US Army Corps of Engineers
Alaska District

Limited Reevaluation Report

Navigation Improvements
Port Lions, Alaska

September 2013

NAVIGATION IMPROVEMENTS

LIMITED REEVALUATION REPORT

PORT LIONS, ALASKA

SEPTEMBER 2013

SUMMARY

This report re-examines the need for improving navigation at Port Lions, Alaska, and verifies the feasibility of Federal participation in potential improvements. The City of Port Lions is on Kodiak Island, approximately 260 air miles southwest of Anchorage.

The primary problem is the lack of adequate wave protection for the existing inner harbor facilities and moored vessels. The mooring basin is subject to severe damages and undesirable wave conditions from northeast waves entering the basin through the near-shore breach and around the deep-water end of the main breakwater. Wave heights of 3 to 5 feet have been observed within the harbor limits. Damage to the float system is especially prevalent on the outer portions of the three main floats due to exposure to higher waves. Significant portions of the mooring floats were unsafe and have been removed from the water. Year-round use of the basin has been reduced from about 124 to 35 vessels. The existing floating breakwater prevents damages caused by smaller, locally generated waves from the southwest. For the general Kodiak Island area, demand for year-round moorage exceeds all planned expansion. A shortage of regional moorage that is both safe and convenient has led to lost income, vessel damages, lost time, and inconvenience.

The revised recommended plan is a 700-foot-long detached rubblemound breakwater located northeast of the existing breakwater, a 40-foot-long extension of the existing breakwater to the west for reduction in the existing gap width, and a 75-foot-long extension of the existing fill at the dock approach to further reduce the gap width. The existing mooring basin would remain unchanged with this alternative. The existing floating breakwater would remain in place..

The features of the revised recommended plan that contribute to the National Economic Development (NED) plan have a construction cost of $12,341,000 (October 2013 price level). The annual investment cost of the project, including the cost of operation and maintenance, is $681,000 with annual NED benefits of $2,553,000. The project's benefit-to-cost-ratio is 3.75 with net annual benefits of $1,872,000.

The local sponsor, the City of Port Lions, would be required to pay the non-Federal share of the costs of construction of general navigation features (GNF) as specified by Section 101 of the Water Resources Development Act of 1986 (Public Law 99-662). The sponsor must also pay the entire cost of the non-GNF, including the float system. The estimated total non-Federal share of the project is $5,059,000, which includes $1,762,000 for GNF and $3,297,000 for the float system. The Federal share of the project is $7,056,000, which includes $10,000 for navigational aids. The U.S. Coast Guard would provide these navigation aids.

Revised Recommended Plan (Alternative 1C)

Channel and Basin		Northeast Breakwater and Existing Breakwater Extension	
		Design wave	8 ft
Mooring basin	8 to 14 ft, MLLW	Length, total	775 ft
Maneuvering basin	2 ac	Crest elevation	19 ft MLLW
Mooring basin	10 ac	Crest width	10 ft
Total	12.0 ac	Primary armor	19,600 yd^3
Dredging volume	0	Secondary armor	12,900 yd^3
		Core rock	25,900 yd^3

Revised Recommended Plan

Item	Federal ($)	Non-Federal ($)	Total ($)
General Navigation Features	7,046,000	1,762,000	8,808,000
Associated costs local service facilities	0	3,297,000	3,297,000
Lands, Easements, Rights of Way, and Relocation	0	0	0
Navigation aids. U.S. Coast Guard	10,000	0	10,000
NED Project Cost	7,056,000	5,059,000	12,115,000
Annual cost, benefit, and benefit cost ratio based on a 2013 price level, 3 3/4 % 50-year project life			
Project First Cost			$8,808,000
NED investment cost (includes interest during construction)			$12,341,000
Average Annual NED invest cost			$550,000
Average Annual OMRR&R			$130,000
Total Average Annual Cost			$681,000
Average Annual NED Benefit			$2,553,000
Net Average Annual Benefit			$1,872,000
Benefit Cost Ratio			3.75

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1.0 INTRODUCTION

1.1 Purpose of Report

The purpose of this Limited Re-evaluation Report (LRR) is to document changes to the project since its authorization in 2007. A value engineering exercise revealed that a plan with features of smaller size could still achieve project objectives and provide protection to the same fleet as analyzed in the original feasibility report. In addition to the change in project design and related cost decrease, the economics for the project have been updated per the requirements of ER 1105-2-100.

1.2 Related Reports and Studies

This LRR relies extensively upon the Port Lions, Alaska, Navigation Improvements Feasibility Report, an Environmental Assessment dated October 2005, and the subsequent related Chief of Engineers Report dated 14 June 2006. The original feasibility report contains other references utilized in the development of the authorized project.

1.3 Project History

Port Lions is on Kodiak Island, approximately 30 air-miles northwest of the City of Kodiak and 260 air-miles southwest of Anchorage. The existing Federal navigation project at Port Lions was authorized under Section 107 (Public Law 86-645) of the 1960 River and Harbor Act, as amended and approved by the Office of the Chief of Engineers, 9 April 1979. The project initially consisted of a 600-foot-long north breakwater and a 170-foot-long stub breakwater to protect a 5-acre mooring basin. Following completion of the initial project, a severe storm caused extensive damage to the main breakwater. The breakwater was reconstructed and extended for a total length of 725 feet. The authorized depth for the mooring basin and entrance channel is –14 feet mean lower low water (MLLW). Figure 1 shows the project location and the features of the existing Federal project.

The Alaska Department of Transportation and Public Facilities (AKDOT&PF) has been the local sponsor for the previous harbor improvements and the feasibility study. In November 2006 AKDOT&PF transferred ownership of the harbor to the City of Port Lions, which has agreed to act as the local sponsor for the PED and construction phases of this project. The City of Port Lions will also assume all the related requirements for a local sponsor. There are no other studies accomplished, directions from Appropriations Committees, any litigation, relationship of project to basin plans or other pertinent information regarding this LRR.

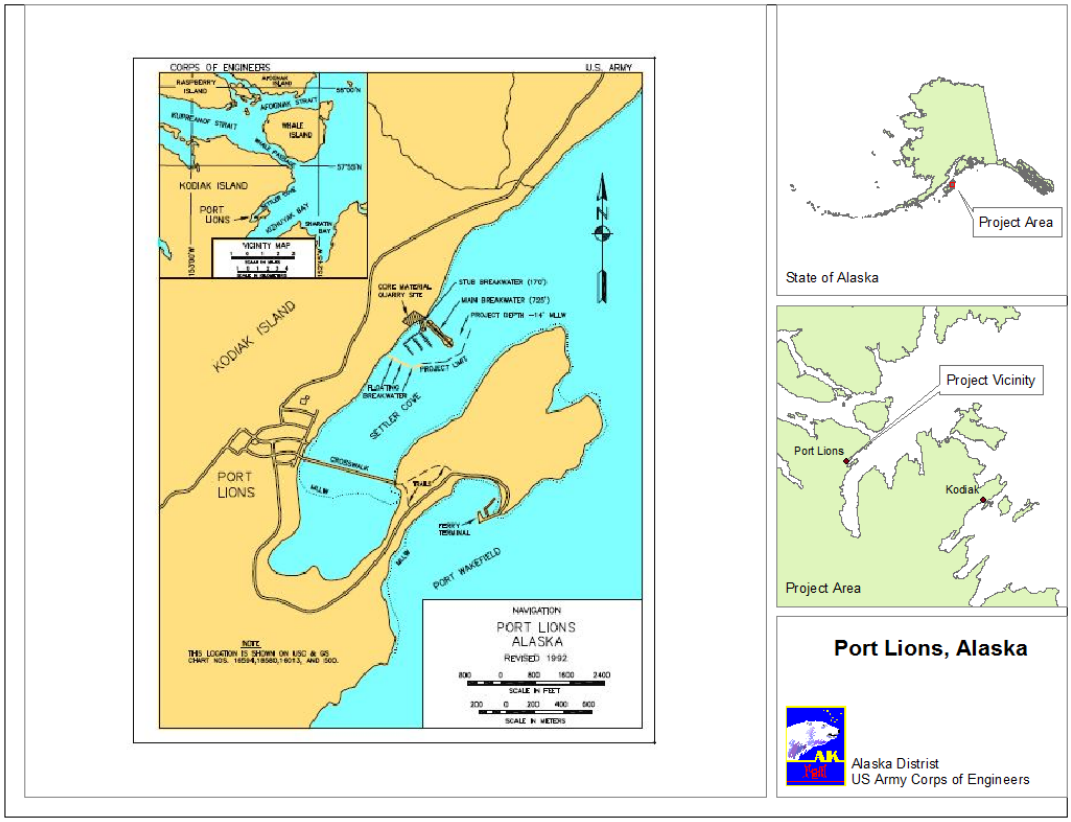

Figure 1 Project Location and Existing Federal Project

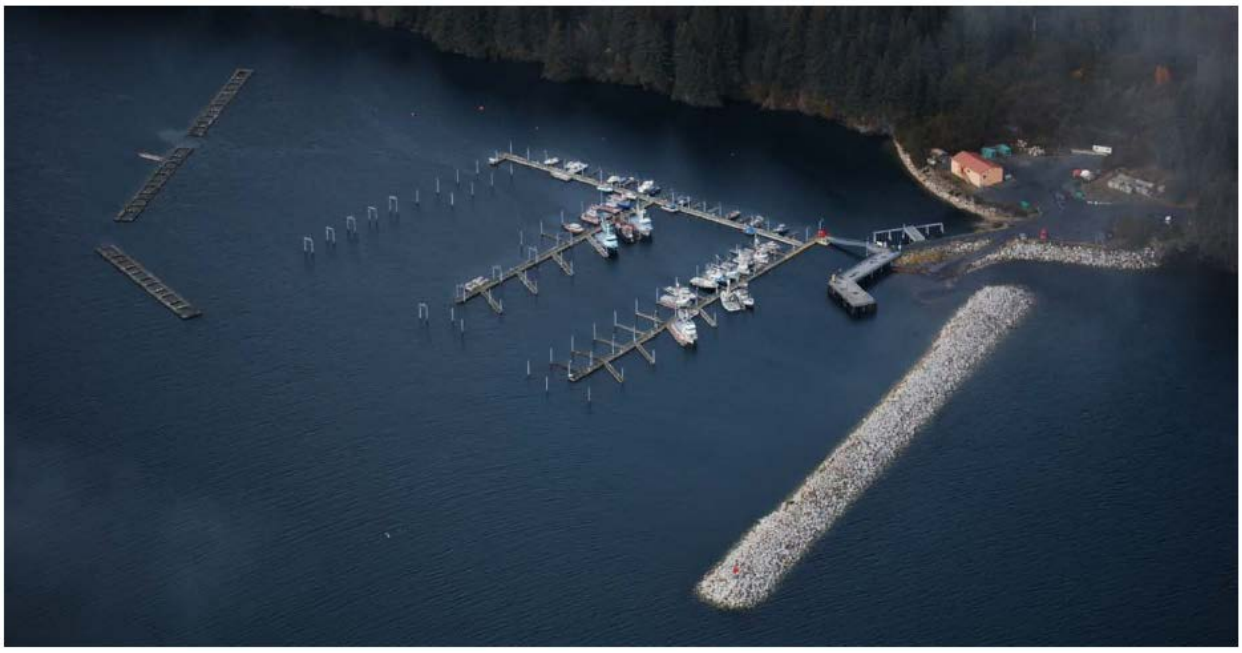

Figure 2 Aerial Photo of Port Lions Harbor in 2009

2.0 AUTHORIZED PROJECT

2.1 Authorization

The Port Lions project is authorized by Section 1001 of the Water Resources Development Act (WRDA) 2007, Public Law 110-114 which reads:

SEC. 1001. PROJECT AUTHORIZATIONS.

Except as otherwise provided in this section, the following projects for water resources development and conservation and other purposes are authorized to be carried out by the Secretary substantially in accordance with the plans, and subject to the conditions, described in the respective reports designated in this section:

(2) PORT LIONS, ALASKA.—The project for navigation, Port Lions, Alaska: Report of the Chief of Engineers dated June 14, 2006, at a total cost of $9,530,000, with an estimated Federal cost of $7,624,000 and an estimated non-Federal cost of $1,906,000.

2.2 Description of Authorized Project

The authorized project would provide a new rubblemound breakwater, 1,360 feet in length, located southwest and east of the existing mooring basin. The new breakwater would protect the design fleet from northeast and southwest waves. The new breakwater would not be shore-connected to provide a 150-foot opening for fish passage. This would allow fish to remain in the shallow water near the shore and minimize the threat of deep-water predation. Additionally, the width of the near-shore opening at the existing breakwater would be reduced to 30 feet by a combination of extending the existing breakwater 40 feet shoreward and by extending the existing stub breakwater 75 feet seaward. The breakwaters would protect a 10-acre mooring basin. The basin would provide protected moorage for a total of 124 commercial and subsistence vessels ranging in length from 22 to 55 feet. The existing basin depths range from -14 feet MLLW near the entrance channel to -8 feet MLLW at the near-shore extent of the basin. Because the authorized project would not have any significant adverse effects, no mitigation measures (beyond management practices and avoidance) or compensation measures are required.

2.3 Funding Since Authorization

A total of $49,999 of funding has been provided for this project since authorization in November 2007 (1st quarter FY 2008).

Table 1. Funding Since Authorization

FY	FY Amount
2013	49,900
2012	49,999
2011	0
2010	0
2009	0
2008	0

3.0 CHANGES TO RECOMMENDED PLAN

3.1 Changes in Scope of Authorized Project

Changes to the Port Lions project came as a result of changed conditions at the harbor. The feasibility phase local sponsor, the State of Alaska, transferred ownership of the harbor to Port Lions. As part of the transfer, the City of Port Lions invested in dock upgrades that include plans to install heavy duty floats. Phase I of this float replacement project is complete, which included replacement of about half of the float system. Phase II of the replacement project will be completed after construction of the Corps breakwater. These stronger floats and the existing floating breakwater will provide sufficient wave protection, which negates the need for a rubblemound breakwater on the south side of the harbor.

A value engineering exercise was undertaken in which the project team compared various aspects of previous alternatives to see if this changed condition could have a corresponding cost savings for the authorized project. The authorized project was to construct Alternative 3B from the feasibility report. The main feature of Alternative 3B is a 1,360-foot-long breakwater that wraps around the southern end of the Port Lions boat harbor. The study team determined that a shorter breakwater that had been proposed as one of the other feasibility study alternatives, Alternative 1A, would be sufficient to provide the remaining protection that the Port Lions Harbor required. Alternative 1A from the feasibility study also included the replacement of the existing floating breakwater. The team determined with the Alternative 1A breakwater, the life of the existing floating breakwater would be extended. Plus, with the stronger exterior floats, the floating breakwater becomes less necessary. Therefore, the replacement of the floating breakwater component was removed from consideration. This new alternative is referred to as Alternative 1C. A more detailed discussion of changes can be found in Section 3.5 of this report. All other features of the authorized plan remain unchanged in the revised plan.

The amount of protected moorage for the revised plan is the same as in the authorized project.

Table 2. Changes in Project Scope

Plan	New Feature	Percent Change in Length New Breakwater	Floating Breakwater
Alternative 3B	1,360-foot-long breakwater	NA	Removed
Alternative 1C	700-foot-long breakwater	-49%	Remains

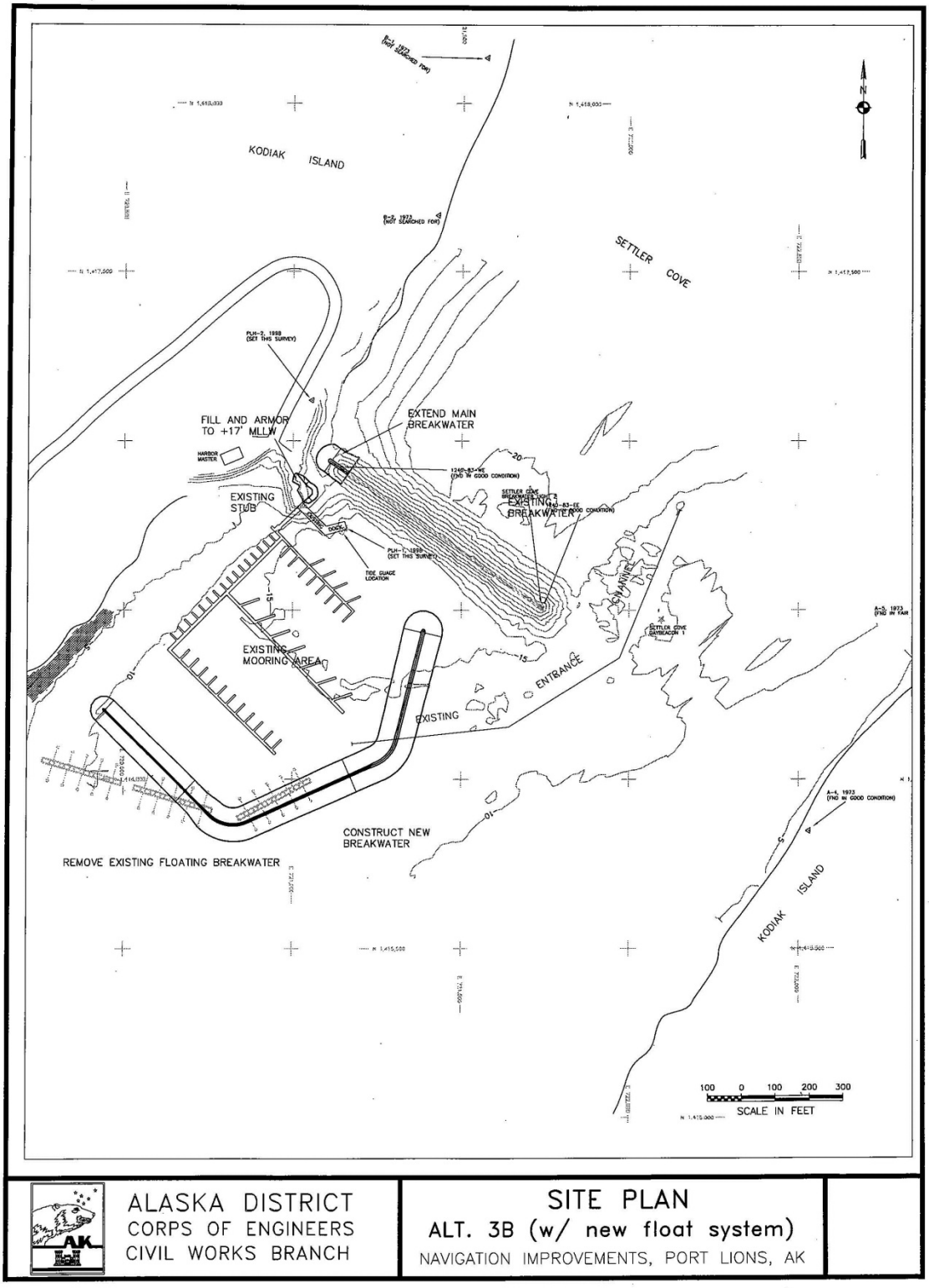

Figure 3 Previously Recommended Plan, Alternative 3B

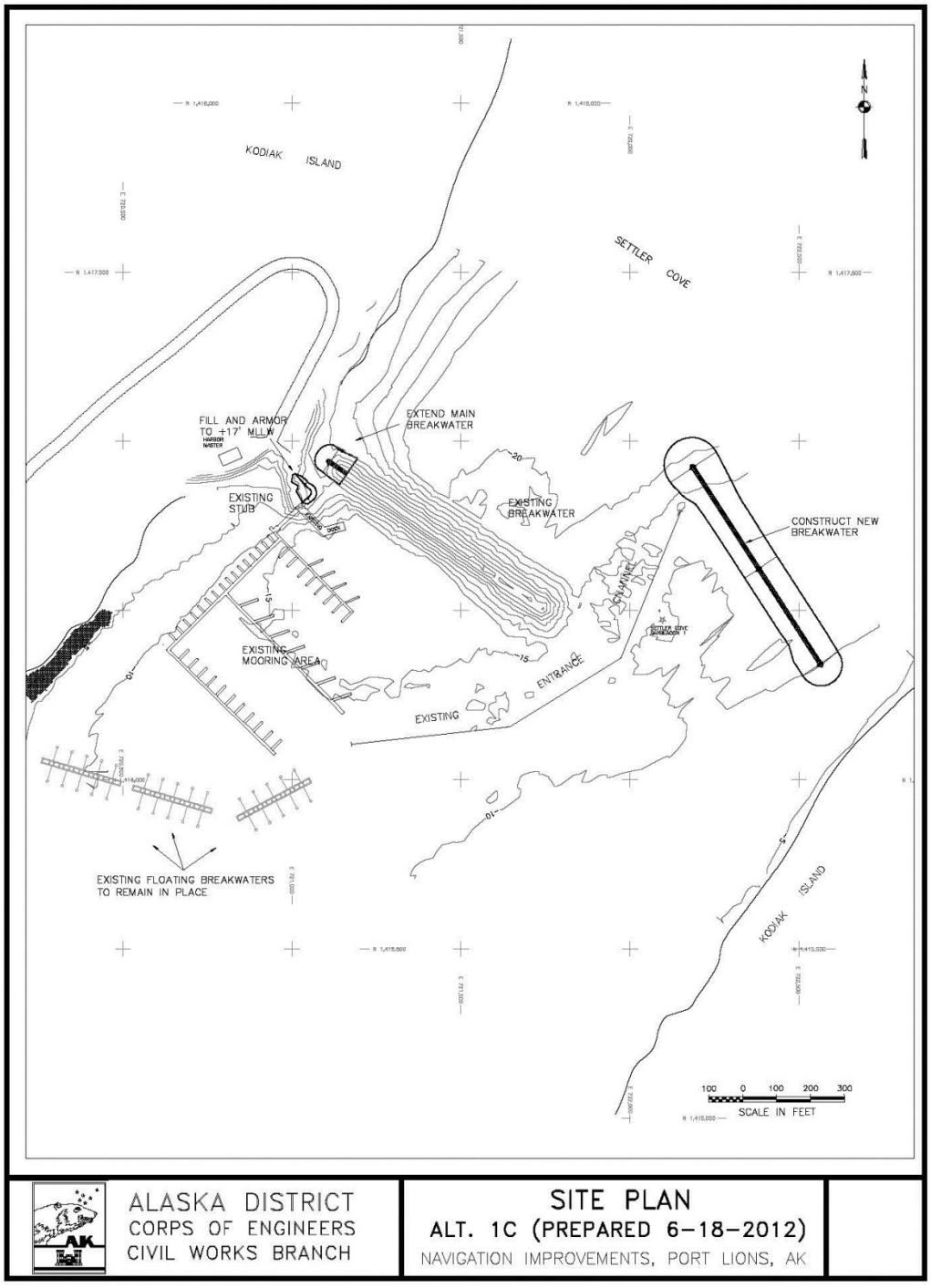

Figure 4 New Recommended Plan, Alternative 1C

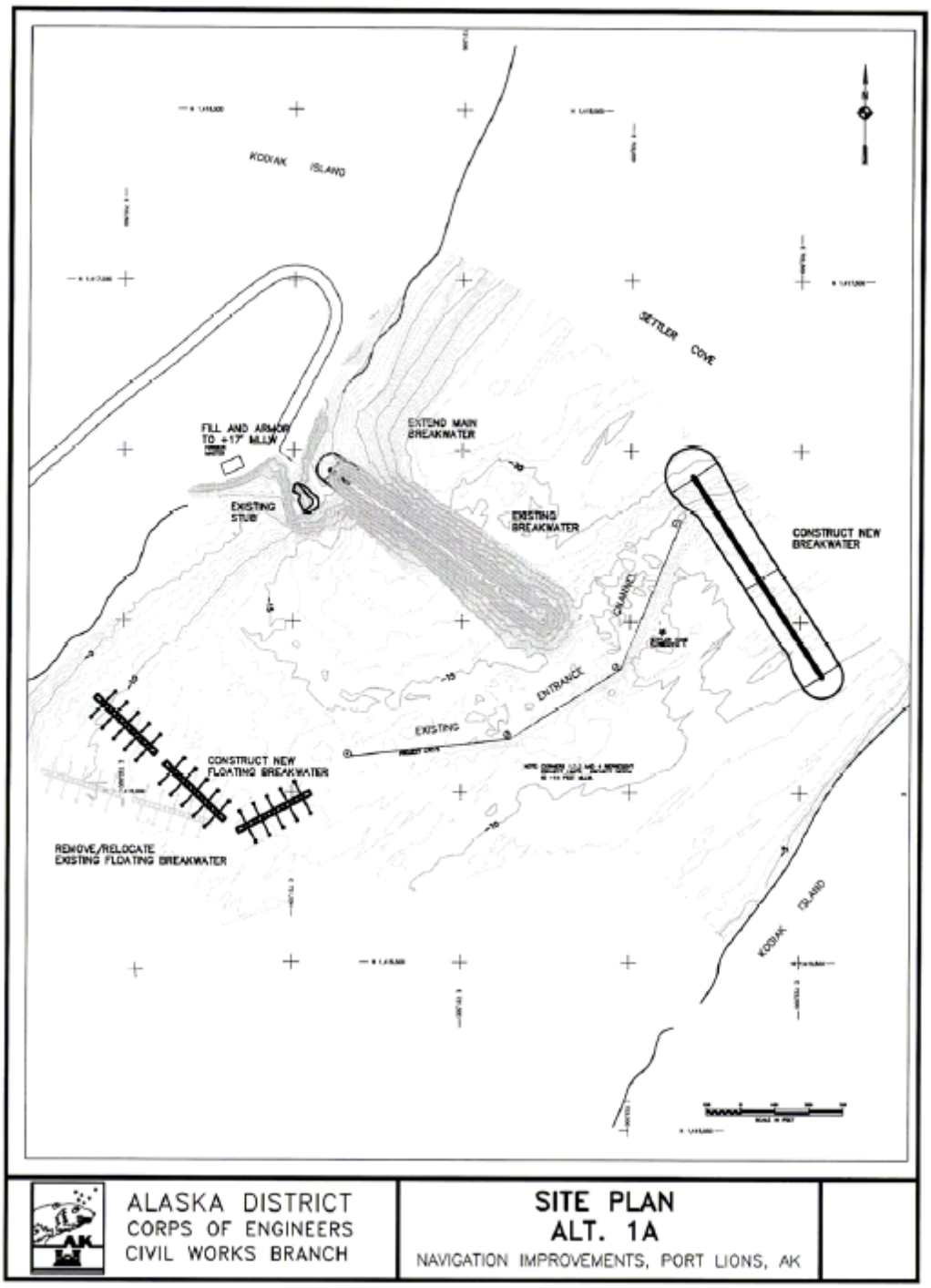

Figure 5 Plan 1A from the approved report

3.2 Changes in Project Purpose

The project purpose of the revised plan is Navigation, the same as the authorized plan.

3.3 Changes in Local Cooperation Requirements

The local sponsor for the project will change from the State of Alaska to the City of Port Lions. The local cooperation requirements remain the same as per the Report of the Chief of Engineers dated June 14, 2006 included in the Recommendations of this report.

3.4 Changes in Location of Project

There is no proposed change in the project location only a change in the alignment of the proposed breakwaters. As shown in Figure 3 and Figure 4, the proposed breakwater alignment has moved from the southwest of the existing breakwater to the northeast of the existing breakwater. No additional real estate is required for the revised plan.

3.5 Design Changes

Description of the Revised Plan. The revised plan replaces the southern 1,360 foot breakwater of the authorized plan with a 700 foot breakwater to the north. In the southern limit of the harbor basin would continue to be protected by the existing floating breakwater segments instead of replacing them with the southern breakwater. The revised plan includes a 40-foot-long extension of the existing breakwater to the west for reduction in the existing gap width, and the 75-foot-long extension of the existing fill at the dock approach to further reduce the gap width similar to the authorized project.

Harbor Basin. The revised harbor basin would have the same dimensions, depths, and orientation as that for the authorized harbor basin

Wave Heights. This alternative would meet the wave criteria along the floats inside the harbor basin as established in Section 5 of the Hydraulic Analysis, Appendix A of the original report.

Circulation. The harbor basin is less enclosed for the revised plan versus the authorized plan therefore the water quality and circulation for the revised plan would be better than that for the authorized plan.

Shoaling. Shoaling of the entrance channel was not expected for the authorized plan n or would it be for the revised plan.

Construction Dredging. No dredging was not required for the authorized plan nor would it be for the revised plan..

Maintenance Dredging. Maintenance dredging for the revised plan would be expected to be minimal or not necessary at all in the future under the same rationale as that for the authorized plan. Costs for this are included in the estimated OMRR&R costs.

Breakwaters. The positioning of the new northeast rubblemound breakwater would create an entrance channel alignment allowing access from the northeast to the basin which varies from the authorized plan. No impacts are expected from this change.

Rubblemound Breakwater Design. The breakwater design methodology described for revised plan is the same as that for authorized plan. The height, width, and rock design remain the same for the revised plan. The breakwater length is decreased from 1,360 feet to 700 feet. Figure 4 shows the revised alignment.

Existing Floating Breakwater. The existing floating breakwater segments provide wave protection for the harbor from the southwest. Since the feasibility study was completed in 2006, ownership of the floating breakwater segments has been turned over to the City of Port Lions from the ADOT&PF. This feature will remain in place as part of the revised plan. The OMRR&R responsibilities for the floating breakwater will remain with the City of Port Lions as owner and operator of the feature.

Uplands. Uplands for the revised plan would be the same as those for authorized plan including the fill and armoring

Entrance Channel Navigation. The proposed breakwater alignment would be different for the revised plan versus the authorized plan. Both plans would be a changed condition for mariners that would be similar for either to adjust to..

Operation and Maintenance. OMRR&R requirements for the revised plan would be similar to those for authorized plan, except that maintenance of the existing floating breakwater segments would be a local responsibility. Condition of the concrete, flotation, connections, anchoring system, and cathodic protection would be evaluated and maintenance requirements would be determined by the City of Port Lions during periodic inspections. It is estimated that the service life of the existing floating breakwater segments would be extended with the construction of the new northeast rubblemound breakwater. The northeast rubblemound breakwater would significantly reduce the wave action from the northeast, which currently causes damage and long-term wear-and-tear on the floating breakwaters. The annual OMRR&R costs for the GNF features are estimated to be $15,000 and $115,000 for the LSF features for a total estimated annual OMRR&R cost of $130,000.

Inner Harbor Facilities. The City of Port Lions has replaced a portion of the existing floats in the harbor (Phase I). They have plans to replace the remainder of the existing float system (Phase II) following construction of the new rubblemound breakwater.

The proposed changes are consistent with the hydraulic analysis from the approved report. The hydraulic analysis from the approved report can be referred to for more detailed information.

3.6 Changes in Total Project First Costs

Per memorandum dated 25 August 2011, subject Corps of Engineers Civil Works Cost Definitions and Applicability, the total first project costs are to include General Navigation Features but not associated and other costs such as Local Service Facilities or Aids to Navigation. The changes in total project first costs are displayed in Table 3.

Table 3 Changes in Total Project First Costs (Oct 2013 Price Level)

Currently Recommended Amount[1]	Authorized Amount	Authorized Amount Updated to Present[2]	Last Amount Presented to Congress[3]
$8,808,000	$9,530,000	$9,684,000	$9,300,000

[1]This amount reflects a net decrease in the project cost from the authorized project. The decrease in cost comes from a decrease in the overall size of the recommended plan.
[2]This amount reflects a cost estimate that has been updated using current standards and information rather than adjusting the cost utilizing the Civil Works Construction Cost Index System.
[3]Last amount presented to Congress was in the Chief's Report dated 14 Jun 2006.

3.7 Changes in Project Benefits

Since the authorized feasibility report was completed, several of the assumptions used to calculate the benefits and costs of the proposed project have changed and warranted an update of the project's justification. Based on the magnitude of these changes, additional economic investigations were completed, including a mail-out survey to potential harbor users.

The 2005 feasibility report assumed that regional moorage demand was greater than supply because other harbors in the region had large waitlists for harbor space. It is often not a valid assumption that boaters would utilize moorage at a particular harbor simply because they are on a waitlist for a harbor in the same region. The updated economic analysis utilizes the results of the Port Lions Small Boat Harbor Survey conducted in December 2012 as a more precise estimate of the demand for moorage.

Another key assumption from the 2005 analysis was that benefits were based primarily on Port Lions being the least cost location for commercial fish harvesting because of proximity to harvest areas. The updated economic analysis follows the same underlying assumption that there are efficiencies to be gained in commercial fish harvesting due to reduced travel costs. The benefits associated with this category were updated using updated vessel operating costs, which are a function of vessel values and fuel costs – both of which have seen dramatic increases since the previous analysis.

Table 4. Summary of Updated Annual Benefits

Benefit Category	October 2005 Annual Benefits	Updated May 2013 Annual Benefits	Difference	Explanation
Preventable Marina Damage	$252,900	$159,000	$(93,900)	(a)
Local Emergency Cost	18,100	22,000	3,900	(b)
Damage to Skiffs	15,600	20,000	4,400	(c)
Beaching Damage	3,500	4,000	500	(d)
Large Vessels Set Adrift	13,500	25,000	11,500	(e)
Lines	8,800	30,000	21,200	(f)
Cleats	600	700	100	(g)
Vessel Tending	-	-	-	(h)
Vessel Damage at the Docks	6,800	15,300	8,500	(i)
Reduction in Harvest Cost	361,900	2,071,000	1,709,100	(j)
Water Taxi Service	49,300	-	(49,300)	(k)
Charter Operations	-	14,000	14,000	(l)
Freighter Travel Cost Savings	-	32,000	32,000	(m)
Alternative Port Impact	-	-	-	(n)
Subsistence (Other Direct Benefit)	53,500	80,000	26,500	(o)
Harbor of Refuge (Other Direct Benefit)	26,000	21,900	(4,100)	(p)
SAR (Other Direct Benefit)	73,300	26,000	(47,300)	(q)
Cost of Leaving/Avoiding Harbor	-	32,000	32,000	(r)
TOTAL	**$884,000**	**$2,553,000**	**$1,669,000**	

(a) Benefits decreased based on the updated price of float repairs and replacement and floating breakwater replacement.
(b) Benefits increased based on updated labor rates using the Employment Cost Index for harbor paid labor.

(c) Benefits increased based on updated cost of lines and CPI update of other skiff repair costs.
(d) Benefits increased based on updated skiff repair costs.

(e) Benefits increased based on increased values of 45- to 58-foot fishing vessels.
(f) Benefits increased based on the increased number of vessels able to use the harbor and the increased price of mooring lines.
(g) Benefits increased based on adjusting the cost of cleat damage incidents to current dollars using the Anchorage Consumer Price Index.
(h) Updating this category was not completed for the Limited Reevaluation Report because vessel tending is no longer a common practice.

(i) Benefits increased based on increased vessel values and more vessels using the harbor.

(j) Benefits increased based on an increase in average hourly vessel operating costs.

(k) Changes to water taxi service at Port Lions is unknown at this time; no benefits have been calculated..
(l) This category was added to the analysis and is based on the increased charter operations resulting from harbor improvements.
(m) This category was added to the analysis and is based on the reduced costs expended by freighters who

would be able to use Port Lions Harbor.

(n) This category was not updated due to the large effort that would be required to accurately capture these cost elements. Also, no benefits were claimed in the previous report.

(o) Benefits increased based on an increased replacement value of subsistence resources.

(p) Benefits decreased based on updating the proportion of with-project available safe harbor; only a 10 percent increase in safe harbor in now expected, rather than 21 percent in the 2005 report.

(q) Benefits decreased based on new information regarding the number of SARs per year in the Kodiak region.

(r) This category was added to the analysis and is based on the travel costs of vessels forced to leave or avoid the harbor based on current conditions.

3.8 Benefit-Cost Ratio

Table 5. Summary of Changes in Benefits and Costs

	Authorized Project: Alt. 3B	**Authorized Project: Alt. 3B**	**Recommended Project: Alt. 1C**
	October 2005 Report	**May 2013 Update**	**May 2013 Update**
Annual Benefit	$884,000	$2,553,000	$2,553,000
Annual Cost	$625,000	$720,000	$681,000
Net Annual Benefit	$259,000	$1,833,000	$1,872,000
Benefit to Cost Ratio	1.41	3.55	3.75
Annual NED Cost	$606,000	$590,000	$550,000
Annual OMRR&R	$19,000	$130,000	$130,000
NED Investment Cost	$10,459,000	$13,233,000	$12,341,000

Note: The 2005 feasibility report used the Federal fiscal year 2006 discount rate of 5.375 percent (based on updated costs in February of 2006) and a 50-year project period of analysis. The 2013 report update uses the Federal fiscal year 2013 discount rate of 3.75 percent and a 50-year period of analysis.

