1.0 INTRODUCTION

The United States Army Corps of Engineers (Corps) has partnered with the City of Nome to conduct the Port of Nome Harbor Improvements Feasibility Study.

This feasibility study is a Corps 3x3x3 SMART Planning feasibility study being conducted in response to a request from the City of Nome

This cost engineering report documents the methods and results of the cost estimates completed at various stages of the study. This estimating process is performed to support the economic analysis, and develop a total project cost, for the recommended plan studies conducted as part of the current feasibility report.

2.0 PRELIMINARY ALTERNATIVE COST ESTIMATES

This section summarizes the development of planning level cost estimates for the final array of action alternatives.

2.1 Purpose

The six alternative estimates were developed in Q3 2019 prices. The cost estimate back-up information, which includes rock pricing information, quantity calculations and abbreviated risk analysis can be found in Attachment 1. The detailed cost estimate tables can be found in Attachment 2.

2.2 Quantities

Quantities for the breakwaters, causeways, demolition of existing breakwaters and spur nose, and dredging of the outer and deep water basins were calculated by the Corps Alaska District. The quantities were checked for reasonableness within the provided spreadsheet and have been used in the alternative estimates.

2.3 Unit Prices

Unit prices for the alternative estimates were taken from various sources that include vendor quotes, RS Means, previous cost estimates, available bid data, and previous study documents. All unit prices have been adjusted with local multipliers that modify the base unit price to reflect localized, labor, equipment and material prices.

1. Mobilization and Demobilization – Two separate mob-demobe costs were calculated; one for the breakwater, causeway, dock construction and one for the dredging construction. Both assume a well-equipped contractor from the West Coast of CONUS. The breakwater/dock will winter equipment at Nome, where the large dredging plants will demobe the West Coast of Alaska during winter months.
2. Breakwater Demolition – Unit cost assumes use of both marine and land based equipment.
3. Armor Rock, B-rock, Core Rock and Gravel – Unit prices assume all rock will be sources from the Cape Nome Quarry. The material could be loaded onto barges for delivery to to the project site, and hauled via truck (20 cy side or end dump). Current updated quotation were attempted but not received, so recent historical unit prices were used (bid data and similar project estimates). It's possible for the contractor to import rock from other sources during mobe, or other as needed to maintain productivity but this estimate does not factor that scenario. The east breakwater will be demoed. Its assumed that approximately 75% of the A, B and C rock from that breakwater will be able to be hauled to shore, resorted, tested and incorporated into the new project.
4. Dredging – CEDEP (Corps of Engineers Dredge Estimating Program) was used to estimate a unit cost for dredging.
5. Dock Construction – All dock construction is assumed to be similar to a modified diaphragm sheet pile wall with gravel backfill. The unit costs for these docks were developed based on historical costs for similar walls/docks constructed at the Port of Nome over the recent 5 years.

2.4 Feature Accounts

The cost estimates have been separated by feature account. The features included are as follows:

1 Land and Damages – There are very minimal real estate costs anticipated for this project, but a small amount was included for administration. The final cost used will come from the real estate plan in the final report.

10 Breakwaters and Seawalls – Costs in this account consist of the majority of construction measures. The breakwaters and causeways fall under this account. Mobilization and demobilization required for these features of work are included here. This includes both Federal and Local Sponsor Funded features.

12 Navigation, Ports and Harbors – Costs for this account consist of the dredging, disposal of dredge spoils, and the sheet pile docks. This includes both Federal and Local Sponsor Funded features.

19 Buildings, Grounds and Utilities – Costs for this account consist of any fuel, water, electricity and all other utilities needed to support the new docks. These costs are all Local Sponsor Funded.

30 Planning, Engineering and Design (PED) – Cost for this account have been assumed to a flat $10M based on discussion with the PDT.

31 Construction Management (CM) – Costs for this account have been assumed to be 4% of total construction costs.

2.5 Contingencies

Contingencies represent allowances to cover unknowns, uncertainties and/or unanticipated conditions that are not possible to adequately evaluate from the data on hand at the time the cost estimate is prepared but must be represented by a sufficient cost to cover the identified risks. An abbreviated risk analysis (ARA) has been prepared for the alternative cost estimates to calculate alternative specific contingencies.

2.6 OMRR&R

OMRR&R costs have been calculated for each alternative. The main O&M scope for Nome Harbor will consist of maintenance dredging the newly established basins. The unit costs were developed based on many years of historical data maintenance dredging at the Port. Means and methods assumed hydraulic cutter head suction dredging, with disposal on or near shore. The following assumptions were used to estimate OMRR&R costs for the alternative estimates:

Annual minor maintenance and inspections - $25,000 per year (every alternative)
Breakwater/Causeway rock replacement - xxx% of armor, b-rock and core rock replaced every x-years

Dredging annually – quantities developed by USACE Hydraulics & Hydrology design section

2.7 Alternative Cost Summary

The summary of alternative costs developed is in Table 1.

Table 1 – Alternative Costs

	SUMMARY FOR ALT 3a with DIFFERENT DREDGE DEPTHS							
	Different Dredge Depth Scenarios	***GNF Drgd***	***GNF BW***	***LSF Total***	**PED 1%**	**SIOH 4%**	**Contingency**	**Total**
	Dredge -28 and -32	$15,548,443	$148,290,210	$46,816,800	$2,106,555	$8,426,218	$73,729,408	$294,918,000
	Dredge -28 and -42	$36,890,979	$148,290,210	$46,816,800	$2,319,980	$9,279,920	$81,199,296	$324,798,000
	SUMMARY FOR ALT 3b with DIFFERENT DREDGE DEPTHS							
	Different Dredge Depth Scenarios	***GNF Drgd***	***GNF BW***	***LSF Total***	**PED 1%**	**SIOH 4%**	**Contingency**	**Total**
	Dredge -28 and -32	$11,158,351	$150,628,410	$37,042,800	$1,988,296	$7,953,182	$69,590,346	$278,361,000
	Dredge -28 and -42	$33,987,979	$150,628,410	$37,042,800	$2,216,592	$8,866,368	$77,580,716	$310,323,000
	SUMMARY FOR ALT 3c with DIFFERENT DREDGE DEPTHS							
	Different Dredge Depth Scenarios	***GNF Drgd***	***GNF BW***	***LSF Total***	**PED 1%**	**SIOH 4%**	**Contingency**	**Total**
	Dredge -28 and -32	$11,158,351	$153,301,010	$24,753,300	$1,892,127	$7,568,506	$66,224,431	$264,898,000
	Dredge -28 and -42	$33,987,979	$153,301,010	$24,753,300	$2,120,423	$8,481,692	$74,214,801	$296,860,000
	SUMMARY FOR ALT 4 with DIFFERENT DREDGE DEPTHS							
	Different Dredge Depth Scenarios	***GNF Drgd***	***GNF BW***	***LSF Total***	**PED 1%**	**SIOH 4%**	**Contingency**	**Total**
	Dredge at -28 and -32	$24,651,905	$170,674,110	$59,323,200	$2,546,492	$10,185,969	$89,127,225	$356,509,000
	Dredge at -28 and -42	$46,359,372	$170,674,110	$59,323,200	$2,763,567	$11,054,267	$96,724,839	$386,900,000
	SUMMARY FOR ALT 8a with DIFFERENT DREDGE DEPTHS							
	Different Dredge Depth Scenarios	***GNF Drgd***	***GNF BW***	***LSF Total***	**PED 1%**	**SIOH 4%**	**Contingency**	**Total**
	Dredge at -28 and -32	$55,033,907	$334,903,941	$72,509,600	$4,624,474	$18,497,898	$161,856,607	$647,427,000
	Dredge at -28 and -42	$67,539,458	$334,903,941	$72,509,600	$4,749,530	$18,998,120	$166,233,550	$664,935,000
	SUMMARY FOR ALT 8b with DIFFERENT DREDGE DEPTHS							
	Different Dredge Depth Scenarios	**GNF Drgd**	**GNF BW**	**LSF Total**	**PED 1%**	**SIOH 4%**	**Contingency**	**Total**
	Dredge at -28 and -32	$55,033,907	$317,199,210	$63,964,000	$4,361,971	$17,447,885	$152,668,991	$615,510,000
	Dredge at -28 and -42	$66,111,658	$314,202,610	$70,413,100	$4,507,274	$18,029,095	$157,754,579	$631,019,000

5.0 RECOMMENDED PLAN COST ESTIMATE

This section documents the development of recommended plan cost estimate, which was completed using MCACES and included a Cost and Schedule Risk Analysis (CSRA) for contingency development. Alternative 8B -40' MLLW deep water basin from the final array of alternatives was selected as the recommended plan.

5.1 Basis of Estimate

The available design document for this project, in which the cost estimate was based on, is the *Port of Nome Harbor Improvement Feasibility Study* prepared by the Alaska District, USACE.

The cost estimate is based on conceptual level project quantity take-offs that have been calculated based on the assumptions and information documented in the previously referenced report. An estimated quantity of rock and dredging volumes were provided by CEPOA-ECD-H and used in the development of the recommended plan Estimated Construction Cost.

5.2 Project Schedule

It is estimated that overall construction duration, from construction notice-to-proceed to completion, would take approximately 4 years to complete. It's assumed the usable months for construction are between mid-May and mid-October. Mob-demobe will be timed so that the equipment and personnel are on site to begin and end outside of this window. For schedule development, construction seasons were used to describe sequencing.

