %		Cont \$\$		Total Cost				
	Alternative 2												
01	Lands & Damages	1 LS	\$	2,206,118	10.82%	\$	238,739	\$	2,444,857				
	Total Lands & Damages	1 LS	\$	2,206,118	10.82%	\$	238,739	\$	2,444,857				
17	Beach Replenishment												
	Breakwaters and Seawalls	1 LS	\$	8,072,664	18.81%	\$	1,518,326	\$	9,590,990				
	Total Beach Replenishment	1 LS	\$	8,072,664	18.81%	\$	1,518,326	\$	9,590,990				
30	Planning, Engineering, and Design	1 LS	\$	646,000	9.37%	\$	60,552	\$	706,552				
31	Construction Management	1 LS	\$	685,000	8.90%	\$	60,952	\$	745,952				
	Total Alternative 2		\$	11,609,782		\$	1,878,569	\$	13,488,351				

### Table E4 – First Cost Table

#### Figure E3 – Total Project Cost Summary for Initial Construction

 PROJECT:
 Hashamomuck Coastal Storm Risk Management Feasibility Study - Alternative 2

 PROJECT
 NO: P2 403349

 LOCATION:
 Southold, NY

DISTRICT: NAN New York PREPARED: 4/13/2016 POC: CHIEF, COST ENGINEERING, Mukesh Kumar

This Estimate reflects the scope and schedule in report; Hashamomuck Feasibility Southold, NY

Civil Works Work Breakdown Structure ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)						TOTAL PROJECT COST (FULLY FUNDED)					
WBS	Civil Works	COST	CNTG	CNTG	TOTAL	ESC	Pro Ef	gram Year (f fective Price CNTG	Budget EC): Level Date: TOTAL	2016 1 OCT 15 Spent Thru: 10/1/2013	TOTAL FIRST COST		COST	CNTG	FULL
A	B	<u>(3K)</u> C	<u>(3K)</u> D	<u>(%)</u>	<u>(3K)</u> F	<u>(%)</u> G	<u>(\$K)</u> H	<u>(SK)</u> 1	<u>(\$K)</u> J	<u>(\$K)</u>	<u>(3K)</u>	<u>(%)</u>	<u>(SK)</u> M	<u>(SK)</u> N	0
17	BEACH REPLENISHMENT	\$8,073	\$1,518	18.8%	\$9,591	0.0%	\$8,073	\$1,518	\$9,591	\$0	\$9,591	7.3%	\$8,661	\$1,629	\$10,290
	CONSTRUCTION ESTIMATE TOTALS:	\$8,073	\$1,518	-	\$9,591	0.0%	\$8,073	\$1,518	\$9,591	\$0	\$9,591	7.3%	\$8,661	\$1,629	\$10,290
01	LANDS AND DAMAGES	\$2,206	\$239	10.8%	\$2,445	0.0%	\$2,206	\$239	\$2,445	\$0	\$2,445	4.2%	\$2,298	\$249	\$2,546
30	PLANNING, ENGINEERING & DESIGN	\$646	\$61	9.4%	\$707	0.0%	\$646	\$61	\$707	\$0	\$707	13.9%	\$735	\$69	\$804
31	CONSTRUCTION MANAGEMENT	\$685	\$61	8.9%	\$746	0.0%	\$685	\$61	\$746	\$0	\$746	17.7%	\$806	\$72	\$878
	PROJECT COST TOTALS:	\$11,610	\$1,879	16.2%	\$13,488		\$11,610	\$1,879	\$13,488	\$0	\$13,488	7.6%	\$12,501	\$2,018	\$14,519

CHIEF, COST ENGINEERING, Mukesh Kumar

 PROJECT MANAGER, Dan Falt	ESTIMATED FEDERAL COST: ESTIMATED NON-FEDERAL COST:	65% 35%	\$9,437 \$5,082
 CHIEF, REAL ESTATE, Noreen Dress	ESTIMATED TOTAL PROJECT COST:	_	\$14,519
 CHIEF, PLANNING, Frank Santomauro			
 CHIEF, ENGINEERING, Arthur Connolly			
 CHIEF, OPERATIONS, Tom Creamer			
 CHIEF, CONSTRUCTION, Timothy Yarger			
 CHIEF, CONTRACTING, Frank Cashman			
 CHIEF, PM-PB, Anthony Ciorra			
 _ CHIEF, DPM, Joseph Seebode			

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PROJECT: Hashamomuck Coastal Storm Risk Management Feasibility Study - Alternative 2 Southold, NY LOCATION: Hashamomuck Feasibility Southold, NY This Estimate reflects the scope and schedule in report;