3.9 Changes in Cost Allocation

The allocations of costs remain the same for the recommended plan and the authorized project both at 100 percent of the cost allocated to navigation. The difference in costs arises from the changes described in Section 3.5.

Table 6 Changes in Cost Allocation (Oct 2013 Price Level)

Project	Cost	Allocation	Percentage
Authorized	$9,684,000	Navigation	100%
Recommended	$8,808,000	Navigation	100%

3.10 Changes in Cost Apportionment

Table 7 displays the cost apportionment for the authorized project utilizing an updated cost with a price level of 2013. Table 8 displays the cost apportionment as a revised plan to an October 2013 price level.

Table 7 Authorized Project Cost Apportionment (Oct 2013 Price Level)

Items	Total Project Cost ($000)	Implementation Costs ($000)			
		Federal	%	Non-Federal	%
General Navigation Features (GNF):					
Construction	8,527	7,674		853	
Preconstruction, engineering, & design	533	480		53	
Construction management (S&A)	622	560		62	
LERR (GNF). Administrative costs	1	1		0	
Subtotal GNF	9,684	8,716	90	968	10
Additional Funding Requirement					
10% of GNF		-968		968	
GNF LERRD credit		0		0	
Adjustment for GNF LERRD credit		-968		968	
Relocations (GNF not creditable)					
Subtotal of GNF Related Items	9,684	7,748		1,936	
LERR (GNF). Acquisition credit		0	0	0	100
Aids to navigation	10	10	100	0	0
Local Service Facilities					
Phase II Floats (with design cost)	3,297	0		3,297	
LERR (LSF)	0	0		0	
TOTAL LOCAL SERVICE FACILITIES	3,297	0		3,297	100
FINAL INITIAL COST REQUIREMENTS	12,991	7,758		5,233	

Table 8 Recommended Project Cost Apportionment (Oct 2013 Price Level)

Items	Total Project Cost ($000)	Implementation Costs ($000)			
		Federal	%	Non-Federal	%
General Navigation Features (GNF):					
Construction	7,693	6,924		769	
Preconstruction, engineering, & design	514	463		51	
Construction management (S&A)	600	540		60	
LERR (GNF). Administrative costs	1	1		0	
Subtotal GNF	8,808	7,928	90	880	10
Additional Funding Requirement					
10% of GNF		-880		880	
GNF LERRD credit		0		0	
Adjustment for GNF LERRD credit		-880		880	
Relocations (GNF not creditable)					
Subtotal of GNF Related Items	8,808	7,048		1,760	
LERR (GNF). Acquisition credit		0	0	0	100
Aids to navigation	10	10	100	0	0
Local Service Facilities					
Phase II Floats (with design cost)	3,297	0		3,297	
LERR (LSF)	0	0		0	
TOTAL LOCAL SERVICE FACILITIES	3,297	0		3,297	100
FINAL INITIAL COST REQUIREMENTS	12,115	7,058		5,057	

3.11 Environmental Considerations in Recommended Changes

As a result of a Limited Revaluation Report (LRR) analysis conducted on the Proposed Port Lions Project, an alternative other than the original Recommended Plan was chosen. The new Recommended Plan was not the preferred plan identified by the EA/FONSI dated September 2005. Based on the analysis at this time, the proposed alternative will not result in substantial (20% or more) increases or decreases in environmental impacts than what was originally assessed in the EA. The USFWS Coordination Act Report (CAR) appended to the EA did not address the current proposed alternative. As a condition of the CAR, further coordination would be required to determine whether or not a need for compensatory mitigation would be required if this new alternative was chosen as the Recommended Plan. As a result, CEPOA-EN-G-ER will be working to update the NEPA analyses (including the 404(b)(1)) and continue coordination with the appropriate natural resources agencies to determine if any further mitigation (compensatory or otherwise) will be necessary beyond what has already been designed into the project (i.e. To avoid and minimize impacts). At this stage of analysis, POA does not anticipate any potential mitigation requirements or cost to substantially change (increase or decrease by

20% or more) the scope of the project. In accordance with ER 200-2-2, the review and update of the NEPA documentation and associated other environmental compliance documentation will be completed during the PED phase of this project.

3.12 Public Involvement

Additional public involvement will occur as part of the update to the Environmental Assessment including an additional public review if deemed necessary. The Alaska District coordinated closely with the local sponsor in the development of this report.

4.0 CONCLUSIONS AND RECOMMENDATIONS

4.1 Conclusions

The studies documented in this LRR indicate that Federal construction of navigational improvements with rubblemound breakwaters, as described in the revised recommended plan (Alternative 1C), is technically possible, economically justified, and environmentally and socially acceptable. The City of Port Lions is willing to act as the non-Federal sponsor for the project and fulfill all the necessary local cooperation requirements. Thus, it is concluded that the navigation improvements described herein should be pursued by the Federal government in cooperation with the City of Port Lions

4.2 Recommendations

I recommend that the navigational improvements at Port Lions, Alaska, be constructed generally in accordance with the plan herein, and with such modifications thereof as in the discretion of the Chief of Engineers may be advisable at an estimated total Federal cost of $7,048,000 and $15,000 annually for Federal maintenance provided that prior to construction the local sponsor agrees to requirements of local sponsorship as provided in the Report of the Chief of Engineers dated June 14, 2006 included as follows:

a. Provide, during the period of design, 25 percent of design costs allocated by the Government to commercial navigation in accordance with the terms of a design agreement entered into prior to commencement of design work for the project; and provide, during the first year of construction, any additional funds necessary to pay the full non-Federal share of design costs allocated by the Government to commercial navigation in accordance with the cost sharing as set out in paragraph b., below;

b. Provide, during construction, 10 percent of the total cost of construction of the general navigation features attributable to dredging to a depth not in excess of 20 feet; plus 25 percent of the total cost of construction of the general navigation features attributable to dredging to a depth in excess of 20 feet but not in excess of 45 feet; plus 50 percent of the total cost of construction of the general navigation features attributable to dredging to a depth in excess of 45 feet;

c. Pay with interest, over a period not to exceed 30 years following completion of the period of construction of the project, up to an additional10 percent of the total cost of construction of the general navigation features. The value of lands, easements, rights-of way, and relocations provided by the non-Federal sponsor for the general navigation features, described below, may be credited toward this required payment. If the amount of credit exceeds 10 percent of the total cost of construction of the general navigation features, the non-Federal sponsor shall not be required to make any contribution under this paragraph, nor shall it be entitled to any refund for the value of lands, easements, rights-of way, and relocations in excess of 10 percent of the total cost of construction of the general navigation features;

d. Provide all lands, easements, and rights-of-way, and perform or ensure the performance of all relocations determined by the Federal Government to be necessary for the construction or operation and maintenance of the general navigation features (including all lands easements, and rights-of-way, and relocations necessary for dredged material disposal facilities);

e. Accomplish all removals determined necessary by the Federal Government other than those removals specifically assigned to the Federal Government;

f. Provide, operate, maintain, repair, replace, and rehabilitate, at its own expense, the local service facilities consisting of the existing float system and additional floats added to accommodate the fleet designed for the recommended project in a manner compatible with the project's authorized purposes and in accordance with applicable Federal and State laws and regulations and any specific directions prescribed by the Federal Government;

g. Shall not use funds from other Federal programs, including any non-Federal contribution required as a matching share thereof, to meet any of the non-Federal obligations for the project unless the Federal agency providing the Federal portion of such funds verifies in writing that expenditure of such funds for such purpose is authorized;

h. Shall prepare and implement a harbor management plan that incorporates best management practices to control water pollution at the project site and to coordinate such plan with local interests;

i. Comply with all applicable provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646, as amended (42 U.S.C. 4601-4655), and the Uniform Regulations contained in 49 CFR Part 24, in acquiring lands, easements, and rights-of-way required for construction or operation and maintenance of the general navigation features and the local service facilities, including those necessary for relocations, the borrowing of materials, or the disposal of dredged or excavated material and inform all affected persons of applicable benefits, policies, and procedures in connection with said Act;

j. Give the Federal Government a right to enter, at reasonable times and in a reasonable manner, upon property that the non-Federal sponsor owns or controls for access to the project for the purpose of operating and maintaining the general navigation features;

k. Hold and save the United States free from all damages arising from the construction or operation and maintenance of the project, any betterments, and the local service facilities, except for damages due to the fault or negligence of the United States or its contractors;

l. Keep and maintain books, records, documents, or other evidence pertaining to costs and expenses incurred pursuant to the project, for a minimum of3 years after completion of the accounting for which such books, records, documents, or other evidence are required, to the extent and in such detail as will properly reflect total costs of construction of the general navigation features, and in accordance with the standards for financial management systems set forth in the Uniform Administrative Requirements for Grants and Cooperative Agreements to State and Local Governments at 32 Code of Federal Regulations (CFR) Section 33.20;
m. Comply with all applicable Federal and State laws and regulations, including, but not limited to: Section 601 of the Civil Rights Act of 1964, Public Law 88-352 (42 U.S.C. 2000d) and Department of Defense Directive 5500.11 issued pursuant thereto; Army Regulation 600-7, entitled "Nondiscrimination on the Basis of Handicap in Programs and Activities Assisted or Conducted by the Department of the Army"; and all applicable Federal labor standards requirements including, but not limited to, 40 U.S.C. 3141-3148 and 40 U.S.C. 3701-3708 (revising, codifying and enacting without substantial change the provisions of the Davis-Bacon Act (formerly 40 U.S.C. 276a *et seq.),* the Contract Work Hours and Safety Standards Act (formerly 40 U.S.C. 327 *et seq.)* and the Copeland Anti-Kickback Act (formerly 40 U.S.C. 276c *et seq.);*

m. Perform, or ensure performance of, any investigations for hazardous substances that are determined necessary to identify the existence and extent of any hazardous substances regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Public Law 96-510, as amended (42 U.S.C. 9601-9675), that may exist in, on, or under lands, easements, or rights-of-way that the Federal Government determines to be required for construction or operation and maintenance of the general navigation features. However, for lands that the Federal Government determines to be subject to the navigation servitude, only the Federal Government shall perform such investigations unless the Federal Government provides the non-Federal sponsor with prior specific written direction, in which case the non-Federal sponsor shall perform such investigations in accordance with such written direction;

n. Assume, as between the Federal Government and the non-Federal sponsor, complete financial responsibility for all necessary cleanup and response costs of any hazardous substances regulated

under CERCLA that are located in, on, or under lands, easements, or rights-of-way that the Federal Government determines to be required for construction or operation and maintenance of the general navigation features;

o. To the maximum extent practicable, perform its obligations in a manner that will not cause liability to arise under CERCLA; and

p. Comply with Section 221 of Public Law 91-611, Flood Control Act of 1970, as amended (42 U.S.C. 1962d-5b), and Section 101(e) of the Water Resources Development Act of 1986, Public Law 99-662, as amended (33 U.S.C. 2211), which provides that the Secretary of the Army shall not commence the construction of any water resources project, or separable element thereof, until each non-Federal sponsor has entered into a written agreement to furnish its required cooperation for the project or separable element.

The recommendations for implementation of navigation improvements at Port Lions, Alaska, reflect the policies governing formulation of individual projects and the information available at this time. They do not necessarily reflect the program and budgeting priorities inherent in the local and State programs or the formulation of a national civil works water resources program. Consequently, the recommendations may be changed at higher review levels of the executive branch outside Alaska before they are used to support funding.

Date: 9/20/13

Christopher D. Lestochi
Colonel, Corps of Engineers
District Commander

Appendix A: Economics Update

Navigation Improvements
Port Lions, Alaska

Economics Appendix to Limited Reevaluation Report

September 2013

U.S. Army Corps of Engineers

Alaska District

NAVIGATION IMPROVEMENTS
ECONOMICS APPENDIX TO LRR
PORT LIONS, ALASKA

CONTENTS

TABLES

ATTACHMENTS

A. Introduction

This portion of the limited reevaluation report (LRR) presents an update of the economic analysis of navigation improvements for Port Lions, Alaska. The most recent report, Appendix B – Economic Analysis of Navigation Improvements at Port Lions, Alaska, was completed in October 2005. In the intervening years, several of the assumptions used to calculate benefits and costs of the proposed project have changed and warranted an update of the project's justification. Based on the magnitude of these changes, additional economic investigations were completed, including a mail-out survey to potential harbor users.

The primary problem in Port Lions is the lack of adequate wave protection for the inner harbor facilities and moored vessels. The mooring basin is subject to severe damages and undesirable wave conditions primarily from northeast waves entering the basin through the near-shore breach and around the deep-water end of the main breakwater. Wave heights of three to five feet have been observed within the harbor limits. Damage to the float system has been especially prevalent on the outer portions of the main floats. The protection recommended in this report will reduce the wave height in the inner harbor to one foot or less during inclement weather.

Following are some of the key updated components as they pertain to moorage demand, vessel values, and fuel prices from the last report. After these general updates is an evaluation of each of the benefit categories from the last report. The pertinent results from the vessel survey are included as applicable in the updated benefit categories, and the summarized survey results are included in this report as Attachment 1.

1. Moorage Demand

The Port Lions harbor was originally constructed in 1983 to accommodate 124 vessels. The 2005 analysis reported that the harbor could only accommodate 35 vessels year-round because of periodic storm-related conditions that cause damage to moored vessels and harbor facilities. The storm events disrupt harbor use, and cause evacuation of some vessels and a need for emergency tie off of others. Conversations with the City of Port Lions harbormaster revealed that conditions at the small boat harbor have deteriorated even further in recent years. The harbormaster reported that annual maintenance is necessary to keep the harbor operating including repairs to the floats and hinges. In 2012 the City of Port Lions completed Phase I of their float system replacement. Before the float system was replaced, the city removed many of the remaining slips including the entire "C" float and about 35-feet of the "B" float. At its worst, damages left the harbor with only 12 slips which were safe for permanent moorage.[1]

The NED recommended plan in the 2005 report, Alternative 3B, would allow space within the harbor for 124 moorage slips—and assumed that the future without-project conditions had

[1] Personal communication with Russell Gunderson, Port Lions Harbormaster, 26 October 2009.

new floats installed. Certain conditions from the last report changed and were noted during a value engineering exercise conducted by the Corps in 2012. Changed since the last report is the ownership of the floating breakwater was turned over to the City of Port Lions from the State Department of Transportation and Public Facilities in November 2006. The transfer included funds for repair and maintenance in the amount of $2,750,000. The City asserts that the floating breakwater is working as designed to protect against southerly wind and waves and no longer needs replacement as recommended in the last study. Through the value engineering exercise, it was determined that the National Economic Development (NED) plan is now Alternative 1C which provides the inner harbor protection at a reduced cost.

In 2012, the City of Port Lions began a two-phase process to replace the float system in the harbor. As of March 2013, there are 69 slips in the harbor for permanent moorage, 55 of which are rented to permanent stall holders. In addition, there is 986 linear feet for transient moorage. The new floats are of more hearty construction and should be able to better withstand the wave action in the inner harbor area. This updated harbor configuration is considered the future without-project condition.

Phase II of the float replacement project will be completed after installation of the new breakwater. The City of Port Lions reports that once float replacement is complete, the harbor will accommodate 124 vessels. This is considered the future with-project condition.

The 2005 feasibility report assumed that regional moorage demand was greater than supply because other harbors in the region had large waitlists for moorage space. There are many factors which affect a boater's decision on moorage location and it is often not a valid assumption that boaters would utilize moorage at a particular harbor simply because they are on a waitlist for a harbor in the same region. This analysis utilizes the results of the Port Lions Small Boat Harbor Survey conducted in December 2012 as a more precise estimate of the demand for moorage.

a. Changes as a result of survey responses

The population of potential Port Lions harbor users was obtained from the Alaska Department of Fish and Game (ADF&G) permit database using the following criteria:

- permit holders with a Port Lions, Kodiak, or Afognak mailing address,
- permit holders with 2012 permits for waters around Kodiak Island, and
- vessel owners indicating that Port Lions or Kodiak were homeports.

Survey respondents were asked if they were currently homeported at Port Lions or if they would use Port Lions in the future with improved harbor conditions.

Port Lions Addresses: All of the survey respondents who indicated that they were currently homeported in Port Lions also had a home address in Port Lions. Since Port Lions is not connected by road to any other community, it is assumed that all 21 boaters with Port Lions addresses would prefer permanent moorage at the Port Lions harbor.

Other Addresses: Survey participants who were not homeported in Port Lions were asked if they would use moorage there if harbor conditions were improved. Twenty-eight percent of all respondents stated that they would use moorage at Port Lions and most of these had home addresses in Kodiak: thirty-one percent of respondents with Kodiak home addresses would

use moorage at Port Lions. Applying the sample proportion of responses of Kodiak boaters who are interested in using moorage at Port Lions to the population of Kodiak boat owners surveyed results in a total of 111 Kodiak boat owners interested in using moorage at Port Lions (31% * 355 = 111).

In addition, there were 3 survey respondents from communities other than Kodiak who expressed interest in using moorage at Port Lions. These 3 responses are added to the estimate of moorage demand.

Other Vessels: Since completion of the feasibility study in 2005, a rock quarry operation opened on Kodiak Island. Freighters operating from the quarry have expressed an interest in Port Lions moorage. Telephone calls to freighters utilizing Port Lions, reveals that one company has 4 vessels which they would consider basing in Port Lions.[2] These four vessels are included in the estimate of moorage demand for Port Lions.

b. Type of Moorage

Vessel operators typically select a type of moorage that will work well for their operation. Permanent moorage requires that the vessel operator sign an agreement for a full year's slip rental in exchange for which they receive a dedicated spot in the harbor. Transient moorage can take several forms: less than one year rental (e.g. 3-month or 6-month), or a vessel operator could simply arrive at the harbor and see if there is space available. Vessels arriving at the harbor may not need moorage at all but just use of the boat ramp to pull the vessel in and out of the water. The survey asked boaters how they would use the harbor if available. Survey respondents indicating they would use moorage at Port Lions fell into the following categories: 67 percent transient, 29 percent permanent, and 5 percent would use the launch ramp. These percentages are applied to the Kodiak boaters who would use moorage at Port Lions.

The survey responses from other boat owners and freighters were used to determine the type of moorage these boaters preferred. Table 1 summarizes moorage demand for Port Lions harbor by moorage type. This moorage demand is for all vessel types (commercial fishing, charter/sightseeing/water-taxi, and subsistence).

[2] Email communication with Sully Sutherlin, Paradigm Marine, LLC. March 7, 2013.

Table 1. Estimated Moorage Demand for Port Lions Harbor, by moorage type

Boaters	Permanent	Transient	Boat Launch	Total
Port Lions boat owners[1]	21	0	0	**21**
Kodiak boat owners[2]	32	74	5	**111**
Other boat owners[3]	1	1	1	**3**
Freighters[4]	4	0	0	**4**
Total	**58**	**75**	**6**	**139**

Source: Port Lions Small Boat Harbor Survey Results, April 2013.

1) All Port Lions boat owners are assumed to prefer permanent moorage. There is no road to the community so boat owners with Port Lions addresses would require a permanent moorage slip in order to travel to and from the island.

2) The moorage demand estimate and moorage type preferences are based on responses from the Port Lions Small Boat Harbor Survey.

3) The moorage type preferences of "Other boat owners" are based on owners' survey responses.

4) Moorage preferences for freighters are based on personal communications with vessel operators.[2]

c. Moorage Demand Stability

The number of vessels seeking moorage at Port Lions can be influenced by many factors. Typical factors include changes in fishery management practices, distance from productive fishing grounds, fuel prices, efficiencies in industry practices, weather, and other similar influences. The advent of Individual Fishing Quotas (IFQs) for instance, resulted in a reduction of the salmon fishing fleet in Alaska as the "race for fish" was replaced with the catch share system. Fishing vessels were no longer tied to a particular period of time to harvest but could harvest their share at any time over the fishing season. Management practices such as these were implemented in the late 1990s and early 2000s for the Gulf of Alaska fisheries.

Data from the State of Alaska Department of Fish and Game (ADF&G) show that the number of vessels participating in Kodiak Island Borough commercial fisheries decreased at a relatively steady rate between 1995 and 2006 (see Figure 1). Between 2006 and 2010 (the most recent year for which data is available), the number of fishing vessels appears to have leveled off. This suggests that the moorage demand depicted here is realistic for the Port Lions harbor improvement.

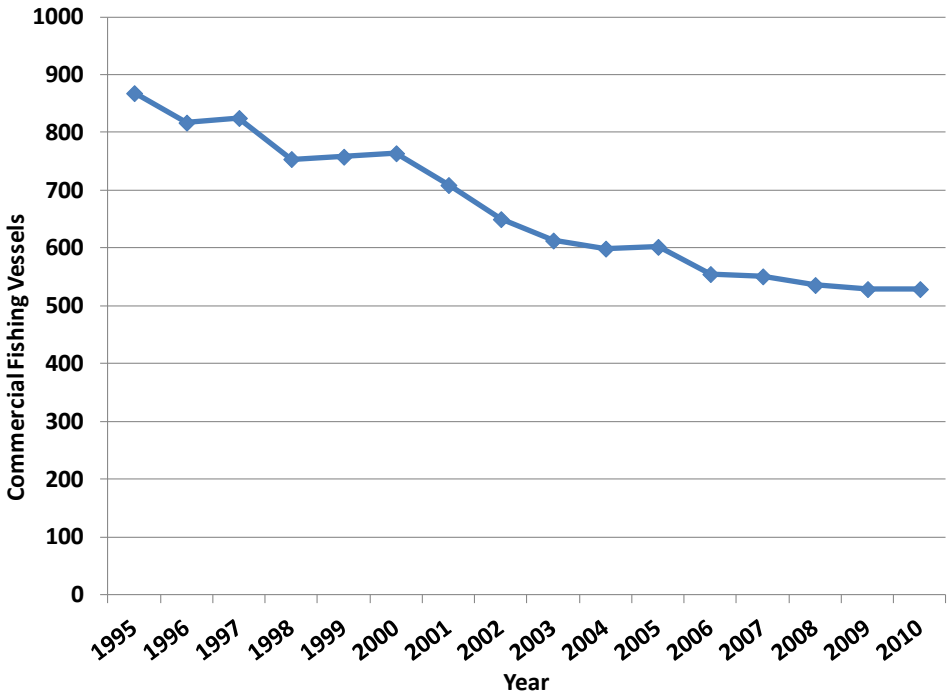

Figure 1. Kodiak Island Borough Commercial Fishing Vessels
Source: State of Alaska Department of Fish and Game, Commercial Fisheries Entry Commission

2. Fuel Prices

The 2005 report used an average fuel price of $1.30 per gallon for vessel operating costs. According to the Pacific States Marine Fisheries Commission (PSMFC) survey of monthly marine fuel prices, the average commercial price per gallon of number 2 marine diesel in Kodiak from February 2012 through January 2013 was $3.96 per gallon. This updated fuel cost was used to update hourly vessel operating costs which are used in several benefit categories.

3. Vessel Investment Costs

Another updated category is the average investment cost for Kodiak Island vessels. The 2005 report estimated vessel values for four different vessel size categories. For this report update, a web search of boat brokers was conducted. Average vessel prices based on vessel length and gear type is $681,000 for 58-foot seine, longline, and crab vessels; $186,000 for 45-foot seine, longline, pot and jig vessels; $102,000 for 32-foot longline and net vessels; and $35,000 for 22-foot net vessels (see Table 2). The 2005 report used a percentage of vessel value to calculate some operating expenses. For example, vessel maintenance and repair was estimated at 9.5 percent of vessel value and business expenses are 2 percent of vessel value. These same proportional assumptions are used to update the vessel operating cost profiles in this update.

Table 2. Vessel Value Updates

Description	58 ft Seine / Longline / Crab	45 ft Seine / Longline / Pot / Jig	32 ft Longline / Net	22 ft Net
Investment in 2005 dollars	$ 336,000	$ 143,000	$ 67,000	$ 33,600
Investment in 2013 dollars	$ 681,000	$ 186,000	$ 102,000	$ 35,000

Source: Vessel values updated using Dock Street Brokers and Alaskaboats.com websites for current selling prices. Investment dollars shown here are the averages of multiple listings available in January 2013.

B. Update of Benefits

The 2005 navigation study evaluated present and future economic losses that could be recovered by correcting harbor related problems. These losses include direct damages to vessels and the harbor infrastructure. The benefit categories are updated as follows:

1. Preventable Marina Damage

According to the 2005 report, the existing breakwater at Port Lions has adequately withstood winter storms but the basin area behind the breakwater can be extremely rough with waves reported as high as six feet. These waves cause movement of the floating dock which has resulted in the docks coming loose from the anchor system and vessels breaking lines, banging against the docks, and chafing at fender systems.

Estimates for this benefit category in the 2005 analysis were based on two events of marina repair which occurred since the breakwater's installation in 1983. Repairs included maintenance to the breakwater and float system and were assumed preventable because they occurred within twenty years of project installation. The 2005 analysis assumed that breakwaters should last twenty years before needing maintenance. The costs of these repairs were based on project records and were annualized over the life of the project. The previous report assumed that the project history formed the basis for annualizing costs and that these costs could be reasonably expected to continue over the 50-year period of analysis.

The 2005 analysis used the State of Alaska's cost estimates for float repair in this benefit category. The condition of the mooring floats within the harbor degraded much faster than expected because of the rough conditions. According to the Port Lions harbormaster, the original floats continued to degrade, despite yearly maintenance efforts, to the point where many were removed, leaving only 12 permanent slips available for vessels in the harbor in 2009.

A portion of the harbor float system was reconstructed in 2012 through funding from the Economic Development Administration (EDA) and a State of Alaska Tier I Port and Harbors

Grant. This is referred to as Phase I of the float replacement project. The estimated cost for Phase I was $4.1 million and it provided 69 slips in the Port Lions Harbor.[3] Phase II of float replacement at Port Lions will be completed once the construction of the Corps project is done. The estimated cost of Phase II is $3.3 million, based on cost estimates provided by the City of Port Lions, and it is expected to provide 55 additional slips.[3]

The average annual cost of float maintenance in the without-project condition is $23,000 as reported by the City of Port Lions (updated to 2013 dollars). In the without-project condition, float replacement is estimated once every ten years due to the rough conditions in the harbor. The estimated cost of float replacement is based on the cost of Phase I float replacement.

In addition, the existing floating breakwater will require reduced frequency of replacement as a result of the additional protection provided by the new Corps rubblemound breakwater. At the time of the previous feasibility study, the State of Alaska owned the floating breakwater in Port Lions. In 2006, the State transferred ownership to the City of Port Lions along with $2.75 million for overall harbor repairs. The City of Port Lions reports that they made some repairs to the floating breakwater and have repositioned it to provide additional protection since 2006. This analysis assumes that in the without project condition, the floating breakwater requires replacement every 15 years. The 2005 feasibility cost appendix estimated the cost to replace the floating breakwater was $1.8 million. Updating this cost to current dollars using the Civil Works Construction Cost Index System results in an updated replacement cost of $2.1 million. The frequency of replacement is based upon the current floating breakwater being considered in "like new" condition in 2006.

The with-project condition shows a reduced frequency of necessary repairs, float replacement, and floating breakwater replacement. Float repairs are only expected once every 15 years. Based on the cost assumptions in the 2005 report, float repairs are estimated at 7 percent of the installation price every 15 years (assuming the remaining floats are constructed following the new breakwater installation). This amount is approximately $518,000 based on the cost of the Phases I and II float replacement. Float replacement with navigation improvements are expected every 30 years at a cost of Phases I and II of float replacement. Floating breakwater replacement is expected once every 25 years in the with-project condition, at a cost of $2.1 million. The difference between the without-project condition and the with-project condition results in reduced marina damage of $159,000 annually.

2. Local Emergency Cost

The 2005 analysis reported that the community must perform maintenance to the harbor, but that they are not adequately funded to perform the necessary services. This means that a large amount of unpaid labor is necessary to maintain the harbor. The report then details the value of this unpaid labor but missing Corps guidance on the value of unpaid labor, uses the direct financial measure from harbor records on the cost of responding to emergencies at the harbor.

[3] Telephone and email communication with Steve Andresen, Mayor of the City of Port Lions. April and July 2013.

The 2005 analysis documented that the cost of paid emergency labor was $18,100 per year. Using the Bureau of Labor Statistics Employment Cost Index for Construction, Extraction, Farming, Fishing and Forestry occupation code to update this value to 2013 dollars (the most recent index year available), the cost of paid emergency labor is $22,000.

Table 3. Value of Paid Emergency Labor

Paid Labor calculation update	
Emergency paid labor (2005 report)	$18,100
Employment Cost Index (March 2005)	97.9
Employment Cost Index (March 2013)	118.8
Emergency paid labor (2012 price level)	**$22,000**

3. Damage to Skiffs

The 2005 report detailed that there were 27 skiffs under 20 feet in the community which were either stored in the small boat harbor or stored on trailers and launched at the boat ramp. The Port Lions small boat harbor ramp is not serviceable in all weather conditions. In the case of a storm, skiffs sustain damages by remaining moored at the small boat harbor or attempting to load onto a trailer during poor weather. If the skiff has to be tied at a high risk slip during a storm, the skiff is sure to experience broken lines, scuffs, broken deck hardware, and potentially total vessel loss.

The 2005 analysis estimated annual skiff damages related to rough mooring conditions. The estimates from the 2005 report are shown in Table 4.

Table 4. Annual Skiff Damage from 2005 report

	Low	High
Line Replacement		
$55 x 27 skiffs	$1,500	
$55 x 27 skiffs		$1,500
Cleat Related Damage		
$300 x 2 skiffs	$600	
$300 x 4 skiffs		$1,200
Scuffs, Scrapes		
$1,500 x 3 skiffs	$4,500	
$1,500 x 5 skiffs		$7,500
Impacts, Dents, Scratches		
$4,500 x 2 skiffs	$9,000	
$4,500 x 4 skiffs		$18,000
Total	**$15,600**	**$28,200**

Conversations with the City of Port Lions reveal that there are now about 30 skiffs which use Port Lions harbor, 25 of which use the launch ramp and the other 5 have permanent slips. The costs for each repair were updated. For line replacement, the 2005 report used the retail price of "MegaBraid" dock lines in 2005 dollars. An internet search revealed the updated prices of

the same "MegaBraid" dock lines, and showed the price had increased by an average of 82 percent. The other damage categories were updated using the Consumer Price Index (CPI). The 2005 report lacked information as to the derivation of these costs, and updating them using an alternative method may not be representative. The results of the cost updates are presented in Table 5. The 2005 report selected the low value for avoided damages and this report does the same.

Table 5. Annual Skiff Damage, 2013 Update

Cost	# Affected skiffs	Low	High
Line Replacement			
$100	30	$3,000	
$100	30		$3,000
Cleat Related Damage			
$360	2	$700	
$360	4		$1,400
Scuffs, Scrapes			
$1,700	3	$5,400	
$1,700	6		$10,800
Impacts, Dents, Scratches			
$5,200	2	$10,800	
$5,200	4		$21,600
Total		**$20,000**	**$37,000**

Note: Columns may not sum due to rounding.

4. Beaching Damage

Skiff owners who are unable to haul their boats out during poor weather conditions may make the choice to beach their boat rather than risk having it swamped. Potential damages from running the skiff onto the beach include boats being swamped in the waves, impact to the hull, and bottom contact with the drive while the prop is engaged. The 2005 report showed that the economic consequences of emergency grounding can be very high but applies only to a few boats each year. Some cases of damage were reported to be severe, while sometimes the skiff can be driven up the beach without incident. The 2005 report assumed that since the number of beaching incidents is small, over a long time span, damages related to emergency beaching will approximate those of vessels left at the harbor in protected areas.

The 2005 study reported that there are 6 to 12 beaching events per year. The report then calculated the amount of damages per vessel based on the skiff damages presented in the previous category. In this report update, the damage per skiff ranges from approximately $670 ($20,000 annual skiff damage / 30 skiffs) to $1,200 per skiff ($37,000 annual skiff damage / 30 skiffs). These skiff damage values are then multiplied by the 6 to 12 beaching events per year to represent an annual beaching damage cost of approximately $4,000 to $14,800 per year. Taking a conservative approach, the selected value in the 2005 report was the low range value. This update follows the same underlying assumptions and uses $4,000 as potential avoided annual cost.

5. Large Vessels Set Adrift

According to the 2005 report, at least one vessel is grounded each year by storm conditions that causes broken lines or pulled cleats from the boat deck or dock. In some years, severe storms affect several vessels, but in any year, at least one vessel is expected to be affected. The amount of time that a vessel is grounded against the rocks is perhaps the single most significant factor in determining damage. Expected annual damage from vessels set adrift is the result of combining the severity and number of events with their expected frequency. The 2005 analysis developed vessel damage scenarios from discussions with repair yards and marine surveyors. Four ranges of damage were identified for boats with fiberglass hulls and boats with aluminum hulls. The damage scenario categories were then used to estimate the likelihood of damage and the expected cost as a percent of vessel value. The calculations of the annual loss rate from the 2005 report are presented in Table 6.

Table 6. Annual Loss Calculation

Damage Range	Frequency	Tide Condition	Avg. % Damage	Freq of Interval	Weighted %
0 - 15%	0.99	0.33	7.5%	0.01	0.03%
5 - 25%	0.50	0.33	15.0%	0.49	2.40%
15 - 40%	0.33	0.33	27.5%	0.17	1.50%
30 - 100%	0.25	0.33	65.0%	0.08	1.72%
				Total	**5.65%**

Typically the larger vessels which are subject to grounding by storms are owned by absentees and are assumed to be a combination fishing boat in the 45-foot to 58-foot class. The 2005 analysis determined estimated annual damage by multiplying the replacement cost of boats in those size classes by the calculated annual loss rate. The average replacement cost of a 45- to 58-foot vessel is $433,500 (see Table 2). Following the methodology from the 2005 report, the estimated annual expected loss from preventing large vessels from being set adrift with subsequent grounding damage is $24,500 ($433,500 x 5.65%).

6. Replacement of Lines

The previous report found that Port Lions skippers replace their lines every year based on harsh docking conditions. While in calmer harbors, dock lines can be used for several years. The amount spent on lines varies with the size of the vessel. The 2005 report assumed that lines cost $500 for the 8 vessels in the 40- to 60-foot range, $300 per vessel for the 13 vessels in the 30 to 40-feet range, and for the 34 vessels under 30-feet the cost is $100 per vessel. These cost estimates were based on the retail price of “Mega Braid” mooring lines, which is typically used on marine vessels.

This analysis updated the price of “Mega Braid” dock lines using an internet search for retail prices for the dock lines. Table 7 shows the costs for dock line in 2005 and 2013.

Table 7. Mooring Line Cost

Mooring Line	Cost (2005 report)	Cost (updated 2013)
Mega Braid Dockline 1-1/4"x80"	$ 409.99	$ 669.99
Mega Braid Dockline 1"x50"	164.99	294.99
Mega Braid Dockline 1"x60"	189.99	389.99
Mega Braid Dockline 1"x50"	199.99	359.99

Source: Western Marine Company online catalog. http://www.westernmarine.com/main/homepage.html

The change in price for each of the Mega Braid Dockline categories is used to update the estimated prices for line losses. In addition, the number and length of vessels changes somewhat from the 2005 report. There are now 55 permanently moored vessels at the harbor with 10 or more transients on any given day. The previous report then assumed that the with-project condition reduces line replacement by 50 to 80 percent for the affected vessels. Updated annual avoided damages from line replacement range from $19,000 to $30,000. The 2005 report used the high range value for total benefits calculation, so this report does the same and uses $30,000 as the annual avoided damages.

Table 8. Line Damage Reduction

Vessel length	Number	Annual/vessel	Annual total
40 - 60 ft	10	$ 965	$ 10,000
30 - 40 ft	29	$ 685	$ 20,000
< 30 ft	26	$ 295	$ 8,000
TOTAL	**65**		**$ 38,000**
With project: Assume line replacements reduced by 50-80%			
50% reduction		Low	$ 19,000
80% reduction		High	$ 30,000

7. Damage to Cleats

If the moorage lines do not break, the shock is transferred to the vessel and to the dock causing failures at other points of the moorage arrangement. Such events lead to cleats breaking off or pulling out of the dock. Related failures on vessels are damage to the surrounding mounting area near the deck cleats. Consequences of these failures can involve major repair cost if aluminum welding or fiberglass repair is required. The 2005 report found that there were no local statistics kept on these events, but personal communications revealed that a reasonable assumption for these events was two cases annually with repair costs ranging anywhere from $300 to $2,000 per event. Similarly, this report found that there is little information available with which to update this benefit category. As such, this effort assumes that two damage events per year at a cost of $300 to $2,000 is still a reasonable assumption given the wide range of repair costs. Updating these costs to 2013 dollars using the Anchorage Consumer Price Index results in repair costs of $360 to $2,400 per event. With two events the annual damage is estimated to range from $700 to $4,800 per year. The 2005 report used the low range estimate and this update does the same, for an annual damage of $700.