The assumption was project award in March/April, therefore the first construction season would mostly be mobe-demobe of mining equipment, and quarry set-up and rock production. Some demo and reconstruction work of breakwaters could begin in the later part of the first season, but it would depend on the availability of rock to close up and protect work over the winter months.

Its possible that during the first season, the east breakwater could be demoed starting from the shore and work toward the first breach by building an access pad. Due to the shallow beach, marine based equipment would need to start farther off shore. Rock would be hauled to the shore or sorted on a barge for reuse in the new breakwaters (east or west). On the west BW, spur nose would be dismantled from shore and rock hauled to the staging area for sorting. The BW core could be placed via split scow, until built up to allow land based equipment to place rock. One dredge plant would be mobed in the first season. This could perform the over-dredging and placement of spec material to pile tip elevation for the footprint of the sheetpile walls. This is to ensure the sheetpile can be driven without encountering large cobbles. Some basin dredging and/or east breakwater demo could occur as well during this first season with this equipment.

Season 2 its assumed 2 dredge plants will be mobed. They will focus on the outer basin, as this is where the majority of material is located. Breakwater work will continue on both sides as its anticipated rock production will have progressed enough to have stockpiles for placement.

Season 3 will also have 2 dredge plants and separate crews working on the east and west features. It's probable the east breakwater will be complete by the end of season 2 or very near complete. Dredging in this season will be finishing up the outer basin and beginning on the deep water basin, as by this time, there will be significant progress on the bw to assist in protection for that work.

Season 4 will be clean up of the deep water basin and any remaining finish work on the docks and breakwaters.

All work schedules for the baseline schedule use 6-12's double shifting during June, July, August and some of September witch is fairly aggressive.

This production rates are most dependent on availability of spec rock for incorporation into the project. Quarry operations and productivity are very hard to predict for rock production. This will require a very specialized contractor because of the large quantity of 22-ton stones needed for the project. For this reason and as discussed in the risk register, a lack of adequate quantity of rock during the first season may push most progress 1 season longer. In other words, the contractor must be able to close up and protect work over the winter seasons, and may choose to not start demo work until enough rock is available to use for that.

5.3 Acquisition Plan

The estimate assumes one contract being awarded for the total project. It is assumed that the bidding process would be unrestricted. All contractor and project mark-ups have been adjusted accordingly in the cost estimate. The estimate assumes a Prime Contractor would do the majority of the work, and infact it's likely a Joint Venture (JV) arrangement would be likely. Very few subcontractors were assumed in this estimate.

5.4 Project Construction

Staging and Site Access

Adequate staging areas are available at or near the Port of Nome. Areas may be designated in the plans and specs, and as has been the case for other projects of this time at Nome, adequate opportunities are available for a contractor to obtain access through private deals with individual land owners if needed.

Construction Methodology

The following is a brief discussion of assumptions made for the unit costs used in the MCACES estimates for both alternatives:

- Mobilization and Demobilization – Assumes mobilizing and demobilizing equipment to and from West Coast of CONUS, and possibly from Anchorage. Dredging equipment being marine based cannot winter in Nome and will need to be hauled to either Anchorage or a similar ice free port. The other land based equipment can be wintered at Nome to avoid haul/backhaul expense.
- Excavation – use of hydraulic excavators on both the breakwater crest, and on barges.
- Hauling – assumes use 20 cy side dumps, end dumps for trucking material from Cape Nome Quarry. Material is delivered to staging areas on/near the beach then reloaded on off-road trucks for hauling and placing on the breakwater/causeways. It's likely some of the core material will be hauled in split scow barges and placed via open water dump methods.
- Armor Rock, B-rock, Core Rock and Gravel – assumes rock will be placed via hydraulic excavator with grapple, bucket and thumb. Gravel may be open water placed via split scow barge. Some larger rock will require large cranes with ability to reach and pick large loads for in water placement.

E

5.5 Effective Dates for Labor, Equipment and Material Pricing

The labor, equipment, and material pricing were developed using the MCACES 2016 English Unit Cost Library, 2019 Alaska Statewide Labor Library, and the 2016 Equipment Library (Region IV) for the base cost estimates. The index pricing data has been prepared in October 2019 dollars.

The base cost estimates have been updated with current quoted fuel prices of $3.75/gal for off-road diesel, $3.38/gal for on-road diesel and $3.25 /gal for gasoline in the state of Alaska.

5.6 Estimated Production Rates

Much of the construction cost estimate was developed utilizing user defined crews and production rates.

5.7 Project Markups

Escalation

Price levels have been escalated from effective price levels of the construction cost estimate for October 2019 (1Q20) to the mid-points of construction for the project. The appropriate escalation cost factors for each date and for each feature account have been calculated within the Total Project Cost Summary (TPCS).

Contingency

A Cost and Schedule Risk Analysis (CSRA) was completed in order to develop the contingency for the Recommended Plan. The CSRA report, documenting the development of the risk-based contingency is included.

Overtime

The estimate assumes that crews would be working 6-days per week and 12-hours per day in order to complete construction within the available work windows.

5.8 MCACES Construction Cost Estimate

The construction cost estimate was developed using MCACES 2nd Generation (MII) estimating software in accordance with guidance contained in ER 1110-2-1302, Civil Works Cost Engineering. See Attachment 10 for the MII output report.

5.9 Total Project Cost Summary (TPCS)

The TPCS was prepared using the latest TPCS Excel spreadsheet provided by the USACE, Walla Walla District. The TPCS incorporates the construction costs developed in MCACES, the project markups and functional costs referenced previously.

6.0 SOURCES

Engineer Regulation 1110-1-1300, Engineering and Design Cost Engineering Policy and General Requirements; U.S. Army Corps of Engineers; Dated 26 March 1993.

Engineer Regulation 1110-2-1150, Engineering and Design for Civil Works Projects; U.S. Army Corps of Engineers; Dated 31 August 1999.

Engineer Regulation 1110-2-1302, Civil Works Cost Engineering; U.S. Army Corps of Engineers; Dated 15 September 2008.

Engineer Manual 1110-2-1304; Civil Works Construction Cost Index System (CWCCIS); U.S. Army Corps of Engineers; Dated 30 September 2008.

Engineering Technical Letter 1110-2-573, Construction Cost Estimating Guide for Civil Works; U.S. Army Corps of Engineers; Dated 31 August 1999.

****** TOTAL PROJECT COST SUMMARY ******

****** CONTRACT COST SUMMARY ******

PROJECT: Port of Nome Modification Feasibility Study
LOCATION: Nome, Alaska
This Estimate reflects the scope and schedule in report; December 2019, Draft Integrated Feasibility Report & EA

DISTRICT: Alaska District-POA
POC: CHIEF, COST ENGINEERING, Karl Harvey
PREPARED: 12/17/2019

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: 1-Oct-19 Effective Price Level: 1-Oct-18				Program Year (Budget EC): 2020 Effective Price Level Date: 1 OCT 19								
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST ($K)	CNTG ($K)	RISK BASED 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*
	gnf													
10	BW Demo & Construct, mob-demobe	$305,130	$79,334	26.0%	$384,464	2.3%	$312,227	$81,179	$393,406	2025Q3	17.8%	$367,699	$95,602	$463,300
12	Dredging Basins, Mob-demobe, Nav aids	$53,509	$13,912	26.0%	$67,421	3.7%	$55,475	$14,424	$69,899	2025Q3	17.8%	$65,332	$16,986	$82,318
05	LOCKS	$0	$0	26.0%	$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
06	FISH & WILDLIFE FACILITIES	$0	$0	0.0%	$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
07	POWER PLANT	$0	$0	0.0%	$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
08	ROADS, RAILROADS & BRIDGES	$0	$0	0.0%	$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
09	CHANNELS & CANALS	$0	$0	0.0%	$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
10	BREAKWATER & SEAWALLS	$0	$0	0.0%	$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
	CONSTRUCTION ESTIMATE TOTALS:	$358,639	$93,246	26.0%	**$451,885**		$367,702	$95,603	$463,305			$433,030	$112,588	$545,618
01	LANDS AND DAMAGES (1)	$0	$0	0.0%	$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
30	PLANNING, ENGINEERING & DESIGN													
0.1%	Project Management	$215	$56	26.0%	$271	3.4%	$223	$58	$280	2021Q1	3.8%	$231	$60	$291
0.1%	Planning & Environmental Compliance	$215	$56	26.0%	$271	3.4%	$223	$58	$280	2021Q1	3.8%	$231	$60	$291
1.0%	Engineering & Design	$3,586	$932	26.0%	$4,519	3.4%	$3,709	$964	$4,673	2021Q1	3.8%	$3,850	$1,001	$4,852
0.1%	Reviews, ATRs, IEPRs, VE	$215	$56	26.0%	$271	3.4%	$223	$58	$280	2021Q1	3.8%	$231	$60	$291
0.1%	Life Cycle Updates (cost, schedule, risks)	$215	$56	26.0%	$271	3.4%	$223	$58	$280	2021Q1	3.8%	$231	$60	$291
0.6%	Contracting & Reprographics	$2,152	$559	26.0%	$2,711	3.4%	$2,225	$579	$2,804	2021Q1	3.8%	$2,310	$601	$2,911
0.1%	Engineering During Construction	$215	$56	26.0%	$271	3.4%	$223	$58	$280	2025Q3	23.0%	$274	$71	$345
0.1%	Planning During Construction	$179	$47	26.0%	$226	3.4%	$185	$48	$234	2025Q3	23.0%	$228	$59	$287
0.0%	Adaptive Management & Monitoring	$0	$0	26.0%	$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
0.1%	Project Operations	$179	$47	26.0%	$226	3.4%	$185	$48	$234	2021Q1	3.8%	$193	$50	$243
31	CONSTRUCTION MANAGEMENT													
3.4%	Construction Management	$12,194	$3,170	26.0%	$15,364	3.4%	$12,609	$3,278	$15,888	2025Q3	23.0%	$15,514	$4,034	$19,547
0.5%	Project Operation:	$1,793	$466	26.0%	$2,259	3.4%	$1,854	$482	$2,336	2025Q3	23.0%	$2,281	$593	$2,875
0.1%	Project Management	$179	$47	26.0%	$226	3.4%	$185	$48	$234	2025Q3	23.0%	$228	$59	$287
	CONTRACT COST TOTALS:	$379,978	$98,794		$478,772		$389,768	$101,340	**$491,108**			$458,833	$119,296	**$578,129**

Note: (1`) The TPCS will be updated with a LERRs estimated cost of $18,200 for the final report to be consistent with the Real Estate Plan.