DISTRICT: NAN New York

PREPARED: 4/13/2016 POC: CHIEF, COST ENGINEERING, Mukesh Kumar

Civil W	/orks Work Breakdown Structure		ESTIMAT	ED COST			PROJECT (Constant	FIRST COS Dollar Basi	ST S)		TOTAL PROJECT COST (FULLY FUNDED)			
		Estir Effect	nate Prepare tive Price Lev	d: /el: RISK BASED	<b>18-Feb-16</b> 1-Oct-15	Prograr Effectiv	n Year (Bud /e Price Lev	lget EC): 'el Date:	2016 1 OCT 15					
WBS <u>NUMBER</u> <b>A</b>	Civil Works Feature & Sub-Feature Description B	COST _(\$K) C	CNTG (\$K) <i>D</i>	CNTG _(%)_ <i>E</i>	TOTAL (\$K) <i>F</i>	ESC _(%)_ 	COST _(\$K)	CNTG (\$K) <i>I</i>	TOTAL (\$K)	Mid-Point <u>Date</u> <b>P</b>	INFLATED (%) 	COST _(\$K) 	CNTG (\$K)	FULL _(\$K) <i>O</i>
17	ALT 2A - WEST COVE BEACH REPLENISHMENT	\$1,743	\$328	18.8%	\$2,071	0.0%	\$1,743	\$328	\$2,071	2019Q4	7.3%	\$1,870	\$352	\$2,222
	CONSTRUCTION ESTIMATE TOTALS:	\$1,743	\$328	18.8%	\$2,071	-	\$1,743	\$328	\$2,071			\$1,870	\$352	\$2,222
01	LANDS AND DAMAGES	\$867	\$87	10.0%	\$954	0.0%	\$867	\$87	\$954	2018Q2	4.2%	\$903	\$90	\$993
30	PLANNING, ENGINEERING & DESIGN													
0.5%	Project Management	\$9	\$1	9.4%	\$10	0.0%	\$9	\$1	\$10	2019Q2	13.1%	\$10	\$1	\$1
0.5%	Planning & Environmental Compliance	\$9	\$1	9.4%	\$10	0.0%	\$9	\$1	\$10	2019Q2	13.1%	\$10	\$1	\$1
4.0%	Engineering & Design	\$70	\$7	9.4%	\$77	0.0%	\$70	\$7	\$77	2019Q2	13.1%	\$79	\$7	\$8
0.5%	Reviews, ATRs, IEPRs, VE	\$9	\$1	9.4%	\$10	0.0%	\$9	\$1	\$10	2019Q2	13.1%	\$10	\$1	\$1
0.3%	Life Cycle Updates (cost, schedule, risks)	\$4	\$0	9.4%	\$4	0.0%	\$4	\$0	\$4	2019Q2	13.1%	\$5	\$0	\$
1.0%	Contracting & Reprographics	\$17	\$2	9.4%	\$19	0.0%	\$17	\$2	\$19	2019Q2	13.1%	\$19	\$2	\$2
1.0%	Engineering During Construction	\$17	\$2	9.4%	\$19	0.0%	\$17	\$2	\$19	2020Q2	17.7%	\$20	\$2	\$2
0.3%	Planning During Construction	\$4	\$0	9.4%	\$4	0.0%	\$4	\$0	\$4	2020Q2	17.7%	\$5	\$0	\$
0.0%	Project Operations	\$0	\$0	9.4%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$
31	CONSTRUCTION MANAGEMENT													
7.5%	Construction Management	\$131	\$12	8.9%	\$143	0.0%	\$131	\$12	\$143	2020Q2	17.7%	\$154	\$14	\$16
0.0%	Project Operation:	\$0	\$0	8.9%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$
1.0%	Project Management	\$17	\$2	8.9%	\$19	0.0%	\$17	\$2	\$19	2020Q2	17.7%	\$20	\$2	\$22
	CONTRACT COST TOTALS:	\$2 897	\$441		\$3 338	i	\$2 897	\$441	\$3 338	i		\$3 106	\$472	\$3 57

Hashamomuck Coastal Storm Risk Management Feasibility Study - Alternative 2 PROJECT: LOCATION: Southold, NY

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

PREPARED: 4/13/2016

This Estimate reflects the scope and schedule in report; Hashamomuck Feasibility Southold, NY

Civil W	Civil Works Work Breakdown Structure ESTIMATED COST					PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estim Effecti	nate Prepare ive Price Lev	d: el:	<b>18-Feb-16</b> 1-Oct-15	Prograr Effectiv	n Year (Bud /e Price Lev	get EC): el Date:	2016 1 OCT 15					
WBS <u>NUMBER</u> <b>A</b>	Civil Works <u>Feature &amp; Sub-Feature Description</u> B ALT 20. CENTRAL COVE	COST <u>(\$K)</u> <b>C</b>	CNTG _(\$K) <b>D</b>	CNTG (%) <b>E</b>	TOTAL (\$K) <i>F</i>	ESC _(%)	COST _(\$K)	CNTG _(\$K)/ _/	TOTAL _ <u>(\$K)</u> 	Mid-Point <u>Date</u> <i>P</i>	INFLATED (%) 	COST _(\$K) 	CNTG _(\$K)	FULL _(\$K) <i>O</i>
17	BEACH REPLENISHMENT	\$2,804	\$527	18.8%	\$3,331	0.0%	\$2,804 \$0	\$527	\$3,331	2019Q4	7.3%	\$3,008	\$566	\$3,574
	CONSTRUCTION ESTIMATE TOTALS:	\$2,804	\$527	18.8%	\$3,331	-	\$2,804	\$527	\$3,331			\$3,008	\$566	\$3,574
01	LANDS AND DAMAGES	\$744	\$88	11.9%	\$833	0.0%	\$744	\$88	\$833	2018Q2	4.2%	\$775	\$92	\$868
30	PLANNING, ENGINEERING & DESIGN													
0.5%	Project Management	\$14	\$1	9.4%	\$15	0.0%	\$14	\$1	\$15	2019Q2	13.1%	\$16	\$1	\$17
0.5%	Planning & Environmental Compliance	\$14	\$1	9.4%	\$15	0.0%	\$14	\$1	\$15	2019Q2	13.1%	\$16	\$1	\$17
4.0%	Engineering & Design	\$112	\$10	9.4%	\$122	0.0%	\$112	\$10	\$122	2019Q2	13.1%	\$127	\$12	\$139
0.5%	Reviews, ATRs, IEPRs, VE	\$14	\$1	9.4%	\$15	0.0%	\$14	\$1	\$15	2019Q2	13.1%	\$16	\$1	\$17
0.3%	Life Cycle Updates (cost, schedule, risks)	\$7	\$1	9.4%	\$8	0.0%	\$7	\$1	\$8	2019Q2	13.1%	\$8	\$1	\$9
1.0%	Contracting & Reprographics	\$28	\$3	9.4%	\$31	0.0%	\$28	\$3	\$31	2019Q2	13.1%	\$32	\$3	\$35
1.0%	Engineering During Construction	\$28 ¢7	\$3 ¢1	9.4%	\$31	0.0%	\$28	\$3 e1	\$31 eo	2020Q2	17.7%	\$33	\$3 #1	\$36 ¢0
0.3%	Project Operations	\$7 \$0	\$0	9.4%	\$0 \$0	0.0%	\$0	\$0	\$0 \$0	0	0.0%	\$0	\$1 \$0	\$9 \$0
31	CONSTRUCTION MANAGEMENT													
7.5%	Construction Management	\$210	\$19	8.9%	\$229	0.0%	\$210	\$19	\$229	2020Q2	17.7%	\$247	\$22	\$269
0.0%	Project Operation:	\$0	\$0	8.9%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
1.0%	Project Management	\$28	\$2	8.9%	\$30	0.0%	\$28	\$2	\$30	2020Q2	17.7%	\$33	\$3	\$36
1	CONTRACT COST TOTALS:	\$4,010	\$658		\$4,668		\$4,010	\$658	\$4,668			\$4,318	\$707	\$5,025