8. Vessel Tending

The 2005 study reported that due to lack of available protected moorage, during severe storm conditions some vessel owners adopted the practice of boarding their boats and securing them or moving them to other locations during storms. The crew tending the vessel stayed for the duration of the storm to keep the boat out of danger. However, this was not always possible due to absentee ownership or sea conditions. The 2005 analysis estimated that storm tending of large vessels was required several times per year and could be avoided with additional harbor protection. The larger vessels sometimes required more than one person to secure the vessel, and they sometimes required around the clock attention during storms of up to 9 days. The 2005 report found that evaluating the costs related to vessel tending was difficult due to lack of information. There exists only anecdotal evidence regarding the time and effort spent tending to vessels. Also, it is difficult to separate the time spent on watch of large vessels from other storm related response activities.

As of January 2010, the Port Lions harbormaster reported that crew members staying aboard vessels while they are moored at the harbor is not a common practice. Most of the vessel owners are residents of Port Lions, so they do not stay aboard their boats, but simply check on them as necessary during storm conditions. When non-local vessels moor at Port Lions, the harbormaster tries to put the vessels in the most protected inner-harbor slips to eliminate potential damages. The harbormaster reports that these non-local vessel owners do not stay on their boats while they are in the harbor. Even during storm conditions, vessels are secured using extra lines and buoys, and are often checked on by vessel owners throughout the night, but generally no one stays aboard the vessel.[4] Given the vessel tending patterns in Port Lions, benefits have not been quantified due to the limited and sporadic amount of time that vessel owners expend tending to their vessels.

9. Vessel Damage at the Docks

Many vessels that moor at the Port Lions harbor are subject to damage from hulls rubbing against the docks or contact with other vessels. Vessel repair costs can be very high because there is no repair facility in Port Lions, so the additional cost of vessel travel and the loss of time spent traveling to Kodiak or an alternate ship yard are induced. Local residents interviewed for the 2005 study stated that cosmetic vessel damages are generally a deferred cost that will not be realized until the vessel is sold. The accrued damage does not interfere with the performance of the vessel, but can reduce the value of the vessel by 5 to 15 percent. Interviews with vessel repair facilities were conducted for the 2005 effort, which confirmed that cosmetic vessel damage usually reduced the vessel value by 5 to 15 percent.

The 2005 report assumed that in the without-project condition, there are 55 vessels at Port Lions during the harvest season. The report assumed that all of these vessels are subject to damage from the docks. The previous analysis assumed that local emergency response action

[4] Personal communication with Russell Gunderson, Port Lions Harbormaster, 8 January 2010.

was effective in preventing 80 percent of vessel damages in the without-project condition and that the remaining vessel damages would be eliminated with navigation improvements. For this report update, there are 55 slips currently rented out to vessels, plus up to 10 additional transient vessels during the harvest season.

The 2005 report utilized a without-project fleet value of $5,920,800 for the 55 vessels in Port Lions. Based on the updated vessel values collected from marine brokers, and the size distribution of the vessels currently able to use Port Lions harbor, the without-project fleet value was recalculated. The updated without-project fleet value is $17,172,000.

The total avoided damages range from $171,720 ($17.2 million fleet value * 20% of vessels at the docks * 5% vessel values) to $515,160 ($17.2 million * 20% * 15%). When these damages are annualized over the project period of analysis using the FY13 discount rate, the annual benefits range from $7,650 to $22,960. The previous report used the average of the range of values and this updated report does the same using $15,300 average annual avoided damages for reduced vessel value.

10. Reduction in Harvest Cost

According to the 2005 report, the unmet regional demand for moorage and Port Lions' proximity to the fishing grounds would result in all 124 potential slips being rented to commercial fishermen. In the updated without-project condition, the harbor can accommodate 69 vessels. The Port Lions survey results confirm that moorage demand exists for moorage at Port Lions for up to 139 vessels. The travel time savings is applied to an additional 55 vessels (124 potential vessels in the harbor footprint minus the 69 slips currently installed).

Alaska fishing regulations open and close various fishery locations at two to four day intervals during the June through September salmon harvest. The 2005 effort analyzed the Alaska Department of Fish and Game's (ADF&G) commercial fishing vessel database in the Kodiak Management Area (KMA) by statistical area.

In-season management of the KMA commercial salmon fishery is structured around seven districts that are subdivided into 56 sections. These sections are divided further into statistical areas.[5] Analyses conducted for the 2005 feasibility report and this report update found that the majority of statistical areas in the KMA were closer to Port Lions than to Kodiak. In addition, the statistical areas which are closer to Port Lions were responsible for a majority (up to 77 percent, depending on the harvest year) of the total salmon harvest in the KMA.[5] Since the majority of fishing is done closer to Port Lions, fishermen could reduce travel time in return to port during fishing season closures.

The 2005 report assumed that the 89 additional slips available with navigation improvements served as the limiting factor for the number of vessels that could take advantage of the Port

[5] Dinnocenzo, J. and I.O. Caldentey. 2008. Kodiak management area commercial salmon annual management report, 2007. Alaska Department of Fish and Game, Fishery Management Report No. 08-45, Anchorage.

Lions location. Similarly this report assumes that the updated value of 55 additional slips (124 slips with-project – 69 slips without-project) serves to limit the number of vessels. The previous report also assumed that the number of salmon season openings during a typical season would determine the number of trips that fishermen would make to return to port during season closures. The number of salmon season openings used in the 2005 report was 43, based on the 1999 fishing season. An examination of the commercial salmon fishing seasons of 2004 through 2010 revealed an average number of salmon season openings of 43 during that period, with a minimum of 37 and a maximum of 53.

The economic benefit of navigation improvements at Port Lions is derived from the number of vessels returning to port during the salmon season and the reduction in operating cost based on the travel time to Port Lions as opposed to Kodiak or alternative harbors. For the low range estimate, return trips were assumed to take place for half of the salmon season closures for each vessel (55 vessels * (43 salmon season closures / 2) = 1,183 vessel trips). Next, the number of vessel trips was reduced by 5 percent to account for vessels under 23-feet which are considered occasional salmon fishermen. The number of vessel trips is further reduced by 23 percent to account for recent participation rates in the salmon fishery.

The reduction in time spent traveling to alternate ports is estimated at 3 hours one-way based on the location of popular fishing grounds relative to Port Lions. The reduction in the value of time spent traveling is determined by the vessel operating costs per hour. These costs were updated for this effort based on increased fuel costs and increased vessel values. The 2005 report then determined the average hourly operating costs for vessels in the with-project fleet based on the assumed distribution of vessel sizes in the future Port Lions fleet. This distribution of the size of the future fleet was based on survey responses for this analysis and the weighted average values of operating costs were updated accordingly and are shown in Table 9.

Table 9. Updated Weighted Average Hourly Operating Cost of the With-Project Fleet

Size Class	Size Distribution	Low Range Hourly Cost	Low Weighted	High Range Hourly Cost	High Weighted
Up to 22 ft	17%	$82.38	$14.20	$211.85	$36.53
23-36 ft	24%	$98.73	$23.83	$169.25	$40.85
37-54 ft	34%	$190.46	$65.67	$326.49	$112.58
55-58 ft	24%	$269.54	$65.06	$462.07	$111.53
Weighted Average Hourly			**$168.77**		**$301.50**

The low range estimate for reduced operating costs as a result of proximity to harvest location is $866,100 (1,183 vessel trips * 72% of vessels participating in the fishery * 6 hours saved per round trip * $168.77 vessel operating cost per hour).

For a high range estimate, the analysis assumes that the number of vessels participating in the fishery increased from 72 percent to 80 percent to include all commercial fisheries rather than just salmon, and return trips were assumed to take place at every closure (55 vessels * 43 season closures = 2,365 vessel trips). The high range estimate for reduced travel costs is $3.42 million (2,365 vessel trips * 80% vessel participation * 6 hours saved per round trip * $301.50 vessel operating cost per hour).

Table 10. Reduction in Harvest Cost Calculation

Calculations	Low	High
Vessels that could relocate to Port Lions	55	55
Season openings	43	43
Return trips (50% and 100%)	22	43
Vessel participation	72%	80%
Round Trip hours saved (per trip)	6	6
Weighted Average Hourly Operating Cost	$168.77	$301.50
Reduction in Harvest Cost	$866,100	$3,422,600
Water taxi		
Price per trip	$ 125	$ 175
Rate of water taxi use	33%	33%
Water taxi expense	$ 35,600	$ 110,400
Harvest Cost Savings (Reduction in harvest cost minus water taxi expense)	**$ 830,500**	**$3,312,200**
Average savings		**$2,071,000**

In the with-project condition, vessels could moor at Port Lions and crews could return to Kodiak via water taxi. So the total annual reduction in harvest cost must subtract water taxi expense from the reduction in travel costs. Water taxi service is estimated between $125 and $175 per passenger, per trip[6] compared to $96 per trip in the 2005 report. Water taxi service is estimated to occur for one-third of fishing vessel return trips to port. Using these assumptions, the cost of water taxi service for the commercial fishing fleet ranges from $35,600 to $110,400 per year.

Once water taxi service has been subtracted, the savings resulting from reduced travel to alternative ports ranges from $830,500 to $3,312,200 per year. The selected value for this benefit category is the average of the high and low range: $2,071,000 per year.

This is a significant increase from the level of harvest cost savings presented in the 2005 report. This can be attributed to an overall increase in vessel operating costs due to an increase in vessel values and fuel costs.

The Port Lions survey asked commercial fishermen to indicate where they currently deliver their catch and if they would change delivery methods with moorage at Port Lions. Most respondents (87 percent) deliver to a shore-based processing facility in Kodiak and/or to a tender vessel. Only two survey respondents indicated they would change their delivery methods with moorage at Port Lions. If commercial fishermen were to increase participation in fisheries near Port Lions, they would still have to make trips to Kodiak (or other communities) to processing facilities. These additional trips may offset the benefits of increased moorage. However, increased fishery participation near Port Lions could entice

[6] Email from City of Port Lions, March 27, 2013 for current water taxi rates to Kodiak.

tenders (or floating processor) to move operations closer to the area, which would save some trips to the land-based processor.

11. Water Taxi Service

The 2005 report assumed that in the without-project condition, existing moorage was inadequate to assure water taxi availability more than about once per week. Water taxis in Port Lions double as charter and commercial fishing vessels and may be out fishing and unavailable for transport when needed. In the case of many passengers, time spent waiting for transportation can translate into lost earnings or lost leisure time.

The 2005 report further assumed that navigation improvements would provide year-round moorage for additional vessels and increase the chance that a vessel would be a full-time water taxi service. Those who wish to travel must wait for weather conditions that will allow flight or the next available ferry service. Ferry service has been intermittent in recent years as the ferry that serviced Port Lions is aged and Alaska Marine Highway System has been challenged to keep it running safely. Changes to the water taxi service at Port Lions is unknown at this time so there are no proposed benefits.

12. Charter Operations

A total of 4 charter boat operators responded to the Port Lions Small Boat Harbor survey: one with a home address in Kodiak with no homeport listed, and 3 with home addresses and homeports in Port Lions. The charter boat operator from Kodiak would not use moorage at Port Lions if harbor conditions were improved. This boat also reported that it did not operate during 2012, so responses were not included in further analyses.

State of Alaska business license records reveal that as of January 2013 there were 12 business licenses in Port Lions for charter fishing operators and/or lodges which could have vessels associated with their operations. The three survey respondents, while not statistically valid, help provide a better picture of Port Lions charter operations and what might change as a result of harbor improvements.

Based on the survey responses, charter, sightseeing, and water taxi boats operating in Port Lions have an average of 4 customers and 1 crew member per trip. The average excursion on these vessels is 8.2 hours and the average charge per passenger is $680 for guided fishing/sightseeing tours, while water taxi fees range from $125 to $175 per person. Based on survey results, charter/sightseeing boats made a total of 105 trips from Port Lions in 2012, with an average of 35 trips per vessel. The survey then asked if these boaters would make additional trips from Port Lions if harbor conditions were improved. One Port Lions respondent wrote the comment that they would, “Possibly have more trips if there were additional moorage for charter vessels.” One other respondent stated that they would not change the number of trips, and the final respondent stated that they would make 3 additional trips per year.

This analysis assumes that in the without-project condition, all 12 charter, sightseeing, and water taxi businesses in Port Lions make an average 35 trips per year, with 4 passengers per trip, and charge $680 per passenger. This equates to gross charter revenues of $1.14 million

per year. In the with-project condition, the survey results are used to form the assumption that two-thirds of Port Lions charter operators would take three additional trips per year with the same number of passengers and cost per passenger. The with-project annual gross charter business revenue becomes $1.21 million.

Table 11. Charter, Sightseeing, and Water Taxi Vessel Gross Revenues

	Without Project	With Project
Charter/Sightseeing/Water Taxi Boats in Port Lions	12	12
Average trips per vessel, per year	35 x 12 vessels	35 x 4 vessels 38 x 8 vessels
Passengers per trip	4	4
Average charge per trip, per passenger	$680	$680
Gross Charter Revenue, per year	$1,142,000	$1,208,000

Engineering Regulation (ER) 1105-2-100 states that benefits resulting from improved charter operations are the increases to net income. This means that net revenue gains for charter operators for additional charter trips must be estimated. This report used the *Navigation Improvements, Valdez, Alaska* (January 2010) feasibility report to calculate charter vessel operating costs. Only the variable costs of operating the vessel change with increased vessel operation because fixed costs are incurred regardless of whether the vessel is put to productive use.

Charter vessel variable operating costs include wages, fuel, and repair and maintenance expenses. Charter wages are a variable cost, because charter captain and crew are typically paid by the hour. These wage rates are based on State of Alaska Department and Labor and Workforce Development Research and Analysis Section wage tables for Southeast Alaska.[7] Fuel costs are based on the current price of marine diesel[8] and assumptions regarding the number of hours per season that charter vessels are used. Repair and maintenance expense are based on 9.5 percent of vessel value. Utilizing these assumptions and data, the average hourly variable operating cost for charter vessels at Port Lions is $260.19.

[7] http://live.laborstats.alaska.gov/wage/index.cfm?at=70&a=200001

[8] Pacific States Marine Fisheries Commission and the Economic Fisheries Data Program track fuel prices by community in Alaska. http://www.psmfc.org/efin/index.html

Table 12. Charter, Sightseeing, and Water Taxi Variable Expenses

Description	45-ft Charter Vessel
Annual Variable Cost	
Annual Charter Wages	$170,000
Annual Fuel Cost	$235,000
Annual Repair/Maintenance (@ 9.5% of vessel value)	$17,700
Total, Annual Operating Cost	**$421,000**
Annual Charter Boat Hours (130 operating days * 12.5 hours per day)	1,625
Hourly variable cost - Charter vessels	**$ 260.19**

Survey data revealed that average excursion length is 8.2 hours, the average number of passengers on an excursion is 4, and about 2/3 of the charter operators would increase the number of trips made annually if harbor conditions were improved.

In the with-project condition, charter and sightseeing vessels have the potential to increase net revenues by $14,000 annually. The calculations associated with the change in net revenues are shown in Table 13.

In addition to the benefit for charter operators, charter customers may also benefit. Charter customers may realize an improved recreation experience aboard their charter in the with-project condition as compared to the without project condition. Also, the new customers who partake in charter trips from Port Lions also represent a recreation benefit for the value of their recreational experience. The 2005 analysis stated that all recreation use of an improved Port Lions Harbor would be incidental to the commercial purpose of the project. Therefore no recreation benefits were calculated. This LRR follows the same assumptions.

Table 13. Charter, Sightseeing, and Water-Taxi Vessel Net Revenues

Total Revenues	
Number of charter boats	12
Passengers per trip	4
Charge per passenger	$680
Annual trips per vessel w/o project	35
Percent of vessels that would increase trips	66.7%
Number of trips per year with project	38
Revenues w/o project	$ 1,142,400
Revenues with project	$ 1,207,700
Total Expenses	
Average hours per trip	8.2
Average vessel operating cost per hour	$ 260.19
Expenses w/o project	$ 896,100
Expenses with project	$ 947,300
Net Revenues	
Without Project	$ 246,300
With Project	$ 260,400
Difference (Potential Charter Benefit)	**$ 14,100**

13. Freighter Travel Cost Savings

Freighter vessels operating from the new Kodiak Island quarry have expressed an interest in Port Lions moorage. One company, Paradigm Marine, has four vessels which they would consider basing in Port Lions if moorage conditions were improved: a landing craft, a tug, and two barges. These are the four "freighters" described in the Moorage Demand section of this report, and listed in Table 1. Paradigm Marine reports that part of the attractiveness of Port Lions as a moorage location is its proximity to quarry operations and ferry service. The company reports that they could avoid trips to Kodiak to retrieve supplies by utilizing ferry service and other facilities at Port Lions instead.[9] The Port Lions harbor can already accommodate freighter traffic. Freighter vessels (typically landing craft) which come to Port Lions to deliver bulk goods or construction materials from Kodiak occasionally enter the harbor to utilize the gravel ramp as an alternate landing site due to poor conditions at the nearby ferry dock. Paradigm Marine would moor in the harbor if a larger protected area was available.

The distance from Port Lions to Kodiak is 48 nautical miles, round-trip. Vessel hourly operating cost information and rates of travel were provide by Paradigm Marine and are used in this category for calculations of avoided travel costs. However, as this data is provided by only one company, it will not be listed for confidentiality reasons. Paradigm Marine estimated

[9] Email communication with Sully Sutherlin, Paradigm Marine, LLC. March 7, 2013.

10 trips per year between Port Lions and Kodiak could be avoided. This means that the annual avoided travel cost for the freighters is $32,000.

This benefit category was not part of the 2005 analysis and represents a changed condition in the intervening years which has changed the economic justification. In this case, the changed condition is the opening of a rock quarry on Kodiak Island which has increased freighter traffic near Port Lions.

14. Alternative Port Impacts

The justification for navigation improvements at Port Lions is based on regional moorage demand outweighing the available supply of moorage at other local harbors. Navigation improvements at Port Lions could alleviate some of the overcrowding since 55 new slips would become available. However, the 2005 analysis pointed out that if improvements at Port Lions decrease the wait list at Kodiak or other locations too much or if it causes Kodiak or others to lose customers, there would be adverse financial impacts on those harbors. This is not anticipated as a likely future scenario. The impacts on alternative ports are negligible as the 55 new slips at Port Lions will not meet all of the demand for moorage indicated by waitlists at other harbors. The current Kodiak waitlist is 66 boats (plus an additional 26 boats who already have moorage at Kodiak but are on the list for different slip sizes).

15. Other Direct Benefits

According to the 2005 report, the 'other direct benefits' are those, which are incidental to the purpose of the project in the sense that the plan formulation pivots on the separable justification of higher priority NED benefits and costs. Because the NED Plan navigation improvements are justified on the merits of narrowly defined net income effects alone, the effects such as Subsistence, Harbor of Refuge, and Search and Rescue are incidental in the sense that they have no incremental cost. The majority of the benefits and project justification for navigation improvements are derived from the NED benefit categories as stated above. But, there are other important effects which must be considered in an accurate analysis of benefits and costs. These are described below.

16. Subsistence Opportunity

The benefits derived from increased subsistence opportunity in the 2005 report are based on an estimated increase in the amount of per capita subsistence harvest and estimated replacement costs for that increased harvest. Estimates for the increase in subsistence harvest per person are based on comparing the demographic characteristics and subsistence harvest information of Port Lions to other nearby communities which have improved navigation.

Port Lions is estimated to be most like the nearby community of Ouzinkie (in terms of population, percent Alaska Native, and employment), which has a 21 percent larger per capita subsistence harvest. Ouzinkie has a small boat harbor facility which includes a breakwater and a dock. Therefore, it is assumed that with improved harbor facilities, the opportunities to harvest subsistence foods would increase, and Port Lions' level of harvest would be closer to Ouzinkie's. Providing improved all-weather moorage serves to increase the usability of

vessels for subsistence purposes. The benefits are derived based on the estimated replacement value of subsistence food. The mid-range estimate from the 2005 analysis was $4 per pound based on State of Alaska subsistence information.

The subsistence harvest information from the 2005 feasibility report was taken from a subsistence database from 1986. Since that time, there is a relatively small amount of new data available regarding the comprehensive subsistence harvest for both Port Lions and Ouzinkie (or other surrounding Kodiak Island communities). Alaska subsistence replacement values are not frequently reported or updated. The State of Alaska Department of Fish and Game publication, "Subsistence in Alaska, a Year 2010 Update", estimated the statewide range of subsistence replacement value to be $3.50 per pound to $7 per pound. Updating these prices to current dollars using the Anchorage CPI, the subsistence replacement value ranges from $3.78 to $7.56 per pound. This analysis utilizes the average replacement value of $5.67 per pound.

In addition, this analysis uses the current 2012[10] Port Lions population estimate of 201 people.[11] The change in subsistence harvest of 70 pounds per person reported in the 2005 report is still believed to accurately represent the effects of navigation improvements. The annual benefit from increased subsistence opportunity reported in the 2005 report was $53,500. The updated value of the increased subsistence harvest is $79,800 based on the updated population and food replacement value.

17. Harbor of Refuge

Navigation improvements at Port Lions would increase the opportunities for vessels to access all weather moorage and will enhance prospects that a vessel in danger will be able to perform self-rescue through accessibility of a safe haven. As further evidence of this, some respondents to the Port Lions survey indicated that Port Lions would provide a good shelter location if there was additional protection in the harbor.

Based on assumptions from the 2005 report, within the fleet that fishes near Kodiak, there is an average annual vessel loss rate of about 1 percent per year. The 2005 report assumed that potential vessel loss would be reduced as a result of adding 89 annual moorage opportunities for the 596 vessels in the Kodiak area. This represented a 15 percent increase in the availability of safe harbor in the KMA (89 slips / 596 vessels). Data from the Commercial Fisheries Entry Commission (CFEC) shows that in 2010 there were 532 commercial fishing vessels in the KMA. Also, this analysis now assumes that 55 potential slips could be added for safe harbor at Port Lions. This represents a 10 percent increase in the availability of safe harbor for vessels in the KMA (55 slips / 532 vessels).

The NED benefit estimate is based on the assumption that there is a tie between available safe havens and the success of self rescue activity from an at-sea vessel emergency. Presence of a

[10] As of this report writing, this is the most up-to-date population estimate available from the State of Alaska for Port Lions.

[11] State of Alaska Department of Labor and Workforce Development, Research and Analysis Section.

safe haven in close proximity to the vessel is presumed to reduce the risk of loss below the threshold of total casualty loss. The 2005 report assumed that a 15 percent increase in protected moorage will reduce the risk of preventable casualty loss to vessels in the immediate vicinity by an equal amount when other risk factors are accounted for. This analysis assumes that the reduction in preventable casualty loss is 10 percent.

The other risk factors which must be accounted for are the probable number of vessels which rely on Port Lions in an emergency situation, the number of days the fleet will be at risk for weather related losses, the casualty losses not preventable by a safe harbor, and the size and value of the vessel fleet. The 2005 report assumed that in the low range scenario, only commercial salmon fishing boats would rely on additional safe harbors. A search of the CFEC revealed that in 2010 there were 344 vessels in the KMA which were registered as salmon-fishing vessels. The high range estimate for this category included all commercial fishing vessels in the KMA, shown to be 532 in 2010. The next risk factor is the number of days the fleet is at risk for weather related losses. The low range estimate for this category included the salmon season exclusively. The timing of the salmon season has not changed since the 2005 report, and is estimated to be 19 weeks per year, or 36 percent of the year. The high range estimate for this category is that commercial fishing vessels are susceptible to weather related losses every day of the year.

The next risk factor category is the amount of casualty losses which are not preventable by additional safe harbor spaces. This is because a lack of accessible safe harbor cannot be blamed as a contributing factor for all vessel losses. The 2005 report completed a review of all vessel loss records between 1998 and 2002 and determined that 34 percent of vessel casualties could not have been avoided with additional safe harbor.

The calculation of benefits for this category utilizes the weighted average fleet value of the with-project Port Lions fleet. The average vessel values were updated based on researching online marine brokers. Based on the updated vessel values and the updated fleet weighting from the Port Lions survey results, an updated average fleet value was calculated. The updated average fleet value is shown in Table 14.

Table 14. Weighted Average Value for the future Expanded Port Lions Fleet

	58 ft	45 ft	32 ft	22 ft	Weighted Average Fleet Value
Investment	$681,000	$186,000	$102,000	$35,000	
Fleet Percent	24%	34%	24%	17%	
Weighted Investment	$164,400	$64,100	$24,600	$6,030	**$259,100**

Using the above assumptions, the benefits as a result of expanded Harbor of Refuge facilities can be calculated. A potential low range loss reduction credited to Port Lions navigation improvements is estimated at $22,000 annually (344 vessels at risk * $259,000 average vessel value * 1 % vessel loss rate per year * 36% of the year for salmon fishing * 66% of accidents believed to be preventable with safe harbor * 10% increase the amount of safe harbors). The high range loss reduction expands the number of vessels to include non-salmon fishers and incorporates loss prevention over the entire year and is estimated at $94,000 (532 vessels at

risk * $259,000 average vessel value * 1 % vessel loss rate per year * 100% of the year for all seasons * 66% of accidents believed to be preventable with safe harbor * 10% increase in safe harbors). These calculations are shown in Table 15. The 2005 analysis selected the low range value for inclusion in total annual benefits. In order to replicate the assumptions used in the previous effort, this report will also use the low range estimate of $22,000 per year of vessel losses which could be avoided with harbor improvements at Port Lions.

Table 15. Harbor of Refuge calculations

	Low	High
Vessels at risk	344	532
Weighted average vessel value	$259,100	$259,100
Vessel loss rate	1%	1%
Salmon season only	36%	100%
Rate of harbor preventable accidents	66%	66%
Estimated increase in safe harbor with project	10%	10%
Benefits from Harbor of Refuge	**$21,900**	**$94,100**

18. Search and Rescue (SAR)

The basis of benefits for this category is the calculation of SAR costs induced by the United States Coast Guard (USCG) per year, in addition to costs by other boaters assisting in SAR, which could be avoided with harbor improvements at Port Lions. The 2005 report utilized data stating that the average USCG cost per SAR mission in Alaska is $6,800. Data regarding the costs of SAR missions are uncommon and difficult to attain. Updating this cost estimate would require effort beyond the scope for this report update, so this figure was believed to accurately represent SAR costs near Kodiak.

Also assumed was that up to eight other fishing vessels in the area of a local SAR aid in search efforts at a cost of $9,600 per incident. This value was updated using the new vessel operating costs, and is assumed to be $6,200 per incident.

The 2005 report also accounted for the value of lost time for crews aboard boats which aid in SAR activities. The report assumed a wage rate of $15 per hour for each of 4 crew members for 24 hours per day for each of the eight additional search vessels. In addition, the lost time for the lost vessel (vessel that is the object of the SAR) was assumed at a wage rate of $15 per hour for each of 4 crew members for 3 days per SAR incident. The amount of time spent per SAR effort is assumed to be accurate, but the labor rates can be updated based on the Cornell University OCT study.[12] The Cornell study states that the value of lost time for a commercial salmon fishing crew to perform a non-fishing job is $32.06 per hour, updated to current values using the Bureau of Labor Statistics Employment Cost Index.

[12] *Value of Time Commercial Fishermen in Alaska Could Save with Improved Harbor Facilities* prepared by Cornell University Human Dimensions Research Unit, September 2006.

Using the updated wage rate and the other stated assumptions, the estimated cost per SAR event is $47,000 (see Table 16). Based on an average of 35 SAR events per year in the Kodiak area[13], the total annual SAR cost is estimated at $1.6 million.

The high and low range estimates for overall SAR costs are then calculated based on the assumptions stated in the Harbor of Refuge benefit category related to the number of incidents which are preventable based on increase safe harbors. The low range value for reduced SAR costs are based on reductions during the salmon season only and is equal to $26,000 ($1.6 million annual SAR cost * 65% of KMA permits for salmon fishing * 36% of the year for salmon fishing * 66% of SAR which are believed to be harbor preventable * 10% increase in safe harbor). The high range estimate for preventable SAR costs are based on year-round SAR prevention for the entire commercial fishing fleet, and is equal to $111,000 ($1.6 million annual SAR cost * 100% of commercial vessels * 100% for year-round benefits * 66% of SAR which are believed to be harbor preventable * 10% increase in safe harbor). The 2005 analysis selected the low range value for inclusion in total annual benefits. In order to replicate the assumptions used in the previous effort, this report will also use the low range estimate of $26,000 per year of SAR costs which could be saved annually with additional safe harbor provided by Port Lions.

[13] Data provided by Commander Paul Webb of the US Coast Guard, via email. April 2, 2013.

Table 16. Updated SAR Expenses

SAR Categories	
US Coast Guard variable cost per SAR	$6,800
SAR costs per day for other vessels	$6,200
Other vessels performing SAR	8
Crew per vessel	4
Value of crew time (per hour)	$32.06
Hours per SAR day	24
Hours per SAR incident	72
Value of lost time for other vessels performing SAR	$24,600
Value of lost time for object vessel	$9,200
Cost per SAR event	$46,800
SAR events per year	35
Total annual SAR cost	**$1,638,000**
Low Range (salmon season only)	
Portion of permits for salmon vessels	65%
Salmon season	36%
Rate of harbor preventable SAR	66%
Estimated increase in safe harbor with project	10%
Low Range SAR cost	**$26,000**
High Range (year-round)	
All vessels	100%
Year round	100%
Rate of harbor preventable SAR	66%
Estimated increase in safe harbor with project	10%
High Range SAR cost	**$111,800**

C. Additional Project Benefits Resulting from Survey Data Collection

The primary purpose of the Port Lions Small Boat Harbor Survey was to identify the current level of demand for the Port Lions Harbor. Conditions had changed enough from the previous analysis that an update for the economic evaluation is needed. The survey also gathered additional data which was used to refine the existing benefit categories and provide additional benefit categories to this analysis. The pertinent survey results which add economic benefits

to the project, and have not already been counted in previous report sections, are described in further detail below.

1. Cost of Leaving or Avoiding Harbor

One survey question asked if boaters had ever avoided or left Port Lions harbor when they would have preferred to moor there. Twenty-three percent of survey respondents indicated that they had left or avoided Port Lions. The survey then asked respondents to choose as many reasons as applicable for leaving or avoiding the harbor. The majority of responses to this question (71 percent) noted that they left or avoided the harbor because wave conditions were bad inside the harbor and/or there was inadequate protection from storms. This analysis assumes that the conditions which forced boaters to leave or avoid the harbor will be improved in the with-project condition (the 3-foot waves will be reduced to 1-foot or less). Therefore, costs to boaters as a result of leaving or avoiding the harbor in the without-project condition will be avoided in the future with improved protection, and these costs can be considered economic benefits.

The survey then asked respondents where they traveled instead of Port Lions and how often per year they made these trips. Boaters indicated they left Port Lions an average of 3 times per year. Table 17 shows the alternate locations listed by survey respondents and the frequency of reach response.

Table 17. Alternate Moorage Locations when Avoiding Port Lions

Region	Percent of Responses
Kodiak	56.3%
Anton Larsen Bay	12.5%
Across the Bay/other	31.3%

Source: Port Lions Small Boat Harbor Survey results, April 2013.

The distances to each of these locations are estimated based on internet research of distances between ports and utilizing Google Earth. The average vessel cruising speed by vessel size based on Port Lions survey data was used in order to determine the amount of time spent transiting to each alternate location. To calculate the cost of the trips, this analysis uses hourly vessel variable operating cost, and the hourly leisure rate from the Cornell OCT study. This analysis assumes that 23 percent of the potential Port Lions harbor users, or 32 boaters (139 * 23%), avoid or leave the harbor due to poor conditions. The annual cost to these 32 boaters of making 3 trips annually to the various alternate locations is $32,000. This analysis conservatively assumes that each trip only occurs one way since the survey question did not differentiate between how often Port Lions is left versus avoided. Table 18 shows the calculations associated with these avoided travel costs.

Table 18. Avoided Travel Costs

Commercial fishing vessels going to:	Number of vessels	# trips per year	Nautical Miles (one-way)	Hours	Vessel Hourly Op. Cost	Hourly Leisure Rate	Number of Crew	Roundtrip Cost
Kodiak								
≤22 ft	1	3	24	1.29	$ 67.62	$73.06	1	$720
23-36 ft	6	3	24	1.27	$56.80	$73.06	1	$2,600
37-54 ft	8	3	24	2.86	$111.80	$73.06	2	$17,700
>55 ft	3	3	24	2.93	$137.64	$73.06	2	$6,600
Anton Larsen Bay								
≤22 ft	0	3	8	0.43	$67.62	$73.06	1	$50
23-36 ft	1	3	8	0.42	$56.80	$73.06	1	$200
37-54 ft	2	3	8	0.95	$111.80	$73.06	2	$1,300
>55 ft	1	3	8	0.98	$137.64	$73.06	2	$490
Across the Bay/Other								
≤22 ft	1	3	4	0.21	$67.62	$73.06	1	$70
23-36 ft	3	3	4	0.21	$56.80	$73.06	1	$240
37-54 ft	5	3	4	0.48	$111.80	$73.06	2	$1,600
>55 ft	2	3	4	0.49	$137.64	$73.06	2	$620
TOTAL	**32**							**$32,000**

D. Summary of Updated Annual Benefits

Table 19 provides a summary of the updated benefits for Port Lions navigation improvements.

Table 19. Summary of Updated Annual Benefits

Benefit Category	October 2005 Benefits	Updated May 2013 Benefits	Difference	Explanation
Preventable Marina Damage	$252,900	$159,000	$(93,900)	(a)
Local Emergency Cost	18,100	22,000	3,900	(b)
Damage to Skiffs	15,600	20,000	4,400	(c)
Beaching Damage	3,500	4,000	500	(d)
Large Vessels Set Adrift	13,500	25,000	11,500	(e)
Lines	8,800	30,000	21,200	(f)
Cleats	600	700	100	(g)
Vessel Tending	-	-	-	(h)
Vessel Damage at the Docks	6,800	15,300	8,500	(i)
Reduction in Harvest Cost	361,900	2,071,000	1,709,100	(j)
Water Taxi Service	49,300	-	(49,300)	(k)
Charter Operations	-	14,000	14,000	(l)
Freighter Travel Cost Savings	-	32,000	32,000	(m)
Alternative Port Impact	-	-	-	(n)
Subsistence	53,500	80,000	26,500	(o)
Harbor of Refuge	26,000	21,900	(4,100)	(p)
SAR	73,300	26,000	(47,300)	(q)
Cost of Leaving/Avoiding Harbor	-	32,000	32,000	(r)
TOTAL	**$884,000**	**$2,553,000**	**$1,669,000**	

(a) Benefits decreased based on the updated price of float repairs and replacement and floating breakwater replacement.
(b) Benefits increased based on updated labor rates using the Employment Cost Index for harbor paid labor.
(c) Benefits increased based on updated cost of lines and CPI update of other skiff repair costs.
(d) Benefits increased based on updated skiff repair costs.
(e) Benefits increased based on increased values of 45- to 58-foot fishing vessels.
(f) Benefits increased based on the increased number of vessels able to use the harbor and the increased price of mooring lines.
(g) Benefits increased based on adjusting the cost of cleat damage incidents to current dollars using the Anchorage Consumer Price Index.
(h) Updating this category was not completed for the Limited Reevaluation Report because vessel tending is no longer a common practice.
(i) Benefits increased based on increased vessel values and more vessels using the harbor.
(j) Benefits increased based on an increase in average hourly vessel operating costs.
(k) Changes to water taxi service at Port Lions is unknown at this time; no benefits have been calculated.
(l) This category was added to the analysis and is based on the increased charter operations resulting from harbor improvements.
(m) This category was added to the analysis and is based on the reduced costs expended by freighters who would be able to use Port Lions Harbor.
(n) This category was not updated due to the large effort that would be required to accurately capture those cost elements. Also, no benefits were claimed in the previous report.
(o) Benefits increased based on an increased replacement value of subsistence resources.
(p) Benefits decreased based on updating the proportion of with-project available safe harbor.
(q) Benefits decreased based on new information regarding the number of SARs per year in the Kodiak region.
(r) This category was added to the analysis and is based on the travel costs of vessels forced to leave or avoid the harbor based on current conditions.