****** TOTAL PROJECT COST SUMMARY ******

****** CONTRACT COST SUMMARY ******

PROJECT: Port of Nome Modification Feasibility Study
LOCATION: Nome, Alaska
This Estimate reflects the scope and schedule in report; December 2019, Draft Integrated Feasibility Report & EA

DISTRICT: Alaska District-POA
POC: CHIEF, COST ENGINEERING, Karl Harvey

PREPARED: 12/17/2019

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: / Effective Price Level:			1-Oct-19 / 1-Oct-18	Program Year (Budget EC): / Effective Price Level Date:			2020 / 1 OCT 19					
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*
	LSF													
10	BREAKWATER & SEAWALLS	$0	$0	26.0%	$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
12	Dredge Dock Berthing Areas	$5,160	$1,342	26.0%	$6,502	3.7%	$5,350	$1,391	$6,741	2025Q3	17.8%	$6,300	$1,638	$7,938
08	Docks, Mooring Pts, Bridge, Causeway Road	$80,483	$20,926	26.0%	$101,409	1.9%	$82,005	$21,321	$103,326	2025Q3	17.8%	$96,574	$25,109	$121,683
19	Utilities	$2,225	$579	26.0%	$2,804	0.4%	$2,234	$581	$2,814	2025Q3	17.8%	$2,631	$684	$3,314
07	POWER PLANT	$0	$0	0.0%	$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
08	ROADS, RAILROADS & BRIDGES	$0	$0	0.0%	$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
09	CHANNELS & CANALS	$0	$0	0.0%	$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
10	BREAKWATER & SEAWALLS	$0	$0	0.0%	$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
	CONSTRUCTION ESTIMATE TOTALS:	$87,868	$22,846	26.0%	**$110,714**		$89,588	$23,293	$112,881			$105,505	$27,431	$132,936
01	LANDS AND DAMAGES	$0	$0	0.0%	$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
30	PLANNING, ENGINEERING & DESIGN													
0.1%	Project Management	$53	$14	26.0%	$66	3.4%	$55	$14	$69	2021Q1	3.8%	$57	$15	$71
0.1%	Planning & Environmental Compliance	$53	$14	26.0%	$66	3.4%	$55	$14	$69	2021Q1	3.8%	$57	$15	$71
1.0%	Engineering & Design	$879	$228	26.0%	$1,107	3.4%	$909	$236	$1,145	2021Q1	3.8%	$943	$245	$1,189
0.1%	Reviews, ATRs, IEPRs, VE	$53	$14	26.0%	$66	3.4%	$55	$14	$69	2021Q1	3.8%	$57	$15	$71
0.1%	Life Cycle Updates (cost, schedule, risks)	$53	$14	26.0%	$66	3.4%	$55	$14	$69	2021Q1	3.8%	$57	$15	$71
0.6%	Contracting & Reprographics	$527	$137	26.0%	$664	3.4%	$545	$142	$687	2021Q1	3.8%	$566	$147	$713
0.1%	Engineering During Construction	$53	$14	26.0%	$66	3.4%	$55	$14	$69	2025Q3	23.0%	$67	$17	$85
0.1%	Planning During Construction	$44	$11	26.0%	$55	3.4%	$45	$12	$57	2025Q3	23.0%	$56	$15	$70
0.0%	Adaptive Management & Monitoring	$0	$0	26.0%	$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
0.1%	Project Operations	$44	$11	26.0%	$55	3.4%	$45	$12	$57	2021Q1	3.8%	$47	$12	$59
31	CONSTRUCTION MANAGEMENT													
3.4%	Construction Management	$2,988	$777	26.0%	$3,764	3.4%	$3,089	$803	$3,893	2025Q3	23.0%	$3,801	$988	$4,789
0.5%	Project Operation:	$439	$114	26.0%	$554	3.4%	$454	$118	$572	2025Q3	23.0%	$559	$145	$704
0.1%	Project Management	$44	$11	26.0%	$55	3.4%	$45	$12	$57	2025Q3	23.0%	$56	$15	$70
	CONTRACT COST TOTALS:	$93,096	$24,205		$117,301		$94,994	$24,698	**$119,693**			$111,826	$29,075	**$140,901**

Risk Register Development

Project: Nome Navigations Improvements - Feasibility Study — TSP Report

t Development Stage/Alternative: Alternative Formulation Milestone #1 - Modified CSRA prepared on

Risk Category: Moderate Risk: Typical Project or Possible Life Safety — **Meeting Date:** 12/4/2019

Schedule Duration — Apr-23 (From (Month/Year)) — Oct-26 (From (Month/Year)) — **Schedule Duration:** 40.5 Months — 49% (Schedule Contingency)

	CWWBS	Feature of Work		Contract Cost	% Contingency		$ Contingency		Total
	Risk Not included within CSRA Model								
	01 LANDS AND DAMAGES	Real Estate (LSF)	$	25,000	20%	$	5,000	$	30,000
	Risk included within CSRA Model								
1		**General Navigation Facilities --- estimated construciton cost (ECC)**	$	358,706,160	26%	$	93,263,602	$	451,969,762
2	10 BREAKWATERS AND SEAWALLS	Mobilization / Demobilization Breakwaters- GNF	$	7,440,849	26%	$	1,934,621	$	9,375,470
3	10 BREAKWATERS AND SEAWALLS	Demo and Build Breakwaters - GNF	$	297,689,249	26%	$	77,399,205	$	375,088,454
	12 NAVIGATION, PORTS AND HARBORS	Mobilization / Demobilization Dredging - GNF	$	11,267,760	26%	$	2,929,618	$	14,197,378
	12 NAVIGATION, PORTS AND HARBORS	Dredge & Dispose Outer and Deep Water Basins-GNF	$	42,240,468	26%	$	10,982,522	$	53,222,990
	12 NAVIGATION, PORTS AND HARBORS	Aids to Navigation-GNF	$	67,834	26%	$	17,637	$	85,471
		Associated Costs - LSF ------ estimated construction cost (ECC)	$	87,867,761	26%	$	22,845,618	$	110,713,379
	08 ROADS, RAILROADS, AND BRIDGES	Causeway Docks, Mooring Dolphins, Breach Bridge	$	54,811,721	26%	$	14,251,048	$	69,062,769
	08 ROADS, RAILROADS, AND BRIDGES	West and East Causeway Fill and Surface Material	$	25,670,884	26%	$	6,674,430	$	32,345,314
	12 NAVIGATION, PORTS AND HARBORS	Dredging Outer and Deep Water Dock Berthing Areas	$	5,160,092	26%	$	1,341,624	$	6,501,716
	19 BUILDINGS, GROUNDS, AND UTILITIES	Utilities	$	2,225,065	26%	$	578,517	$	2,803,582
13	30 PLANNING, ENGINEERING, AND DESIGN	Planning, Engineering, & Design-ASSUME 2% OF ECC	$	13,397,218	26%	$	3,483,277	$	16,880,495
14	31 CONSTRUCTION MANAGEMENT	Construction Management-ASSUME 4% OF ECC	$	13,397,218	26%	$	3,483,277	$	16,880,495
22	All Other	**Remaining Construction Items**				$	-	$	-
XX	FIXED DOLLAR RISK ADD (EQUALLY DISPERSED TO ALL, MUST INCLUDE JUSTIFICATION SEE BELOW)					$	-		

Totals							
Real Estate (LSF)	$	25,000	20%	$	5,000	$	30,000.00
Total Construction Estimate	$	473,368,356	26%	$	123,075,773	$	596,444,129
Fixed Dollar Risk Equally Distributed	$	-	0%	$	-	$	-
Total	$	473,368,356	26%	$	123,075,773	$	596,444,129

Fixed Dollar Risk Add: (Allows for additional risk to be added to the risk analsyis. Must include

Contingency on Base Estimate		80% Confidence Project Cost
Baseline Estimate Cost ->OCTOBER 1, 2014 PRICE LEVEL	$473,368,356	
Baseline Estimate Cost Contingency Amount ->	$121,770,046	26%
Baseline Estimate Construction Cost (80% Confidence) ->	$595,138,403	