PROJECT: Hashamomuck Coastal Storm Risk Management Feasibility Study - Alternative 2 LOCATION: Southold, NY

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

PREPARED: 4/13/2016

This Estimate reflects the scope and schedule in report; Hashamomuck Feasibility Southold, NY

Civil W	forks Work Breakdown Structure		ESTIMAT	ED COST			PROJECT (Constant I	FIRST COST TOTAL PROJECT COST (FULLY FUN Jollar Basis)				Y FUNDED)		
		Estin Effect	nate Prepare ive Price Lev	d: ·el:	<b>18-Feb-16</b> 1-Oct-15	Progran Effectiv	n Year (Bud ve Price Lev	get EC): el Date:	2016 1 OCT 15					
WBS <u>NUMBER</u> <b>A</b>	Civil Works <u>Feature &amp; Sub-Feature Description</u> <b>B</b>	COST _(\$K) <b>C</b>	CNTG (\$K) <b>D</b>	CNTG _(%) 	TOTAL _ <u>(\$K)</u> <i>F</i>	ESC (%) G	COST _(\$K)	CNTG _(\$K)/	TOTAL _(\$K)	Mid-Point <u>Date</u> <i>P</i>	INFLATED	COST (\$K)	CNTG _(\$K)	FULL _(\$K) <i>O</i>
17	ALT 2A - EAST COVE BEACH REPLENISHMENT	\$3,526	\$663	18.8%	\$4,189	0.0%	\$3,526 \$0	\$663	\$4,189	2019Q4	7.3%	\$3,783	\$712	\$4,495
	CONSTRUCTION ESTIMATE TOTALS:	\$3,526	\$663	18.8%	\$4,189	-	\$3,526	\$663	\$4,189			\$3,783	\$712	\$4,495
01	LANDS AND DAMAGES	\$595	\$64	10.7%	\$658	0.0%	\$595	\$64	\$658	2018Q2	4.2%	\$619	\$66	\$686
30	PLANNING, ENGINEERING & DESIGN													
0.5%	Project Management	\$18	\$2	9.4%	\$20	0.0%	\$18	\$2	\$20	2019Q2	13.1%	\$20	\$2	\$22
0.5%	Planning & Environmental Compliance	\$18	\$2	9.4%	\$20	0.0%	\$18	\$2	\$20	2019Q2	13.1%	\$20	\$2	\$22
4.0%	Engineering & Design	<b>\$14</b> 1	\$13	9.4%	\$154	0.0%	\$141	\$13	\$154	2019Q2	13.1%	\$160	\$15	\$174
0.5%	Reviews, ATRs, IEPRs, VE	\$18	\$2	9.4%	\$20	0.0%	\$18	\$2	\$20	2019Q2	13.1%	\$20	\$2	\$22
0.3%	Life Cycle Updates (cost, schedule, risks)	\$9	\$1	9.4%	\$10	0.0%	\$9	\$1	\$10	2019Q2	13.1%	\$10	\$1	\$11
1.0%	Contracting & Reprographics	\$35	\$3	9.4%	\$38	0.0%	\$35	\$3	\$38	2019Q2	13.1%	\$40	\$4	\$43
1.0%	Engineering During Construction	\$35	\$3	9.4%	\$38	0.0%	\$35	\$3	\$38	2020Q2	17.7%	\$41	\$4	\$45
0.3%	Planning During Construction	\$9	\$1	9.4%	\$10	0.0%	\$9	\$1	\$10	2020Q2	17.7%	\$11	\$1	\$12
0.0%	Project Operations	\$0	\$0	9.4%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
31	CONSTRUCTION MANAGEMENT													
7.5%	Construction Management	\$264	\$23	8.9%	\$287	0.0%	\$264	\$23	\$287	2020Q2	17.7%	\$311	\$28	\$338
0.0%	Project Operation:	\$0	\$0	8.9%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
1.0%	Project Management	\$35	\$3	8.9%	\$38	0.0%	\$35	\$3	\$38	2020Q2	17.7%	\$41	\$4	\$45
:	CONTRACT COST TOTALS:	\$4,703	\$780		\$5,483		\$4,703	\$780	\$5,483			\$5,077	\$839	\$5,916