E. Summary of Benefits and Costs

The following table provides a summary of the updated benefits, costs, and benefit cost ratio for the proposed Port Lions navigation improvements. The project benefits have increased since 2005. Project costs have decreased as a result of choosing the new alternative 1C. An updated Corps project cost estimate was used in this analysis, including calculating the costs for Operations, Maintenance, Repair, Replacement, and Rehabilitation (OMRR&R). As a result of this report update, annual benefits increased from $884,000 to $2.55 million and the benefit to cost ratio (BCR) for this analysis is 3.75 compared to 1.41 in the 2005 report.

Table 20. Summary of Benefits and Costs

	October 2005 Report	May 2013 Update
Annual Benefit	$884,000	$2,553,000
Annual Cost	$625,000	$681,000
Net Annual Benefit	$259,000	$1,872,000
Benefit to Cost Ratio	1.41	3.75
Annual NED Cost	$606,000	$550,000
Annual OMRR&R	$19,000	$130,000
NED Investment Cost	$10,459,000	$12,341,000

Note: The 2005 feasibility report used the Federal fiscal year 2006 discount rate of 5.375 percent (based on updated costs in February of 2006) and a 50-year period of analysis. The 2013 report update uses the Federal fiscal year 2013 discount rate of 3.75 percent and a 50-year period of analysis.

1. Seven Percent Discount Rate

The benefit-cost ratio at seven percent is one of the required inputs for construction projects being submitted for FY15 budget consideration. One final note is that the benefit to cost ratio falls to 2.59 when a 7 percent discount rate is used. This calculation is based on the total cost of construction – includes costs to finish the project and Interest During Construction for the 12-month construction period.

Attachment 1
Port Lions Small Boat Harbor Vessel Survey Results

Introduction

Following is a summary of the City of Port Lions Small Boat Harbor vessel survey conducted in December 2012. In conjunction with the U.S. Army Corps of Engineers (USACE), Alaska District, the City of Port Lions mailed 813 surveys to current or potential users of the Port Lions harbor followed by a postcard reminder. In addition, the City of Port Lions handed out up to 25 additional surveys to local residents; eight were returned to the Corps. Two surveys were returned as undeliverable and three surveys could not be sent due to a lack of forwarding address for the permit holder/vessel owner. USACE received a total of 103 completed surveys for a response rate of 13 percent. At a 95 percent confidence level, the margin of error for general questions asked of all survey respondents is within plus/minus 9.6 percent.

Several surveys were returned with a comment or note that the targeted permit holder or vessel owner either no longer fished or had never been to Port Lions and had no interest in using Port Lions in the future. These responses are only included in the analysis of survey results where responses were provided with general vessel information, as applicable. The response levels for each question are provided.

The Corps of Engineers prepared an Excel spreadsheet to use in recording the responses received. Survey respondents were instructed to answer all questions as they pertain to one vessel only and for activities that occurred in calendar year 2012. Additional copies of the survey were available from the City of Port Lions offices and from the Corps of Engineers.

Survey questions were categorized three ways; general, charter/sightseeing/water taxi, and commercial fishing/tenders. The following discussion summarizes responses to each question in the order which they were asked. A copy of the survey instrument follows this summary.

Vessel Characteristics

Length, Beam, and Draft

The first survey question asked existing and potential harbor users about their vessel characteristics. Sixteen survey respondents did not answer the question regarding vessel length overall, 22 did not respond to beam, and 25 did not respond to vessel draft. Approximately 24 percent of survey respondents had vessels greater than 54-feet length overall, followed by 34

percent of vessels between 37- and 54-feet, and 24 percent of vessels between 23- and 36-feet. Table 1 shows a summary of responses to this question broken down by vessel length.

Table 1. Vessel Size and Draft (measured in feet)

Length overall (ft)	0-22	23-36	37-54	>54	n (sample size)
Number of vessels	15	21	30	21	87
Beam (average)	8.2	10.7	14.0	20.9	81
Draft (average, unloaded)	1.1	2.2	4.3	6.8	78
Draft (average, loaded)	2.1	3.3	5.8	8.8	78

Vessel Speed

Respondents were asked about vessel speeds while cruising and fishing. Eighteen survey respondents left the question regarding average vessel cruising speed blank and 34 did not respond to the average speed while fishing. The average cruising speed for all responses was 12.7 knots and the average speed while fishing was 4.2 knots. Table 2 shows the responses to these questions broken down by vessel length.

Table 2. Average Vessel Speed (Knots)

Length overall (ft)	0-22	23-36	37-54	>54	n (sample size)
Number of vessels	15	21	30	21	87
Cruising	18.6	18.9	8.4	8.2	85
Fishing	4.9	5.0	4.2	3.3	69

Vessel Purpose

Respondents were then asked to identify the primary purpose of their vessel. The survey directed that only one response per vessel be chosen. In the instances where more than one response was chosen, the higher priority item was counted once – no survey was recorded with more than one vessel purpose. Priority was given first to commercial operations (commercial fishing, tenders, freighters, charter/sightseeing/water taxi vessels), then to subsistence, and lastly to recreation and 'other' vessels. Fourteen respondents did not answer this question. The majority of respondents, 82 percent, indicated that they are primarily commercial fishing vessels.

Table 3. Vessel Primary Purpose
(n = 89)

Vessel Primary Purpose	Number of Respondents	Percent of Respondents
Commercial Fishing	73	82.0%
Tender	1	1.1%
Freighter	0	0.0%
Charter/Sightseeing/Water-Taxi	4	4.5%
Subsistence	6	6.7%
Recreation	3	3.4%
Other	2	2.2%
Total	**89**	

Note: The two 'Other' responses were: (1) Hunting and (2) Survey.

Harbor Use

Homeport in 2012

Survey responses revealed that 11 of those surveyed (12 percent) homeported their vessel in Port Lions in 2012. Of the 79 respondents who indicated that they did not homeport their vessel in Port Lions, 50 provided the name of their current homeport. Kodiak was the most popular response with 57 percent.

Table 4. Vessel Homeport
(n = 61)

Homeport	Number of Responses	Percent of Responses
Port Lions	11	18.0%
Kodiak	35	57.4%
Kodiak/Homer	1	1.6%
Viekoda Bay	1	1.6%
Larsen Bay	1	1.6%
Anchor Point	1	1.6%
Chief Cove - Uyak Bay	1	1.6%
Homer	3	4.9%
Moser Bay	1	1.6%
Anton Larson Bay	1	1.6%
Naknek	1	1.6%
Ketchikan	1	1.6%
Home	1	1.6%
Seward	1	1.6%
Total	**61**	

Interest in future moorage at Port Lions

Survey respondents who indicated that Port Lions was not their current homeport were then asked if they would seek transient or permanent moorage at Port Lions if inner harbor conditions were improved. Of the 79 respondents who indicated they were not homeported at Port Lions, 74 responded to this question regarding future moorage at Port Lions. Approximately 29 percent of survey respondents (21 responses) indicated that they would use moorage at Port Lions if inner harbor conditions were improved. Of those who indicated they would not seek moorage at Port Lions, 30 provided a reason. The most common reasons were that they lived elsewhere or had no need to travel to Port Lions.

Table 5. If inner harbor conditions were improved, would you seek transient or permanent moorage at Port Lions?
(n = 74)

	Number of Responses	Percent of Responses
Yes	21	28.4%
No	51	68.9%
Maybe/Possibly[1]	2	2.7%
Total	**74**	

1.) The survey offered respondents the choice of "Yes" or "No", however one respondent wrote in an answer of "maybe" and another wrote "possibly".

Table 6 shows the most frequent responses provided as to why respondents would not seek moorage at Port Lions. This was an open-ended question. For this analysis, similar responses were aggregated into categories even if the text from the responses was not an exact match.

Table 6. Explanations for no interest in moorage at Port Lions
(n = 30)

Explanation	Number of Responses	Percent of Responses
Live in Kodiak, work in Kodiak, and/or have moorage slip in Kodiak	13	43.3%
Do not travel to Port Lions	6	20.0%
Possibly	1	3.3%
Live elsewhere	3	10.0%
Transient moorage	1	3.3%
Temporary	1	3.3%
Infrequent need/occasional use	2	6.7%
Depends on Cost, but probably not	2	6.7%
Questionable security at Port Lions	1	3.3%
Total	**30**	

Respondents who would use moorage at Port Lions were asked to indicate the type of moorage they would prefer. All 21 respondents who stated they would use moorage at Port Lions provided

an answer to the type of moorage they would use. Most, 67 percent, preferred transient moorage, while 29 percent preferred permanent, and 5 percent preferred boat launch use.

Table 7. Type of Moorage Preferred by those who indicated they would use Port Lions
(n = 21)

Moorage Type	Number of Responses	Percent of Responses
Transient	14	66.7%
Permanent	6	28.6%
Boat Launch User	1	4.8%
Total	**21**	

Avoidance of Port Lions Harbor

The survey asked respondents if they have ever avoided or left Port Lions harbor when they would have preferred to moor there. Thirty respondents did not answer this question. Most respondents, 77 percent, stated they had not left or avoided Port Lions Harbor.

Table 8. Have you ever avoided or left Port Lions harbor when you would have preferred to moor there?
(n = 73)

Response	Number of Responses	Percent of Responses
Yes	17	23.3%
No	56	76.7%
Total	**73**	

All 17 respondents who avoided or left Port Lions harbor, noted a reason for doing so. Respondents were asked to choose from a list of reasons for avoiding the harbor and to choose as many as applicable: 13 respondents chose just one reason for avoiding or leaving and 4 respondents chose 2 reasons each, for a total of 21 explanations. The most popular reason for leaving or avoiding Port Lions was "wave conditions were bad inside the harbor," at 48 percent of responses, followed by "inadequate protection from storms," at 24 percent.

Table 9. Reasons for leaving or avoiding Port Lions Harbor
(n = 21)

Explanations:	Number of Responses	Percent of Responses
Wave conditions were bad inside the harbor	10	47.6%
Harbor was already full	0	0.0%
Changed locations due to fishery opening elsewhere	2	9.5%
Had previous problems at harbor	3	14.3%
Inadequate protection from storms	5	23.8%
Other	1	4.8%
Total	**21**	

Note: The 'Other' response was, "Lack of available services/parts for projects."

Those who indicated they left or avoided Port Lions harbor were then asked to identify their alternate moorage location during these instances. Of those 17 who responded that they had avoided or left Port Lions harbor, 16 listed an alternate location. Most, 56 percent, indicated that they went to Kodiak instead. Ten people provided a response when asked how often per year they venture to their alternate location while avoiding Port Lions. Based on those responses, the average boater avoided or left Port Lions 3 times per year, with a maximum of 10 and a minimum of 1.

Table 10. Alternate locations when avoiding Port Lions Harbor
(n = 16)

Location	Number of Responses	Percent of Responses
Kodiak	9	56.3%
Anchor	2	12.5%
Anton Larsen Bay	1	6.3%
Ferry dock or up to Bay - wind direction dependent	1	6.3%
Across the bay	1	6.3%
Ouzinkie, Kodiak, or Anton's	1	6.3%
Varies	1	6.3%
Total	**16**	

Charter/Sightseeing/Water Taxi Boats

The Corps received 4 completed surveys from boat owners who selected charter, sightseeing, or water taxi as the primary purpose for their vessel. This equates to a response rate of 0.5 percent. At a 95 percent confidence interval, the margin of error for questions asked of charter/sightseeing/water taxi respondents is within plus/minus 49 percent (or 41 percent at a 90 percent confidence interval).

These 4 responses do not constitute a representative sample of the 815 people surveyed, and the large margin of error prevents meaningful use of the data. However, based on information from the State of Alaska, there were 12 businesses in Port Lions listed as charters or lodges during 2012. These 4 survey responses do make up a representative sample of the charter and lodge businesses in Port Lions.

Despite the issues associated with the small sample size, the responses provided by charter/sightseeing/water taxi boats are still provided here.

Excursion Summary

Charter, sightseeing, and water taxi vessels operating out of Port Lions in 2012 were first asked to describe the typical number of passengers and crew on each trip. Each of the four respondents stated they took four passengers per trip, and an average of 1.3 crew members, including the

captain (one respondent reported 2 crew and 2 respondents reported 1 crew member, and one did not answer this portion of the question).

The length of each trip ranged from 6 hours to 9.5 hours with an average of 8.2 hours. Only three charter operators answered the question regarding average length of each trip.

One charter vessel operator did not answer the question regarding average price charged per customer. Of the three responses, charter vessels charged an average of $680 per passenger. All four charter operators made a total of 105 trips from Port Lions during 2012. Survey responses show that each charter/sightseeing/water taxi vessel made an average of 26 trips during 2012, with a minimum of 0 trips and a maximum of 60.

Table 11. Summary of Charter/Sightseeing/Water Taxi Trips from Port Lions in 2012

Charter Vessels - Typical Trips from Port Lions in 2012	Average	n (sample size)
Number of Customers	4	4
Number of Crew (Including Captain)	1.3	3
Hours Per Excursion	8.2	3
Cost per passenger	$ 683	3
Trips in 2012	26.3	4

Anticipated Additional Trips

Charter/Sightseeing/Water Taxi operators were asked if they anticipate using the harbor more often if inner harbor conditions were improved. Those respondents who indicated that they would use the harbor more often were asked to quantify this increase by identifying the number of additional trips per year. Of the 4 total responses to this question, 2 did not anticipate additional trips from Port Lions. One respondent indicated that they would make three additional trips per year, and one respondent did not quantify an additional number of trips, but wrote in the other comments section, “Possibly have more trips if there were additional moorage for more charter vessels.”

Table 12. Anticipated Additional Charter/Sightseeing/Water Taxi Trips from Port Lions with Improved Inner Harbor Conditions

(n = 4)

Additional Charter trips from Port Lions	Number of Responses
Yes	1
No	2
Other: "Possibly"	1

Commercial Fishing/Tender Vessels

The Corps received 73 completed survey responses from boat owners who selected commercial fishing or tender as the primary purpose of their vessel. This equates to a response rate of 9

percent. At a 95 percent confidence level, the margin of error for questions asked of commercial fishing respondents is within plus/minus 11.5 percent.

The Port Lions Survey instrument directed respondents not currently homeported in Port Lions and with no future interest in moorage at Port Lions to skip the commercial fishing/tender boat questions. There were only 20 responses that indicated they were commercial fishing or tender vessels and were homeported in Port Lions or had a future interest in using Port Lions. However, a total of 64 survey respondents answered the commercial fishing/tender vessel questions. All 64 of these responses are presented in this analysis.

Employment – Crew Size

A total of 64 survey responses indicated the number of crew aboard their commercial fishing or tender vessel. The average crew size was 3.7, including the skipper, in 2012. The minimum crew size was 1 (though two respondents indicated their crew size was 0 and noted they did not fish in 2012), and the maximum was 6 on a single vessel. Table 13 shows the average crew size per vessel, by vessel size.

Table 13. Average Crew Size (including skipper) of Port Lions Commercial Fishing/Tender Vessels, by vessel length
(n = 64)

Length overall (ft)	0-22	23-36	37-54	>54	Total
Number of vessels	9	9	24	19	61
Average Number of Crew	2.8	3.4	3.7	4.2	

Note: The total number of vessels is listed as 61 because three of the 64 survey respondents did not provide the length of their vessel, but did provide the number of crew.

Product Delivery

The survey then asked commercial fishing vessels and tenders to indicate where they currently deliver their commercial catch and the percent delivered to each location: shore-based plant in Kodiak, other shore-based plant not in Kodiak, at-sea processor, tender, or other (with a prompt to provide an explanation). Sixty commercial fishing/tender vessels provided responses to this question. Most respondents utilized one or two product delivery locations or methods, each with 46.7 percent of responses, while 6.7 percent of respondents utilized three delivery methods. Table 14 summarizes the results of the responses to this question.

Table 14. Product Delivery Method for Commercial Fishing and Tender Vessels, 2012
(n = 60)

Facility Type:	Number of Responses	Average Percent of Catch Delivered to that Facility
Shore-based plant in Kodiak	47	50.1%
Other shore-based plant not in Kodiak	10	61.2%
At-sea processor	1	5.0%
Tender	38	78.4%
Other	2	40.0%

Note: The two "Other" responses were: (1) Homer and (2) Out West, Dutch.

Anticipated Future Product Delivery

Commercial fishing and tender vessel owners were then asked if they would change where they deliver their catch with moorage at Port Lions. A total of 63 commercial fishing or tender vessel owners provided a response to this question. Most respondents, 60, or 95 percent, indicated that they would not change their deliveries.

Table 15. Potential Changes to Product Delivery Method based on Moorage at Port Lions
(n = 63)

Change how or where you deliver catch?	Number of Responses	Percent of Responses
Yes	2	3.2%
No	60	95.2%
Don't know[1]	1	1.6%
Total	**63**	

(1) The survey offered respondents the choice of "Yes" or "No", however one respondent wrote in an answer of "Don't know".

Those survey respondents who indicated that they would change their commercial fishing deliveries based on moorage availability at Port Lions were asked to indicate how and where they would deliver their catch in the future with moorage at Port Lions. Two respondents indicated they would change their delivery location. One responded that they would deliver 100 percent of their catch to a shore-based plant in Kodiak and the other noted that they would deliver 100 percent of their catch to a tender at Port Lions Harbor.

Other Comments

Survey respondents were given the opportunity to provide any additional comments that they would like to make about the project, or comments to pass along to the city. Many of the survey respondents took this opportunity to provide their feedback. The following comments are summarized into categories; similar comments have been annotated parenthetically.

Not a boat owner or Do Not use Port Lions Harbor

- I'm not a boat owner, only a permit holder and/or do not fish (5)
- Do not intend to use Port Lions Harbor (12)
- Unless one lives there I see no need for anyone to want to moor there or stop there, there are no attractions or amenities.
- I have had fishing boats moored at Kodiak St. Paul Harbor for 43 years.
- I'm a setnet fisherman on Raspberry Island and own property in Anton Larsen. Don't get to Port Lions much.
- We only occasionally visit Port Lions however it is appreciated that moorage is available when we do.
- At this time Kodiak provides the services I need.
- The boat has only been in Port Lions once, in the early 1980s. The boat has not fished since 2006 because NMFS wanted boats to join co-ops in order to lessen pressure on crab stocks.
- Both Port Lions and Ouzinkie have reportedly heavy alcohol and drug problems. Will stay in Kodiak until such time as there is a lessened threat to property left there.

Commercial Catch Deliveries

- I deliver 100% of my halibut to Kodiak, which is very little after quota catch reductions, and I deliver 100% of my salmon to shore based cannery via tender.
- We deliver all of our salmon to Larsen Bay or one of their tenders.

Facilities at and Location of Port Lions

- Would consider mooring my boat in Port Lions, to access the ferry system during summer fishing season.
- Would use Port Lions as a base for subsistence use.
- I know a number of commercial fishermen who live in and work out of Port Lions. A safe and secure harbor is essential for the survival of the community.
- Port Lions is located in a central area on the North end of Kodiak Island and would be used more as a safe port. At times when Outlet Cape or Spruce Cape is foul Port Lions would provide a good harbor to hold up for weather.

- The new facility looks great.

- Reliable, safe moorage is sorely needed for mariners traveling between Kodiak and the west side of the island to hunt, sport fish, commercial fish, and recreate. The region Port Lions serves is a commercially active region 12 months a year and water travel is the only dependable way for commerce to thrive.

- Port Lions is a great area for sport and subsistence fishing, any improvement to the harbor would be a bonus for everyone.

- Port Lions has a ferry service this makes it an easy access harbor. I will continue to use Port Lions, any improvements would be welcomed.

- Port Lions would be a convenient place for me to moor when fishing Marmot Bay but I'm unsure of capabilities of the boat harbor.

- I am looking for the best harbor to moor my 48-foot seiner. I live in Seward but would prefer to keep my boat in Kodiak or Port Lions if I would have electricity and arrange a boat watchman for the months I am not onboard myself.

- I never used the Port Lions Harbor except to ride by there on the ferry. If there was a good harbor I might use it instead of going into Anton Larson Bay for shelter.

Current Use of Port Lions Facilities

- I have tied up at the ferry dock a few times in the past but the locals aren't into sharing their facilities with outsiders that much.

- Only moor at Port Lions during spring herring. Am aware of lack of protection at harbor, has not affected me.

- I have lived in Port Lions or maintained a boat at Port Lions since 1978. The harbor has never been completed because of the Corps of Engineers project was never finished as designed. It has always been less than adequate for our boats.

Improvements Needed at Port Lions

- Port Lions harbor is not protected from NE swells at high tide levels. An additional breakwater placed on the west side of the Point just north of the harbor would make a big difference in the inner harbor mooring conditions.

- We need more protection from the NE storms. Put breakwater from Perigrebnee Point.

- It would be a lot nicer if our boats were more protected from North East swells.

- Port Lions needs additional breakwater protection on the north-northeast side. Otherwise it remains a very good harbor.

- Needs better weather protection and better harbor services for the amount requested for stall fees.

- City of Port Lions has limited or no commercial fish processing facilities. Larsen Bay and Alitak have limited seasonal operations – Kodiak has majority of commercial processing potential as well as fuel and support industries.

- We could use more of the 25'-30' slips with power and water outlets.

- Not enough moorage slips. Rough water in the harbor during storms due to inadequate breakwater.

- I would like the City of Port Lions to make their harbor a clean harbor. Fix the discharge of waste and do what Homer, Alaska and Seward, Alaska did with their harbors, become a certified clean harbor. That way you don't have to fix that issue later.

- I would like to see Port Lions become a clean harbor like Homer and Seward. You would not have to apply for federal funding in the future. Do it now and become a clean harbor.

- Make harbor for deep draft vessels like 10 and 20% [sic].

- Sometimes waves come in the NE end and sometimes the wind makes waves from the SW side not good in the harbor. Also the NE entrance is shallow at minus tide for my boat.

- Regardless of who uses the PLBH a 2nd breakwater is needed and was needed when the PLBH was completed. The Corps of Engineers screwed up. Same with Kodiak harbor entrance it needs to be fixed just like Port Lions.

- Dredge entrance into the harbor. At low tide in a boat that draws 8 feet of water it is a little spooky. Great place! Wonderful people!

General

- Good harbors provide great value to fishing communities.

- Good harbors are essential, maintenance and care are important, with costs and replacement bore by users.

- The residents of Port Lions will have the best solution to any questions or obstacles.

Port Lions Small Boat Harbor Survey

Research conducted by the U.S. Army Corps of Engineers
– Alaska District –
in cooperation with the City of Port Lions.

OMB Number 0710-0001

U.S. Army Corps of Engineers
Agency Disclosure Notice

The public report burden for this data collection effort is estimated to average 30 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this data collection, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters Services, Executive Services Directorate, Information Management Division, 1155 Defense Pentagon, Washington DC, 20301-1155 and the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, DC 20503, Attn: Desk Officer for US Army Corps of Engineers. Respondents should be aware that notwithstanding any other provision of law, an agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number.

PLEASE DO NOT RETURN YOUR RESPONSE TO THE ABOVE ADDRESS

City of Port Lions Administrative Office
P.O. Box 110 Port Lions, Alaska 99550 • Phone: (907) 454-2332 • Fax: (907) 454-2420
E-mail: cityofportlions@hotmail.com

Dear Kodiak Island Boater,

The Port Lions Harbor lacks adequate wave protection for inner harbor facilities. The mooring basin is subject to severe damages and undesirable conditions from waves entering the basin. These wave conditions, in part, have prevented the City from completing the inner harbor float construction. The City of Port Lions asked the Army Corps of Engineers to assist in identifying potential solutions to problems at the harbor. We need your help in answering some questions about your experience using Port Lions harbor. You were chosen to participate in this survey because you are listed as a current permit holder and/or vessel owner in the Kodiak Island region. Your participation is completely ***voluntary***. Your answers will help identify the best approach for navigation improvements at the harbor.

Please complete the enclosed survey at your earliest convenience, seal it in the enclosed envelope, and drop it in any mailbox (return postage has been provided). All information you provide will be kept ***confidential*** and will not be associated with your name. If you have comments you would like to pass on to the City or the Corps, there is space at the end of the survey. The questionnaire has an identification number so your name can be crossed of the list when you respond and you will not receive further reminder notices.

We appreciate your assistance with this important project. Once complete, the survey results will be made available to the City or can be requested directly from the Corps.

Thank you,

Steve Andresen, Mayor, City of Port Lions

Vessel Survey Number _____

Survey Purpose: The U.S. Army Corps of Engineers in cooperation with the City of Port Lions is sending this survey to you to identify boating activity and the demand for moorage in the Port Lions area. Results of this survey will be used to justify future harbor development at Port Lions. Participation in this survey is **completely voluntary**. Failure to provide all or any part of the information will not affect you or any business you may have with the U.S. Army Corps of Engineers or the City of Port Lions. All responses will be aggregated to protect confidentiality of the respondent. The information collected will be managed in accordance with Army records retention requirements. If you have any questions or need to obtain additional copies of the survey, please contact Lorraine Cordova at the U.S. Army Corps of Engineers, at (907) 753-2672 or by email at Lorraine.a.cordova@usace.army.mil .

Please answer the following survey questions for one vessel only. Survey forms are available from the City's office or the Corps for additional vessels operating in the Port Lions/Kodiak region.

1. Please describe your vessel below:

a. Vessel size:

Length Overall _____ feet
Beam _____ feet
Draft (unloaded)_____ feet
Draft (loaded) _____ feet

b. Vessel speed:

Average cruising speed _____ knots
Average speed when fishing _____ knots

c. Vessel primary purpose (check one that best applies):

Recreation boat ☐
Subsistence boat ☐
Charter/sightseeing vessel ☐
Water taxi boat ☐
Commercial fishing vessel ☐
Tender ☐
Freighter ☐
Other:_____ ☐

2.a. Was this vessel homeported in Port Lions in 2012?

☐ Yes (Skip to Question 3) ☐ No

If no, which community or harbor was your homeport?_____

b. If inner harbor conditions were improved, would you seek transient or permanent moorage at Port Lions?

☐ Yes ☐ No.

If no, please explain: _____

(Skip to Question 7)

c. If yes, please indicate the type of moorage you would prefer:

permanent slip ☐ (year-round stall assignment)

transient boat slip ☐ (occasional slip user)

boat launch user ☐ (no need for moorage stall)

3.a. Have you ever avoided or left Port Lions harbor when you would have preferred to moor there?

☐ Yes ☐ No (Skip to Question 4)

If **yes**, please indicate your reason(s) for avoiding or leaving the harbor (check all that apply):

☐ wave conditions were bad inside the harbor

☐ harbor was already full

☐ changed locations due to fishery opening elsewhere

☐ had previous problems at harbor (too crowded, vessel damage from rafting, vandalism, etc.)

☐ inadequate protection from storms

☐ other reason:_____

☐ other reason:_____

b. When you leave or avoid Port Lions Harbor:

Where do you go instead? _____

On average, how often does this happen per year? _____

CHARTER/SIGHTSEEING/WATER TAXI BOATS.

Only answer the following questions if you indicated in Question 1C that this is primarily a charter/sightseeing vessel or water taxi boat, otherwise skip to Question 6.

4. Think of a typical charter/sightseeing/water-taxi excursion that you led during 2012.

a. How many people went on the trip?

_____# of customers
_____# of crew, including captain

b. How many hours in a typical charter/sightseeing/water-taxi excursion from Port Lions?

_____ hours

c. How much did you charge your customers in total for this excursion?

$_____ per passenger

d. How many charter/sightseeing/water-taxi excursions did you lead from Port Lions during 2012?

_____# of trips

5. If inner harbor conditions at Port Lions were improved, would you change the number of trips you typically make from Port Lions?

☐ No, I would continue with the same number of trips regardless of changes to the harbor.

☐ Yes #_____ additional trips from Port Lions **per year**

☐ Other, please explain: _____

_____

Go to Question #7.

COMMERCIAL FISHING/TENDER VESSELS.

Only answer the following questions if you indicated in Question 1C that this is a commercial fishing or tender vessel, otherwise skip to Question 7.

6.a. Think of your commercial fishing activity in the Kodiak region. What was the average crew size, including skipper, for commercial fishing trips in 2012?

_____ # of crew, including skipper

b. Please indicate the percent of catch and where you currently deliver: (Check all that apply in left column and indicate the percent of catch delivered in right column.)

☐	Shore-based plant in Kodiak	_____ %
☐	Other shore-based plant not in Kodiak	_____ %
☐	At-sea processor	_____ %
☐	Tender	_____ %
☐	Other (describe):_____	_____ %

Column should total 100 percent.

c. If you could moor at Port Lions, would you change how and where you deliver your catch?

☐ No, would not change how I deliver (Skip to Question 7)

☐ Yes

If **yes**, please indicate the percent of catch and where you would deliver. This is an estimate of how your delivery **changes** as a result of moorage at Port Lions. (Check all that apply in left column and indicate the percent of catch in the right column.)

☐	Shore-based plant in Kodiak	_____ %
☐	Other shore-based plant not in Kodiak	_____ %
☐	At-sea processor	_____ %
☐	Tender	_____ %
☐	Other (describe):_____	_____ %

Column should total 100 percent.

7. Please provide any other comments that you would like to share with the study team or the City of Port Lions:

_____

_____

_____

_____

_____

_____

_____

_____

_____

THANK YOU FOR YOUR PARTICIPATION.

Please return the questionnaire in the postage paid, pre-addressed envelope provided to:

U.S. Army Engineer District, Alaska
CEPOA-EN-CW-EC
PO Box 6898
JBER, AK 99506

Appendix B: Cost Estimate Update

WALLA WALLA COST ENGINEERING MANDATORY CENTER OF EXPERTISE

COST AGENCY TECHNICAL REVIEW

CERTIFICATION STATEMENT

For Project No. P2 010599

POA Navigation improvements – Port Lions

The Navigation Improvements Port Lions project, as presented by Alaska District, has undergone a successful Cost Agency Technical Review (Cost ATR), performed by the Walla Walla District Cost Engineering Mandatory Center of Expertise (Cost MCX) team. The Cost ATR included study of the project scope, report, cost estimates, schedules, escalation, and risk-based contingencies. This certification signifies the products meet the quality standards as prescribed in ER 1110-2-1150 Engineering and Design for Civil Works Projects and ER 1110-2-1302 Civil Works Cost Engineering.

As of September 6, 2013, the Cost MCX certifies the estimated total project cost of:

FY 2014 Price Level: $8,808,000
Fully Funded Amount: $9,198,000

It remains the responsibility of the District to correctly reflect these cost values within the Final Report and to implement effective project management controls and implementation procedures including risk management throughout the life of the project.

CALLAN.KIM.C.1231558221

Digitally signed by CALLAN.KIM.C.1231558221
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=CALLAN.KIM.C.1231558221
Date: 2013.09.06 15:21:49 -07'00'

Kim C. Callan, PE, CCE, PM
Chief, Cost Engineering MCX
Walla Walla District

US Army Corps of Engineers®

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

PROJECT: Navigation Improvements Port Lions PN 010599
LOCATION: Port Lions, Alaska

DISTRICT: POA Alaska PREPARED: 9/6/2013
POC: CHIEF, COST ENGINEERING, Karl Harvey

This Estimate reflects the scope and schedule in report; Port Lions Feasibility Report Oct 2005

WBS Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
						Program Year (Budget EC): 2014								
						Effective Price Level Date: 1 OCT 13								
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST ($K)	CNTG ($K)	CNTG (%)	TOTAL ($K)	ESC (%)	COST ($K)	CNTG ($K)	TOTAL ($K)	Spent Thru: 1-Apr-13 ($K)		COST ($K)	CNTG ($K)	FULL ($K)
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
10	BREAKWATER & SEAWALLS	$5,830	$1,768	30%	$7,597	1.3%	$5,903	$1,790	$7,693	$0		$6,141	$1,862	$8,002
	CONSTRUCTION ESTIMATE TOTALS:	$5,830	$1,768		$7,597	1.3%	$5,903	$1,790	$7,693	$0		$6,141	$1,862	$8,002
01	LANDS AND DAMAGES	$1	$0	20%	$1	1.3%	$1	$0	$1	$0		$1	$0	$1
30	PLANNING, ENGINEERING & DESIGN	$406	$95	23%	$501	2.6%	$416	$97	$514	$0		$439	$103	$541
31	CONSTRUCTION MANAGEMENT	$466	$118	25%	$585	2.6%	$478	$121	$600	$0		$521	$132	$653
	PROJECT COST TOTALS:	$6,703	$1,981	30%	$8,684		$6,799	$2,009	**$8,808**	$0		$7,101	$2,097	$9,198

Mandatory by Regulation	CHIEF, COST ENGINEERING, Karl Harvey
Mandatory by Regulation	PROJECT MANAGER, Bruce Sexauer
Mandatory by Regulation	CHIEF, REAL ESTATE, Thomas Kretzschmar
	CHIEF, PLANNING, Bruce Sexauer
	CHIEF, ENGINEERING, Dave Frenier
	CHIEF, OPERATIONS, Patrick Coullahan
	CHIEF, CONSTRUCTION, Dave Gerland
	CHIEF, CONTRACTING, Chris Tew
	CHIEF, PM-PB, Karen Farmer
	CHIEF, DPM, Larry McCallister

ESTIMATED FEDERAL COST:	**80%**	**$7,359**
ESTIMATED NON-FEDERAL COST:	**20%**	**$1,840**
ESTIMATED TOTAL PROJECT COST:		**$9,198**

O&M OUTSIDE OF TOTAL PROJECT COST:

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

**** CONTRACT COST SUMMARY ****

PROJECT: Navigation Improvements Port Lions PN 010599
LOCATION: Port Lions, Alaska
This Estimate reflects the scope and schedule in report; Port Lions Feasibility Report Oct 2005

DISTRICT: POA Alaska PREPARED: 9/6/2013
POC: CHIEF, COST ENGINEERING, Karl Harvey

WBS Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: 30-Mar-13 Effective Price Level: 1-Apr-13				Program Year (Budget EC): 2014 Effective Price Level Date: 1 OCT 13								
				RISK BASED										
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST ($K)	CNTG ($K)	CNTG (%)	TOTAL ($K)	ESC (%)	COST ($K)	CNTG ($K)	TOTAL ($K)	Mid-Point Date	INFLATED (%)	COST ($K)	CNTG ($K)	FULL ($K)
A	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*I*	*J*	*P*	*L*	*M*	*N*	*O*
	PHASE 1 or CONTRACT 1													
10	MOBILIZE-DEMOBILIZE	$301	$37	12%	$338	1.3%	$305	$37	$342	2016Q2	4.0%	$317	$39	$356
10	NEW RUBBLEMOUND BREAKWATER	$5,164	$1,635	32%	$6,799	1.3%	$5,229	$1,655	$6,884	2016Q2	4.0%	$5,440	$1,722	$7,161
10	EXTEND RUBBLEMOUND BREAKWATERS	$306	$91	30%	$398	1.3%	$310	$92	$403	2016Q2	4.0%	$323	$96	$419
10	NAV MARKER & BASE	$16	$1	5%	$16	1.3%	$16	$1	$17	2016Q2	4.0%	$17	$1	$17
10	HYDROGRAPHIC SURVEYS	$42	$4	10%	$47	1.3%	$43	$4	$47	2016Q2	4.0%	$44	$5	$49
							$0							
	CONSTRUCTION ESTIMATE TOTALS:	$5,830	$1,768	30%	**$7,597**		$5,903	$1,790	$7,693			$6,141	$1,862	$8,002
01	LANDS AND DAMAGES	$1	$0	20%	$1	1.3%	$1	$0	$1	2015Q3	2.6%	$1	$0	$1
30	PLANNING, ENGINEERING & DESIGN													
1.5%	Project Management	$85	$20	23%	$104	2.6%	$87	$20	$107	2015Q2	4.8%	$91	$21	$112
1.0%	Planning & Environmental Compliance	$58	$14	23%	$72	2.6%	$60	$14	$74	2015Q2	4.8%	$63	$15	$77
1.5%	Engineering & Design	$88	$21	23%	$109	2.6%	$90	$21	$111	2015Q2	4.8%	$95	$22	$117
0.5%	Engineering Tech Review ITR & VE	$29	$7	23%	$36	2.6%	$30	$7	$37	2015Q2	4.8%	$31	$7	$39
1.0%	Contracting & Reprographics	$58	$14	23%	$72	2.6%	$60	$14	$74	2015Q2	4.8%	$63	$15	$77
0.5%	Engineering During Construction	$29	$7	23%	$36	2.6%	$30	$7	$37	2016Q2	8.9%	$33	$8	$40
0.5%	Planning During Construction	$29	$7	23%	$36	2.6%	$30	$7	$37	2016Q2	8.9%	$33	$8	$40
0.5%	Project Operations	$29	$7	23%	$36	2.6%	$30	$7	$37	2015Q2	4.8%	$31	$7	$39
31	CONSTRUCTION MANAGEMENT													
3.5%	Construction Management	$204	$52	25%	$256	2.6%	$209	$53	$262	2016Q2	8.9%	$228	$58	$286
2.0%	Project Operation:	$117	$30	25%	$146	2.6%	$120	$30	$150	2016Q2	8.9%	$130	$33	$163
2.5%	Project Management	$146	$37	25%	$183	2.6%	$149	$38	$187	2016Q2	8.9%	$163	$41	$204
	CONTRACT COST TOTALS:	$6,703	$1,981		$8,684		$6,799	$2,009	**$8,808**			$7,101	$2,097	**$9,198**

Port Lions Wally Revised Estimate
UPC=PTL001 Breakwater & Dredging y:\SBH\PTL01B\ALT 1C \ Current Working Estimate.