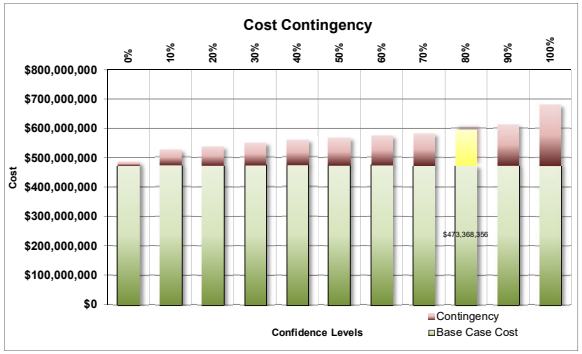
Contingency on Schedule		80% Confidence Project Schedule
Project Base Schedule Duration ->	40.5 Months	
Schedule Contingency Duration ->	19.8 Months	49%
Project Schedule Duration (80% Confidence) ->	60.3 Months	

Nome Navigations Improvements - Feasibility Study
Thursday, December 19, 2019

- PROJECT CONTINGENCY DEVELOPMENT -

INITIAL CONSTRUCTION
Contingency Analysis

Base Case Cost	$473,368,356	
Confidence Level	**Value**	**Contingency**
0%	12,827,502	3%
10%	54,197,378	12%
20%	66,177,436	14%
30%	75,370,421	16%
40%	84,722,479	18%
50%	93,860,679	20%
60%	102,089,464	22%
70%	110,946,303	24%
80%	**121,770,046**	**26%**
90%	140,848,947	30%
100%	208,832,017	45%

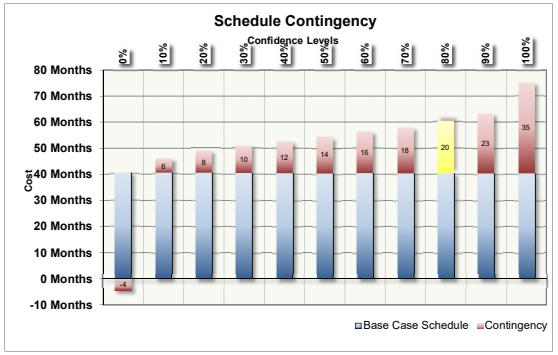


Nome Navigations Improvements - Feasibility Study
Thursday, December 19, 2019

- SCHEDULE CONTINGENCY (DURATION) DEVELOPMENT -

Initial Proejct Schedule Duration
Contingency Analysis

Base Case Schedule	40.5 Months	
Confidence Level	**Value**	**Contingency**
0%	-4 Months	-11.0%
10%	6 Months	14.0%
20%	8 Months	21.0%
30%	10 Months	26.0%
40%	12 Months	31.0%
50%	14 Months	35.0%
60%	16 Months	39.0%
70%	18 Months	44.0%
80%	**20 Months**	**49.0%**
90%	23 Months	57.0%
100%	35 Months	86.0%



					Project Cost			Project Schedule		
Ref #	Risk Type	Risk/Opportunity Event	Concern (Risk Event Description)	PDT Discussions on Impact and Likelihood	Impact ($)	Likelihood ($)	Risk Level ($)	Impact ($)	Likelihood ($)	Risk Level ($)
01	02 Scope Variance	Overall Project Scope - Breakwater Construction	Current scope for design and layout of the breakwaters and causeways w/ docks may change during PED. Breakwaters are rubble mound with causeways built in and docks are modified diaphram sheet pile walls with backfill.	The baseline scope for the BW/CW and docks are rubblemound breakwaters, gravel drivable road with modified diaphram sheetpile docks. the concept layout was coordinated and analyzed with multiple variation during alternative decision milestones and TSP. The design team used ship sim and a lot of current wave data available at Nome to develop the new layout. While it's possible the layout will change during PED, the current design provides for a very large upgrade and a very complete and useable facility for the current port and it's users. No current geotech survey, only working with historical data. Low risk for ground improvement, benches, or ground construction needed	Marginal	Possible	Low	Moderate	Likely	Moderate
02	02 Scope Variance	Project purpose and objectives are not 100% defined	Potential for redefined Objective of project	At the ADM, it was decided to keep the current recommended scope for vessel depth and size. The models have been run, alternatives compared, and stakeholder inputs/reviews finished.	Moderate	Unlikely	Low	Moderate	Unlikely	Low
03	02 Scope Variance	Overall Project Scope - Dredging	currently the scope is to dredge the new enlarged outer basin to -28 with 1' OD, and the deep water basin to -40' with 2' OD. The disposal site is near shore between -12 and -20' and runs parallel along the shoreline east of the project site. The quantities are based on current hydro surveys. Concern is potential for these basin sizes to change during PED, breakwaters to change ect.	The basin size may change slightly during PED, but because of the work done during FS, ship simulation, vessel sizes being considered for design, and the docks incorporated into the project, the overall size is unlikely to change much. the depths were also discussed at length during the TSP and planning stages. There were multiple depths considered with costs and economic benifits analyzed to ultimatly come to the recommended plan and depths. Design depths and current hydro survey's were used to develop quantities for baseline estimate. There is good survey data because of our annual maintenance dredging contract. The project	Moderate	Possible	Moderate	Moderate	Possible	Moderate
04	08 Cost and Schedule	Material Unit Costs Rock	The current assumption for rock unit price is based on historical costs for sizes and quantities that are similar but not exact for those specified in the concept design for the recommended plan. There is a large amount of rock required for the project. Of the rock required, a large portion of that is BIG rock 22 ton stone. Historically, the cost for rock quarried from a source is a function of the "yield quantity" of the largest rock. In otherwords, the operator will design their drill and blast pattern to generate the most large rock as possible, anything else generated from a blast will be the rest of the rock specified and needed. Because of that, obtaining a good quote for the rock needed (size and quantity) for large projects such as this one are near impossible to obtain at this stage.	The baseline estimate assums that the rock will be sourced from Cape Nome Quarry. This is a proven source the has quality stone, but costs to produce specified size and quantity are hard to predict and obtain quotes for. Rock costs Unit cost of rock is biggest risk in cost variation and are based on quotations provided for a project in Barrow and other historical projects. Previous quarry operators likely have different rate and costs of current quarry operator. Cost will likely be different when the KTR goes to buy it once the project is awarded. Previous work in Nome had contractor produce their own material from quarry with agreement with quarry operator. Rock cost is a sensitive item. A fairly small variance in the cost of rock can impact the overall project cost a great deal.	Critical	Very Likely	High	Negligible	Unlikely	Low
05	04 Ability to Execute	Can quarry source produce qty needed?	Difficult to predict the quarry production rate. This could impact the length of time the project will take to finish, which will increase job office overhead costs Currently the schedule assumes the quarry will be able to produce rock fast enough to keep up with production. The 1st season after contract award is assumed to mainly consist of rock production to stockpile enough to 'feed' placement activities in the following years.	current assumption is the quarry operator will be able to produce enough rock in the first season to build a stockpile for the placement activities to follow in the subsequent season, then continue production to keep up with placement for all project features. If the rock production can't keep up with placement, it's possible that additional time to complete the project could happen or rock would be imported from other source. Nearest source in Alaska is Dutch Harbor. Imported rock could mean increase in unit price for rock (risk discussed above). If additional time is needed to complete proejct, JOOH could also increase.	Moderate	Likely	Moderate	Significant	Very Likely	High
06	04 Ability to Execute	availability of enough equipment anticipated for dredging	Current Estimate assumes large number of plants (1 to 2 Clamshells) and tugs and dump scows	Current plan is dependant on fleet availability. Reduced competition due to multiple dredges being required for dredging. There are extremely limited available dredges. The plan utilizes high number of dump scows. The impact to cost of limited competition; increase cost due to market conditions, and possible the project could take longer because of lack of available plants	Moderate	Possible	Moderate	Significant	Possible	Moderate
07	07 Construction Activitiy	Adequacy of construction schedule depicting durations, sequencing, phasing, production rates	Season is variable and dependent on temperatures above freezing.	Arctic warming trends would indicate seasonal ice will melt earlier rather than later, and fall freeze-up will occur within a short window. Days of greatest daylight occur early in the season, and contractors will take advantage by completeing as much work as possible as early as possible.	Moderate	Likely	Moderate	Moderate	Likely	Moderate
08	06 Technical Data Variance	Dock	Pile Driving Complications • complications include encountering cobbles and boulders, hard material • environmental complications could be encountered if permits limit pile driving activities around certain marine animals.Nome has recent data of shutdowns and sightings - overall not much impact to previous project.	to mitigate cobble and boulder encounters, current baseline estimate assumes ktr will be required to dredge footpring of the pilewall then backfill with spec material before driving and installing pile walls, therefore low likelihood of impacts	Significant	Possible	Moderate	Marginal	Possible	Low
09	08 Cost and Schedule	Dock	Pile and Dock Costs • currently the baselline estimate uses historical in-place costs for similar walls built in Nome by the City. The concern is there is no detailed design for these features of work at this point, so the basis of cost is parametric. While the method of construction (modified diaphram sheepile wall) is not highly complex, there is still a chance the walls designed during PED will vary from the walls used to develop costs in the baseline estimate.	•The in-place costs per dock received from the City of Nome were validated for reasonableness with an addition to the steel quantity as suggested by the Structural PDT member to account for deeper/longer piles for the docks in this scope of work. •Its likely there are unknowns that will be discovered during PED that make these unique compared to the historical costs used. •Steel prices are likely to increase over typ escalation, plus the differences in the parametric costs versus those that will be designed during PED are likely and could be significant.	Significant	Likely	High	Marginal	Possible	Low
10	06 Technical Data Variance	Design Efforts	Risk associated with additional Design efforts prior to contract award and during construction	PED is currently slated for a 2 year duration to allow enough time to coordinate all disciplnes. This is reasonabel for the size of the project. • Potential for cost increases due to unforseen items in PED.	Moderate	Possible	Moderate	Moderate	Unlikely	Low
11	07 Construction Activitiy	Construction Oversight	Risk associated with additional Design efforts prior to contract award and during construction	Assume normal risk for levels for additional labor cost due to scope and schedule issues.	Moderate	Possible	Moderate	Moderate	Unlikely	Low
12	03 Funding Issues	Sufficient funding on a yearly basis	Project most likely will require multiple construction seasons. Funding share from the sponsor likely?	• Project will not be awarded if not fully funded. • sponsor fully on board for the estimated value at FS	Moderate	Possible	Moderate	Moderate	Possible	Moderate
13	08 Cost and Schedule	mobe, demobe, prepwork	Requires tug/barge hauling of floating plants, temporary facilities and rolling stock from Seattle area.	All such equipment comes from Lower 48 by barge. CWE addresses additional costs of Mobilization hauling and insurance, plus setup/takedown costs.	Negligible	Unlikely	Low	Negligible	Unlikely	Low
14	05 Contract Acquisition	Performance of work by Prime Contractor	• Possibility that the prime contractor will sub contract a large portion of the work due to size of the project • Currently the estimate assumes all of the work performed by the Prime contractor. • If some of the work is required for small business or is sub contracted out, there will be additional markups resulting in higher costs	• Based on previous projects of this type and size (Nome Nav Improvements) it's anticipated that a Joint Venture is likely. This will allow the dredging specialty and the rock construction specialty work to be prime performed. • the likelihood of a subcontract of other features is likely and could increase cost.	Moderate	Likely	Moderate	Negligible	Unlikely	Low
15	05 Contract Acquisition	Contract Type	Final acquisition method has not been identified/May change from base assumptions • discussion about having some material provided for the contractor (ie rock and or quarry spoils)	Assume full and open competitive Bid. Currently estimate assumes all work except for 3rd party survey will be prime performed. Use of owner supplied materials is difficult to administer, potentially higher risk to government but potentially lower cost. Not likely an option at this time, assume contractor supplies rock.	Significant	Possible	Moderate	Negligible	Unlikely	Low