#### Figure E4 – Total Project Cost Summary for Renourishment

 PROJECT:
 Hashamomuck Coastal Storm Risk Management Feasibility Study - Alt. 2

 PROJECT NO:P2 403349
 LOCATION:

 Southold, NY
 Southold, NY

DISTRICT: NAN New York PREPARED: 4/13/2016 POC: CHIEF, COST ENGINEERING, Mukesh Kumar

This Estimate reflects the scope and schedule in report;

Hashamomuck Feasibility Study. Southold, NY

CHIEF, REAL ESTATE, Noreen Dress

CHIEF, PLANNING, Frank Santomauro CHIEF, ENGINEERING, Arthur Connolly

CHIEF, OPERATIONS, Tom Creamer

CHIEF, PM-PB, Anthony Ciorra CHIEF, DPM, Joseph Seebode

CHIEF, CONSTRUCTION, Timothy Yarger CHIEF, CONTRACTING, Frank Cashman

Civil	Works Work Breakdown Structure		ESTIMATE	D COST				PROJEC (Consta	CT FIRST CO nt Dollar Bas	ST iis)			TOTAL F (FULI	ROJECT CO Y FUNDED)	ST
							Pro Ef	gram Year (I 'ective Price	Budget EC): Level Date:	2016 1 OCT 15	1				
WBS <u>NUMBER</u> A	Civil Works <u>Feature &amp; Sub-Feature Description</u> <b>B</b>	COST _(\$K) 	CNTG _(\$K)_ D	CNTG _(%) 	TOTAL _(\$K)_ <i>F</i>	ESC (%) <b>G</b>	COST _(SK)_ H	CNTG (\$K) /	TOTAL _(\$K) 	Spent Thru: 10/1/2015 _(\$K)_	TOTAL FIRST COST <u>(\$K)</u> K	INFLATED _(%)_ L	COST (\$K) M	CNTG _(\$K)	FULL (\$K) <i>O</i>
17	BEACH REPLENISHMENT	\$3,021	\$445	14.7%	\$3,466	0.0%	\$3,021	\$445	\$3,466	\$0	\$3,466	80.0%	\$5,438	\$801	\$6,239
	RENOURISHMENT ESTIMATE TOTALS:	\$3,021	\$445	-	\$3,466	0.0%	\$3,021	\$445	\$3,466	\$0	\$3,466	80.0%	\$5,438	\$801	\$6,239
30	PLANNING, ENGINEERING & DESIGN	\$336	\$38	11.4%	\$374	0.0%	\$336	\$38	\$374	\$0	\$374	138.3%	\$800	\$91	\$891
31	CONSTRUCTION MANAGEMENT	\$357	\$53	14.7%	\$409	0.0%	\$357	\$53	\$409	\$0	\$409	337.3%	\$1,559	\$230	\$1,789
	PROJECT COST TOTALS:	\$3,713	\$536	14.4%	\$4,248		\$3,713	\$536	\$4,248	\$0	\$4,248	109.9%	\$7,796	\$1,121	\$8,918
	CHIEF, COST ENGINEERING, Mul					h Kum	ar			ESTI		EDERAL	COST:	50%	\$4,459
		PROJECT MANAGER, Dan Fa								ESTIMATE	I-NON U:		COST:	50%0	<b>\$4,459</b>

ESTIMATED TOTAL PROJECT COST: \$8,918

#### \*\*\*\* CONTRACT COST SUMMARY \*\*\*\*

PROJECT: Hashamomuck Coastal Storm Risk Management Feasibility Study - Alt. 2 LOCATION: Southold, NY

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DISTRICT: NAN New York PREPARED: 4/13/2016 POC: CHIEF, COST ENGINEERING, Mukesh Kumar

This Estimate reflects the scope and schedule in report; Hashamomuck Feasibility Study. Southold, NY