The existing harbor in Settler Bay lies to the northeast of the city of Port Lions. The community has a harbor, partly sheltered by a breakwater, constructed by the Corps of Engineers in 1983.The breakwaters protect a 1 0-acre mooring basin. The existing basin depths range from -14 feet mean lower low water (MLL W) near the entrance channel to -8 feet MLL W at the near-shore extent of the basin.

The harbor is an important part of the economic fabric of the community in that it provides a transportation link for the community, which is not accessible by road; and it serves as the only moorage for the local fishing fleet.

Port Lions is located on on the northeast coast of Kodiak Island, approximately 30 air-miles northwest of the City of Kodiak and 260 air-miles southwest of Anchorage, and can be reached from Anchorage with a 45-minute flight. Kodiak Island is the largest island in Alaska, and is second only in size to Hawaii in the U.S.

Port Lions and the contiguous marine waters of Settler Cove are at latitude 57°53' N and longitude 152°53' W. Port Lions is accessible by air and water. There is a state-owned 2,200-foot gravel airstrip. Regular and charter flights are available from Kodiak, however, regular air service is frequently cancelled due to visibility limitations. The local gravel airstrip is not suitable for instrument landings or departures, making the water taxi a cost-effective alternative for passenger and freight delivery.

The state ferry operates bi-monthly from Kodiak between May and October. Barge service is available from Seattle. The local road network is adequate to travel from the airport to town and to the ferry dock, a total distance of less than 5 miles.

The area has a maritime climate primarily influenced by strong low pressure centers generated in the Gulf of Alaska and North Pacific Ocean. Cool summers, mild winters, and year-round rainfall characterize the climate. Average annual precipitation per year is 54 inches. Snow falls primarily between November and April, and the average annual snowfall is 75 inches. Normal winter temperature ranges from 10 to 40 °F, while
summer temperatures range from 55 to 70 °F. The mean tide range at Port Lions is 8.7 feet and the diurnal range is 18.0 feet. The Port Lions area as with most of Kodiak Island is known for intense storms that occur
from various directions.

In general, the waters in the vicinity of Kodiak Island are ice-free year round. Local icing conditions along the shoreline can occur during extreme cold temperatures. Ice has been reported in the existing harbor area from local freshwater sources but it is relatively short lived due to the moderate temperatures, and wave and current conditions.

Estimated by	NWW
Designed by	CEPOA-EN-CW
Prepared by	Brassfield 503.658.7148
Preparation Date	9/2/2013
Effective Date of Pricing	9/2/2013
Estimated Construction Time	120 Days

Labor ID: EQ ID: EP11R08 | Currency in US dollars | TRACES MII Version 4.2

Designed by
CEPOA-EN-CW
Estimated by
NWW
Prepared by
Brassfield 503.658.7148

Design Document	PORT LIONS SBH, AK - ALT 1C
Document Date	6/18/2012
District	Alaska District
Contact	Karl Harvey, 753-
Budget Year	2014
UOM System	English

Direct Costs

LaborCost
EQCost
MatlCost
SubBidCost
ShipCost
OTHER

Timeline/Currency

Preparation Date	9/2/2013
Escalation Date	9/2/2013
Eff. Pricing Date	9/2/2013
Estimated Duration	120 Day(s)
Currency	US dollars
Exchange Rate	1.000000

Costbook CB12EB-b: MII English Cost Book 2012-b

Labor : Alaska Labor & Mech 2013

Labor Rates

LaborCost1
LaborCost2
LaborCost3
LaborCost4

Equipment EP11R08: MII Equipment 2011 Region 08

08 NORTHWEST

Sales Tax	5.40
Working Hours per Year	1,540
Labor Adjustment Factor	1.05
Cost of Money	2.50
Cost of Money Discount	25.00
Tire Recap Cost Factor	1.50
Tire Recap Wear Factor	1.80
Tire Repair Factor	0.15
Equipment Cost Factor	1.00
Standby Depreciation Factor	0.50

Fuel

Electricity	0.072
Gas	3.670
Diesel Off-Road	3.450
Diesel On-Road	3.990

Shipping Rates

Over 0 CWT	28.32
Over 240 CWT	26.60
Over 300 CWT	24.23
Over 400 CWT	22.06
Over 500 CWT	11.26
Over 700 CWT	9.51
Over 800 CWT	6.48

Currency in US dollars

Date	Author	Note
	Al Arruda	Revised converted M2 estimate with latest cost book, libraires, and assemblies. Utilized KONIAG, Inc., rock pricing information.

Direct Cost Markups	Category	Method
Mtl Esc	TaxAdj	Running % on Selected Costs
MatlCost		
Kodiak Sales Tax	TaxAdj	Running % on Selected Costs
MatlCost		
Kodiak Bed Tax	TaxAdj	Running % on Selected Costs
SubBidCost		

6-12 OT — Overtime — Overtime

	Days/Week	*Hours/Shift*	*Shifts/Day*	*1st Shift*	*2nd Shift*	*3rd Shift*
Standard	*5.00*	*8.00*	*1.00*	*8.00*	*0.00*	*0.00*
Actual	*6.00*	*8.00*	*1.00*	*12.00*	*0.00*	*0.00*

Day	*OT Factor*	*Working*	*OT Percent*	*FCCM Percent*
Monday	*1.50*	*Yes*	*22.22*	*(44.44)*
Tuesday	*1.50*	*Yes*		
Wednesday	*1.50*	*Yes*		
Thursday	*1.50*	*Yes*		
Friday	*1.50*	*Yes*		
Saturday	*1.50*	*Yes*		
Sunday	*2.00*	*No*		

7-10 OT — Overtime — Overtime

	Days/Week	*Hours/Shift*	*Shifts/Day*	*1st Shift*	*2nd Shift*	*3rd Shift*
Standard	*5.00*	*8.00*	*2.00*	*8.00*	*7.50*	*0.00*
Actual	*7.00*	*8.00*	*2.00*	*10.00*	*7.50*	*0.00*

Day	*OT Factor*	*Working*	*OT Percent*	*FCCM Percent*
Monday	*1.50*	*Yes*	*21.63*	*(67.35)*
Tuesday	*1.50*	*Yes*		
Wednesday	*1.50*	*Yes*		
Thursday	*1.50*	*Yes*		
Friday	*1.50*	*Yes*		
Saturday	*1.50*	*Yes*		
Sunday	*1.50*	*Yes*		

Contractor Markups	Category	Method
JOOH (Small Tools)	JOOH	% of Labor
JOOH	JOOH	JOOH (Calculated)
FIELD OH (Running%)	JOOH	Running %
HOME OFC (Running%)	MiscContract	Running %
PROFIT (Running%)	Profit	Running %
Prime Profit (PWG)	Profit	Profit Weighted Guidelines

Guideline	*Value*	*Weight*	*Percentage*
Risk	*0.100*	*20*	*2.00*
Difficulty	*0.080*	*15*	*1.20*

Labor ID: EQ ID: EP11R08 | Currency in US dollars | TRACES MII Version 4.2

Size	*0.040*	*15*	*0.60*
Period	*0.050*	*15*	*0.75*
Invest (Contractor's)	*0.070*	*5*	*0.35*
Assist (Assistance by)	*0.070*	*5*	*0.35*
SubContracting	*0.120*	*25*	*3.00*
Total		*100*	*8.25*

BOND (Running%)	Bond	Running %
Prime Bond	Bond	Bond Table

Class B, Tiered, 24 months, 1.00% Surcharge

Contract Price	*Bond Rate*
500,000	*15.84*
2,000,000	*9.57*
2,500,000	*7.59*
2,500,000	*6.93*
7,500,000	*6.34*

Owner Markups	**Category**	**Method**
Esc to MdPt	Escalation	Running %
Contingency	Escalation	Running %
SIOH	Escalation	Running %
EDC	Escalation	Running %

Labor ID: EQ ID: EP11R08 Currency in US dollars TRACES MII Version 4.2

Description	Quantity	UOM	ContractCost	Escalation	Contingency	SIOH	MiscOwner	ProjectCost
Project Cost Summary Report			**5,830,292**	**0**	**0**	**0**	**0**	**5,830,292**
Mob, Demob & Preparatory Work	**1.00**	**EA**	**301,486**	**0**	**0**	**0**	**0**	**301,486**
Barge Mob/Demob Anc-Port Lions	**1.00**	**YR**	**217,004**	**0**	**0**	**0**	**0**	**217,004**
Road Mobilization/Demobilization	**2.00**	**EA**	**16,480**	**0**	**0**	**0**	**0**	**16,480**
Personnel Mob/Demob	**7.00**	**PN**	**15,178**	**0**	**0**	**0**	**0**	**15,178**
Preliminary Work & Setup	**1.00**	**EA**	**44,509**	**0**	**0**	**0**	**0**	**44,509**
Closeout Work & Teardown	**1.00**	**EA**	**8,315**	**0**	**0**	**0**	**0**	**8,315**
Construct New Breakwater and Modify Exisitng Breakwater and Fish passage	**61,530.00**	**ECY**	**5,470,902**	**0**	**0**	**0**	**0**	**5,470,902**
Quarry Operation	**98,500.00**	**TON**	**4,006,720**	**0**	**0**	**0**	**0**	**4,006,720**
Transport between quarry and placement site	**98,500.00**	**TON**	**589,688**	**0**	**0**	**0**	**0**	**589,688**
Install Breakwater and Mod Exist	**98,500.00**	**TON**	**874,495**	**0**	**0**	**0**	**0**	**874,495**
Hydrographic Survey	**1.00**	**EA**	**42,234**	**0**	**0**	**0**	**0**	**42,234**
Navigation Markers	**1.00**	**EA**	**15,670**	**0**	**0**	**0**	**0**	**15,670**
Navigation Foundation	**1.00**	**EA**	**3,071**	**0**	**0**	**0**	**0**	**3,071**
USCGS Nav Aids	**1.00**	**EA**	**12,599**	**0**	**0**	**0**	**0**	**12,599**

Labor ID: EQ ID: EP11R08 Currency in US dollars TRACES MII Version 4.2

Abbreviated Risk Analysis

Project (less than $40M): **Port Lions, Alaska, Nav Imp Alt#1C**
Project Development Stage: Feasibility LRR
Risk Category: **Moderate Risk: Typical Project or Possible Life Safety**

Total Construction Contract Cost = **$ 5,830,292**

	CWWBS	Feature of Work	Contract Cost		% Contingency	$ Contingency	Total
	01 LANDS AND DAMAGES	Real Estate	$ 1,000		20.00%	$ 200	$ 1,200.00
1	10 BREAKWATERS AND SEAWALLS	**Mobilization - Demobilization**	$ 301,486		12.30%	$ 37,085	$ 338,570.88
2	10 BREAKWATERS AND SEAWALLS	**New Rubblemound Breakwater**	$ 5,164,442		31.65%	$ 1,634,388	$ 6,798,830.67
3	10 BREAKWATERS AND SEAWALLS	**Extend Rubblemound Breakwaters**	$ 306,460		29.72%	$ 91,090	$ 397,549.49
4	10 BREAKWATERS AND SEAWALLS	**Nav Marker & Base**	$ 15,670		4.46%	$ 699	$ 16,368.79
5	10 BREAKWATERS AND SEAWALLS	**Hydro Surveys**	$ 42,234		10.16%	$ 4,292	$ 46,525.95
6	10 BREAKWATERS AND SEAWALLS				0.00%	$ -	$ -
7	10 BREAKWATERS AND SEAWALLS				0.00%	$ -	$ -
8	10 BREAKWATERS AND SEAWALLS				0.00%	$ -	$ -
9	10 BREAKWATERS AND SEAWALLS				0.00%	$ -	$ -
12		**Remaining Construction Items**	$ -	*0.0%*	0.00%	$ -	$ -
13	30 PLANNING, ENGINEERING, AND DESIGN	**Planning, Engineering, & Design**	$ 406,000		23.38%	$ 94,904	$ 500,904.27
14	31 CONSTRUCTION MANAGEMENT	**Construction Management**	$ 466,000		25.35%	$ 118,130	$ 584,130.00

Totals					
Real Estate	$ 1,000		20.00%	$ 200	$ 1,200.00
Total Construction Estimate	$ 5,830,292		30.32%	$ 1,767,553	$ 7,597,846
Total Planning, Engineering & Design	$ 406,000		23.38%	$ 94,904	$ 500,904
Total Construction Management	$ 466,000		25.35%	$ 118,130	$ 584,130
Total	$ 6,703,292			$ 1,980,788	$ 8,684,080

Port Lions, Alaska, Nav Imp Alt#1C
Feasibility LRR
Abbreviated Risk Analysis

Typical Risk Elements	Potential Risk Areas													
	Mobilization - Demobilization	New Rubblemound Breakwater	Extend Rubblemound Breakwaters	Nav Marker & Base	Hydro Surveys	0	0	0	0	0	0	Remaining Construction Iten	Planning, Engineering, & Design	Construction Management
Project Scope Growth	1	1	1	1	1	-	-	-	-	-	-	-	1	1
Acquisition Strategy	2	2	1	-	1	-	-	-	-	-	-	2	-	1
Construction Elements	1	2	2	-	1	-	-	-	-	-	-	-	2	2
Quantities for Current Scope	-	2	2	-	1	-	-	-	-	-	-	-	2	2
Specialty Fabrication or Equipment	-	2	2	-	-	-	-	-	-	-	-	-	2	2
Cost Estimate Assumptions	1	3	3	-	-	-	-	-	-	-	-	-	3	3
External Project Risks	1	2	2	1	1	-	-	-	-	-	-	-	-	-

Port Lions, Alaska, Nav Imp Alt#1C
Feasibility LRR
Abbreviated Risk Analysis

Meeting Date: 4-Sep-13

Risk Level

	Negligible	Marginal	Significant	Critical	Crisis
Very Likely	2	3	4	5	5
Likely	1	2	3	4	5
Possible	0	1	2	3	4
Unlikely	0	0	1	2	3

Risk Element	Feature of Work	Concerns Pull Down Tab (ENABLE MACROS THRU TRUST CENTER) (Choose ALL that apply)	Concerns	PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)	Likelihood	Impact	Risk Level
Project Scope Growth							
						Max Potential Cost Growth	**75%**
PS-1	Mobilization - Demobilization	• Potential for scope growth, added features and quantities?	• Potential for scope growth, added features and quantities? Mob-demobe bid price higher or modified over bid price due to scope creap.	Project scope growth for mob-demob could occur if additional or different types of equipment are required after award of contract. This scenario is possible if a major change in the design happens (ie, originally a breakwater project, but changes to require something additional like dredging). Mob-demob is unlikely to alter due to project scope growth because design scope is relatively straight forward and known at this point.	Unlikely	Significant	1
PS-2	New Rubblemound Breakwater	• Investigations sufficient to support design assumptions?	• Project accomplish intent? Intent is to protect harbor via detached b/w - concern that after construction, it won't protect and a new design requires additional work. • Investigations sufficient to support design assumptions? Actual wave height is greater than actual rendering design inadequate.	Geotechnical data that exists is adequate to determine design conditions. Quantities of breakwater materials are fairly certain given the existing rubble mound construction. Design wave height was more thoroughly studied and estimated using current technologies and methods; high confidence in the design conditions. Through construction conformance with specifications should assure adequate performance of bw to meet intent. The specification for material layers is adequate for the design wave height.	Unlikely	Significant	1
PS-3	Extend Rubblemound Breakwaters	• Project accomplish intent?	• Project accomplish intent? Close off existing b/w to help reduce wave energy in harbor will not reduce energy	A 40-ft long extension of the existing breakwater to the west for reduction in the existing gap width, and a 75-ft long extension of the existing fill at the dock approach to further reduce the gap width. Quantities of breakwater materials are fairly certain given the existing breakwaters.	Unlikely	Significant	1
PS-4	Nav Marker & Base	• Potential for scope growth, added features and quantities?	• Potential for scope growth, added features and quantities? Coast Guard provides and installs navigation marker after the USACE Contractor builds and installs concrete base. Concern that marker anchor bolt pattern in contract changes after construction and new pattern will be needed.	The U.S. Coast Guard will provide and install these navigation aids and they also provide the bolt pattern and specifics needed (size and shape of base). Potential exists that the design requirement can change after award therefore causing a modification to the USACE contract. Impact would be fairly small but always possible.	Possible	Marginal	1
PS-5	Hydro Surveys	• Design confidence?	• Project accomplish intent? Hydro survey spec not sufficient to define bottom and establish before and after conditions • Design confidence? Hydro survey may reveal different bottom depth requiring additional survey's.	Project is fairly straight forward, and location is easy to access via marine transport with adequate support facilities and equipment to accomplish surveys per spec. Adequate certified surveyors in region will not pose challenge to complete valid surveys for quantity verification and quality control.	Possible	Marginal	1
PS-12	Remaining Construction Items	• Potential for scope growth, added features and quantities?	No remaining construction items identified as all cost items are included in the features of work (mob-demobe, new breakwater construction, existing breakwater construction, nav marker & base, hydro surveys).	N/A	Unlikely	Negligible	0
PS-13	Planning, Engineering, & Design	• Design confidence?	• Project accomplish intent? Hydro survey spec insufficient to define bottom and establish before and after conditions. • Design confidence? Hydro survey may reveal different bottom depth requiring additional survey's.	Project is fairly straight forward, and location is easy to access via marine transport with adequate support facilities and equipment to accomplish surveys per spec. Adequate certified surveyors in region will not pose challenge to complete valid surveys for quantity verification and quality control.	Possible	Marginal	1
PS-14	Construction Management	• Potential for scope growth, added features and quantities?	• Project accomplish intent? Intent is to protect harbor via detached b/w - after construction, it doesn 't protect and new design requires additional work. • Investigations sufficient to support design assumptions? Actual wave height is greater than actual rendering design inadequate.	Geotechnical data that exists is adequate to determine design conditions. Quantities of breakwater materials are fairly certain given the existing rubble mound construction. Design wave height was more thoroughly studied and estimated using current technologies and methods; high confidence in the design conditions. Through construction conformance with specifications should assure adequate performance of bw to meet intent. The specification for material layers is adequate for the design wave height.	Unlikely	Significant	1

Port Lions, Alaska, Nav Imp Alt#1C
Feasibility LRR
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Risk Level

	Negligible	Marginal	Significant	Critical	Crisis
Very Likely	2	3	4	5	5
Likely	1	2	3	4	5
Possible	0	1	2	3	4
Unlikely	0	0	1	2	3

Risk Element	Feature of Work	Concerns Pull Down Tab (ENABLE MACROS THRU TRUST CENTER) (Choose ALL that apply)	Concerns	PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)	Likelihood	Impact	Risk Level
Acquisition Strategy							
						Max Potential Cost Growth	**30%**
AS-1	Mobilization - Demobilization	• Contracting plan firmly established?	• High-risk acquisition limits competition, design/build? • Limited bid competition anticipated? • Bid schedule developed to reduce quantity risks? • 8a or small business likely? • Contracting plan firmly established? Potential delay in funding could cause increase in escalation	Port Lions is located on the northeast coast of Kodiak Island, approximately 30 air-miles northwest of the City of Kodiak and 260 air-miles southwest of Anchorage, and can be reached from Anchorage with a 45-minute flight. Abundant local competition should not result in contractor traveling farther. Due to relatively low amounts of this type of Federal Govt work in the near future (3-5 years), completion should not be limited. 8A not likely but could be a possibility.	Possible	Significant	2
AS-2	New Rubblemound Breakwater	• Accelerated schedule or harsh weather schedule?	• 8a or small business likely? Potential to award to inexperienced contractor that will struggle with construction. • Accelerated schedule or harsh weather schedule? Award too late in the year to begin therefore pushing construction to unfavorable weather.	RFP will stress past performance and low price technically acceptable to mitigate unknowns for contractor performance. Intend on allowing 2 construction seasons so schedule is not compressed. No known in-water work constraints. FAR Clause for VEQ will be included to address over-under runs.	Possible	Significant	2
AS-3	Extend Rubblemound Breakwaters	• Accelerated schedule or harsh weather schedule?	• 8a or small business likely? Potential to award to inexperienced contractor that will struggle with construction. • Accelerated schedule or harsh weather schedule? Award too late in the year to begin therefore pushing construction to in favorable weather.	RFP will stress past performance and low price technically acceptable to mitigate unknowns for contractor performance. Intend on allowing 2 construction seasons so schedule is not compressed. No known in-water work constraints. FAR Clause for VEQ will be included to address over-under runs.	Possible	Marginal	1
AS-4	Nav Marker & Base	• Contracting plan firmly established?	No concerns identified for this risk element.	N/A	Unlikely	Marginal	0
AS-5	Hydro Surveys	• Requirement for subcontracting?	• Requirement for subcontracting? Will be subcontracted (required per specs to have 3rd party independent surveyor). Concern is prime will not be able to retain and oversee sub	Sub-Contractor willingness for remote site work is driver. Typically no issue with competition and willing surveyors to compete for this work. USG will withhold payment to prime for not performing, and therefore risk is unlikely - impact will not be large.	Possible	Marginal	1
AS-12	Remaining Construction Items	• Contracting plan firmly established?	No remaining construction items identified as all cost items are included in the features of work (mob-demobe, new breakwater construction, existing breakwater construction, navigation marker & base, hydro surveys).	N/A	Possible	Significant	2
AS-13	Planning, Engineering, & Design	• Contracting plan firmly established?	• Contracting plan firmly established? Potential delay in funding could cause increase in escalation	likelihood that funding will be delayed is possible with impact being significant.	Unlikely	Marginal	0
AS-14	Construction Management	• Accelerated schedule or harsh weather schedule?	• 8a or small business likely? Potential to award to inexperienced contractor that will struggle with construction. • Accelerated schedule or harsh weather schedule? Award too late in the year to begin therefore pushing construction to in favorable weather. • Accelerated schedule or harsh weather schedule?	RFP will stress past performance and low price technically acceptable to mitigate unknowns for contractor performance. Intend on allowing 2 construction seasons so schedule is not compressed. No known in-water work constraints. FAR Clause for VEQ will be included to address over-under runs.	Possible	Marginal	1

Port Lions, Alaska, Nav Imp Alt#1C
Feasibility LRR
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Meeting Date: 4-Sep-13

Risk Level

	Negligible	Marginal	Significant	Critical	Crisis
Very Likely	2	3	4	5	5
Likely	1	2	3	4	5
Possible	0	1	2	3	4
Unlikely	0	0	1	2	3

Risk Element	Feature of Work	Concerns Pull Down Tab (ENABLE MACROS THRU TRUST CENTER) (Choose ALL that apply)	Concerns	PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)	Likelihood	Impact	Risk Level
Construction Elements							
						Max Potential Cost Growth	25%
CE-1	Mobilization - Demobilization	• High risk or complex construction elements, site access, in-water?	• Special mobilization? Mobe to location is large undertaking and requires well equipped contractor with the right equipment • Special equipment or subcontractors needed?	Construction of currently designed breakwater is fairly straight forward - therefore, type of equipment to be mobilized-demobilized should be easily to predict and plan for and available from a well equipped contractor. Should special equipment be required, estimated cost may increase. its' unlikely technically qualified contractors will not mob correctly but if it occurs the impact to project estimate could be significant.	Unlikely	Significant	1
CE-2	New Rubblemound Breakwater	• Special equipment or subcontractors needed?	• Potential for construction modification and claims? There is always a potential for modifications due to different bottom depth, non-constructible design or other factors. • Special equipment or subcontractors needed? Contractor will not have proper equipment to place material per contract, or equipment will breakdown causing delays	Design is relatively straight forward as it's a straight shape and alignment. Bottom is fairly shallow so controlling the material placement is less complex; tidal range is very small in this area and work is anticipated to occur in summer months when wave influence is minimal. unique equipment not anticipated for this type of construction.	Possible	Significant	2
CE-3	Extend Rubblemound Breakwaters	• High risk or complex construction elements, site access, in-water?	• High risk or complex construction elements, site access, in-water? Potential issues when removing existing material to tie-in new layers of rock - storm damage during a-rock removal; remove more rock than estimated to adequately tie-in new layers; work will require both land-based and water based due to shallow depths;	work will require working around tides where close to the shore, may require land based and water based or a combination. If contractors schedule shows removal during traditionally stormy seasons, USG may have some input to disallow contractor to disassemble existing bw. Likelihood that contractor choose stormy season to compete work, is possible, Impact is it could take a little extra time to figure it out and work around environmental conditions	Possible	Significant	2
CE-4	Nav Marker & Base	• High risk or complex construction elements, site access, in-water?	• High risk or complex construction elements, site access? Installation of base by USACE contractor may require rework of special placed a rock.	The USACE contractor will have to sequence installation of base with the rest of the breakwater construction. Potential for re-work is unlikely and impact will be minimal.	Unlikely	Marginal	0
CE-5	Hydro Surveys	• Special equipment or subcontractors needed?	• Special equipment or subcontractors needed? Hydro surveyor not equipped or doesn't deliver adequate submittals due to work around water and shoreline features of work	relatively shallow depth, straight bw design, low tide range, low and mild wave area, and past projects have demonstrated a wealth of qualified surveyors in the region to complete this work.	Possible	Marginal	1
CE-12	Remaining Construction Items	• Accelerated schedule or harsh weather schedule?	No remaining construction items identified as all cost items are included in the features of work (mob-demobe, new breakwater construction, existing breakwater construction, nav marker & base, hydro surveys).	N/A	Unlikely	Negligible	0
CE-13	Planning, Engineering, & Design	• High risk or complex construction elements, site access, in-water?	• High risk or complex construction elements, site access, in-water? Potential issues when removing existing material to tie-in new layers of rock - storm damage during a-rock removal; remove more rock than estimated to adequately tie-in new layers; work will require both land-based and water based due to shallow depths;	work will require working around tides where close to the shore, may require land based and water based or a combination. If contractors schedule shows removal during traditionally stormy seasons, USG may have some input to disallow contractor to disassemble existing bw. Likelihood that contractor choose stormy season to compete work, is possible, Impact is it could take a little extra time to figure it out and work around environmental conditions	Possible	Significant	2
CE-14	Construction Management	• Special equipment or subcontractors needed?	• Potential for construction modification and claims? There is always a potential for modifications due to different bottom depth, unconstructable design or other factors. • Special equipment or subcontractors needed? Contractor will not have proper equipment to place material per contract, or equipment will breakdown causing delays	Design is relatively straight forward as it's a straight shape and alignment. Bottom is fairly shallow so controlling the material placement is less complex; tidal range is very small in this area and work is anticipated to occur in summer months when wave influence is minimal. unique equipment not anticipated for this type of construction.	Possible	Significant	2

Port Lions, Alaska, Nav Imp Alt#1C
Feasibility LRR
Abbreviated Risk Analysis

Meeting Date: 4-Sep-13

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	Negligible	Marginal	Significant	Critical	Crisis
Very Likely	2	3	4	5	5
Likely	1	2	3	4	5
Possible	0	1	2	3	4
Unlikely	0	0	1	2	3

Risk Element	Feature of Work	Concerns Pull Down Tab (ENABLE MACROS THRU TRUST CENTER) (Choose ALL that apply)	Concerns	PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)	Likelihood	Impact	Risk Level
Quantities for Current Scope							
						Max Potential Cost Growth	**20%**
Q-1	Mobilization - Demobilization	• Level of confidence based on design and assumptions?	• Level of confidence based on design and assumptions?	While there is always a potential for quantities to change, if that is the case and quantities do increase, mob-demobe cost in the contract would not be effected unless an additional piece of equipment would be needed to stay on schedule. With 2 years to complete, risk is low.	Unlikely	Marginal	0
Q-2	New Rubblemound Breakwater	• Appropriate methods applied to calculate quantities?	• Level of confidence based on design and assumptions? • Possibility for increased quantities due to loss, waste, or subsidence? --- Quantities were provided by H&H designers who calculated them based on current survey. survey at time of construction could change therefore rendering the estimated qty in bid schedule inadequate. • Appropriate methods applied to calculate quantities? estimate assumes typical quarry yield but because it's unproven the quarry costs could increase if yield is different and quantity required for project means operator has to move more material.	Quantities are based on recent hydro survey and project is in -10 to -15 MLLW depths that are shallow. Therefore the survey had good bathymetry definition to base quantity calculations on. Bottom is very stable without historical scouring or shoaling. Based on that, the chance of seeing large fluctuations in the quantities post award are fairly unlikely but as always present a possibility. VEQ clause allows 15% plus/minus changes for payment purposes. Designers used current technologies to calculate. If large fluctuations are seen, the cost overruns could be significant but they are unlikely to happen.	Possible	Significant	2
Q-3	Extend Rubblemound Breakwaters	• Level of confidence based on design and assumptions?	Estimated quantities may increase during construction. Extent of rock to be removed can be greater than estimated. Contractor is required to remove enough to tie-in new armor layers.	Design requires removal of enough material to tie-in new layers. To get enough material off to tie in new layers, quantity may be more than estimated, therefore it's likely to happen cost impact would be marginal	Likely	Marginal	2
Q-4	Nav Marker & Base	• Level of confidence based on design and assumptions?	No concerns identified for this risk element.	N/A	Unlikely	Negligible	0
Q-5	Hydro Surveys	• Level of confidence based on design and assumptions?	number of survey's needed more than estimate covers.	contract stipulates number of quantities needed. contract is very clear that a pre-, interim and post survey are require.	Unlikely	Significant	1
Q-12	Remaining Construction Items	• Level of confidence based on design and assumptions?	No remaining construction items identified as all cost items are included in the features of work (mob-demobe, new breakwater construction, existing breakwater construction, nav marker & base, hydro surveys).	N/A	Unlikely	Negligible	0
Q-13	Planning, Engineering, & Design	• Appropriate methods applied to calculate quantities?	• Level of confidence based on design and assumptions? • Possibility for increased quantities due to loss, waste, or subsidence? --- Quantities were provided by H&H designers who calculated them based on current survey. survey at time of construction could change therefore rendering the estimated qty in bid schedule inadequate.	Quantities are based on recent hydro survey and project is in -10 to -15 MLLW depths that are shallow. Therefore the survey had good bathymetry definition to base quantity calculations on. Bottom is very stable without historical scouring or shoaling. Based on that, the chance of seeing large fluctuations in the quantities post award are fairly unlikely but as always present a possibility. VEQ clause allows 15% plus/minus changes for payment purposes.	Possible	Significant	2
Q-14	Construction Management	• Level of confidence based on design and assumptions?	Estimated quantities may increase during construction. Extent of rock to be removed can be greater than estimated. Contractor is required to remove enough to tie-in new armor layers.	Design requires removal of enough material to tie-in new layers. To get enough material off to tie in new layers, quantity may be more than estimated, therefore it's likely to happen cost impact would be marginal	Likely	Marginal	2

Port Lions, Alaska, Nav Imp Alt#1C
Feasibility LRR
Abbreviated Risk Analysis

Meeting Date: 4-Sep-13

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	Negligible	Marginal	Significant	Critical	Crisis
Very Likely	2	3	4	5	5
Likely	1	2	3	4	5
Possible	0	1	2	3	4
Unlikely	0	0	1	2	3

Risk Element	Feature of Work	Concerns Pull Down Tab (ENABLE MACROS THRU TRUST CENTER) (Choose ALL that apply)	Concerns	PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)	Likelihood	Impact	Risk Level
Specialty Fabrication or Equipment							
					Max Potential Cost Growth		**75%**
FE-1	Mobilization - Demobilization	• Ability to reasonably transport?	• Ability to reasonably transport?	Mobe-demobe of equipment needed to construct breakwater not unique and is reasonably available in heavy marine construction industry.	Unlikely	Marginal	0
FE-2	New Rubblemound Breakwater	• Confidence in suppliers' ability?	• Confidence in suppliers' ability? Estimate assumes Shakmanof quarry. If this quarry doesn't have a permit or material doesn't pass testing, another quarry would be required.	potential for no permit is possible, impact is high. Potential for quarry not producing material per specification low based on geotechnical experts review of known data however impact would be significant.	Possible	Significant	2
FE-3	Extend Rubblemound Breakwaters	• Unusual parts, material or equipment manufactured or installed?	• Confidence in suppliers' ability? Estimate assumes Shakmanof quarry. If this quarry doesn't have a permit or material doesn't pass testing, another quarry would be required.	Potential for no permit is possible, impact is high. Potential for quarry not producing material per specification low based on geotechnical experts review of known data however impact would be significant.	Possible	Significant	2
FE-4	Nav Marker & Base	• Unusual parts, material or equipment manufactured or installed?	No concerns for this risk element identified.	N/A	Unlikely	Marginal	0
FE-5	Hydro Surveys	• Unusual parts, material or equipment manufactured or installed?	No concerns for this risk element identified.	N/A	Unlikely	Negligible	0
FE-12	Remaining Construction Items	• Unusual parts, material or equipment manufactured or installed?	No remaining construction items identified as all cost items are included in the features of work (mob-demobe, new breakwater construction, existing breakwater construction, nav marker & base, hydro surveys).	N/A	Unlikely	Negligible	0
FE-13	Planning, Engineering, & Design	• Confidence in suppliers' ability?	• Confidence in suppliers' ability? Estimate assumes Shakmanof quarry. If this quarry doesn't have a permit or material doesn't pass testing, another quarry would be required.	potential for no permit is possible, impact is high. Potential for quarry not producing material per specification low based on geotechnical experts review of known data however impact would be significant.	Possible	Significant	2
FE-14	Construction Management	• Unusual parts, material or equipment manufactured or installed?	• Confidence in suppliers' ability? Estimate assumes Shakmanof quarry. If this quarry doesn't have a permit or material doesn't pass testing, another quarry would be required.	potential for no permit is possible, impact is high. Potential for quarry not producing material per specification low based on geotechnical experts review of known data however impact would be significant.	Possible	Significant	2

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	Negligible	Marginal	Significant	Critical	Crisis
Very Likely	2	3	4	5	5
Likely	1	2	3	4	5
Possible	0	1	2	3	4
Unlikely	0	0	1	2	3