					Project Cost			Project Schedule		
Ref #	Risk Type	CSRF Risk/Opportunity Event	Concern (Risk Event Description)	PDT Discussions on Impact and Likelihood	Impact ©	Likelihood ©	Risk Level ©	Impact ($)	Likelihood ($)	Risk Level ($)
16	05 Contract Acquisition	Bid Schedule Structure and Contract Documents.	Structure of bid schedule may pass on unintentional risk to contractor. This could result in higher contractor cost. BW payment is based on in-place quantities	Since quantities are known and minor shoaling to occur a bid structure of price per cy will be used. This should result in low risk levels to contractor.	Moderate	Unlikely	Low	Negligible	Unlikely	Low
17	05 Contract Acquisition	Contractor Competition and perceived Risk	Dredging competition is limited throughout the industry.	Limited available dredging contractors in this remote location. Dredging projects across the country have resulted in higher prices due to limited competition. Assume 20% higher dredging costs as High Side	Moderate	Likely	Moderate	Negligible	Unlikely	Low
18	05 Contract Acquisition	Contract structure (LSF & GNF)	For acquisition methods. It is assumed two separate contracts for GNF vs LSF work. Using one contract could result in additional markups.	To be determined during PED	Moderate	Possible	Moderate	Negligible	Unlikely	Low
19	07 Construction Activitiy	Dredging Effective Time (Time spent active dredging of material)	Dredging Production Rate and Length of Construction Season Changes. All costs and schedule is basd on	Production rates calced from CEDEP using cycle time for depths of basin, and assumes consolidated top layer, with loose digging under that. Production rates and duration assumes double shifting, 10 hrs per shift, due to short haul distance. Schedule shows the outer basin will need 3 seasons to dredge out, one of which will need 2 plants. THe deep water basin will need 2 seasons with one plant. total dredge time will be 3.5 seasons (essentially 4). Likelihood of an increase due to lack of plant, or decrease in production rates likely and will most likely extend the project to an additional season. Nome is witnessing some increased construction seasons (Assume travel in may, work until early November, however, dredge plants will not want to be traversing the Gulf of Alaska past late October/November. Baseline estimate assume 3.5 construction seasons, most likely 4, high is 5. Assume 13.2 Million per year overhead (46 Million for 3.5 years per year average)	Significant	Very Likely	High	Significant	Likely	High
20	07 Construction Activitiy	Material Hauling Time Effective Time (Time spent active hauling of dredged material)	Risk would be if restrictions on placed dredged material disposal methods or moving disposal location.	• During the Study process, the disposal site has been vetted and determined to be a viable location. The current assumption for dredge disposal is via split hull scow directlyinto ocean. The disposal site designated in the recommended plan is within 1 mile of the project site. If this site does not get approved in PED, the alternatives may require 1) farther haul off shore and a lengthy permit process for a new disposal site or 2) rehandling of material to dispose of it upland.	Significant	Likely	High	Moderate	Likely	Moderate
21	07 Construction Activitiy	Debris Separation and physical obstructions	There is potential for additional debris within the dredging prism. It is assumed for open water disposal the material will be screened with grizzly for separation.	Based on the Nome Navigation Improvements project in 2003/04, debris in the outer basin area was not encountered; the debris was encountered in the inner harbor which is not included in the recommended plan	Negligible	Possible	Low	Marginal	Possible	Low
22	07 Construction Activitiy	Mob, Demob & Prepwork	Requires tug/barge hauling of floating plants, temporary facilities and rolling stock from Seattle area.	All such equipment comes from Lower 48 by barge. CWE addresses additional costs of Mobilization hauling and insurance, plus setup/takedown costs.	Negligible	Unlikely	Low	Negligible	Unlikely	Low
23	07 Construction Activitiy	Weather Impacts	Storm Impacts to schedule, Potential for foul weather.	Construction contract will identify projected non-work time due to typical weather delays. Construction schedule will include allowance for weather days, and schedule make-up days. Potential risk for additional overhead cost & time for floating plant operations. Assume land-based equipment can continue most operations during bad weather.	Negligible	Unlikely	Low	Negligible	Unlikely	Low
24	07 Construction Activitiy	Inadequate housing/utilities to support labor force	Nome is a popular location for summer travelers and outdoor recreation. Housing demand increases during construction season.	• Allowances for housing crews during project are usually included in the job office overhead markup. As of now, the estimate has almost $18M per year for JOOH. • On the off chance of a shortage and rent is high for temp housing,the estimate has a reasonable allowance for covering increased cost with this markup factor.	Marginal	Possible	Low	Negligible	Very Likely	Low
25	07 Construction Activitiy	Adequacy of construction schedule depicting durations, sequencing, phasing, production rates	• Season is variable and dependent on temperatures above freezing. The season assumed for schedule developement could be shortened due to changes in weather, or it could be extended if warmer than anticipated. • Production rates calculated are based on historical data and best judgement. • These all factor into the contract duration developed in the baseline estimate/schedule and if these baseline assumptions are off, the project schedule could be extended causing increases in cost and time to complete.	•Arctic warming trends would indicate seasonal ice will melt earlier rather than later, and fall freeze-up will occur within a short window. Days of greatest daylight occur early in the season, and contractors will take advantage by completeing as much work as possible as early as possible. • current schedule assumes Mid May to Mid-October for possible work season. This is fairly consistent with recent events. If warm trends come to fruition, the contractor could capitalize on that opportunity. This assumption is fairly close to reality. • schedule assumes double shifting in June, July, Aug and some in Sept. • Production rates for placement and dredging using the above assumptions result in roughly 3.5 seasons (2023 half season due to award assumption 2Q23), then full seasons 2024-2026. • Should the project delay or require additional season, costs would include an extra mob/demobe, and JOOH.	Moderate	Possible	Moderate	Moderate	Likely	Moderate
26	07 Construction Activitiy	Limited transportation / haul routes available	Cape Nome Quarry and access road inaccessible in winter.	Cape Nome Quarry can be reached by road and barge. Assume gravel products trucked to Nome, and rock products barged to Nome. Winter work in Nome is not practicle or safe.	Marginal	Unlikely	Low	Negligible	Unlikely	Low
27	07 Construction Activitiy	Hydro-surveys Costs	•In-water surveys for construction required to verify pay quantities. •Topo survey's required for in-place quantities for payment of rock placed. as rock is placed, the different types and layers need to be verified. • with multiple layers and vast areas, verification survey's could be labor intese and there may be lack of qualified surveyors	•Estimate assumes 2 different survey crews for the duration of the project - 1 for hydro surveys and 1 for topo survey's. •through previous projects at Nome and other remote areas, there is low risk for not having qualified surveyors available. •Estimate assumes mob-demobe for each hydro & totp survey, 1 per month for each season of work. • estimate assumes all survey by subcontractor •Risk of additional mobes and survey's if seasons extend to 5th year.	Moderate	Possible	Moderate	Negligible	Unlikely	Low
28	08 Cost and Schedule	Estimate dredge quantity changes during project duration	Storm Impacts/Shoaling	Shoaling and storm damage repair will be funded by O&M. Assumes no additional risk to authorized cost based on shoaling	Moderate	Unlikely	Low	Negligible	Unlikely	Low
29	08 Cost and Schedule	CWE reasonableness of crews and productivities	Dredge cycle times and effective work times developed in CEDEP. Engineered performance Cost Book items used for land-based tasks. Estimator Judgement for Rock work and Dock construction productivity.	District has large historical data and experience. Project includes rock removal. Risk associated with removal of rock and dredge cycle and effective times.	Marginal	Unlikely	Low	Negligible	Unlikely	Low
30	10 Lands & Damages	Status of real estate acquisition	Risk associated with real estate acquisition for project execution.	This project is constructed under Navigational Servitude. Real estate costs are mostly administration labor. Any new acquisition will take place during PED. No real estate requirement identified for BW extension.	Marginal	Unlikely	Low	Negligible	Unlikely	Low
31	01 Management	Implementation of VE Recommendations	VE will be performed on project to develop alternatives.	VE study will have to be done during PED. Likely some items will be identified that may help cost and schedule. Not possible to determine what those could be at this point.	Marginal	Unlikely	Low	Negligible	Unlikely	Low
32	09 Regulatory & Environmental	Environmental and Water quality issues	• Potential for changes to contract requirements for water quality. • Possible delays and extra costs during PED obtaining final permits that could result in changes to the baseline assumptions for dredging and construction. • when driving piles, there may be restrictions on work due to animals in the area	• Currently the baseline study and estimate is based on ability to reasonablly obtain permits needed for this project. • Driving pile will likely require observers and shutdowns if certain conditions happen. This may delay project progress,but based on historical proejcts similar, very few delays have been realized. • dredging water quality is fairly established in terms of requirements needed and are incorporated into the estimate and plans • Dredge disposal area is low riks of not being approved	Marginal	Unlikely	Low	Negligible	Unlikely	Low
33	09 Regulatory & Environmental	Biological Area Restoration flor Crabs	Possible that during PED studies will show contract will need to have habitats established outside of the port to off set where the new breakwaters are at.	• To account for this concern, the report and baseline estimate include allowances for contractor to place rubble, large boulders and other new habitat in the water. • estimat assumes multiple loads of large rock be disposed of off shore for this requirement and it equates to about $1M to accomplish this. • this was the recommendation from the Environmental PDT member during FS	Marginal	Unlikely	Low	Negligible	Unlikely	Low
34	06 Technical Data Variance				Marginal	Unlikely	Low	Negligible	Unlikely	Low