Civil Works Work Breakdown Structure			ESTIMATED COST PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)								
			Estim Effecti	ate Prepareo ve Price Lev	d: el:	<b>22-Feb-16</b> 1-Oct-15	Progran Effectiv	n Year (Budg ve Price Leve	jet EC): Il Date:	2016 1 OCT 15					
				F	RISK BASED										
WBS	Civil Works		COST	CNTG	CNTG	TOTAL	ESC	COST	CNTG	TOTAL	Mid-Point	INFLATED	COST	CNTG	FULL
NUMBER	Feature & Sub-Feature Description		<u>(\$K)</u>	<u>(\$K)</u>	_(%)_	<u>(\$K)</u>	(%)	<u>(\$K)</u>	<u>(\$K)</u>	<u>(\$K)</u>	Date	(%)	<u>(\$K)</u>	<u>(\$K)</u>	<u>(\$K)</u>
A	B PERIODIC REQUEISHMENT (every 5 yrs	)	C	D	E	F	G	н	'	J		L	м	N	0
17	BEACH REPLENISHMENT	, Year 2024	\$336	\$49	14.7%	\$385	0.0%	\$336	\$49	\$385	2024Q2	17.3%	\$394	\$58	\$452
17	BEACH REPLENISHMENT	Year 2029	\$336	\$49	14.7%	\$385	0.0%	\$336	\$49	\$385	2029Q2	29.5%	\$435	\$64	\$499
17	BEACH REPLENISHMENT	Year 2034	\$336	\$49	14,7%	\$385	0.0%	\$336	\$49	\$385	2034Q2	43.0%	\$480	\$71	\$551
17	BEACH REPLENISHMENT	Year 2039	\$336	\$49	14.7%	\$385	0.0%	\$336	\$49	\$385	2039Q2	57.8%	\$530	\$78	\$608
17	BEACH REPLENISHMENT	Year 2044	\$336	\$49	14.7%	\$385	0.0%	\$336	\$49	\$385	2044Q2	74.3%	\$585	\$86	\$671
17	BEACH REPLENISHMENT	Year 2049	\$336	\$49	14.7%	\$385	0.0%	\$336	\$49	\$385	2049Q2	92.4%	\$646	\$95	\$741
17	BEACH REPLENISHMENT	Year 2054	\$336	\$49	14.7%	\$385	0.0%	\$336	\$49	\$385	2054Q2	112.4%	\$713	\$105	\$818
17	BEACH REPLENISHMENT	Year 2059	\$335	\$49	14.7%	\$385	0.0%	\$335	\$49	\$385	2059Q2	134.6%	\$787	\$116	\$903
17	BEACH REPLENISHMENT	Year 2064	\$335	\$49	14.7%	\$385	0.0%	\$335	\$49	\$385	2064Q2	159.0%	\$869	\$128	\$997
	CONSTRUCTION ESTIMATE TOTAL	. <b>S</b> :	\$3,021	\$445	14.7%	\$3,466	-	\$3,021	\$445	\$3,466			\$5,438	\$801	\$6,239
30	PLANNING, ENGINEERING & DESIGN														
	PLANNING, ENGINEERING & DESIGN	Year 2024	\$37	\$4	11.4%	\$42	0.0%	\$37	\$4	\$42	2024Q2	38.2%	\$52	\$6	\$57
	PLANNING, ENGINEERING & DESIGN	Year 2029	\$37	\$4	11.4%	\$42	0.0%	\$37	\$4	\$42	2029Q2	38.2%	\$52	\$6	\$57
	PLANNING, ENGINEERING & DESIGN	Year 2034	\$37	\$4	11.4%	\$42	0.0%	\$37	\$4	\$42	2034Q2	38.2%	\$52	\$6	\$57
	PLANNING, ENGINEERING & DESIGN	Year 2039	\$37	\$4	11.4%	\$42	0.0%	\$37	\$4	\$42	2039Q2	38.2%	\$52	\$6	\$57
	PLANNING, ENGINEERING & DESIGN	Year 2044	\$37	\$4	11.4%	\$42	0.0%	\$37	\$4	\$42	2044Q2	38.2%	\$52	\$6	\$57
	PLANNING, ENGINEERING & DESIGN	Year 2049	\$37	\$4	11.4%	\$42	0.0%	\$37	\$4	\$42	2049Q2	38.2%	\$52	\$6	\$57
	PLANNING, ENGINEERING & DESIGN	Year 2054	\$37	\$4	11.4%	\$42	0.0%	\$37	\$4	\$42	2054Q2	488.7%	\$219	\$25	\$244
	PLANNING, ENGINEERING & DESIGN	Year 2059	\$37	\$4	11.4%	\$42	0.0%	\$37	\$4	\$42	2059Q2	488.7%	\$219	\$25	\$244
	PLANNING, ENGINEERING & DESIGN	Year 2064	\$37	\$4	11.4%	\$42	0.0%	\$37	\$4	\$42	2064Q2	38.2%	\$52	\$6	\$57
31	CONSTRUCTION MANAGEMENT														
	CONSTRUCTION MANAGEMENT	Year 2024	\$40	\$6	14.7%	\$45	0.0%	\$40	\$6	\$45	2024Q2	38.2%	\$55	\$8	\$63
	CONSTRUCTION MANAGEMENT	Year 2029	\$40	\$6	14.7%	\$45	0.0%	\$40	\$6	\$45	2029Q2	71.6%	\$68	\$10	\$78
	CONSTRUCTION MANAGEMENT	Year 2034	\$40	\$6	14.7%	\$45	0.0%	\$40	\$6	\$45	2034Q2	117.7%	\$86	\$13	\$99
	CONSTRUCTION MANAGEMENT	Year 2039	\$40	\$6	14.7%	\$45	0.0%	\$40	\$6	\$45	2039Q2	179.2%	\$111	\$16	\$127
	CONSTRUCTION MANAGEMENT	Year 2044	\$40	\$6	14.7%	\$45	0.0%	\$40	\$6	\$45	2044Q2	258.0%	\$142	\$21	\$163
	CONSTRUCTION MANAGEMENT	Year 2049	\$40	\$6	14.7%	\$45	0.0%	\$40	\$6	\$45	2049Q2	359.1%	\$182	\$27	\$209
	CONSTRUCTION MANAGEMENT	Year 2054	\$40	\$6	14.7%	\$45	0.0%	\$40	\$6	\$45	2054Q2	488.7%	\$233	\$34	\$268
	CONSTRUCTION MANAGEMENT	Year 2059	\$40	\$6	14.7%	\$45	0.0%	\$40	\$6	\$45	2059Q2	655.0%	\$299	\$44	\$343
	CONSTRUCTION MANAGEMENT	Year 2064	\$40	\$6	14.7%	\$45	0.0%	\$40	\$6	\$45	2064Q2	868.2%	\$384	\$56	\$440
	CONTRACT COST TOTALS:		\$3,713	\$536		\$4,248		\$3,713	\$536	\$4,248			\$7,796	<b>\$1</b> ,121	\$8,918