Risk Element	Feature of Work	Concerns Pull Down Tab (ENABLE MACROS THRU TRUST CENTER) (Choose ALL that apply)	Concerns	PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)	Likelihood	Impact	Risk Level
Cost Estimate Assumptions							
						Max Potential Cost Growth	**35%**
CT-1	Mobilization - Demobilization	• Overuse of Cost Book, lump sum, allowances?	• Site accessibility, transport delays, congestion? • Overuse of Cost Book, lump sum, allowances?	Cost estimate Mobe-demobe item is based on calculated costs for typical equipment spread seen on similar projects of this type. Development of equipment spread used was based on past construction projects list, photos, quality control daily reports, and discussions with POA personnel having first hand knowledge. Origin of contractor used in estimate is based from Anchorage but potential for a contractor to bid from Southeast Alaska or Pacific NW area.	Possible	Marginal	1
CT-2	New Rubblemound Breakwater	• Assumptions regarding crew, productivity, overtime?	• Assumptions related to prime and subcontractor markups/assignments? • Assumptions regarding crew, productivity, overtime? • Lack confidence on critical cost items? Quarry royalty fee is at $10 per cy in estimate for unproven quarry. Potential this could increase by the time project is awarded. • Assumptions regarding crew, productivity, overtime? estimate assumes minor amount of overburden for quarry development. should actual amount increase, cost of rock production would be higher than estimate	Critical cost item for this project is cost of rock at quarry and transport cost from quarry to project. Assume Shakmanof Quarry for rock. If other quarry is required because Shakmanof not able to deliver, impact could would be critical. Likelihood that could happen - good possibility.	Possible	Critical	3
CT-3	Extend Rubblemound Breakwaters	• Reliability and number of key quotes?	• Assumptions related to prime and subcontractor markups/assignments? • Assumptions regarding crew, productivity, overtime? • Lack confidence on critical cost items?	Critical cost item for this project is cost of rock at quarry and transport cost from quarry to project. Assume Shakmanof Quarry for rock. If other quarry is required because Shakmanof not able to deliver, impact could would be critical. Likelihood that could happen - good possibility.	Possible	Critical	3
CT-4	Nav Marker & Base	• Site accessibility, transport delays, congestion?	No concerns identified for this risk element.	N/A	Unlikely	Negligible	0
CT-5	Hydro Surveys	• Overuse of Cost Book, lump sum, allowances?	• Lack confidence on critical cost items? • Overuse of Cost Book, lump sum, allowances?	Estimate uses historical pricing for similar hydro survey tasks. Likelihood that costs will be outside of historical pricing is unlikely and could impact marginal.	Unlikely	Marginal	0
CT-12	Remaining Construction Items	• Reliability and number of key quotes?	No remaining construction items identified as all cost items are included in the features of work (mob-demobe, new breakwater construction, existing breakwater construction, nav marker & base, hydro surveys).	N/A	Unlikely	Negligible	0
CT-13	Planning, Engineering, & Design	• Reliability and number of key quotes?	• Assumptions related to prime and subcontractor markups/assignments? • Assumptions regarding crew, productivity, overtime? • Lack confidence on critical cost items?	Critical cost item for this project is cost of rock at quarry and transport cost from quarry to project. Assume Shakmanof Quarry for rock. If other quarry is required because Shakmanof not able to deliver, impact could would be critical. Likelihood that could happen - good possibility.	Possible	Critical	3
CT-14	Construction Management	• Assumptions regarding crew, productivity, overtime?	• Assumptions related to prime and subcontractor markups/assignments? • Assumptions regarding crew, productivity, overtime? • Lack confidence on critical cost items? Quarry royalty fee is at $10 per cy in estimate for unproven quarry. Potential this could increase by the time project is awarded. • Assumptions regarding crew, productivity, overtime? estimate assumes minor amount of overburden for quarry development. should actual amount increase, cost of rock production would be higher than estimate	Critical cost item for this project is cost of rock at quarry and transport cost from quarry to project. Assume Shakmanof Quarry for rock. If other quarry is required because Shakmanof not able to deliver, impact could would be critical. Likelihood that could happen - good possibility.	Possible	Critical	3

Port Lions, Alaska, Nav Imp Alt#1C
Feasibility LRR
Abbreviated Risk Analysis

Meeting Date: 4-Sep-13

Risk Level

	Negligible	Marginal	Significant	Critical	Crisis
Very Likely	2	3	4	5	5
Likely	1	2	3	4	5
Possible	0	1	2	3	4
Unlikely	0	0	1	2	3

Risk Element	Feature of Work	Concerns Pull Down Tab (ENABLE MACROS THRU TRUST CENTER) (Choose ALL that apply)	Concerns	PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)	Likelihood	Impact	Risk Level
External Project Risks							
						Max Potential Cost Growth	**40%**
EX-1	Mobilization - Demobilization	• Unanticipated inflations in fuel, key materials?	• Potential for market volatility impacting competition, pricing? • Unanticipated inflations in fuel, key materials? • Funding from Federal Sponsors not obtained? No funding could jeopardize or delay authority to advertise, award or if awarded, jeopardize the ability to continue and complete once awarded.	Market factors could increase or decrease the actual costs compared to the estimated costs. Fuel is always an unknown but has stayed relatively steady for the past 5 years. The estimate assumes a fairly safe cost at $5.50/gal for ORD. Mobe-demobe to this project site typically is not executed until weather allows and with planned work window in summer weather is traditionally acceptable.	Possible	Marginal	1
EX-2	New Rubblemound Breakwater	• Potential for severe adverse weather?	• Potential for severe adverse weather? • Unanticipated inflations in fuel, key materials? • Funding from Federal Sponsors not obtained? No funding could jeopardize or delay authority to advertise, award or if awarded, jeopardize the ability to continue and complete once awarded.	Weather impacts and funding delays are possible and could have a significant impact on overall estimated cost.	Possible	Significant	2
EX-3	Extend Rubblemound Breakwaters	• Potential for severe adverse weather?	• Funding from Federal Sponsors not obtained? No funding could jeopardize or delay authority to advertise, award or if awarded, jeopardize the ability to continue and complete once awarded.	Weather impacts and funding delays are possible and could have a significant impact on overall estimated cost.	Possible	Significant	2
EX-4	Nav Marker & Base	• Political influences, lack of support, obstacles?	• Funding from Federal Sponsors not obtained? No funding could jeopardize or delay authority to advertise, award or if awarded, jeopardize the ability to continue and complete once awarded. • Political influences, lack of support, obstacles?	Weather impacts and funding delays are possible and could have a significant impact on overall estimated cost.	Possible	Marginal	1
EX-5	Hydro Surveys	• Potential for severe adverse weather?	• Funding from Federal Sponsors not obtained? No funding could jeopardize or delay authority to advertise, award or if awarded, jeopardize the ability to continue and complete once awarded.	Weather impacts and funding delays are possible and could have a significant impact on overall estimated cost.	Possible	Marginal	1
EX-12	Remaining Construction Items	• Potential for severe adverse weather?	No remaining construction items identified as all cost items are included in the features of work (mob-demobe, new breakwater construction, existing breakwater construction, nav marker & base, hydro surveys).	N/A	Unlikely	Negligible	0
EX-13	Planning, Engineering, & Design	• Unanticipated inflations in fuel, key materials?	• Potential for market volatility impacting competition, pricing? • Unanticipated inflations in fuel, key materials?	Potential for political pressure to limit or stop project progress is unlikely. This project has had a very positive reaction from the local community which is very dependent on water transport, fishing and lifestyle. If design functions as anticipated, the benefits to the local community are great.	Unlikely	Negligible	0
EX-14	Construction Management	• Unanticipated inflations in fuel, key materials?	• Potential for market volatility impacting competition, pricing? • Unanticipated inflations in fuel, key materials?	Weather impacts could result in additional days on site, requiring additional per diem ect for QAR oversight however the percentage applied is historically a reasonable number to oversee project.	Unlikely	Negligible	0

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

PROJECT: Navigational Improvement Alt#3B
LOCATION: Port Lions, Alaska

DISTRICT: POA Alaska PREPARED: 9/6/2013
POC: CHIEF, COST ENGINEERING, Karl Harvey

This Estimate reflects the scope and schedule in report; Port Lions Feasibility Report Oct 2005

WBS Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
						Program Year (Budget EC): 2014								
						Effective Price Level Date: 1 OCT 13								
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST ($K)	CNTG ($K)	CNTG (%)	TOTAL ($K)	ESC (%)	COST ($K)	CNTG ($K)	**TOTAL ($K)**	Spent Thru: 1-Apr-13 ($K)		COST ($K)	CNTG ($K)	FULL ($K)
A	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*I*	*J*	*K*	*L*	*M*	*N*	*O*
10	BREAKWATER & SEAWALLS	$6,348	$1,931	30%	$8,279	3.0%	$6,539	$1,989	$8,527	$0		$6,687	$2,034	$8,720
	CONSTRUCTION ESTIMATE TOTALS:	$6,348	$1,931		$8,279	3.0%	$6,539	$1,989	$8,527	$0		$6,687	$2,034	$8,720
01	LANDS AND DAMAGES	$1	$0	20%	$1	3.0%	$1	$0	$1	$0		$1	$0	$1
30	PLANNING, ENGINEERING & DESIGN	$406	$95	23%	$501	6.5%	$432	$101	$533	$0		$439	$103	$541
31	CONSTRUCTION MANAGEMENT	$466	$118	25%	$584	6.5%	$496	$126	$622	$0		$520	$132	$653
	PROJECT COST TOTALS:	$7,221	$2,144	30%	$9,365		$7,468	$2,216	**$9,684**	$0		$7,647	$2,269	$9,915

Mandatory by Regulation	CHIEF, COST ENGINEERING, Karl Harvey
Mandatory by Regulation	PROJECT MANAGER, Bruce Sexauer
Mandatory by Regulation	CHIEF, REAL ESTATE, Thomas Kretzschmar
	CHIEF, PLANNING, Bruce Sexauer
	CHIEF, ENGINEERING, Dave Frenier
	CHIEF, OPERATIONS, Patrick Coullahan
	CHIEF, CONSTRUCTION, Dave Gerland
	CHIEF, CONTRACTING, Chris Tew
	CHIEF, PM-PB, Karen Farmer
	CHIEF, DPM, Larry McCallister

ESTIMATED FEDERAL COST:	**100%**	**$9,915**
ESTIMATED NON-FEDERAL COST:	**0%**	**$0**
ESTIMATED TOTAL PROJECT COST:		**$9,915**

O&M OUTSIDE OF TOTAL PROJECT COST:

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

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

PROJECT: Navigational Improvement Alt#3B
LOCATION: Port Lions, Alaska
This Estimate reflects the scope and schedule in report; Port Lions Feasibility Report Oct 2005

DISTRICT: POA Alaska PREPARED: 9/6/2013
POC: CHIEF, COST ENGINEERING, Karl Harvey

WBS Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: 30-Mar-13 Effective Price Level: 1-Apr-13				Program Year (Budget EC): 2015 Effective Price Level Date: 1 OCT 14								
				RISK BASED										
WBS	Civil Works	COST	CNTG	CNTG	TOTAL	ESC	COST	CNTG	TOTAL	Mid-Point	INFLATED	COST	CNTG	FULL
NUMBER	Feature & Sub-Feature Description	($K)	($K)	(%)	($K)	(%)	($K)	($K)	($K)	Date	(%)	($K)	($K)	($K)
A	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*I*	*J*	*P*	*L*	*M*	*N*	*O*
	PHASE 1 or CONTRACT 1													
10	MOBILIZE-DEMOBILIZE	$302	$37	12%	$339	3.0%	$311	$38	$349	2016Q2	2.3%	$318	$39	$357
10	NEW RUBBLEMOUND BREAKWATER	$5,678	$1,797	32%	$7,475	3.0%	$5,848	$1,851	$7,700	2016Q2	2.3%	$5,981	$1,893	$7,874
10	EXTEND RUBBLEMOUND BREAKWATER	$306	$91	30%	$398	3.0%	$316	$94	$409	2016Q2	2.3%	$323	$96	$419
10	NAV MARKER & BASE	$16	$1	5%	$16	3.0%	$16	$1	$17	2016Q2	2.3%	$17	$1	$17
10	HYDROGRAPHIC SURVEYS	$46	$5	10%	$51	3.0%	$47	$5	$52	2016Q2	2.3%	$48	$5	$53
							$0							
	CONSTRUCTION ESTIMATE TOTALS:	$6,348	$1,931	30%	**$8,279**		$6,539	$1,989	$8,527			$6,687	$2,034	$8,720
01	LANDS AND DAMAGES	$1	$0	20%	$1	3.0%	$1	$0	$1	2015Q3	0.9%	$1	$0	$1
30	PLANNING, ENGINEERING & DESIGN													
1.2%	Project Management	$76	$18	23%	$93	6.5%	$80	$19	$99	2015Q2	1.0%	$81	$19	$100
1.0%	Planning & Environmental Compliance	$63	$15	23%	$78	6.5%	$68	$16	$83	2015Q2	1.0%	$68	$16	$84
1.2%	Engineering & Design	$76	$18	23%	$94	6.5%	$81	$19	$100	2015Q2	1.0%	$82	$19	$101
0.5%	Engineering Tech Review ITR & VE	$32	$7	23%	$39	6.5%	$34	$8	$42	2015Q2	1.0%	$34	$8	$42
1.0%	Contracting & Reprographics	$63	$15	23%	$78	6.5%	$68	$16	$83	2015Q2	1.0%	$68	$16	$84
0.5%	Engineering During Construction	$32	$7	23%	$39	6.5%	$34	$8	$42	2016Q2	4.9%	$35	$8	$44
0.5%	Planning During Construction	$32	$7	23%	$39	6.5%	$34	$8	$42	2016Q2	4.9%	$35	$8	$44
0.5%	Project Operations	$32	$7	23%	$39	6.5%	$34	$8	$42	2015Q2	1.0%	$34	$8	$42
31	CONSTRUCTION MANAGEMENT													
3.3%	Construction Management	$212	$54	25%	$266	6.5%	$226	$57	$283	2016Q2	4.9%	$237	$60	$297
2.0%	Project Operation:	$127	$32	25%	$159	6.5%	$135	$34	$170	2016Q2	4.9%	$142	$36	$178
2.0%	Project Management	$127	$32	25%	$159	6.5%	$135	$34	$170	2016Q2	4.9%	$142	$36	$178
	CONTRACT COST TOTALS:	$7,221	$2,144		**$9,365**		$7,468	$2,216	$9,684			$7,647	$2,269	**$9,915**

Abbreviated Risk Analysis

Project (less than $40M): **Port Lions, Alaska, Nav Imp Alt#1C**
Project Development Stage: Feasibility LRR
Risk Category: **Moderate Risk: Typical Project or Possible Life Safety**

Total Construction Contract Cost = **$ 6,347,848**

	CWWBS	Feature of Work	Contract Cost		% Contingency	$ Contingency	Total
	01 LANDS AND DAMAGES	Real Estate	$ 1,000		20.00%	$ 200	$ 1,200.00
1	10 BREAKWATERS AND SEAWALLS	**Mobilization - Demobilization**	$ 301,582		12.30%	$ 37,096	$ 338,678.40
2	10 BREAKWATERS AND SEAWALLS	**New Rubblemound Breakwater**	$ 5,677,659		31.65%	$ 1,796,806	$ 7,474,464.55
3	10 BREAKWATERS AND SEAWALLS	**Extend Rubblemound Breakwaters**	$ 306,460		29.72%	$ 91,090	$ 397,549.49
4	10 BREAKWATERS AND SEAWALLS	**Nav Marker & Base**	$ 15,674		4.46%	$ 699	$ 16,373.49
5	10 BREAKWATERS AND SEAWALLS	**Hydro Surveys**	$ 46,473		10.16%	$ 4,722	$ 51,195.26
6	10 BREAKWATERS AND SEAWALLS				0.00%	$ -	$ -
7	10 BREAKWATERS AND SEAWALLS				0.00%	$ -	$ -
8	10 BREAKWATERS AND SEAWALLS				0.00%	$ -	$ -
9	10 BREAKWATERS AND SEAWALLS				0.00%	$ -	$ -
12		**Remaining Construction Items**	$ 0	*0.0%*	3.90%	$ 0	$ 0.27
13	30 PLANNING, ENGINEERING, AND DESIGN	**Planning, Engineering, & Design**	$ 406,000		23.38%	$ 94,904	$ 500,904.27
14	31 CONSTRUCTION MANAGEMENT	**Construction Management**	$ 466,000		25.35%	$ 118,130	$ 584,130.00

Totals					
Real Estate	$ 1,000		20.00%	$ 200	$ 1,200.00
Total Construction Estimate	$ 6,347,848		30.41%	$ 1,930,413	$ 8,278,261
Total Planning, Engineering & Design	$ 406,000		23.38%	$ 94,904	$ 500,904
Total Construction Management	$ 466,000		25.35%	$ 118,130	$ 584,130
Total	$ 7,220,848			$ 2,143,648	$ 9,364,496

Port Lions Alt 3B Revised POA
UPC=PTL001

The existing harbor in Settler Bay lies to the northeast of the city of Port Lions. The community has a harbor, partly sheltered by a breakwater, constructed by the Corps of Engineers in 1983.The breakwaters protect a 1 0-acre mooring basin. The existing basin depths range from -14 feet mean lower low water (MLL W) near the entrance channel to -8 feet MLL W at the near-shore extent of the basin.

The harbor is an important part of the economic fabric of the community in that it provides a transportation link for the community, which is not accessible by road; and it serves as the only moorage for the local fishing fleet.

Port Lions is located on on the northeast coast of Kodiak Island, approximately 30 air-miles northwest of the City of Kodiak and 260 air-miles southwest of Anchorage, and can be reached from Anchorage with a 45-minute flight. Kodiak Island is the largest island in Alaska, and is second only in size to Hawaii in the U.S.

Port Lions and the contiguous marine waters of Settler Cove are at latitude 57°53' N and longitude 152°53' W. Port Lions is accessible by air and water. There is a state-owned 2,200-foot gravel airstrip. Regular and charter flights are available from Kodiak, however, regular air service is frequently cancelled due to visibility limitations. The local gravel airstrip is not suitable for instrument landings or departures, making the water taxi a cost-effective alternative for passenger and freight delivery.

The state ferry operates bi-monthly from Kodiak between May and October. Barge service is available from Seattle. The local road network is adequate to travel from the airport to town and to the ferry dock, a total distance of less than 5 miles.

The area has a maritime climate primarily influenced by strong low pressure centers generated in the Gulf of Alaska and North Pacific Ocean. Cool summers, mild winters, and year-round rainfall characterize the climate. Average annual precipitation per year is 54 inches. Snow falls primarily between November and April, and the average annual snowfall is 75 inches. Normal winter temperature ranges from 10 to 40 °F, while
summer temperatures range from 55 to 70 °F. The mean tide range at Port Lions is 8.7 feet and the diurnal range is 18.0 feet. The Port Lions area as with most of Kodiak Island is known for intense storms that occur
from various directions.

In general, the waters in the vicinity of Kodiak Island are ice-free year round. Local icing conditions along the shoreline can occur during extreme cold temperatures. Ice has been reported in the existing harbor area from local freshwater sources but it is relatively short lived due to the moderate temperatures, and wave and current conditions.

Estimated by	NWW
Designed by	CEPOA-EN-CW
Prepared by	Al Arruda
Preparation Date	9/6/2013
Effective Date of Pricing	9/2/2013
Estimated Construction Time	120 Days

Labor ID: EQ ID: EP11R08 Currency in US dollars TRACES MII Version 4.2

Designed by
CEPOA-EN-CW
Estimated by
NWW
Prepared by
Al Arruda

Design Document	PORT LIONS SBH, AK - ALT 1C
Document Date	6/18/2012
District	Alaska District
Contact	Karl Harvey, 753-5738
Budget Year	2014
UOM System	English

Direct Costs

LaborCost
EQCost
MatlCost
SubBidCost
ShipCost
OTHER

Timeline/Currency

Preparation Date	9/6/2013
Escalation Date	9/2/2013
Eff. Pricing Date	9/2/2013
Estimated Duration	120 Day(s)
Currency	US dollars
Exchange Rate	1.000000

Costbook CB12EB-b: MII English Cost Book 2012-b

Labor : Alaska Labor & Mech 2013

Labor Rates

LaborCost1
LaborCost2
LaborCost3
LaborCost4

Equipment EP11R08: MII Equipment 2011 Region 08

08 NORTHWEST

Sales Tax	5.40
Working Hours per Year	1,540
Labor Adjustment Factor	1.05
Cost of Money	2.50
Cost of Money Discount	25.00
Tire Recap Cost Factor	1.50
Tire Recap Wear Factor	1.80
Tire Repair Factor	0.15
Equipment Cost Factor	1.00
Standby Depreciation Factor	0.50

Fuel

Electricity	0.072
Gas	3.670
Diesel Off-Road	3.450
Diesel On-Road	3.990

Shipping Rates

Over 0 CWT	28.32
Over 240 CWT	26.60
Over 300 CWT	24.23
Over 400 CWT	22.06
Over 500 CWT	11.26
Over 700 CWT	9.51
Over 800 CWT	6.48

Currency in US dollars

Date	Author	Note
	Al Arruda	Revised converted M2 estimate with latest cost book, libraires, and assemblies. Utilized KONIAG, Inc., rock pricing information.
9/6/2013	Al Arruda	Extrapolated Alt 1C CWE to new rock work qty for Alt 3B.

Direct Cost Markups	Category	Method
Mtl Esc	TaxAdj	Running % on Selected Costs
MatlCost		
Kodiak Sales Tax	TaxAdj	Running % on Selected Costs
MatlCost		
Kodiak Bed Tax	TaxAdj	Running % on Selected Costs
SubBidCost		

6-12 OT — Overtime — Overtime

	Days/Week	*Hours/Shift*	*Shifts/Day*	*1st Shift*	*2nd Shift*	*3rd Shift*
Standard	*5.00*	*8.00*	*1.00*	*8.00*	*0.00*	*0.00*
Actual	*6.00*	*8.00*	*1.00*	*12.00*	*0.00*	*0.00*

Day	*OT Factor*	*Working*	*OT Percent*	*FCCM Percent*
Monday	*1.50*	*Yes*	*22.22*	*(44.44)*
Tuesday	*1.50*	*Yes*		
Wednesday	*1.50*	*Yes*		
Thursday	*1.50*	*Yes*		
Friday	*1.50*	*Yes*		
Saturday	*1.50*	*Yes*		
Sunday	*2.00*	*No*		

7-10 OT — Overtime — Overtime

	Days/Week	*Hours/Shift*	*Shifts/Day*	*1st Shift*	*2nd Shift*	*3rd Shift*
Standard	*5.00*	*8.00*	*2.00*	*8.00*	*7.50*	*0.00*
Actual	*7.00*	*8.00*	*2.00*	*10.00*	*7.50*	*0.00*

Day	*OT Factor*	*Working*	*OT Percent*	*FCCM Percent*
Monday	*1.50*	*Yes*	*21.63*	*(67.35)*
Tuesday	*1.50*	*Yes*		
Wednesday	*1.50*	*Yes*		
Thursday	*1.50*	*Yes*		
Friday	*1.50*	*Yes*		
Saturday	*1.50*	*Yes*		
Sunday	*1.50*	*Yes*		

Contractor Markups	Category	Method
JOOH (Small Tools)	JOOH	% of Labor
JOOH	JOOH	JOOH (Calculated)
FIELD OH (Running%)	JOOH	Running %
HOME OFC (Running%)	MiscContract	Running %
PROFIT (Running%)	Profit	Running %
Prime Profit (PWG)	Profit	Profit Weighted Guidelines

Guideline	*Value*	*Weight*	*Percentage*
Risk	*0.100*	*20*	*2.00*

Labor ID: EQ ID: EP11R08 Currency in US dollars TRACES MII Version 4.2

Difficulty	*0.080*	*15*	*1.20*
Size	*0.040*	*15*	*0.60*
Period	*0.050*	*15*	*0.75*
Invest (Contractor's)	*0.070*	*5*	*0.35*
Assist (Assistance by)	*0.070*	*5*	*0.35*
SubContracting	*0.120*	*25*	*3.00*
Total		*100*	*8.25*

BOND (Running%)	Bond	Running %
Prime Bond	Bond	Bond Table

Class B, Tiered, 24 months, 1.00% Surcharge

Contract Price	*Bond Rate*
500,000	*15.84*
2,000,000	*9.57*
2,500,000	*7.59*
2,500,000	*6.93*
7,500,000	*6.34*

Owner Markups	**Category**	**Method**
Esc to MdPt	Escalation	Running %
Contingency	Escalation	Running %
SIOH	Escalation	Running %
EDC	Escalation	Running %

Labor ID: EQ ID: EP11R08 Currency in US dollars TRACES MII Version 4.2

Description	Quantity	UOM	ContractCost	Escalation	Contingency	SIOH	MiscOwner	ProjectCost
Project Cost Summary Report			**6,343,902**	**0**	**0**	**0**	**0**	**6,343,902**
			301,595.03					*301,595.03*
01 Mob, Demob & Preparatory Work	**1.00**	**EA**	**301,595**	**0**	**0**	**0**	**0**	**301,595**
(Note: Port Lions is 16 miles to Ouzinkie, 31 miles to Kodiak, 155 miles to Homer, 215 miles to Seward, and 300 miles to Anchorage by water. Assume Ktr equipment is mob/demob from Anchorage. Standby for equipment Mob/demob is included. Job site transportaton of personel to from Kodiak to job site and every other week end back to Kodiak is included under Prime contractor JOOH.)								
			217,082.05					*217,082.05*
Barge Mob/Demob Anc-Port Lions	**1.00**	**YR**	**217,082**	**0**	**0**	**0**	**0**	**217,082**
(Note: Assume ocean tug can haul 6000 ton per trip on two cargo barges.)								
			25,206.87	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*25,206.87*
USR Marine Insurance	2.00	EA	50,414	0	0	0	0	50,414
(Note: Assume total value of barged equipment and materials = $2m; premium @ 1%.)								
			1,965.03					*1,965.03*
Equipment Standby for Mob	**5.00**	**DAY**	**9,825**	**0**	**0**	**0**	**0**	**9,825**
			15.40	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*15.40*
MAP L40KM008 LOADER, FRONT END, WHEEL, 6.50 CY BUCKET, ARTICULATED, 4X4	40.00	HR	616	0	0	0	0	616
			14.16	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*14.16*
EP H25CA023 HYDRAULIC EXCAVATOR, CRAWLER, 49,000 LBS, 0.80 CY BUCKET, 39.0' MAX DIGGING DEPTH, LONG REACH BOOM	80.00	HR	1,133	0	0	0	0	1,133
			2.79	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*2.79*
EP G10XX011 GENERATOR SET, SKID MTD, 200 KW	40.00	HR	111	0	0	0	0	111
			7.33	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*7.33*
EP D10IR003 DRILL, AIR TRACK, CRAWLER, 2.5-4.0" DIA, 12' FEED (ADD COST FOR DRILL STEEL AND BIT WEAR, ADD 750 CFM COMPRESSOR)	80.00	HR	586	0	0	0	0	586
			8.37	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*8.37*
MAP A15IA007 AIR COMPRESSOR, 750 CFM, 300 PSI (ADD HOSE)	40.00	HR	335	0	0	0	0	335
			0.84	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.84*
EP A20XX006 AIR HOSE, 2.50", 100', HARDROCK	160.00	HR	134	0	0	0	0	134
			64.65	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*64.65*

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Description	Quantity	UOM	ContractCost	Escalation	Contingency	SIOH	MiscOwner	ProjectCost
GEN C85Z2410 CRANE, MECHANICAL, LATTICE BOOM, CRAWLER, DRAGLINE/CLAMSHELL, 7.0 CY (5.3 M3), 250 TON (227 MT), 100' (30.5 M) BOOM (ADD BUCKET)	40.00	HR	2,586	0	0	0	0	2,586
			42.08	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*42.08*
NON XX0XX740 WORK BARGE, FLAT DECK, 2000 TON WITH 4 SPUDS	40.00	HR	1,683	0	0	0	0	1,683
(Note: For Barge-mounted Crane.)								
			11.54	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*11.54*
MAP R50CA009 ROLLER, VIBRATORY, SELF-PROPELLED, SINGLE DRUM, SMOOTH, 12.2 TON, 84" WIDE, 3X2, SOIL COMPACTOR	40.00	HR	462	0	0	0	0	462
			21.52	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*21.52*
NON XX0XX750 WORK BARGE, FLAT DECK, 2000 TON WITH RAMP	40.00	HR	861	0	0	0	0	861
			6.18	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*6.18*
EP T15JD007 TRACTOR, CRAWLER (DOZER), 90 HP, POWERSHIFT, W/2.60 CY ANGLE BLADE (ADD ATTACHMENTS)	40.00	HR	247	0	0	0	0	247
			12.35	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*12.35*
GEN T15Z6500 TRACTOR, CRAWLER (DOZER), 136-180 HP (101-134 KW), POWERSHIFT, W/UNIVERSAL BLADE	40.00	HR	494	0	0	0	0	494
			1.41	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*1.41*
EP T50XX004 TRUCK, HIGHWAY, CONVENTIONAL, 1/2 TON PICKUP, 4X4	40.00	HR	56	0	0	0	0	56
			2.87	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*2.87*
EP T50GM005 TRUCK, HIGHWAY, 8,600 GVW, 4X4 (SUBURBAN)	40.00	HR	115	0	0	0	0	115
			0.87	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.87*
GEN T40Z7090 TRUCK OPTION, DUMP BODY, REAR, 12 CY (9.2 M3) (ADD 45,000 LB (20,412 KG) GVW TRUCK)	40.00	HR	35	0	0	0	0	35
			1.65	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*1.65*
MAP T50XX005 TRUCK, HIGHWAY, CONVENTIONAL, 3/4 TON PICKUP, 4X4	40.00	HR	66	0	0	0	0	66
			2.04	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*2.04*

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Description	Quantity	UOM	ContractCost	Escalation	Contingency	SIOH	MiscOwner	ProjectCost
EP T45XX034 TRUCK TRAILER, FLATBED, 40 TON, 2 AXLE (ADD TOWING TRUCK)	40.00	HR	82	0	0	0	0	82
			5.57	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*5.57*
MAP T50XX028 TRUCK, HIGHWAY, 45,000 LBS GVW, 3 AXLE, 6X4 (CHASSIS ONLY-ADD OPTIONS)	40.00	HR	223	0	0	0	0	223
			78,421.59					*78,421.59*
Barge Mob/Demob	**2.00**	**EA**	**156,843**	**0**	**0**	**0**	**0**	**156,843**
(Note: Assume Mob/Demob from Anc to Port Lions = 300 miles one-way. 2 trip x 300 miles/trip x 1 hr/8miles = 75 hrs round trip.)								
			1,493.74	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*1,493.74*
USR Ocean Tug/Barge Mobilization	75.00	HR	112,031	0	0	0	0	112,031
(Note: Assume Mob/Demob from Anc to Port Lions = 300 miles one-way. 2 trip x 300 miles/trip x 1 hr/8miles = 75 hrs round trip.)								
			1,493.74	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*1,493.74*
USR Barge Mobilization Load/Unload Standby Time	30.00	HR	44,812	0	0	0	0	44,812
(Note: Assume 1/2 days for Off-load and 1 Days for Load in Anc & Port Lions. = 3 days = 30 hrs)								
			8,242.96					*8,242.96*
Road Mobilization/Demobilization	**2.00**	**EA**	**16,486**	**0**	**0**	**0**	**0**	**16,486**
(Note: Assume transport equipment to/from port.)								
			426.08	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*426.08*
RSM 015436500100 Mobilization or demobilization, dozer, loader, backhoe or excavator, above 150 H.P., up to 50 miles	8.00	EA	3,409	0	0	0	0	3,409
(Note: Assuem dozer, loader, and 2 excavators)								
			199.04	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*199.04*
RSM 015436501150 Mobilization or demobilization, delivery charge for equipment, on flatbed trailer behind pickup truck	6.00	EA	1,194	0	0	0	0	1,194
(Note: Assume skid loader, generator, compactor.)								
			92.44	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*92.44*
RSM 015436501100 Mobilization or demobilization, delivery charge for small equipment, placed in rear of, or towed by pickup	6.00	EA	555	0	0	0	0	555
(Note: Assume compressor, cement mixer, vibe compactor.)								
			407.06	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*407.06*
RSM 310660150020 Mobilization, 600 C.F.M., set up and remove air compressor	2.00	EA	814	0	0	0	0	814

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Description	Quantity	UOM	ContractCost	Escalation	Contingency	SIOH	MiscOwner	ProjectCost
			472.63	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*472.63*
USR Equipment Usage, during mob/demo 2 Pickups local rental	20.00	DAY	9,453	0	0	0	0	9,453
			132.71	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*132.71*
USR 022340450 Mob Hauling, hwy haulers, 12 CY, 20 mi round trip @ 40 MPH	8.00	HR	1,062	0	0	0	0	1,062
(Note: Assume 4 haulers to/from barge.)								
			2,169.08					*2,169.08*
Personnel Mob/Demob	**7.00**	**PN**	**15,184**	**0**	**0**	**0**	**0**	**15,184**
(Note: Assume 6 Management and 6 Worker personnel RT. Additional personnel are local hire.)								
			630.17	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*630.17*
USR Air Fare	7.00	EA	4,411	0	0	0	0	4,411
(Note: Assume ANC - Kodiak - Port Lions RT.)								
			83.40	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*83.40*
MIL B-LABORERGR3 Travel Time, Laborers, Group 3 - AK	112.00	HR	9,341	0	0	0	0	9,341
(Note: Assume 8 hrs Travel for Mob and 8 hrs for Demob per person. Updated 5/17/12 AKDOL N1203 S1203 GROUP 3: Alarm Installer; Bit Grinder; Guardrail Machine Operator; High Rigger and tree topper; High Scaler; Multiplate; Slurry Seal Squeegee Man, Welder)								
			102.22	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*102.22*
USR Subsistence 7 Men @ 2 days	14.00	DAY	1,431	0	0	0	0	1,431
(Note: Assume partial meals for travel days.)								
			44,525.25					*44,525.25*
Preliminary Work & Setup	**1.00**	**EA**	**44,525**	**0**	**0**	**0**	**0**	**44,525**
			100.83	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*100.83*
USR Setup & Remove Temp Const Office lodging facilities are	40.00	HR	4,033	0	0	0	0	4,033
			83.40	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*83.40*
MIL B-LABORERGR3 Equipment Setup and Take Down - 3 men x 2 Days @ 10 Hr/day	60.00	HR	5,004	0	0	0	0	5,004
(Note: Laborers, Group 3 - AK Updated 5/17/12 AKDOL N1203 S1203 GROUP 3: Alarm Installer; Bit Grinder; Guardrail Machine Operator; High Rigger and tree topper; High Scaler; Multiplate; Slurry Seal Squeegee Man, Welder)								
			5,373.11					*5,373.11*
Surveys	**1.00**	**EA**	**5,373**	**0**	**0**	**0**	**0**	**5,373**

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Description	Quantity	UOM	ContractCost	Escalation	Contingency	SIOH	MiscOwner	ProjectCost
(Note: Pre-Construction Survey. A pre-construction survey shall be conducted prior to initial placement of any materials. Post-Construction Survey. A post-construction survey shall be conducted immediately following completion of the breakwater. Quantity Computations and Final Cross-Sections. The surveyor shall plot final cross-sections generated from the pre-construction survey, interim condition surveys and the post-construction survey in the same manner as the interim condition surveys. All requirements of SECTION 01016 SPECIAL ITEMS (CIVIL WORKS) shall be met. The surveyor shall also compute quantities for all material placed using the surveys listed above. The surveyor shall furnish quantities for each 25-foot station, compute the percent difference between the actual and design and show the information next to the plotted cross-sections. Final cross-sections and quantity computations shall be submitted to the Contracting Officer within (10) days of completion of the final survey.)								
			5,373.11					*5,373.11*
Pre-Work	**1.00**	**EA**	**5,373**	**0**	**0**	**0**	**0**	**5,373**
			1,791.04	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*1,791.04*
RSM 017123131200 Boundary & survey markers, crew for building layout, 3 person crew	3.00	DAY	5,373	0	0	0	0	5,373
			30,114.79					*30,114.79*
Submittals	**1.00**	**EA**	**30,115**	**0**	**0**	**0**	**0**	**30,115**
			136.29	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*136.29*
RSM 011131750100 Post Survey Plots, 20" x 30", maximum	3.00	EA	409	0	0	0	0	409
(Note: One set of paper copies (3 shts) for final survey. Survey data plots on CD. Dr Chks Comment 4694545: Scope of Work Section 4.5, Special Provsions, Page 9, 4th full paragraph discussing surveys, Parent Contract Section 01 19 40.00 29: Paragraph 1.24.5, delete the words "full size mylars and" paragraph 1.24.6, delete the words "Upon completing a final survey" and add "Upon completing a preliminary survey"... Modify 1.24.8 (b) closure error, to "meet or exceed" vice "not" 1 part in 5,000 parts. Submitted By: Julie Anderson (907-753-5685). Submitted On: 27-Jun-12 1-0 Evaluation Concurred Done. Submitted By: alan jeffries (907-753-2740) Submitted On: 05-Jul-12)								
			14,833.86	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*14,833.86*
USR Work Plans	1.00	EA	14,834	0	0	0	0	14,834
(Note: Contractor shall submit a Navigation Safety and Coordination Plan as part of the Accident Prevention Plan as specified in section 01 19 40.00 29, paragraph 1.4. Dr Chks Rvw Comment 4693008: Note 10. Does the contractor need to provide a temporary marker if he chooses to remove and reinstall? Submitted By: Deirdre Ginter (907-753-2805). Submitted On: 26-Jun-12 1-0 Evaluation Concurred No. The Contractor will have markers and buoys as part of their navigation safety plan measures implemented while they are working in the entrance channel. These will provide sufficient marking of the navigation channel during dredging. Submitted By: alan jeffries (907-753-2740) Submitted On: 03-Jul-12)								
			2,016.55	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*2,016.55*
RSM 013213500400 Scheduling, computer-update, micro, includes plots, maximum	1.00	EA	2,017	0	0	0	0	2,017
(Note: Dr Chks Comment 4693318: T.O.-Page 9 Project Schedule. Suggest you have the contractor provide a schedule using the critical path method rather than a bar chart. This Contract seems to require more careful coordination with windows, harbor users, and potential blasting. Submitted By: Deirdre Ginter (907-753-2805). Submitted On: 26-Jun-12 1-0 Evaluation Concurred: Done. Removed sentence in T.O. page 9 allowing bar chart substitution for critical path method. Parent contract section 01 32 01.00 10 Subpart 3.3.1 will apply. Submitted By: alan jeffries (907-753-2740) Submitted On: 05-Jul-12)								