						Project Cost			Project Schedule		
Ref #	Risk Type	CREF	Risk/Opportunity Event	Concern (Risk Event Description)	PDT Discussions on Impact and Likelihood	Impact ($)	Likelihood ($)	Risk Level ($)	Impact ($)	Likelihood ($)	Risk Level ($)
35	06 Technical Data Variance					Marginal	Unlikely	Low	Negligible	Unlikely	Low
36	06 Technical Data Variance		Upland Facilities & Utilities	Scope is Security Gate; plus Electrical, Water, and Fuel extended from existing causeway to new dock. No design, and only rough lengths used for estimate (parametric at best)	• current estimate depends on very little design development input. • only lengths are used to develop cost. •high likelihood of changes to estimate assumptions and impact could be significant • no real impact from PED schedule, but overall project schedule could see delays as a result of trying to complete utility work during the same time as the breakwater work is being done.	Significant	Likely	High	Moderate	Likely	Moderate
37	06 Technical Data Variance					Marginal	Unlikely	Low	Negligible	Unlikely	Low
38	06 Technical Data Variance		Steel Sheetpile Dock	Could see scope growth due to required length of vessels.	At the ADM, it was decided to keep the current recommended scope for vessel depth and size.	Marginal	Unlikely	Low	Negligible	Unlikely	Low
39	06 Technical Data Variance		Sea Level Rise	Base estimate incorporate cost of sea level rise.	Risk identified within the Breakwater design. Current design based on historical rates.	Marginal	Unlikely	Low	Negligible	Unlikely	Low
40	06 Technical Data Variance		Hazardous waste concerns	Soil sampling completed. No hazardous material located within project footprint.	No risk identified in deep water construction. The identified contamination was only found in the Inner Small Boat Harbor.	Marginal	Unlikely	Low	Negligible	Unlikely	Low
41	06 Technical Data Variance					Marginal	Unlikely	Low	Negligible	Unlikely	Low
42	05 Contract Acquisition		Small Business Acquisition strategy	The contracting plan has not been firmly established. Small Business contracts could result in a restricted competitive market and higher overheads.	Current assumption is competitive bids, full and open competition for the rubblemound and dredging work which is the major portion of the cost. Smaller sub-contracts w/ small business are expected for the utilities and inland area improvements. This work is critical rubblemound and earthwork. Potential for competitive joint venture bids from small businesses. Small business could have an impact on price of the disposal area work.	Negligible	Unlikely	Low	Negligible	Unlikely	Low
43	05 Contract Acquisition		Modifications and Claims During Construction	Project is primarily a large breakwater construction and dredging project with rock removal.	Good soil borings on project, however, there is risk for additional hard material. The District built a similar breakwater extension ten years ago which is now being extended further. Qty's most likely are locked in.	Marginal	Possible	Low	Negligible	Unlikely	Low
44	08 Cost and Schedule		Fuel Cost	Fuel is typically a key cost driver for dredging projects where large equipment usage is dependent on fuel.	There is always concern for increases in fuel price over typical escalation increases. Currently the dredge fuel costs are set at $3.15 and land based equipment set at $3.50 (average for gas,off- and on-road diesel). Since the project is equipment intensive, variations in fuel costs will impact overall costs	Significant	Likely	High	Negligible	Unlikely	Low
45	08 Cost and Schedule		Prevailing Wages	Use of Alaska version Davis Bacon wages are used.	Wages tend to escalate along normal inflation rates. It's possible the remote project site will require a labor bonus to attract skilled workforce and the market will require labor bonus for skilled labor	Moderate	Very Likely	High	Negligible	Unlikely	Low
46	08 Cost and Schedule		Dredge Window Restrictions	Shortening of allowed dredging months.	Assume travel in May, work until beginning of November. Nome witnessed rock production in June. Land-Based: May start-up - 30 Oct shutdown(Lost light) Water-Based: 15MAY Showtime - 15OCT shutdown, DEMOB by 15 Oct Environmental Windows: Black-out windows are unknown at this time (ESA species shutdown windows). Know during PED Concern: O&M Dredging - Out of inner harbor by 1JUL (Out of Snake River - Shutdown) for migrating fish	Moderate	Possible	Moderate	Moderate	Possible	Moderate
47	08 Cost and Schedule		Dredge Production Turbidly Requirements	The assumed contract requirements would not allow for water overflow.	No reason to think the assumptions will change	Marginal	Possible	Low	Negligible	Unlikely	Low
48	08 Cost and Schedule		Perm. Navigation Aids	Navigation Aids will be installed on the project. USACE may install the aids, but the Coast Guard pays 100% of the installation cost.	happens for all nav improvements proejcts	Negligible	Unlikely	Low	Negligible	Unlikely	Low
49	08 Cost and Schedule		Mobilization / Demobilization	• Assumptions regarding crew, productivity, overtime? • Level of Estimate?	•Baseline estimate assumes separate Mob for Rock and Dredge efforts. •Land based equipment includes initial mobe of project site, winter over of equipment, demobe at end of project •Dredge mobe demobe assumes travel from west coast Conus to Nome in spring, demobe from Nome to West Coast CONUS in fall. Can not winter over dredge plants at Nome. • number of trips follows the baseline schedule. There coulld be a possibility of an extra mobe if schedule duration increases past the baseline	Significant	Possible	Moderate	Significant	Unlikely	Moderate
50	08 Cost and Schedule		Shoaling	Shoaling increases material to be dredged to reach dredge prism.	Assumption is likely not to change	Moderate	Unlikely	Low	Negligible	Unlikely	Low
51	08 Cost and Schedule		Soil Material	soil material type and dredge means are difficult to predict due to lack of geotechnical data. Soil type and density impact dredge production and equipment used.	•PDT advises that the assumptions for dredge means methods and production will be similar to the historical rates seen during the 2003/04 Nome Nav Improvements project. During this project, a clamshell was used. the top few feet of material was consolidated then the remaining layers were looser, well suited for mech dredging. •current assumptions use those means methods so chances of conditions varying are low. •cobbles and boulders will be encountered, but with mech dredging, this is doable.	Marginal	Possible	Low	Marginal	Possible	Low
52	07 Construction Activitiy		Weather related Impacts	Risk of storm event which requires demobilization and then mobilization back into job site of plant and crew.	• In general, the land based work will be insulated from most shutdown delays during the construction season. There will be storms and short weather delays throughout the season that are factored into the workable days a ktr should expect. •The marine based work will be more subject to weather shutdown during the construciton season. The dredging operations in the baseline schedule assume dredging will be done when all or part of the breakwaters are constructed to provide some form of wave and weather protection. Shutdowns are factored into the schedule for short weather events • Additionalls, large equipment is fairly robust, offers some resistance to poor weather. Baseline estimate is high level, captures weather delays as a function of antcipated construction season lengths. From Nome - Shutdown only likely in extremely severe storms only - rare event.	Moderate	Possible	Moderate	Moderate	Possible	Moderate