### Figure E5 – Abbreviated Risk Analysis

	1	Abbreviated Risk Analysis							
	Project Name & Location: Project Development Stage/Alternative: Risk Category	Project Name & Location: Hashamomuck Coastal Risk Management Project Development Stage/Alternative: Feasibility (Recommended Plan) Risk Category: Moderate Risk: Typical Project Construction Type Total Estimated Construction Contract Cost = 5 11.0						N - NYD 2 12/16/2015	
	Т	otal Estimated Construction Contract Cost =	\$	11,093,504					
	CWWBS	Feature of Work	2	Contract Cost	<u>c</u>	<u>% Contingency</u>	<u>\$</u>	Contingency	<u>Total</u>
	01 LANDS AND DAMAGES	Real Estate	\$	2,206,118		10.82%	\$	238,739 \$	2,444,857
1	17 BEACH REPLENISHMENT	Berm	\$	8,072,664		18.81%	\$	1,518,326 \$	9,590,990
2	17 BEACH REPLENISHMENT	Renourishment	\$	3,020,840		14.73%	\$	444,920 \$	3,465,760
3						0.00%	\$	- \$	-
4						0.00%	\$	- \$	-
5						0.00%	\$	- \$	-
6						0.00%	\$	- \$	-
7						0.00%	\$	- \$	-
8	06 FISH AND WILDLIFE FACILITIES					0.00%	\$	- \$	-
9	18 CULTURAL RESOURCE PRESERVATION					0.00%	\$	- \$	-
10	17 BEACH REPLENISHMENT					0.00%	\$	- \$	-
<b>1</b> 1						0.00%	\$	- \$	-
12	All Other (less than 10% of construction costs)	Remaining Construction Items	\$	-	0.0%	0.00%	\$	- \$	-
13	30 PLANNING, ENGINEERING, AND DESIGN	Planning, Engineering, & Design	\$	1,069,856		9.37%	\$	100,282 \$	1,170,138
14	31 CONSTRUCTION MANAGEMENT	Construction Management	\$	1,135,284		8.90%	\$	101,018 \$	1,236,303
xx	FIXED DOLLAR RISK ADD (EQUALLY DISPERSED TO ALL, MU	IST INCLUDE JUSTIFICATION SEE BELOW)					\$		
		Totals							
		Real Estate	\$	2,206,118		10.82%	\$	238,739 \$	2,444,856.93
		Total Construction Estimate	\$	11,093,504		17.70%	\$	1,963,246 \$	13,056,750
		Total Planning, Engineering & Design	\$	1,069,856		9.37%	\$	100,282 \$	1,170,138
		I otal Construction Management	\$	1,135,284		8.90%	\$	101,018 \$	1,236,303
		Total	\$	15,504,762		16%	\$	2,403,285 \$	17,908,048
					_	Base		50%	80%
		-		Range Estimate (\$	000's)	\$15,505k		\$16,947k	\$17,908k
	Fixed Dollar Risk Add: (Allows for additional risk to						* 50%	% based on base is at 50% CL.	]
	be added to the risk analsyis. Must include justification. Does not allocate to Real Estate.								



PS-14	Construction Management	N/A	Straight foward, typical coastal project that USACE have a lot of experience on. Therefore, no concerns are foreseen.	Negligible	Unlikely	0
Acquisition	n Strategy			Maximum Proje	ct Growth	40%
AS-1	Berm	N/A	Basic construction feature. Sufficient contractors available in the region capable to for this work. Therefore, no concers are foreseen	Negligible	Unlikely	0
AS-2	Renourishment	Limited bid competition anticipated	Competition of delivery of sand is competitive due to the number of sand quarries in the county	Negligible	Unlikely	0
AS-3	0			Negligible	Unlikely	0
AS-4	0			Negligible	Unlikely	0
AS-5	0			Negligible	Unlikely	0
AS-6	0			Negligible	Unlikely	0
AS-7	0			Negligible	Unlikely	0
AS-8	0			Negligible	Unlikely	0
AS-9	0			Negligible	Unlikely	0
AS-10	0			Negligible	Unlikely	0
AS-11	0			Negligible	Unlikely	0
AS-12	Remaining Construction Items			Negligible	Unlikely	0
AS-13	Planning, Engineering, & Design	N/A	Basic construction feature. Sufficient contractors available in the region capable to for this work. Therefore, no concers are foreseen	Negligible	Unlikely	0