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Description	Quantity	UOM	ContractCost	Escalation	Contingency	SIOH	MiscOwner	ProjectCost
			107.13	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*107.13*
USR Final As-built Survey & Drawings	120.00	HR	12,856	0	0	0	0	12,856
			8,318.27					*8,318.27*
Closeout Work & Teardown	**1.00**	**EA**	**8,318**	**0**	**0**	**0**	**0**	**8,318**
			100.83	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*100.83*
USR Setup & Remove Temp Const Office lodging facilities are	40.00	HR	4,033	0	0	0	0	4,033
(Note: available at Seward)								
			107.13	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*107.13*
USR Equipment Setup and Take Down 1 Days @ 10 Hr/day	40.00	HR	4,285	0	0	0	0	4,285
			88.75					*88.75*
Construct New Breakwater and Modify Exisitng Breakwater and Fish passage	**67,430.00**	**ECY**	**5,984,382**	**0**	**0**	**0**	**0**	**5,984,382**
(Note: Neat line Q (ECY) = 20480(A Rock) plus 13750 (B rock) plus 27300 (core) = 61,530 ECY.)								
			40.69					*40.69*
Quarry Operation	**107,944.99**	**TON**	**4,392,586**	**0**	**0**	**0**	**0**	**4,392,586**
(Note: Assume Shakmanof Quarry is source for rubblemound materials. Neat line Q (ECY) = 20480(A Rock) plus 13750 (B rock) plus 27300 (core) = 61,530 ECY. At 1.6 T/ECY = 98500 T.)								
			23,966.17					*23,966.17*
Quarry Overhead- Month Cost Items	**4.38**	**MO**	**105,057**	**0**	**0**	**0**	**0**	**105,057**
(Note: Includes 1 month Mob/demob time)								
			3,781.03	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*3,781.03*
USR Weight Scales	4.38	MO	16,574	0	0	0	0	16,574
			3,150.86	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*3,150.86*
USR Powder Mag and Sep Cap Mag	4.38	MO	13,812	0	0	0	0	13,812
			7,294.36	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*7,294.36*
NON XX0XX740 WORK BARGE, FLAT DECK, 2000 TON WITH 4 SPUDS	4.38	MO	31,975	0	0	0	0	31,975
			7,562.06	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*7,562.06*
USR Fuel Barge service placement and Quarry Crews	4.38	MO	33,149	0	0	0	0	33,149
			268.44	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*268.44*

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Description	Quantity	UOM	ContractCost	Escalation	Contingency	SIOH	MiscOwner	ProjectCost
GEN M10Z4230 MARINE EQUIPMENT, BOATS & LAUNCHES, 18' (5.5 M) LONG, R-RUNNER V-HULL, 1,350 LBS (612 KG), NO CABIN, OUTBOARD ENGINE	4.38	MO	1,177	0	0	0	0	1,177
			681.47	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*681.47*
RSM 015213200250 Office Trailer, furnished, rent per month, 20' x 8', excl. hookups	4.38	MO	2,987	0	0	0	0	2,987
			117.89	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*117.89*
HNC 015213201400 Toilet, portable, chemical, rent per month	4.38	MO	517	0	0	0	0	517
			0.00	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00*
USR New Project Item	4.38	EA	0	0	0	0	0	0
			0.00	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00*
USR New Project Item	4.38	EA	0	0	0	0	0	0
			981.95	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*981.95*
EP W30SO004 Fuel Tank - use water tank for pricing	4.38	MO	4,304	0	0	0	0	4,304
			128.12	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*128.12*
RSM 015213201350 Storage Boxes, rent per month, 40' x 8'	4.38	EA	562	0	0	0	0	562
			1,919.83					*1,919.83*
Quarry Equipment Operating	**723.29**	**HR**	**1,388,584**	**0**	**0**	**0**	**0**	**1,388,584**
(Note: 10 weeks at 66 hours/week)								
			189.05	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*189.05*
USR Primary Grizzly with Vib Feeder	723.29	HR	136,738	0	0	0	0	136,738
			63.02	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*63.02*
USR B Rock Bar Grizzly	723.29	HR	45,579	0	0	0	0	45,579
			36.99	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*36.99*
EP S30HW015 SCREENING & CRUSHING PLANTS, SCREENING PLANT, 6' X 16' VIBRATORY SLOPE TRIPLE DECK SCREENS W/36" X 16.5' UNDER SCREEN CONVEYOR/ 7 CY HOPPER/ & FEEDER, TRAILER MTD	723.29	HR	26,756	0	0	0	0	26,756
			177.32	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*177.32*
MAP L40KM009 LOADER, FRONT END, WHEEL, 8.00 CY BUCKET, ARTICULATED, 4X4	1,446.57	HR	256,503	0	0	0	0	256,503
			218.53	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*218.53*

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Description	Quantity	UOM	ContractCost	Escalation	Contingency	SIOH	MiscOwner	ProjectCost
GEN T15Z6600 TRACTOR, CRAWLER (DOZER), 341-440 HP (254-328 KW), POWERSHIFT, W/UNIVERSAL BLADE	1,446.57	HR	316,113	0	0	0	0	316,113
			194.27	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*194.27*
GEN H25Z3230 HYDRAULIC EXCAVATOR, CRAWLER, 165,000 LB (74,843 KG), 6.00 CY (4.7 M3) BUCKET, 26.6' (8.1 M) MAX DIGGING DEPTH	1,446.57	HR	281,029	0	0	0	0	281,029
			106.25	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*106.25*
GEN T55Z7685 TRUCK, OFF-HIGHWAY, ARTICULATED FRAME, 25 TON (22.7 MT), 13-17 CY (9.9-13 M3), REAR DUMP	2,169.86	HR	230,543	0	0	0	0	230,543
			7.30	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*7.30*
GEN T40Z7055 TRUCK OPTION, WATER TANK, 3,000 GAL (11,356 L) (ADD 45,000 LB (20,412 KG) GVW TRUCK)	180.82	HR	1,321	0	0	0	0	1,321
			60.84	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*60.84*
GEN T50Z7600 TRUCK, HIGHWAY, 50,000 LB (22,680 KG) GVW, 6X4, 3 AXLE (ADD ACCESSORIES)	180.82	HR	11,001	0	0	0	0	11,001
			108.39	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*108.39*
GEN G15Z3079 GRADER, MOTOR, ARTICULATED, 215 HP (160 KW), 12' (3.6 M) BLADE WIDTH	180.82	HR	19,600	0	0	0	0	19,600
			71.32	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*71.32*
GEN G10Z3060 GENERATOR SET, SKID MOUNTED, 275 KW, 240/480V, 60HZ	723.29	HR	51,586	0	0	0	0	51,586
			12.57	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*12.57*
GEN P50Z5100 PUMP, WATER, CENTRIFUGAL, TRASH, ENGINE DRIVE, 6" (152 MM) DIA, 1,300 GPM (4,921 LPM) @ 100' (30.5 M) HEAD, TRAILER MTD (ADD HOSE)	723.29	HR	9,091	0	0	0	0	9,091
			0.24	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.24*
GEN P50Z5098 PUMP, WATER, CENTRIFUGAL, TRASH, HOSE, SUCTION/DISCH, 4" (100 MM) DIA X 50' (15 M) WITH COUPLING (PER SECTION)	723.29	HR	171	0	0	0	0	171
			7.06	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*7.06*
EP L20AB020 LITE SET, TRAILER MTD., 4/1,000W, W/6 KW GEN, MANUAL MAST WINCH	361.64	HR	2,553	0	0	0	0	2,553
			999.34					*999.34*
Quarry Equipment Standby	**87.67**	**HR**	**87,614**	**0**	**0**	**0**	**0**	**87,614**

Currency in US dollars

Description	Quantity	UOM	ContractCost	Escalation	Contingency	SIOH	MiscOwner	ProjectCost
(Note: mob/demob 2 weeks at 40hrs/week = 80 hrs grader and water truck 10 weeks at (40 - 17) = 230+80=310hrs)								
			189.05	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*189.05*
USR Primary Grizzly with Vib Feeder	87.67	HR	16,574	0	0	0	0	16,574
			63.02	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*63.02*
USR B Rock Bar Grizzly	87.67	HR	5,525	0	0	0	0	5,525
			3.09	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*3.09*
GEN G10Z3060 GENERATOR SET, SKID MOUNTED, 275 KW, 240/480V, 60HZ	87.67	HR	271	0	0	0	0	271
			17.16	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*17.16*
GEN G15Z3079 GRADER, MOTOR, ARTICULATED, 215 HP (160 KW), 12' (3.6 M) BLADE WIDTH	350.68	HR	6,018	0	0	0	0	6,018
			29.49	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*29.49*
GEN H25Z3230 HYDRAULIC EXCAVATOR, CRAWLER, 165,000 LB (74,843 KG), 6.00 CY (4.7 M3) BUCKET, 26.6' (8.1 M) MAX DIGGING DEPTH	175.34	HR	5,170	0	0	0	0	5,170
			0.82	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.82*
EP L20AB020 LITE SET, TRAILER MTD., 4/1,000W, W/6 KW GEN, MANUAL MAST WINCH	350.68	HR	289	0	0	0	0	289
			26.13	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*26.13*
MAP L40KM009 LOADER, FRONT END, WHEEL, 8.00 CY BUCKET, ARTICULATED, 4X4	175.34	HR	4,583	0	0	0	0	4,583
			0.04	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.04*
GEN P50Z5098 PUMP, WATER, CENTRIFUGAL, TRASH, HOSE, SUCTION/DISCH, 4" (100 MM) DIA X 50' (15 M) WITH COUPLING (PER SECTION)	87.67	HR	4	0	0	0	0	4
			1.27	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*1.27*
GEN P50Z5100 PUMP, WATER, CENTRIFUGAL, TRASH, ENGINE DRIVE, 6" (152 MM) DIA, 1,300 GPM (4,921 LPM) @ 100' (30.5 M) HEAD, TRAILER MTD (ADD HOSE)	87.67	HR	111	0	0	0	0	111
			9.20	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*9.20*
EP S30HW015 SCREENING & CRUSHING PLANTS, SCREENING PLANT, 6' X 16' VIBRATORY SLOPE TRIPLE DECK SCREENS W/36" X 16.5' UNDER SCREEN CONVEYOR/ 7 CY HOPPER/ & FEEDER, TRAILER MTD	87.67	HR	807	0	0	0	0	807
			218.53	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*218.53*

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Description	Quantity	UOM	ContractCost	Escalation	Contingency	SIOH	MiscOwner	ProjectCost
GEN T15Z6600 TRACTOR, CRAWLER (DOZER), 341-440 HP (254-328 KW), POWERSHIFT, W/UNIVERSAL BLADE	87.67	HR	19,158	0	0	0	0	19,158
			7.30	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*7.30*
GEN T40Z7055 TRUCK OPTION, WATER TANK, 3,000 GAL (11,356 L) (ADD 45,000 LB (20,412 KG) GVW TRUCK)	350.68	HR	2,562	0	0	0	0	2,562
			60.84	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*60.84*
GEN T50Z7600 TRUCK, HIGHWAY, 50,000 LB (22,680 KG) GVW, 6X4, 3 AXLE (ADD ACCESSORIES)	350.68	HR	21,335	0	0	0	0	21,335
			19.79	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*19.79*
GEN T55Z7685 TRUCK, OFF-HIGHWAY, ARTICULATED FRAME, 25 TON (22.7 MT), 13-17 CY (9.9-13 M3), REAR DUMP	263.01	HR	5,206	0	0	0	0	5,206
			1,006.71					*1,006.71*
Quarry Crew Labor	**723.29**	**HR**	**728,143**	**0**	**0**	**0**	**0**	**728,143**
			101.13	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*101.13*
MIL B-EQOPRGR1A Foreman Equip. Operator Group 1A - AK	723.29	HR	73,147	0	0	0	0	73,147
(Note: Updated 5/17/12 AKDOL A1602 GROUP 1A: Cranes-over 45 tons or 150 foot (including jib and attachments): (a) Shovels, backhoes, draglines, clamshells-over 3 yards, (b) Tower cranes; Loaders over 5 yds.; Motor Patrol Grader, Dozer, Grade Tractor (finish: when finishing to final grade and/or to hubs, or for asphalt); Power Plants: 1000 k.w. and over; Quad; Screed; Sidebooms over 45 tons; Slip Form Paver C.M.I. and similar types; Scrapers over 40 yards; Camera/Tool/Video Operator (Slipline). Certified Welder, Electrical Mechanic, Camp Maintenance Engineer, Mechanic over 10,000 hours)								
			77.90	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*77.90*
MIL B-EQOPRGR4 Equip. Operator Group 4 - AK	4,339.72	HR	338,060	0	0	0	0	338,060
(Note: Updated 5/17/12 AKDOL A1605 GROUP 4: Rig Oiler/Assistant Engineer (Advances to Group III if over 45 tons or 3 yards or 150 ft. boom); Swamper (on trenching machines or shovel type equipment); Spotter; Steam Cleaner)								
			81.77	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*81.77*
MIL B-LABORERGR2 Laborers, Group 2 - AK	1,446.57	HR	118,293	0	0	0	0	118,293
(Note: Updated 5/17/12 AKDOL N1202 S1202 GROUP 2: Burning and Cutting Torch; Cement or Lime Dumper or Handler (sack or bulk); Choker Splicer; Chucktender (wagon, airtrack and hydraulic drills); Concrete Laborers (power buggy, concrete saws, pumpcrete nozzleman, vibratorman); Culvert Pipe Laborer; Cured in place Pipelayer; Environmental Laborer (marine work, oil spill skimmer operator, small boat operator); Foam Gun or Foam Machine Operator; Green Cutter (dam work); Gunnite Operator; Hod Carriers; Jackhammer or Pavement Breakers (more than 45 pounds);Laying of Decorative Block (retaining walls, flowered decorative block above 4 feet); Mason Tender and Mud Mixer (sewer work); Pilot Car; Plasterer, Bricklayer and Cement Finisher Tenders; Power Saw Operator; Railroad Switch Layout Laborer; Sandblaster; Sewer Caulkers; Sewer Plant Maintenance Man; Thermal Plastic Applicator; Timber Faller, chain saw operator, filer; Timberman)								
			91.55	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*91.55*
MIL B-TRKDVRGR1 Truck Drivers, Group 1 - AK	2,169.86	HR	198,642	0	0	0	0	198,642

Currency in US dollars

Description	Quantity	UOM	ContractCost	Escalation	Contingency	SIOH	MiscOwner	ProjectCost
(Note: Updated 5/17/12 AKDOL A2101 GROUP 1: Air/Sea Traffic Controllers, Ambulance/Fire Truck Driver (EMT certified), Semi with Double Box Mixer; Dump Trucks (including rockbuggy and trucks with pups) over 40 yards up to and including 60 yards; Deltas, Commanders, Rollogans and similar equipment when pulling sleds, trailers or similar equipment; Captains & Pilots (air & water), Boat Coxswain; Lowboys including attached trailers and jeeps, up to and including 12 axles; Ready-mix over 12 yards up to and including 15 yards); Water Wagon (250 Bbls and above); Tireman, Heavy Duty/Fueler)								
			4.66					*4.66*
Drill Blast = 65,500 BCY	**71,780.68**	**BCY**	**334,154**	**0**	**0**	**0**	**0**	**334,154**
			8.75					*8.75*
Drill	**21,917.76**	**LF**	**191,889**	**0**	**0**	**0**	**0**	**191,889**
			525.30					*525.30*
Drill Crew Hours	**365.30**	**HR**	**191,889**	**0**	**0**	**0**	**0**	**191,889**
			13.53	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*13.53*
GEN D10Z2675 DRILL, HYDRAULIC TRACK, CRAWLER, 5.25" (133 MM) DIA, 12' (305 MM) FEED (ADD COST FOR DRILL STEEL AND BIT WEAR)	365.30	HR	4,944	0	0	0	0	4,944
			109.11	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*109.11*
GEN D10Z2675 DRILL, HYDRAULIC TRACK, CRAWLER, 5.25" (133 MM) DIA, 12' (305 MM) FEED (ADD COST FOR DRILL STEEL AND BIT WEAR)	365.30	HR	39,858	0	0	0	0	39,858
			31.14	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*31.14*
EP T50XX025 TRUCK, HIGHWAY, 30,000 LBS GVW, 2 AXLE, 4X4 (CHASSIS ONLY-ADD OPTIONS)	365.30	HR	11,376	0	0	0	0	11,376
			3.47	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*3.47*
USR Drill Steel and Bits	21,917.76	LF	75,966	0	0	0	0	75,966
			81.77	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*81.77*
MIL B-LABORERGR2 Laborers, Group 2 - AK	365.30	HR	29,872	0	0	0	0	29,872
(Note: Updated 5/17/12 AKDOL N1202 S1202 GROUP 2: Burning and Cutting Torch; Cement or Lime Dumper or Handler (sack or bulk); Choker Splicer; Chucktender (wagon, airtrack and hydraulic drills); Concrete Laborers (power buggy, concrete saws, pumpcrete nozzleman, vibratorman); Culvert Pipe Laborer; Cured in place Pipelayer; Environmental Laborer (marine work, oil spill skimmer operator, small boat operator); Foam Gun or Foam Machine Operator; Green Cutter (dam work); Gunnite Operator; Hod Carriers; Jackhammer or Pavement Breakers (more than 45 pounds);Laying of Decorative Block (retaining walls, flowered decorative block above 4 feet); Mason Tender and Mud Mixer (sewer work); Pilot Car; Plasterer, Bricklayer and Cement Finisher Tenders; Power Saw Operator; Railroad Switch Layout Laborer; Sandblaster; Sewer Caulkers; Sewer Plant Maintenance Man; Thermal Plastic Applicator; Timber Faller, chain saw operator, filer; Timberman)								
			81.77	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*81.77*
MIL B-LABORERGR2 Laborers, Group 2 - AK	365.30	HR	29,872	0	0	0	0	29,872

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Description	Quantity	UOM	ContractCost	Escalation	Contingency	SIOH	MiscOwner	ProjectCost
(Note: Updated 5/17/12 AKDOL N1202 S1202 GROUP 2: Burning and Cutting Torch; Cement or Lime Dumper or Handler (sack or bulk); Choker Splicer; Chucktender (wagon, airtrack and hydraulic drills); Concrete Laborers (power buggy, concrete saws, pumpcrete nozzleman, vibratorman); Culvert Pipe Laborer; Cured in place Pipelayer; Environmental Laborer (marine work, oil spill skimmer operator, small boat operator); Foam Gun or Foam Machine Operator; Green Cutter (dam work); Gunnite Operator; Hod Carriers; Jackhammer or Pavement Breakers (more than 45 pounds);Laying of Decorative Block (retaining walls, flowered decorative block above 4 feet); Mason Tender and Mud Mixer (sewer work); Pilot Car; Plasterer, Bricklayer and Cement Finisher Tenders; Power Saw Operator; Railroad Switch Layout Laborer; Sandblaster; Sewer Caulkers; Sewer Plant Maintenance Man; Thermal Plastic Applicator; Timber Faller, chain saw operator, filer; Timberman)								
			1.98					*1.98*
Blasting	**71,780.68**	**BCY**	**142,265**	**0**	**0**	**0**	**0**	**142,265**
			1.55					*1.55*
Materials and Supplies	**71,780.68**	**BCY**	**111,275**	**0**	**0**	**0**	**0**	**111,275**
			1.70	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*1.70*
USR Explosives	35,945.13	LB	61,239	0	0	0	0	61,239
			647.39	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*647.39*
USR Det Cord	54.79	MLF	35,474	0	0	0	0	35,474
			13.29	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*13.29*
USR Blast Caps	1,095.89	EA	14,563	0	0	0	0	14,563
			28.28					*28.28*
Load and Shoot cost per hole	**1,095.89**	**EA**	**30,990**	**0**	**0**	**0**	**0**	**30,990**
			83.40	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*83.40*
MIL B-LABORERGR3 Laborers, Group 3 - AK	156.56	HR	13,057	0	0	0	0	13,057
(Note: Updated 5/17/12 AKDOL N1203 S1203 GROUP 3: Alarm Installer; Bit Grinder; Guardrail Machine Operator; High Rigger and tree topper; High Scaler; Multiplate; Slurry Seal Squeegee Man, Welder)								
			83.40	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*83.40*
MIL B-LABORERGR3 Laborers, Group 3 - AK	156.56	HR	13,057	0	0	0	0	13,057
(Note: Updated 5/17/12 AKDOL N1203 S1203 GROUP 3: Alarm Installer; Bit Grinder; Guardrail Machine Operator; High Rigger and tree topper; High Scaler; Multiplate; Slurry Seal Squeegee Man, Welder)								
			31.14	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*31.14*
EP T50XX025 TRUCK, HIGHWAY, 30,000 LBS GVW, 2 AXLE, 4X4 (CHASSIS ONLY-ADD OPTIONS)	156.56	HR	4,876	0	0	0	0	4,876
			13.63					*13.63*
Quarry Royality Fee	**128,328.51**	**TON**	**1,749,035**	**0**	**0**	**0**	**0**	**1,749,035**
			13.63	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*13.63*
USR Quarry Royality Fee	128,328.51	TON	1,749,035	0	0	0	0	1,749,035

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Description	Quantity	UOM	ContractCost	Escalation	Contingency	SIOH	MiscOwner	ProjectCost
			5.99					*5.99*
Transport between quarry and placement site	**107,944.99**	**TON**	**646,465**	**0**	**0**	**0**	**0**	**646,465**
(Note: Assume Truck Haul 1 mile one-way from Shakmanof quarry to Loadout Dock. Assume Barge Haul from Shakmanof Loadout to Port Lions = 12 miles one-way.)								
			1,113.02					*1,113.02*
Crew for Transport between quarry and placement site	**580.82**	**HR**	**646,465**	**0**	**0**	**0**	**0**	**646,465**
			33.70	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*33.70*
NON XX0XX730 WORK BARGE, FLAT DECK, 3000 TON	1,742.46	HR	58,715	0	0	0	0	58,715
			554.36	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*554.36*
NON XX0XX620 TOWING VESSEL TUG, 1500 HP	580.82	HR	321,985	0	0	0	0	321,985
			91.89	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*91.89*
USR Ship Captain - AK	580.82	HR	53,373	0	0	0	0	53,373
(Note: Updated 5/17/12 AKDOL A2101 Captains & Pilots (air & water))								
			83.90	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*83.90*
MIL B-LABORERGR2 Laborers, Group 2 - AK	1,161.64	HR	97,462	0	0	0	0	97,462
(Note: Updated 5/17/12 AKDOL N1202 S1202 GROUP 2: Burning and Cutting Torch; Cement or Lime Dumper or Handler (sack or bulk); Choker Splicer; Chucktender (wagon, airtrack and hydraulic drills); Concrete Laborers (power buggy, concrete saws, pumpcrete nozzleman, vibratorman); Culvert Pipe Laborer; Cured in place Pipelayer; Environmental Laborer (marine work, oil spill skimmer operator, small boat operator); Foam Gun or Foam Machine Operator; Green Cutter (dam work); Gunnite Operator; Hod Carriers; Jackhammer or Pavement Breakers (more than 45 pounds);Laying of Decorative Block (retaining walls, flowered decorative block above 4 feet); Mason Tender and Mud Mixer (sewer work); Pilot Car; Plasterer, Bricklayer and Cement Finisher Tenders; Power Saw Operator; Railroad Switch Layout Laborer; Sandblaster; Sewer Caulkers; Sewer Plant Maintenance Man; Thermal Plastic Applicator; Timber Faller, chain saw operator, filer; Timberman)								
			655.45					*655.45*
Equipment Standby	**175.34**	**HR**	**114,928**	**0**	**0**	**0**	**0**	**114,928**
(Note: two wweks begining of job and 2 weeks at end of job 4 weeks at 40 = 160 hrs)								
			33.70	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*33.70*
NON XX0XX730 WORK BARGE, FLAT DECK, 3000 TON	526.03	HR	17,725	0	0	0	0	17,725
			554.36	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*554.36*
NON XX0XX620 TOWING VESSEL TUG, 1500 HP	175.34	HR	97,203	0	0	0	0	97,203
			8.76					*8.76*
Install Breakwater and Mod Exist	**107,944.99**	**TON**	**945,331**	**0**	**0**	**0**	**0**	**945,331**
(Note: Assume remove/replace 1350 ECY existing BW materials, place 6100 ECY Fish Passage materials, and place new BW materials is included.)								

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Description	Quantity	UOM	ContractCost	Escalation	Contingency	SIOH	MiscOwner	ProjectCost
			1,594.59					*1,594.59*
Material Placement Crew	**580.82**	**HR**	**926,171**	**0**	**0**	**0**	**0**	**926,171**
(Note: Assume place 58,400 ECY for new Main BW, place 1400 ECY to extend existing BW, and place 1730 ECY to extend existing Fish Passage stub BW; totaling 61,530 ECY of BW material.)								
			11.60	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*11.60*
EP H25LU027 HYDRAULIC EXCAVATOR, ATTACHMENT, MATERIAL HANDLING, GRAPPLE, 6.50CY, 4-TINE/ 5-TINE (ADD 75,000 LB HYDRAULIC EXCAVATOR)	580.82	HR	6,736	0	0	0	0	6,736
			261.45	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*261.45*
GEN H25Z3230 HYDRAULIC EXCAVATOR, CRAWLER, 165,000 LB (74,843 KG), 6.00 CY (4.7 M3) BUCKET, 26.6' (8.1 M) MAX DIGGING DEPTH	580.82	HR	151,857	0	0	0	0	151,857
			24.72	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*24.72*
GEN G10Z3065 GENERATOR SET, SKID MOUNTED, 35 KW, VARIABLE POWER SETTINGS, RECONNECTIBLE	580.82	HR	14,356	0	0	0	0	14,356
			52.87	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*52.87*
GEN M10Z4230 MARINE EQUIPMENT, BOATS & LAUNCHES, 18' (5.5 M) LONG, R-RUNNER V-HULL, 1,350 LBS (612 KG), NO CABIN, OUTBOARD ENGINE	580.82	HR	30,709	0	0	0	0	30,709
			27.80	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*27.80*
EP B25HB015 BUCKET, CLAMSHELL, 6.0 CY, HEAVY DUTY/DIGGING	580.82	HR	16,148	0	0	0	0	16,148
			191.92	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*191.92*
GEN L35Z4270 LOADER, FRONT END, CRAWLER, 3.75 CY (2.9 M3) BUCKET	580.82	HR	111,470	0	0	0	0	111,470
			392.48	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*392.48*
NON XX0XX410 BARGE MOUNTED CLAMSHELL, 10 CY CRANE	580.82	HR	227,963	0	0	0	0	227,963
			17.96	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*17.96*
EP B35XX005 Placement Skip 10 CY	580.82	HR	10,430	0	0	0	0	10,430
			42.08	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*42.08*
NON XX0XX740 WORK BARGE, FLAT DECK, 2000 TON WITH 4 SPUDS	580.82	HR	24,443	0	0	0	0	24,443
			101.13	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*101.13*
MIL B-EQOPRGR1A Foreman Equip. Operator Group 1A - AK	580.82	HR	58,739	0	0	0	0	58,739

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Description	Quantity	UOM	ContractCost	Escalation	Contingency	SIOH	MiscOwner	ProjectCost
(Note: Updated 5/17/12 AKDOL A1602 GROUP 1A: Cranes-over 45 tons or 150 foot (including jib and attachments): (a) Shovels, backhoes, draglines, clamshells-over 3 yards, (b) Tower cranes; Loaders over 5 yds.; Motor Patrol Grader, Dozer, Grade Tractor (finish: when finishing to final grade and/or to hubs, or for asphalt); Power Plants: 1000 k.w. and over; Quad; Screed; Sidebooms over 45 tons; Slip Form Paver C.M.I. and similar types; Scrapers over 40 yards; Camera/Tool/Video Operator (Slipline). Certified Welder, Electrical Mechanic, Camp Maintenance Engineer, Mechanic over 10,000 hours)								
			97.51	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*97.51*
MIL B-EQOPRGR1A Equip. Operator Group 1A - AK	1,161.64	HR	113,273	0	0	0	0	113,273
(Note: Updated 5/17/12 AKDOL A1602 GROUP 1A: Cranes-over 45 tons or 150 foot (including jib and attachments): (a) Shovels, backhoes, draglines, clamshells-over 3 yards, (b) Tower cranes; Loaders over 5 yds.; Motor Patrol Grader, Dozer, Grade Tractor (finish: when finishing to final grade and/or to hubs, or for asphalt); Power Plants: 1000 k.w. and over; Quad; Screed; Sidebooms over 45 tons; Slip Form Paver C.M.I. and similar types; Scrapers over 40 yards; Camera/Tool/Video Operator (Slipline). Certified Welder, Electrical Mechanic, Camp Maintenance Engineer, Mechanic over 10,000 hours)								
			81.77	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*81.77*
MIL B-LABORERGR2 Laborers, Group 2 - AK	1,161.64	HR	94,993	0	0	0	0	94,993
(Note: Updated 5/17/12 AKDOL N1202 S1202 GROUP 2: Burning and Cutting Torch; Cement or Lime Dumper or Handler (sack or bulk); Choker Splicer; Chucktender (wagon, airtrack and hydraulic drills); Concrete Laborers (power buggy, concrete saws, pumpcrete nozzleman, vibratorman); Culvert Pipe Laborer; Cured in place Pipelayer; Environmental Laborer (marine work, oil spill skimmer operator, small boat operator); Foam Gun or Foam Machine Operator; Green Cutter (dam work); Gunnite Operator; Hod Carriers; Jackhammer or Pavement Breakers (more than 45 pounds);Laying of Decorative Block (retaining walls, flowered decorative block above 4 feet); Mason Tender and Mud Mixer (sewer work); Pilot Car; Plasterer, Bricklayer and Cement Finisher Tenders; Power Saw Operator; Railroad Switch Layout Laborer; Sandblaster; Sewer Caulkers; Sewer Plant Maintenance Man; Thermal Plastic Applicator; Timber Faller, chain saw operator, filer; Timberman)								
			77.90	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*77.90*
MIL B-EQOPRGR4 Oiler Equip. Operator Group 4 - AK	580.82	HR	45,245	0	0	0	0	45,245
(Note: Updated 5/17/12 AKDOL A1605 GROUP 4: Rig Oiler/Assistant Engineer (Advances to Group III if over 45 tons or 3 yards or 150 ft. boom); Swamper (on trenching machines or shovel type equipment); Spotter; Steam Cleaner)								
			13.75	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*13.75*
EP B35XX005 BUCKET, DRAGLINE, 11.0 CY, LIGHT WEIGHT	580.82	HR	7,988	0	0	0	0	7,988
			67.42					*67.42*
Equipment Standby	**175.34**	**EA**	**11,821**	**0**	**0**	**0**	**0**	**11,821**
(Note: 2 weeks begining of job plus two week end of job 4 weeks x 40 = 160 hrs)								
			6.08	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*6.08*
EP B25HB015 BUCKET, CLAMSHELL, 6.0 CY, HEAVY DUTY/DIGGING	175.34	HR	1,066	0	0	0	0	1,066
			1.07	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*1.07*
GEN G10Z3065 GENERATOR SET, SKID MOUNTED, 35 KW, VARIABLE POWER SETTINGS, RECONNECTIBLE	175.34	HR	188	0	0	0	0	188

Labor ID: EQ ID: EP11R08 Currency in US dollars TRACES MII Version 4.2

Description	Quantity	UOM	ContractCost	Escalation	Contingency	SIOH	MiscOwner	ProjectCost
			2.72	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*2.72*
EP H25LU027 HYDRAULIC EXCAVATOR, ATTACHMENT, MATERIAL HANDLING, GRAPPLE, 6.50CY, 4-TINE/ 5-TINE (ADD 75,000 LB HYDRAULIC EXCAVATOR)	175.34	HR	476	0	0	0	0	476
			29.49	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*29.49*
GEN H25Z3230 HYDRAULIC EXCAVATOR, CRAWLER, 165,000 LB (74,843 KG), 6.00 CY (4.7 M3) BUCKET, 26.6' (8.1 M) MAX DIGGING DEPTH	175.34	HR	5,170	0	0	0	0	5,170
			22.74	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*22.74*
GEN L35Z4270 LOADER, FRONT END, CRAWLER, 3.75 CY (2.9 M3) BUCKET	175.34	HR	3,987	0	0	0	0	3,987
			1.39	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*1.39*
GEN M10Z4230 MARINE EQUIPMENT, BOATS & LAUNCHES, 18' (5.5 M) LONG, R-RUNNER V-HULL, 1,350 LBS (612 KG), NO CABIN, OUTBOARD ENGINE	175.34	HR	244	0	0	0	0	244
			0.00	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00*
NON XX0XX410 BARGE MOUNTED CLAMSHELL, 10 CY CRANE	175.34	HR	0	0	0	0	0	0
			0.00	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00*
NON XX0XX740 WORK BARGE, FLAT DECK, 2000 TON WITH 4 SPUDS	175.34	HR	0	0	0	0	0	0
			3.93	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*3.93*
EP B35XX005 Placement Skip 10 CY	175.34	HR	689	0	0	0	0	689
			1,596.71					*1,596.71*
Existing Material Removal Crew	**12.00**	**HR**	**19,161**	**0**	**0**	**0**	**0**	**19,161**
(Note: Assume existing BW requires 1350 ECY removed. PER H&H, NO REMOVAL OF ROCK NEEDED ON STUB.)								
			11.60	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*11.60*
EP H25LU027 HYDRAULIC EXCAVATOR, ATTACHMENT, MATERIAL HANDLING, GRAPPLE, 6.50CY, 4-TINE/ 5-TINE (ADD 75,000 LB HYDRAULIC EXCAVATOR)	12.00	HR	139	0	0	0	0	139
			261.45	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*261.45*
GEN H25Z3230 HYDRAULIC EXCAVATOR, CRAWLER, 165,000 LB (74,843 KG), 6.00 CY (4.7 M3) BUCKET, 26.6' (8.1 M) MAX DIGGING DEPTH	12.00	HR	3,137	0	0	0	0	3,137
			24.72	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*24.72*

Labor ID: EQ ID: EP11R08 Currency in US dollars TRACES MII Version 4.2

Description	Quantity	UOM	ContractCost	Escalation	Contingency	SIOH	MiscOwner	ProjectCost
GEN G10Z3065 GENERATOR SET, SKID MOUNTED, 35 KW, VARIABLE POWER SETTINGS, RECONNECTIBLE	12.00	HR	297	0	0	0	0	297
			52.87	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*52.87*
GEN M10Z4230 MARINE EQUIPMENT, BOATS & LAUNCHES, 18' (5.5 M) LONG, R-RUNNER V-HULL, 1,350 LBS (612 KG), NO CABIN, OUTBOARD ENGINE	12.00	HR	634	0	0	0	0	634
			27.80	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*27.80*
EP B25HB015 BUCKET, CLAMSHELL, 6.0 CY, HEAVY DUTY/DIGGING	12.00	HR	334	0	0	0	0	334
			191.92	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*191.92*
GEN L35Z4270 LOADER, FRONT END, CRAWLER, 3.75 CY (2.9 M3) BUCKET	12.00	HR	2,303	0	0	0	0	2,303
			392.48	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*392.48*
NON XX0XX410 BARGE MOUNTED CLAMSHELL, 10 CY CRANE	12.00	HR	4,710	0	0	0	0	4,710
			17.96	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*17.96*
EP B35XX005 Placement Skip 10 CY	12.00	HR	215	0	0	0	0	215
			42.08	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*42.08*
NON XX0XX740 WORK BARGE, FLAT DECK, 2000 TON WITH 4 SPUDS	12.00	HR	505	0	0	0	0	505
			101.13	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*101.13*
MIL B-EQOPRGR1A Foreman Equip. Operator Group 1A - AK	12.00	HR	1,214	0	0	0	0	1,214
(Note: Updated 5/17/12 AKDOL A1602 GROUP 1A: Cranes-over 45 tons or 150 foot (including jib and attachments): (a) Shovels, backhoes, draglines, clamshells-over 3 yards, (b) Tower cranes; Loaders over 5 yds.; Motor Patrol Grader, Dozer, Grade Tractor (finish: when finishing to final grade and/or to hubs, or for asphalt); Power Plants: 1000 k.w. and over; Quad; Screed; Sidebooms over 45 tons; Slip Form Paver C.M.I. and similar types; Scrapers over 40 yards; Camera/Tool/Video Operator (Slipline). Certified Welder, Electrical Mechanic, Camp Maintenance Engineer, Mechanic over 10,000 hours)								
			97.51	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*97.51*
MIL B-EQOPRGR1A Equip. Operator Group 1A - AK	24.00	HR	2,340	0	0	0	0	2,340
(Note: Updated 5/17/12 AKDOL A1602 GROUP 1A: Cranes-over 45 tons or 150 foot (including jib and attachments): (a) Shovels, backhoes, draglines, clamshells-over 3 yards, (b) Tower cranes; Loaders over 5 yds.; Motor Patrol Grader, Dozer, Grade Tractor (finish: when finishing to final grade and/or to hubs, or for asphalt); Power Plants: 1000 k.w. and over; Quad; Screed; Sidebooms over 45 tons; Slip Form Paver C.M.I. and similar types; Scrapers over 40 yards; Camera/Tool/Video Operator (Slipline). Certified Welder, Electrical Mechanic, Camp Maintenance Engineer, Mechanic over 10,000 hours)								
			81.77	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*81.77*
MIL B-LABORERGR2 Laborers, Group 2 - AK	24.00	HR	1,963	0	0	0	0	1,963