					Project Cost			Project Schedule		
Ref #	Risk Type CREF	Risk/Opportunity Event	Concern (Risk Event Description)	PDT Discussions on Impact and Likelihood	Impact ©	Likelihood ©	Risk Level ©	Impact (S)	Likelihood (S)	Risk Level (S)
53	8 Construction Activitiy	Rock Reuse	Assumption of 75% Reuse of Existing East Revetment Rock Wrong	•Project scope includes demo of east breakwater. This was built in 2004 with rock from Cape Nome which is very good rock. The A- and B-rock in that BW is likely to be very useable after demo. The PDT discussed at length, the ratio of useable rock once demoed and finally decided to use 75% as a baseline assumption. • The opportunity for more rock is possible and maybe likely; likewise there's a chance once removed, it will break and be useable but will meet spec as something other than what it was originally. • The estimate assumes 75% and accounts for costs to remove, handle to a stockpile for sorting, testing and then reincorporation into the project. • Estimate assumes 75% of rock demoed throughout the project will be reusable. THis volume of rock is small compared to the overall qty needed for the project, so revising the assumption from 75% to 95% will not impact the overall total project cost significantly. This risk will be modled none the less.	Moderate	Likely	Moderate	Marginal	Possible	Low
54	10 Construction Activitiy	Construction Sequencing	Construction Sequencing differs from baseline assumptions	Must maintain operational port. Can live without a breakwater, not ideal, but can work. Simultaneous demo of east breakwater and construction of new east causeway/BW is feasible. Possibly setup 3 construction seasons as low, 4 as most likely, and 5 as high end. Breakwater gets built before dredging. 3 seasons for dredging as baseline assumption Controlled aspects of construction sequence are optomized as part of baseline estimate and are not likely to change. Uncontrollable aspects of constructions sequence (workforce/equipment shortfalls, weather delays, rock production limits, are already captured under other modeled risks, recommend do not model unless risk structure is altered.	Moderate	Possible	Moderate	Moderate	Possible	Moderate
55	14 Construction Activitiy	Archaelogical Monitoring	Archaeological Monitoring Duration During Construction	Focused on on-land portion of breakwater only. During grading and any removal of existing breakwater and installation of new causeway/BW on land. Assume 20 days of monitoring by USACE.	Negligible	Possible	Low	Negligible	Unlikely	Low
56	08 Cost and Schedule	Work Day Length	Work Day Varies from Initial Assumptions	Possibly 24 hr operation for dredging and rock placement. Extra daylight during summer season. Double shifts will happen at a minimum, adjustments we be made as light changes. Baseline estimate assumes 6/12 double shift during June July and Aug.. More aggressive shift work leads to risk from production degridation, safety issues ect.	Marginal	Possible	Low	Moderate	Possible	Moderate
57	16 Construction Activitiy	Real Estate	Insufficient Available Staging Areas/Staging Areas Not Identified	Currently have no staging area identified. City owns land so during PED its likely an area will be identified. Plan on entire sand pit area and beach west of the channel.Contractor retains option to make arrangement with city of Nome, however, USACE requires a real estate plan and part of the environmental assesment. Contract has to include a staging area (NEPA), but could add caveat to allow contractor to make arrangement with other entities for additional areas. Historic cemetary near west beach. Biggest issue is if private land is impacted, easy to work with city-owned land.	Marginal	Possible	Low	Marginal	Possible	Low
58	17 Construction Activitiy	Archaelogical Discovery	Unearthing Cultural Sites During Construction	Cultural sites could potentially be found during work, causing delays. This can be mitigated by the requirement for an arch monitor during any work in the area of potential sites being discovered. The likelihood of finding something is possible, but impact is low if monitored and mitigated correctly by contract specifications	Marginal	Possible	Low	Marginal	Possible	Low
59										
60										
61										

Nome Port Modification Study - Plan 8B -40'MLLW
Nome Port Modification Study 2019 – Alt #8B/-40FT MLLW

All cost libraries were updated on 07 AUG 2019

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Estimated by	CENPOA-ECD-C
Designed by	CENPOA-ECD-H
Prepared by	Harvey
Preparation Date	12/18/2019
Effective Date of Pricing	8/21/2019
Estimated Construction Time	1,800 Days

Labor ID: AK160001 EQ ID: EP16R09 Currency in US dollars TRACES MII Version 4.4

Description	UOM	Quantity	ContractCost
Base Line Cost no Contingency			**446,573,893**
Federal Funded Items (GNF)	**LS**	**1**	**358,706,137**
Mobilization and Demobilization - Land Based Equipment	**YR**	**4**	**7,440,849**
Barge Mobilization	**MI**	**23,200**	**6,598,705**
Equipment Standby	**HR**	**3,867**	**268,920**
Equipment Road Transport	**EA**	**8**	**122,752**
Mob Construction Facilities & Supplies	**EA**	**4**	**278,363**
Mob Personnel	**PN**	**120**	**172,109**
Demo and Build Breakwaters	**LS**	**1**	**297,689,248**
Demo West Spur BW Nose	**EA**	**1**	**1,625,666**
"A1" 22 Ton ROCK Removal	**LCY**	**15,194**	**692,782**
"B2" 2 Ton Rock Rock removal	**BCY**	**12,178**	**319,249**
Core & Quarry Spall removal	**LCY**	**28,839**	**613,623**
Boulder Relocation for Crab Habitat	**CY**	**5,000**	**1,056,496**
New 2 Ton Rock Rock placement	**BCY**	**5,000**	**1,056,496**
Build New West Causeway Extension	**LF**	**3,484**	**200,951,364**
Dredge for Causeway BW Armor toe	**BCY**	**51,424**	**946,449**
A1 22T Rock	**CY**	**270,162**	**132,300,474**
A5 Rock	**CY**	**52,375**	**1,415,640**
B2 Rock	**CY**	**155,746**	**30,420,562**
B3 Rock	**CY**	**24,744**	**3,590,723**
C1 Rock	**CY**	**47,310**	**8,072,611**
C2 Rock	**CY**	**15,884**	**2,214,323**
D Fill	**CY**	**87,191**	**13,250,056**
Filter Rock	**CY**	**21,016**	**2,731,391**
Relocate Rock for Re-use - all land based salvagable rock (A Rock & B Rock)	**CY**	**109,156**	**1,318,132**

Labor ID: AK160001 EQ ID: EP16R09 Currency in US dollars TRACES MII Version 4.4

Description	UOM	Quantity	ContractCost
West Causeway - E- and F-Fill	LS	1	4,691,001
Demo East Breakwater	LS	1	3,607,800
A1 Rock Removal	LCY	17,379	594,830
A5 Rock Removal	CY	63,646	1,563,993
B2 Rock removal	BCY	13,762	204,316
B3 Rock Removal	CY	15,144	212,800
C2 Rock Removal	CY	38,649	543,086
C1 RockRemoval	CY	1,966	16,664
Core & Quarry Spall removal	LCY	47,646	472,110
Build New East BW	LF	3,900	88,378,776
Dredge for Causeway BW Armor toe	BCY	3,093	56,926
A1 Rock	CY	26,932	14,333,739
A5 Rock	CY	113,901	43,203,423
B2 Rock	CY	20,174	4,398,116
B3 Rock	CY	54,330	9,986,129
C1 Rock	CY	3,250	545,992
C2 Rock	CY	35,575	4,865,639
Filter Rock	CY	34,363	4,322,522
D Fill	CY	32,046	4,922,314
East BW Causeway - E- and F-Fill	EA	1	1,743,975
Survey Verification-Breakwaters	YR	4	2,069,146
Field Work	DAY	288	1,937,299
Mobe-demobe-lodging	EA	24	131,848
Mobe-Demobe - Dredging Equipment	YR	4	11,267,739
Mob-Demobe Dredges	YR	4	11,267,739
Dredging Outer Basin and Deep Water Basin	LS	1	42,240,468

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Description	UOM	Quantity	ContractCost
Dredging	BCY	3,955,200	40,215,893
Outer Basin	BCY	1,827,600	31,951,347
Deep Water Basin	BCY	422,100	8,264,546
Dredge Pre- and Post- Hydrosurveys	EA	16	2,024,575
Field Work	EA	1	1,874,264
Travel-Perdiem-MobDemob	EA	1	150,310
Aids to Navigation	EA	1	67,834
Non-Federal Funded Items (LSF)	EA	1	87,867,755
Causeway Docks, Mooring Dolphins, Breach Bridge - good	EA	1	54,811,720
Bridge at Breach	EA	1	2,210,599
Security Gates	EA	1	21,839
Mooring Dolphins	EA	10	6,867,201
Vert Piles	EA	10	1,016,781
Batter Piles	EA	40	4,067,122
Anodes	EA	50	54,990
Gussets	EA	80	227,627
Decks	EA	10	105,544
Catwalks #	LF	1,000	1,395,136
1 ea 400 LF Existing West Causeway	EA	1	10,847,777
Demo for New Dock	EA	1	298,029
New Dock and Fill	EA	1	6,063,357
E Fill	BCY	92,238	1,500,168
F Fill	BCY	23,975	1,508,183
Surface (D1) Course	CY	1,393	174,168
Dredge for 400 LF Dock at Existing Causeway	BCY	70,844	1,303,871
2 each 450 LF Dock on New West CW Extension	EA	2	17,053,193