AS-14	Construction Management	N/A	Basic construction feature. Sufficient contractors available in the region capable to for this work. Therefore, no concers are foreseen	Negligible	Unlikely	0
Construction	on Elements			Maximum Proje	ct Growth	30%
CON-1	Berm	Special mobilization. High risk or complex construction elements, Site access, in-water. Potential for construction modification and claims.	Current assumptions on site access and storage area might not be allowed during actual construction. Construction modification and claim typical on construction projects. 80% factor incoporated in the cost estimate in consideration for site access.	Negligible	Likely	1
CON-2	Renourishment	Accelerated schedule or harsh weather schedule.	Bad weather days area already factor into our design. Therefore it is not a concern. Possible environmental windows will be factor into the construction windows.	Negligible	Possible	0
CON-3	0			Negligible	Unlikely	0
CON-4	0			Negligible	Unlikely	0
CON-5	0			Negligible	Unlikely	0
CON-6	0			Negligible	Unlikely	0
CON-7	0			Negligible	Unlikely	0
CON-8	0			Negligible	Unlikely	0
CON-9	0			Negligible	Unlikely	0
CON-10	0			Negligible	Unlikely	0
CON-11	0			Negligible	Unlikely	0
CON-12	Remaining Construction Items			Negligible	Unlikely	0
CON-13	Planning, Engineering, & Design	Potential for construction modification and claims.	It's a known construction. The corps have a lot of expereince and therefore, a reasonable amount of cost allocated to consider for the potential modification and claims.	Negligible	Unlikely	0
CON-14	Construction Management	Accelerate schedule or harsh weather schedule. Potential for construction modifiationand claims.	Construction modification and claims and unforeseen weather condition is typical on a project.	Marginal	Likely	2
Quantities	for Current Scope			Maximum Proje	ct Growth	20%
Q-1	Berm	Sufficient investigations to develop quantities, Level of confidence based on design and assumptions.	Detail survey needed prior to P&S. Location is on the eroded area so quantity might go up.	Marginal	Likely	2

Q-2	Renourishment	Possibility for increased quantities due to loss, waste, or subsidence. Level of confidence based on design and assumptions. Appropriate methods applied to calculated quantities.	We don't anticipate changes in quantities base on historical analysis.	Moderate	Unlikely	1
Q-3	0			Negligible	Unlikely	0
Q-4	0			Negligible	Unlikely	0
Q-5	0			Negligible	Unlikely	0
Q-6	0			Negligible	Unlikely	0
Q-7	0			Negligible	Unlikely	0
Q-8	0			Negligible	Unlikely	0
Q-9	0			Negligible	Unlikely	0
Q-10	0			Negligible	Unlikely	0
Q-11	0			Negligible	Unlikely	0
Q-12	Remaining Construction Items			Negligible	Unlikely	0
Q-13	Planning, Engineering, & Design	N/A	N/A	Negligible	Unlikely	0
Q-14	Construction Management	N/A	N/A	Negligible	Unlikely	0
Specialty F	abrication or Equipment			Maximum Proje	ct Growth	75%
FE-1	Berm	N/A	N/A	Negligible	Unlikely	0
FE-2	Renourishment	N/A	N/A	Negligible	Unlikely	0
FE-3	0			Negligible	Unlikely	0
FE-4	0			Negligible	Unlikely	0