Labor ID: AK160001 EQ ID: EP16R09 Currency in US dollars TRACES MII Version 4.4

Description	UOM	Quantity	ContractCost
Mod Diaphram Sheetpile Dock	LF	900	17,053,193
1 ea 600 LF Dock on New West CW Extension	EA	1	11,747,755
Mod Diaphram Sheetpile Dock	LF	600	11,747,755
1 ea 400 LF Dock on New East CW	EA	1	6,063,357
Mod Diaphram Sheetpile Dock	LF	400	6,063,357
West and East Causeway Fill and Surface Material - good	EA	1	25,670,884
West Causeway - Roadway Material	LS	1	18,633,247
E Fill	BCY	902,043	11,236,239
F Fill	BCY	103,609	6,228,260
Surface (D1) Course	CY	8,916	1,168,748
East BW Causeway - Roadway Material	EA	1	7,037,638
E Fill	BCY	107,116	1,468,206
F Fill	BCY	66,963	4,079,104
Surface (D1) Course	CY	3,190	515,756
Dredge for Dock Footprint	BCY	52,952	974,572
Utilities - good	EA	1	2,225,059
Utilities	LF	3,534	2,225,059
Water	LF	3,534	354,124
Electric	LF	3,534	1,091,976
Fuel	LF	3,534	778,959
Dredging Outer Basin and Deep Water Basin	EA	1	5,160,092
Dredging	BCY	284,000	5,160,092
Outer Basin	BCY	188,200	3,290,240
Deep Water Basin	BCY	95,500	1,869,851

Labor ID: AK160001 EQ ID: EP16R09 Currency in US dollars TRACES MII Version 4.4

ID	Task Name	Duration	Start	Finish	Predecessors
0	**Nome Harbor Improvements**	**2251 days**	**Fri 2/2/18**	**Thu 9/17/26**	
1	**Feasibility**	**671 days?**	**Fri 2/2/18**	**Fri 8/28/20**	
2	TSP	286 days	Fri 2/2/18	Fri 3/8/19	
3	ADM	36 days	Mon 10/7/19	Mon 11/25/19	
4	Submit FR/EA to HQ	1 day?	Fri 4/24/20	Fri 4/24/20	
5	Director Report Signed	1 day	Fri 8/28/20	Fri 8/28/20	
6	**PED**	523 days	Wed 9/30/20	Fri 9/30/22	
7	**Procurement**	**120 days**	**Mon 10/3/22**	**Fri 3/17/23**	**6**
8	Advertise	60 days	Mon 10/3/22	Fri 12/23/22	
9	Award	60 days	Mon 12/26/22	Fri 3/17/23	8
10	**Construction**	**915 days**	**Mon 3/20/23**	**Thu 9/17/26**	**9**
11	**Pre Construction Plans and Mob**	**60 days**	**Mon 3/20/23**	**Fri 6/9/23**	
12	Pre-Construction Plans	60 days	Mon 3/20/23	Fri 6/9/23	9
13	Mobilize Project, Mining Ops and BW Equipment	60 days	Mon 3/20/23	Fri 6/9/23	9
14	**Quarry Production**	**851 days**	**Mon 6/12/23**	**Fri 9/11/26**	
15	2023 Rock Production	100 days	Mon 6/12/23	Fri 10/27/23	13
16	2024 Rock Production	125 days	Mon 4/29/24	Fri 10/18/24	
17	2025 Rock Production	125 days	Mon 4/28/25	Fri 10/17/25	
18	2026 Rock Production and Quarry Close Out	100 days	Mon 4/27/26	Fri 9/11/26	
19	**West Breakwater/Causeway and Docks**	**623 days**	**Wed 5/1/24**	**Thu 9/17/26**	
20	**2024 Season**	**135 days**	**Wed 5/1/24**	**Tue 11/5/24**	
21	2024 Mob-Startup	15 days	Wed 5/1/24	Tue 5/21/24	
22	Dredge Dock Foundations/Place New Fill	10 days	Wed 5/29/24	Tue 6/11/24	21
23	Demo Spur	15 days	Wed 6/12/24	Tue 7/2/24	22
24	Construct BW/CW	75 days	Wed 7/3/24	Tue 10/15/24	23
25	450 Dock No 1 and Mooring Points	45 days	Wed 8/14/24	Tue 10/15/24	24SS+30 days
26	2024 Shutdown and Protect Work	15 days	Wed 10/16/24	Tue 11/5/24	24,25
27	**2025 Season**	**125 days**	**Thu 5/1/25**	**Wed 10/22/25**	
28	2025 Mob-Restart	10 days	Thu 5/1/25	Wed 5/14/25	
29	Breakwater/Causeway Rock Placement Sta 9+00 to	100 days	Thu 5/15/25	Wed 10/1/25	28
30	450 Dock No 2 and Mooring Points	45 days	Thu 6/26/25	Wed 8/27/25	29SS+30 days
31	2025 Shutdown and Protect Work	15 days	Thu 10/2/25	Wed 10/22/25	29
32	**2026 Season**	**100 days**	**Fri 5/1/26**	**Thu 9/17/26**	

ID	Task Name	Duration	Start	Finish	Predecessors
33	2026 Mob-Restart	10 days	Fri 5/1/26	Thu 5/14/26	
34	Breakwater/Causeway Rock Placement Sta 23+00 to	70 days	Fri 5/15/26	Thu 8/20/26	33
35	600 LF Dock No 3 and Mooring Points	60 days	Fri 6/26/26	Thu 9/17/26	34SS+30 days
36	West Breakwater and Causeway Utilities	85 days	Fri 5/1/26	Thu 8/27/26	
37	**East Breakwater/Causeway and Dock**	**415 days**	**Mon 3/20/23**	**Fri 10/18/24**	
38	**2023 Season**	**115 days**	**Mon 6/12/23**	**Fri 11/17/23**	
39	Dredge Dock Foundations/Place New Fill	10 days	Mon 6/12/23	Fri 6/23/23	13
40	Demo BW Beach to Breach (land based)	30 days	Mon 6/12/23	Fri 7/21/23	13
41	Construction BW / CW (land based)	80 days	Mon 6/19/23	Fri 10/6/23	
42	Demo BW from Breach and proceed to End (marine	70 days	Mon 7/24/23	Fri 10/27/23	40
43	2023 Shutdown and Protect Work	15 days	Mon 10/30/23	Fri 11/17/23	42
44	**2024 Season**	**415 days?**	**Mon 3/20/23**	**Fri 10/18/24**	
45	2024 Mob-Restart	10 days?	Mon 5/6/24	Fri 5/17/24	
46	Construction BW / CW (land based)	100 days	Mon 5/20/24	Fri 10/4/24	45
47	Demo BW from Breach and proceed to End (marine	95 days?	Mon 5/20/24	Fri 9/27/24	45
48	400LF Dock and Mooring Points	60 days	Mon 5/20/24	Fri 8/9/24	45
49	East BW Breach Bridge	1 day?	Mon 3/20/23	Mon 3/20/23	
50	East Breakwater/Causeway Utilities	1 day?	Mon 3/20/23	Mon 3/20/23	
51	2024 Shutdown and Protect Work	15 days	Mon 9/30/24	Fri 10/18/24	47
52	**Dredge and Disposal**	**902 days**	**Mon 3/20/23**	**Mon 8/31/26**	
53	**2023**	**165 days**	**Mon 3/20/23**	**Fri 11/3/23**	
54	2023 - Mobe 1 Dredge	60 days	Mon 3/20/23	Fri 6/9/23	9
55	Dredge Dock Foundations/Place New Fill	15 days	Mon 6/12/23	Fri 6/30/23	54
56	Dredge Outer Basin	60 days	Mon 7/3/23	Fri 9/22/23	55
57	2023 Demobe	30 days	Mon 9/25/23	Fri 11/3/23	56
58	**2024**	**150 days**	**Mon 4/22/24**	**Fri 11/15/24**	
59	2024 - Mobe 2 Plants	25 days	Mon 4/22/24	Fri 5/24/24	
60	Dredge Dock Foundations/Place New Fill	10 days	Mon 5/27/24	Fri 6/7/24	59
61	Dredge Outer Basin	95 days	Mon 5/27/24	Fri 10/4/24	59
62	2024 Demobe	30 days	Mon 10/7/24	Fri 11/15/24	61
63	**2025**	**150 days**	**Mon 4/21/25**	**Fri 11/14/25**	
64	2025 Mobe 2 Plants	25 days	Mon 4/21/25	Fri 5/23/25	
65	Dredge Dock Foundations/Place New Fill	5 days	Mon 5/26/25	Fri 5/30/25	64

ID	Task Name	Duration	Start	Finish	Predecessors
66	Dredge Outer Basin - Plant 1	95 days	Mon 5/26/25	Fri 10/3/25	64
67	Dredge Outer Basin - Plant 2	15 days	Mon 5/26/25	Fri 6/13/25	
68	Dredge Deep Water Basin - Plant 2	80 days	Mon 6/16/25	Fri 10/3/25	67
69	2025 Demobe	30 days	Mon 10/6/25	Fri 11/14/25	68
70	**2026**	**95 days**	**Tue 4/21/26**	**Mon 8/31/26**	
71	2026 Mobe 1 Plant	30 days	Tue 4/21/26	Mon 6/1/26	
72	Dredge Dock Foundations/Place New Fill	5 days	Tue 6/2/26	Mon 6/8/26	71
73	Dredge Deep Water Basin - Plant 1	30 days	Tue 6/9/26	Mon 7/20/26	72
74	2026 Demobe	30 days	Tue 7/21/26	Mon 8/31/26	73