FE-5	0			Negligible	Unlikely	0
FE-6	0			Negligible	Unlikely	0
FE-7	0			Negligible	Unlikely	0
FE-8	0			Negligible	Unlikely	0
FE-9	0			Negligible	Unlikely	0
FE-10	0			Negligible	Unlikely	0
FE-11	0			Negligible	Unlikely	0
FE-12	Remaining Construction Items			Negligible	Unlikely	0
FE-13	Planning, Engineering, & Design	N/A	N/A	Negligible	Unlikely	0
FE-14	Construction Management	N/A	NA	Negligible	Unlikely	0
FE-14	Construction Management ate Assumptions	N/A	NA	Negligible Maximum Proje	Unlikely ct Growth	0 35%
FE-14 Cost Estimates EST-1	Construction Management ate Assumptions Berm	N/A Reliability and number of key quotes. Assumptions regarding crew productivity and overtime.	N/A Sand price subject to change. Depending on where we obtain the sand and how the project is futther developed down the road, the method of sand placement could either be via trucking, barge or dredging.	Negligible Maximum Proje Marginal	Unlikely ct Growth Likely	0 35% 2
FE-14 Cost Estima EST-1 EST-2	Construction Management ate Assumptions Berm Renourishment	N/A Reliability and number of key quotes. Assumptions regarding crew productivity and overtime. Sand cost (\$/cy) for future re-nourishment events.	N/A Sand price subject to change. Depending on where we obtain the sand and how the project is futther developed down the road, the method of sand placement could either be via trucking, barge or dredging. Sand is subject to change. Depending on where we obtain the sand and how the project is further developed down the road, the method of sand placement could either be via trucking, barge or dredging. A high \$/cy value for trucked sand is included in the current estimate. This unit cost (\$/cy) may decrease if other sand sources are selected in the future.	Negligible Maximum Proje Marginal Marginal	Unlikely ct Growth Likely Likely	0 35% 2 2
FE-14 Cost Estima EST-1 EST-2 EST-3	Construction Management  ate Assumptions Berm Renourishment 0	N/A Reliability and number of key quotes. Assumptions regarding crew productivity and overtime. Send cost (\$/cy) for future re-nourishment events.	N/A Sand price subject to change. Depending on where we obtain the sand and how the project is futther developed down the road, the method of sand placement could either be via trucking, barge or dredging. Sand is subject to change. Depending on where we obtain the sand and how the project is further developed down the road, the method of sand placement could either be via trucking, barge or dredging. A high \$/cy value for trucked sand is included in the current estimate. This unit cost (\$/cy) may decrease if other sand sources are selected in the future.	Negligible Maximum Proje Marginal Marginal Negligible	Unlikely  ct Growth  Likely  Likely  Unlikely	0 35% 2 2 2
FE-14 Cost Estima EST-1 EST-2 EST-3 EST-4	Construction Management	N/A Reliability and number of key quotes. Assumptions regarding crew productivity and overtime. Sand cost (\$/cy) for future re-nourishment events.	N/A Sand price subject to change. Depending on where we obtain the sand and how the project is futther developed down the road, the method of sand placement could either be via trucking, barge or dredging. Sand is subject to change. Depending on where we obtain the sand and how the project is further developed down the road, the method of sand placement could either be via trucking, barge or dredging. A high \$<'ref{y} vulue for trucked sand is included in the current estimate. This unit cost (\$<'ref{y}) may decrease if other sand sources are selected in the future.	Negligible Maximum Proje Marginal Marginal Negligible Negligible	Unlikely  Ct Growth  Likely  Unlikely  Unlikely  Unlikely	0 35% 2 2 2 0
FE-14 Cost Estima EST-1 EST-2 EST-3 EST-4 EST-5	Construction Management	N/A Reliability and number of key quotes. Assumptions regarding crew productivity and overtime. Sand cost (\$/cy) for future re-nourishment events.	N/A Sand price subject to change. Depending on where we obtain the sand and how the project is further developed down the road, the method of sand placement could either be via trucking, barge or dredging. Sand is subject to change. Depending on where we obtain the sand and how the project is further developed down the road, the method of sand placement could either be via trucking, barge or dredging. A high \$'cy value for trucked sand is included in the current estimate. This unit cost (\$'cy) may decrease if other sand sources are selected in the future.	Negligible       Maximum Proje       Marginal       Marginal       Negligible       Negligible	Unlikely  ct Growth  Likely  Unlikely  Unlikely  Unlikely  Unlikely	0 35% 2 2 0 0 0
FE-14 Cost Estima EST-1 EST-2 EST-3 EST-3 EST-4 EST-5 EST-6	Construction Management	N/A Reliability and number of key quotes. Assumptions regarding crew productivity and overtime. Sand cost (\$/cy) for future re-nourishment events.	N/A Sand price subject to change. Depending on where we obtain the sand and how the project is futther developed down the road, the method of sand placement could either be via trucking, bareo or dredging. Sand is subject to change. Depending on where we obtain the sand and how the project is further developed down the road, the method of sand placement could either be via trucking, bareo or dredging. A high \$cy value for trucket sand is included in the current estimate. This unit cost (\$cy) may decrease if other sand sources are selected in the future.	Negligible       Marginal       Marginal       Negligible       Negligible       Negligible       Negligible	Unlikely et Growth Likely Unlikely Unlikely Unlikely Unlikely Unlikely Unlikely	0 35% 2 2 0 0 0 0

EST-8	0			Negligible	Unlikely	0
EST-9	0			Negligible	Unlikely	0
EST-10	0			Negligible	Unlikely	0
EST-11	0			Negligible	Unlikely	0
EST-12	Remaining Construction Items			Negligible	Unlikely	0
EST-13	Planning, Engineering, & Design	N/A	N/A	Negligible	Unlikely	0
EST-14	Construction Management	N/A	N/A	Negligible	Unlikely	0
<u>External P</u>	roject Risks	-	-	Maximum Proje	ct Growth	40%
EX-1	Berm		Very unlikely we would have an adverse weather	Moderate	Unlikely	1
EX-2	Renourishment	N/A	N/A	Negligible	Unlikely	0
EX-3	0			Negligible	Unlikely	0
EX-4	0			Negligible	Unlikely	0
EX-5	0			Negligible	Unlikely	0
EX-6	0			Negligible	Unlikely	0
EX-7	0			Negligible	Unlikely	0
EX-8	0			Negligible	Unlikely	0
EX-9	0			Negligible	Unlikely	0
EX-10	0			Negligible	Unlikely	0
EX-11	0			Negligible	Unlikely	0

EX-12	Remaining Construction Items			Negligible	Unlikely	0
EX-13	Planning, Engineering, & Design	Political influence, lack of support, obstacles.	Public access debat might delay the start of P&S and construction.	Marginal	Likely	2
EX-14	Construction Management	N/A	N/A	Negligible	Unlikely	0

Print Date Thu 28 April 2016 Eff. Date 4/13/2016	e Thu 28 April 2016 U.S. Army Corps of Engineers 4/13/2016 Project LI, NY: Hashamomuck Alternative 2 Hashamomuck Alternative 2						
Description	Quantity	UOM	ContractCost	Contingency	Escalation	ProjectCost	
Project Cost			8,072,664.40	0.00	0.00	8,072,664.40	
Hashamomuck Alternative 2	159,733.0000	СҮ	8,072,664.40	0.00	0.00	8,072,664.40	
17 BEACH REPLENISHMENT	159,733.0000	СҮ	8,072,664.40	0.00	0.00	8,072,664.40	
Alt 2A - West Area (25' Berm)	33,630.0000	СҮ	1,743,170.55	0.00	0.00	1,743,170.55	
Alt 2C - Central Area (75'/25' Berm)	55,850.0000	СҮ	2,803,520.85	0.00	0.00	2,803,520.85	
Alt 2A - East Area (25' Berm)	70,253.0000	СҮ	3,525,973.01	0.00	0.00	3,525,973.01	

### Figure E6 – MII Estimate

Labor ID: NLS2015 EQ ID: EP14R01

Currency in US dollars

TRACES MII Version 4.2