Currency in US dollars

Description	Quantity	UOM	ContractCost	Escalation	Contingency	SIOH	MiscOwner	ProjectCost
(Note: Updated 5/17/12 AKDOL N1202 S1202 GROUP 2: Burning and Cutting Torch; Cement or Lime Dumper or Handler (sack or bulk); Choker Splicer; Chucktender (wagon, airtrack and hydraulic drills); Concrete Laborers (power buggy, concrete saws, pumpcrete nozzleman, vibratorman); Culvert Pipe Laborer; Cured in place Pipelayer; Environmental Laborer (marine work, oil spill skimmer operator, small boat operator); Foam Gun or Foam Machine Operator; Green Cutter (dam work); Gunnite Operator; Hod Carriers; Jackhammer or Pavement Breakers (more than 45 pounds);Laying of Decorative Block (retaining walls, flowered decorative block above 4 feet); Mason Tender and Mud Mixer (sewer work); Pilot Car; Plasterer, Bricklayer and Cement Finisher Tenders; Power Saw Operator; Railroad Switch Layout Laborer; Sandblaster; Sewer Caulkers; Sewer Plant Maintenance Man; Thermal Plastic Applicator; Timber Faller, chain saw operator, filer; Timberman)								
			77.90	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*77.90*
MIL B-EQOPRGR4 Oiler Equip. Operator Group 4 - AK	12.00	HR	935	0	0	0	0	935
(Note: Updated 5/17/12 AKDOL A1605 GROUP 4: Rig Oiler/Assistant Engineer (Advances to Group III if over 45 tons or 3 yards or 150 ft. boom); Swamper (on trenching machines or shovel type equipment); Spotter; Steam Cleaner)								
			13.75	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*13.75*
EP B35XX005 BUCKET, DRAGLINE, 11.0 CY, LIGHT WEIGHT	12.00	HR	165	0	0	0	0	165
			67.42					*67.42*
Equipment Standby	**4.00**	**EA**	**270**	**0**	**0**	**0**	**0**	**270**
(Note: 2 weeks begining of job plus two week end of job 4 weeks x 40 = 160 hrs)								
			6.08	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*6.08*
EP B25HB015 BUCKET, CLAMSHELL, 6.0 CY, HEAVY DUTY/DIGGING	4.00	HR	24	0	0	0	0	24
			1.07	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*1.07*
GEN G10Z3065 GENERATOR SET, SKID MOUNTED, 35 KW, VARIABLE POWER SETTINGS, RECONNECTIBLE	4.00	HR	4	0	0	0	0	4
			2.72	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*2.72*
EP H25LU027 HYDRAULIC EXCAVATOR, ATTACHMENT, MATERIAL HANDLING, GRAPPLE, 6.50CY, 4-TINE/ 5-TINE (ADD 75,000 LB HYDRAULIC EXCAVATOR)	4.00	HR	11	0	0	0	0	11
			29.49	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*29.49*
GEN H25Z3230 HYDRAULIC EXCAVATOR, CRAWLER, 165,000 LB (74,843 KG), 6.00 CY (4.7 M3) BUCKET, 26.6' (8.1 M) MAX DIGGING DEPTH	4.00	HR	118	0	0	0	0	118
			22.74	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*22.74*
GEN L35Z4270 LOADER, FRONT END, CRAWLER, 3.75 CY (2.9 M3) BUCKET	4.00	HR	91	0	0	0	0	91

Labor ID: EQ ID: EP11R08 Currency in US dollars TRACES MII Version 4.2

Description	Quantity	UOM	ContractCost	Escalation	Contingency	SIOH	MiscOwner	ProjectCost
			1.39	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*1.39*
GEN M10Z4230 MARINE EQUIPMENT, BOATS & LAUNCHES, 18' (5.5 M) LONG, R-RUNNER V-HULL, 1,350 LBS (612 KG), NO CABIN, OUTBOARD ENGINE	4.00	HR	6	0	0	0	0	6
			0.00	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00*
NON XX0XX410 BARGE MOUNTED CLAMSHELL, 10 CY CRANE	4.00	HR	0	0	0	0	0	0
			0.00	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00*
NON XX0XX740 WORK BARGE, FLAT DECK, 2000 TON WITH 4 SPUDS	4.00	HR	0	0	0	0	0	0
			3.93	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*3.93*
EP B35XX005 Placement Skip 10 CY	4.00	HR	16	0	0	0	0	16
			14,083.21					*14,083.21*
13 Hydrographic Survey	**3.00**	**EA**	**42,250**	**0**	**0**	**0**	**0**	**42,250**
(Note: Interim and Final surveys for payment.)								
			14,083.21	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*14,083.21*
USR Hydrographic Survey	3.00	EA	42,250	0	0	0	0	42,250
			15,675.15					*15,675.15*
14 Navigation Markers	**1.00**	**EA**	**15,675**	**0**	**0**	**0**	**0**	**15,675**
(Note: Bases constructed and installed by Ktr. Nav Aids installed by USCG.)								
			3,071.72					*3,071.72*
1402 Navigation Foundation	**1.00**	**EA**	**3,072**	**0**	**0**	**0**	**0**	**3,072**
(Note: Assume Nav Marker Base is 7ft x 7ft x 2ft, CIP concrete (4cy), 9-#6 bars T&B EW, 9-#6 bent bars typ 4 sides (0.26ton).)								
			23.29	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*23.29*
USR 031101651 Pad Foundation Forms, 1 Use	74.00	SF	1,723	0	0	0	0	1,723
(Note: 8ft x 2ft x 4sides = 74sf)								
			1,681.81	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*1,681.81*
USR 032101002 Gr 50 Resteel,Ftgs & Slabs,#7-Up	0.27	TON	454	0	0	0	0	454
(Note: 9 x 2 x 2 x 6.5ft = 234ft; 9 x 4 x 3.5ft = 126ft; 126ft + 234ft = 360ft; 360ft x 1.5plf x 1ton/2000lb = 0.27ton)								
			82.00	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*82.00*
RSM 050523051320 Anchor bolt, L-type, 4-bolt set, plain steel, 3/4" dia x 24" L, incl nut & washer, job-built 4-hole template	1.00	SET	82	0	0	0	0	82
(Note: Set to USCG specifications.)								

Labor ID: EQ ID: EP11R08 Currency in US dollars TRACES MII Version 4.2

Description	Quantity	UOM	ContractCost	Escalation	Contingency	SIOH	MiscOwner	ProjectCost
			182.22	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*182.22*
USR 033111161 Pour Slab on Gr,< 6",Crane & Bkt < (15 cm) Place 3000 PSI Conc	4.00	CY	729	0	0	0	0	729
(Note: 7ft x 7ft x 2ft x 1.1cy/25cf = 4cy)								
			20.89	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*20.89*
USR 031101651 Place and Mount Nav Marker base	4.00	HR	84	0	0	0	0	84
(Note: Assume lift precast conc base and place on BW.)								
			12,603.43					*12,603.43*
USCGS Nav Aids	**1.00**	**EA**	**12,603**	**0**	**0**	**0**	**0**	**12,603**
			12,603.43	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*12,603.43*
USR GFM Project Item	1.00	EA	12,603	0	0	0	0	12,603
(Note: The Federal share of the project includes $10,000 for navigational aids. The U.S. Coast Guard would provide these navigation aids. PORT LIONS FEASIBILITY REPORT OCT 2005.)								

Labor ID: EQ ID: EP11R08 Currency in US dollars TRACES MII Version 4.2

Description **Page**

Appendix C: Real Estate Plan Update

REAL ESTATE PLAN:

Navigation Improvements Project
Port Lions, Alaska

Project Summary: The draft feasibility report for this project is scheduled for completion in January 2004. The proposed project will modify the existing Port Lions Harbor within Settler Cove, off Kizhuyak Bay, on the north coast of Kodiak Island, which was constructed in 1983 under local cooperation with the City of Port Lions. The proposed project, with the State of Alaska, Department of Transportation and Public Facilities (ADOT&PF) as the Local Sponsor, includes the following Federal General Navigation Features (GNF): construction of a three-segment rubblemound breakwater; extending the western shoreward end of the existing main breakwater; and for additional fill material on the northern side of the existing stub breakwater. Although there are no new Local Service Facilities (LSF) included in the proposed project, the sponsor will be required to repair or replace portions of the existing inner harbor facilities. The new breakwater construction, and modifications to the existing breakwaters, will provide additional wave protection, and reduce damages to vessels and inner harbor facilities.

Real property interests required for the project: The Non-Federal sponsor, the City of Port Lions, will be required to provide all lands, easements, and rights-of-way (LER) necessary for access, construction, and operation and maintenance of the project, if needed. The Governments dominant right of navigation servitude will be exercised for project tidelands below the Mean High Water (MHW) line. Therefore, there are no known estates required for this project given that construction is to be accomplished from marine equipment within Settler Cove. The sponsor will only be afforded any credit for the value of the LER, should an unforeseen need of uplands arise. Should uplands be required, the sponsor will then be obligated to acquire such lands in accordance with Public Law 91-646, as amended.

Current Ownership: The tidelands within Settler Cove are owned by the State of Alaska, and managed by the State Department of Natural Resources, with the U.S. Fish and Wildlife Service, Alaska Maritime National Wildlife Refuge having oversight responsibilities. The Alaska Division of Lands State 'Status Plats' for the harbor area are annotated with 'PER TDL ADL 206501 APN', and the State issued a 'Letter of Entry' to the City in 1980 for construction of the existing breakwaters. The State recently advised the City that they should apply for conveyance of the tidelands within their Corporate Boundary under Alaska Statute 38.05.825. The City of Port Lions and private residents own the uplands adjacent to the harbor.

REAL ESTATE PLAN:

Navigation Improvements Project
Port Lions, Alaska

Improvements: The two (2) existing breakwaters were built under the Federal GNF of the original harbor project. No in-water boundary was defined for the existing project. The ADOT&PF installed vessel moorage facilities and three floating breakwaters. The City filled in a portion of the tidelands to the west of the existing breakwaters for harbor access.

Summary of Required Real Estate Interests:

Federal - General Navigation Features (GNF)	**Acres**	**Owner**	**Interest**
Existing three-segment Floating Breakwater New Breakwater	**2.4**	**State**	**Nav. Serv.**
Existing Breakwater Extension & Stub Breakwater Additional Fill	**0.2**	**State**	**Nav. Serv.**
Construction Boundary	**0.1**	**State**	**Nav. Serv.**
	17.6	**State**	**Nav. Serv.**

Map: A map depicting the real estate required for the navigation improvements project is shown as Attachment 1.

Relocation assistance benefits: No persons or businesses are to be displaced by this project. Therefore, no relocation assistance benefits under Public Law 91-646 will be required for this project.

Potential flooding, induced by construction, operation or maintenance of project: No known flooding should occur due to the planned harbor navigation improvements.

Mineral activity: There is no known mineral activity occurring within the lands required for the project.

Relocation of roads, facilities, or utilities: There are no known relocations anticipated.

Hazardous and Toxic Waste (HTW): There are no known hazardous and/or toxic waste within the tidelands required for the project.

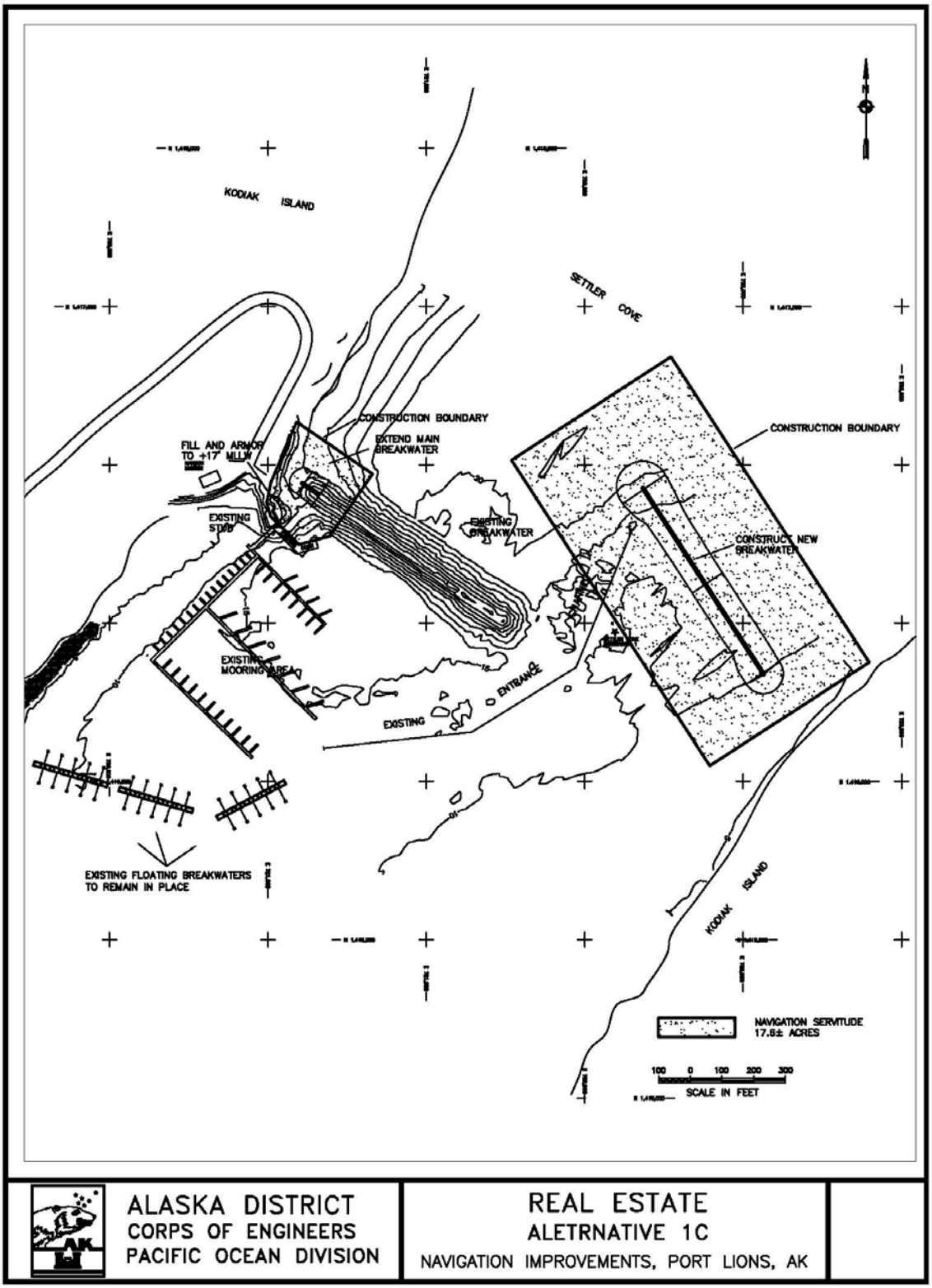
Baseline Cost Estimate: Estimated administrative costs are shown below. A gross appraisal or informal estimate of lands was not needed for the project because construction will be accomplished under the Governments rights of navigation servitude.

	Federal	**Non-Federal**
Lands	0	0
Administrative Costs	$1,000.00	0
TOTAL Real Estate Costs	$1,000.00	$ 0

Schedule: No schedule was prepared since the Governments right of navigation servitude will be used for this project construction.

Known or Anticipated Support or Opposition to the Project: There is strong support for the project from the community of Port Lions, and no known opposition.

Assessment of Non-Federal Sponsor's Real Estate Acquisition Capability: Will be provided for the execution of the PED agreement.



Attachment I

Appendix D: Report of the Chief of Engineers

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
WASHINGTON, D.C. 20314-1000

CEMP-POD (1105-2-10a)

JUN 14 2006

SUBJECT: Port Lions, Alaska

THE SECRETARY OF THE ARMY

1. I submit for transmission to Congress my report on navigation improvements for Port Lions, Alaska. It is accompanied by the report of the district and division engineers. These reports are in partial response to a resolution adopted by the Committee on Public Works of the House of Representatives on 2 December 1970. The study resolution requested review of the reports of the Chief of Engineers on Rivers and Harbors in Alaska, published as House Document 414, 83rd Congress, and other pertinent reports, with a view to determine whether any modifications of the recommendations contained therein are advisable. Preconstruction engineering and design activities for the Port Lions, Alaska, project will be continued under the authority provided by the resolution cited above.

2. The reporting officers recommend constructing navigation improvements of the existing harbor at Port Lions, Alaska. The recommended plan provides a new rubble-mound breakwater, 1,360 feet in length, located southwest and east of the existing mooring basin. The new breakwater would protect the design fleet from northeast and southwest waves. The new breakwater would not be shore-connected to provide a 150-foot opening for fish passage. This would allow fish to remain in the shallow water near the shore and minimize the threat of deep-water predation. Additionally, the width of the near-shore opening at the existing breakwater would be reduced to 30 feet by a combination of extending the existing breakwater 40 feet shoreward and by extending the existing stub breakwater 75 feet seaward. The breakwaters would protect a 10-acre mooring basin. The basin would provide protected moorage for a total of 124 commercial and subsistence vessels ranging in length from 22 to 55 feet. The existing basin depths range from -14 feet mean lower low water (MLLW) near the entrance channel to -8 feet MLLW at the near-shore extent of the basin. Because the recommended plan would not have any significant adverse effects, no mitigation measures (beyond management practices and avoidance) or compensation measures are required. The recommended plan is the national economic development plan.

3. Project costs are allocated to the commercial navigation purpose. The estimated initial implementation cost of the general navigation features (GNF) of the recommended plan based on an October 2005 price level is $9,300,000. All GNF costs are associated with the breakwater construction. In accordance with Section 101 of the Water Resources Development Act (WRDA) 1986, as amended by Section 201 of WRDA 1996, the ultimate

Federal and non-Federal shares of GNF are estimated to be $7,440,000 and $1,860,000, respectively. In addition, the Federal Government would incur the costs of navigation aids currently estimated to be $10,000. The non-Federal share includes 10 percent of the cost of the GNF, which is based on an overall project depth less than -20 feet MLLW and an additional cash payment of 10 percent of costs allocated to GNF. The additional 10 percent of GNF, including interest, and less credit for land, easements, rights-of-way, and relocations, may be paid in cash over a period not to exceed 30 years. The non-Federal sponsor, the Alaska Department of Transportation and Public Facilities, would invest $1,150,000 in local service facilities, which would include a mooring float system. Total costs for all features required to obtain the projected navigation benefits, including GNF; lands, easements, rights-of-way, and relocations; local service facilities; and aids-to-navigation are estimated to be $10,460,000.

4. The total equivalent annual cost of the project, based on a discount rate of 5 1/8 percent and a 50-year period of economic evaluation, is $641,000. This amount includes the equivalent annual cost of operation and maintenance of the project currently estimated to be $20,000, including $8,000 for the Federal portion for maintenance of the breakwaters and conducting periodic hydrographic surveys. The equivalent annual cost for the non-Federal sponsor to operate and maintain the mooring float system and maintain depths within the harbor is $11,000. The U.S. Coast Guard would maintain the navigation aids at an annual cost of $1,000. Equivalent annual benefits are estimated at $884,000, for a benefit-to-cost ratio of 1.4 to 1 and average annual net benefits of $243,000.

5. Washington level review indicates that the plan recommended by the reporting officers is technically sound, economically justified, and environmentally and socially acceptable. The plan conforms with essential elements of the U.S. Water Resources Council's Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies and complies with other applicable administration and legislative policies and guidelines. Also, the views of interested parties, including Federal, State and local agencies, have been considered.

6. I generally concur in the findings, conclusions, and recommendation of the reporting officers. Accordingly, I recommend that navigation improvements for the Port Lions, Alaska, project be authorized generally in accordance with the reporting officers recommended plan and with such modifications as in the discretion of the Chief of Engineers may be advisable in the future. My recommendation is subject to cost sharing, financing, and other applicable requirements of Federal and State laws and policies, including Public Law 99-662 (WRDA 1986), as amended by Section 201 of Public Law 104-303 (WRDA 1996). This recommendation is subject to the non-Federal sponsor

agreeing to comply with all applicable Federal laws and policies, including the following requirements:

a. Provide, during the period of design, 25 percent of design costs allocated by the Government to commercial navigation in accordance with the terms of a design agreement entered into prior to commencement of design work for the project; and provide, during the first year of construction, any additional funds necessary to pay the full non-Federal share of design costs allocated by the Government to commercial navigation in accordance with the cost sharing as set out in paragraph b., below;

b. Provide, during construction, 10 percent of the total cost of construction of the general navigation features attributable to dredging to a depth not in excess of 20 feet; plus 25 percent of the total cost of construction of the general navigation features attributable to dredging to a depth in excess of 20 feet but not in excess of 45 feet; plus 50 percent of the total cost of construction of the general navigation features attributable to dredging to a depth in excess of 45 feet;

c. Pay with interest, over a period not to exceed 30 years following completion of the period of construction of the project, up to an additional 10 percent of the total cost of construction of the general navigation features. The value of lands, easements, rights-of-way, and relocations provided by the non-Federal sponsor for the general navigation features, described below, may be credited toward this required payment. If the amount of credit exceeds 10 percent of the total cost of construction of the general navigation features, the non-Federal sponsor shall not be required to make any contribution under this paragraph, nor shall it be entitled to any refund for the value of lands, easements, rights-of-way, and relocations in excess of 10 percent of the total cost of construction of the general navigation features;

d. Provide all lands, easements, and rights-of-way, and perform or ensure the performance of all relocations determined by the Federal Government to be necessary for the construction or operation and maintenance of the general navigation features (including all lands easements, and rights-of-way, and relocations necessary for dredged material disposal facilities);

e. Accomplish all removals determined necessary by the Federal Government other than those removals specifically assigned to the Federal Government;

f. Provide, operate, maintain, repair, replace, and rehabilitate, at its own expense, the local service facilities consisting of the existing float system and additional floats added to

accommodate the fleet designed for the recommended project in a manner compatible with the project's authorized purposes and in accordance with applicable Federal and State laws and regulations and any specific directions prescribed by the Federal Government;

g. Shall not use funds from other Federal programs, including any non-Federal contribution required as a matching share thereof, to meet any of the non-Federal obligations for the project unless the Federal agency providing the Federal portion of such funds verifies in writing that expenditure of such funds for such purpose is authorized;

h. Shall prepare and implement a harbor management plan that incorporates best management practices to control water pollution at the project site and to coordinate such plan with local interests;

i. Comply with all applicable provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646, as amended (42 U.S.C. 4601-4655), and the Uniform Regulations contained in 49 CFR Part 24, in acquiring lands, easements, and rights-of-way required for construction or operation and maintenance of the general navigation features and the local service facilities, including those necessary for relocations, the borrowing of materials, or the disposal of dredged or excavated material and inform all affected persons of applicable benefits, policies, and procedures in connection with said Act;

j. Give the Federal Government a right to enter, at reasonable times and in a reasonable manner, upon property that the non-Federal sponsor owns or controls for access to the project for the purpose of operating and maintaining the general navigation features;

k. Hold and save the United States free from all damages arising from the construction or operation and maintenance of the project, any betterments, and the local service facilities, except for damages due to the fault or negligence of the United States or its contractors;

l. Keep and maintain books, records, documents, or other evidence pertaining to costs and expenses incurred pursuant to the project, for a minimum of 3 years after completion of the accounting for which such books, records, documents, or other evidence are required, to the extent and in such detail as will properly reflect total costs of construction of the general navigation features, and in accordance with the standards for financial management systems set forth in the Uniform Administrative Requirements for Grants and Cooperative Agreements to State and Local Governments at 32 Code of Federal Regulations (CFR) Section 33.20;

m. Comply with all applicable Federal and State laws and regulations, including, but not limited to: Section 601 of the Civil Rights Act of 1964, Public Law 88-352 (42 U.S.C. 2000d) and Department of Defense Directive 5500.11 issued pursuant thereto; Army Regulation 600-7, entitled "Nondiscrimination on the Basis of Handicap in Programs and Activities Assisted or Conducted by the Department of the Army"; and all applicable Federal labor standards requirements including, but not limited to, 40 U.S.C. 3141- 3148 and 40 U.S.C. 3701 – 3708 (revising, codifying and enacting without substantial change the provisions of the Davis-Bacon Act (formerly 40 U.S.C. 276a *et seq.*), the Contract Work Hours and Safety Standards Act (formerly 40 U.S.C. 327 *et seq.*) and the Copeland Anti-Kickback Act (formerly 40 U.S.C. 276c *et seq.*);

n. Perform, or ensure performance of, any investigations for hazardous substances that are determined necessary to identify the existence and extent of any hazardous substances regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Public Law 96-510, as amended (42 U.S.C. 9601-9675), that may exist in, on, or under lands, easements, or rights-of-way that the Federal Government determines to be required for construction or operation and maintenance of the general navigation features. However, for lands that the Federal Government determines to be subject to the navigation servitude, only the Federal Government shall perform such investigations unless the Federal Government provides the non-Federal sponsor with prior specific written direction, in which case the non-Federal sponsor shall perform such investigations in accordance with such written direction;

o. Assume, as between the Federal Government and the non-Federal sponsor, complete financial responsibility for all necessary cleanup and response costs of any hazardous substances regulated under CERCLA that are located in, on, or under lands, easements, or rights-of-way that the Federal Government determines to be required for construction or operation and maintenance of the general navigation features;

p. To the maximum extent practicable, perform its obligations in a manner that will not cause liability to arise under CERCLA; and

q. Comply with Section 221 of Public Law 91-611, Flood Control Act of 1970, as amended (42 U.S.C. 1962d-5b), and Section 101(e) of the Water Resources Development Act of 1986, Public Law 99-662, as amended (33 U.S.C. 2211), which provides that the Secretary of the Army shall not commence the construction of any water resources project, or separable element thereof, until each non-Federal sponsor has entered into a written agreement to furnish its required cooperation for the project or separable element.

7. The recommendation contained herein reflects the information available at this time and current departmental policies governing formulation of individual projects. It does not reflect program and budgeting priorities inherent in the formulation of a national civil works construction program or the perspective of higher review levels within the executive branch. Consequently, the recommendation may be modified before it is transmitted to the Congress as a proposal for authorization and implementation funding. However, prior to transmittal to the Congress, the non-Federal sponsor, the Alaska Department of Transportation and Public Facilities; interested Federal agencies; and other parties will be advised of any modifications and will be afforded an opportunity to comment further.

CARL A. STROCK
Lieutenant General, US Army
Chief of Engineers

APPENDIX E

ENGINEERING ANALYSIS

1.0 INTRODUCTION

1.1 Appendix Purpose

This Engineering Analysis (Appendix E) describes the technical aspects of the Port Lions Navigation Improvements Limited Reevaluation Report (LRR). It covers the engineering analysis conducted for the new Alternative 1C plan. It also addresses additional engineering concerns such as sea level change (SLC) and harbor resonance. For previous coastal and hydraulic engineering work conducted in support of Alternatives 1A, 1B, and 3B, refer to Appendix A (Hydraulic Analysis) contained in the 2005 Navigation Improvements Feasibility Report. Sections 2 through 5, and 7of Appendix A are applicable to this Appendix E.

2.0 INTRODUCTION

This section provides additional coastal hydraulic aspects of the project site not previously covered in Section 2 of Appendix A in the 2005 Feasibility Report.

2.1 Sea Level Rise

The Corps of Engineers requires that planning studies and engineering designs consider alternatives that are formulated and evaluated for the entire range of possible future rates of SLC. Guidance for addressing SLC is in Engineer Circular EC 1165-2-212 and detailed below. Three scenarios of "low," "intermediate," and "high" SLC are evaluated over the project life cycle. According to the EC, the SLC "low" rate is the historic SLC. The "intermediate" and "high" rates are computed using the following:

> Estimate the "intermediate" rate of local mean sea-level change using the modified NRC Curve I and the NRC equations. Add those to the local historic rate of vertical land movement.
>
> Estimate the "high" rate of local mean sea-level change using the modified NRC Curve III and NRC equations. Add those to the local rate of vertical land movement. This "high" rate exceeds the upper bounds of Intergovernmental Panel on Climate Change (IPCC) estimates from both 2001 and 2007 to accommodate potential rapid loss of ice from Antarctica and Greenland.

NRC Equations

The 1987 NRC described these three scenarios using the following equation:

$$E(t) = 0.0012t + bt^2$$

in which t represents years, starting in 1986, b is a constant, and $E(t)$ is the eustatic sea-level change, in meters, as a function of t. The NRC committee recommended

"projections be updated approximately every decade to incorporate additional data." At the time the NRC report was prepared, the estimate of global mean sea-level change was approximately 1.2 mm/year. Using the current estimate of 1.7 mm/year for GMSL change, as presented by the IPCC (IPCC 2007), results in this equation being modified to be:

$$E(t) = 0.0017t + bt^2$$

The three scenarios proposed by the NRC result in global eustatic sea-level rise values, by the year 2100, of 0.5 meters, 1.0 meters, and 1.5 meters. Adjusting the equation to include the historic GMSL change rate of 1.7 mm/year and the start date of 1992 (which corresponds to the midpoint of the current National Tidal Datum Epoch of 1983-2001), results in updated values for the variable b being equal to 2.71E-5 for modified NRC Curve I, 7.00E-5 for modified NRC Curve II, and 1.13E-4 for modified NRC Curve III. The three GMSL rise scenarios are depicted in Figure 1(Figure 5 from EC 1165-2-212).

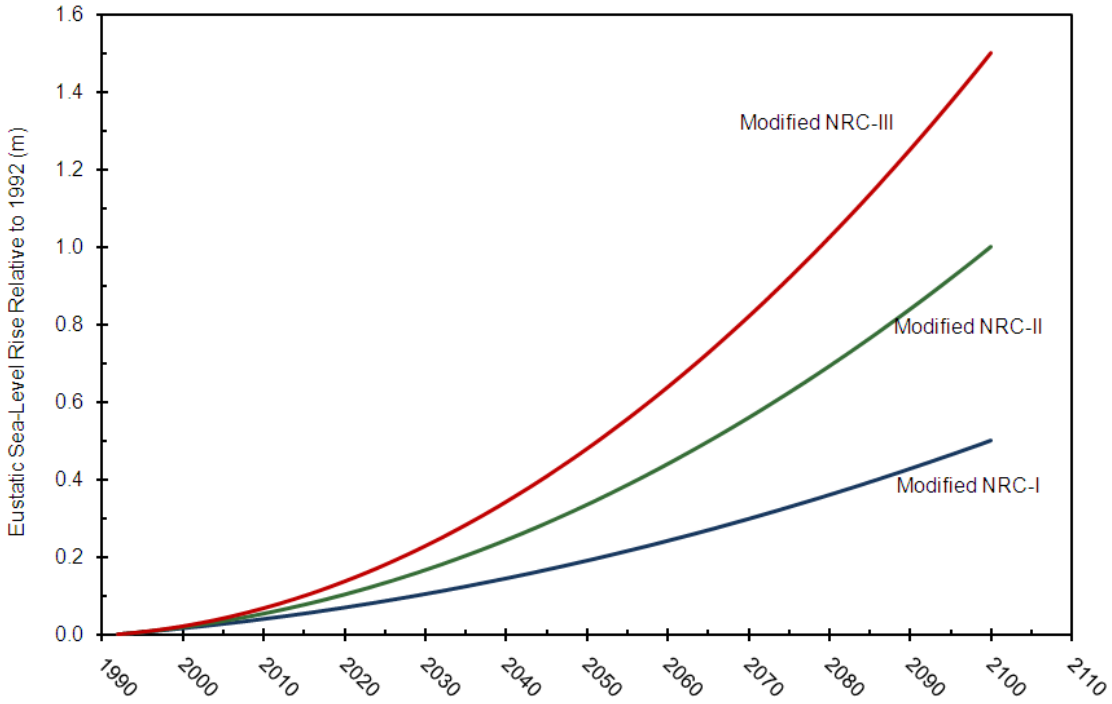


Figure 1. (Figure 5 from EC 1165-2-212). Scenarios for GMSL Rise (based on updates to NRC 1987 equation).

Manipulating the equation to account for the fact that it was developed for eustatic sea level rise starting in 1992, while projects will actually be constructed at some date after 1992, results in the following equation:

$$E(t_2) - E(t_1) = 0.0017(t_2 - t_1) + b(t_2^2 - t_1^2)$$

where t_1 is the time between the project's construction date and 1992 and t_2 is the time between a future date at which one wants an estimate for sea-level change and 1992 (or t_2

$= t_1$ + number of years after construction) . For the three scenarios proposed by the NRC, b is equal to 2.71E-5 for Curve 1, 7.00E-5 for Curve 2, and 1.13E-4 for Curve 3.

This sea level rise was then added to a measured sea level trend for the Kodiak Island area. NOAA has sea level trends published for Kodiak Island, Alaska, which is the applicable station for Port Lions. The sea level trend for Kodiak Island is -10.42 mm/year (-0.41 inches/year), which is equivalent to -1.71 feet in 50 years. This value was added to the values obtained from the NRC equation as shown in Table 1 (Table 3per EC 1165-2-212).

Table 1. (Table 3 per EC 1165-2-212). Sea Level Rise Prediction for a 50-Year Project Life.

Scenario	Low	Intermediate	High
SLC	-1.01 feet	-0.33 feet	0.22 feet

Due to isostatic rebound, and possibly techtonic rebound, the land on Kodiak Island has been rising faster than sea level. Since the glaciers that historically covered the land mass have essentially disappeared, the historic trend has been such that rising sea level is more than compensated for by the rise in land mass. Only under the "high" scenario is SLC such that a net increase in sea level would be expected.

3.0 NEW ALTERNATIVE (1C) CONSIDERED IN DETAIL

This Section corresponds to Section 6 of Appendix A in the 2005 Feasibility Report.

3.1 Alternative 1C

Alternative 1C is very similar in configuration to Alternative 1A. The difference between the two is that the southern limit of the harbor basin would continue to be protected by the existing floating breakwater segments instead of removing them and replacing them with new floating breakwater segments. This alternative, shown in figure 4 in the Limited Reevaluation Report, incorporates all other features as in Alternative 1A: a 700-foot-long detached rubblemound breakwater located northeast of the existing breakwater, a 40-foot-long extension of the existing breakwater to the west to reduce the existing gap width, and a 75-foot-long extension of the existing fill at the dock approach to further reduce the gap width. The existing mooring basin would remain unchanged with this alternative. The 8.5-acre mooring basin could accommodate the range of vessels in the fleet, with stalls oriented with the prevailing wind direction as at present. The existing float system could be expanded considerably in the future if so desired and still be protected from the northeast wave exposure. The harbor entrance would be oriented with more of an "S-turn" movement around the heads of the new and existing breakwaters and into the maneuvering area. This entrance channel configuration is somewhat different from the existing condition but was designed to meet safe navigation criteria under extreme wave and tidal current conditions. A new navigation marker light would be established on the head of the new detached breakwater along with the existing one to guide mariners into the harbor.

Harbor Basin. The harbor basin would have the same dimensions, depths, and orientation as that for Alternative 1A. It would not require dredging since existing depths range from –10 to –18 feet MLLW. These depths are sufficient for the design fleet based on criteria previously given in Section 5 of Appendix A. The deeper portion of the mooring basin would be located closest to the entrance channel. The shallower portion would be located farther into the harbor toward the western shoreline. The maneuvering area just inside the basin would not require dredging since existing depths range from –12 to –17 feet MLLW. A total combined maneuvering and mooring basin area of approximately 10.0 acres would be available in the basin for alternative 1C. This area could easily be expanded in the future without additional breakwater protection or dredging.

Wave Heights. This alternative would meet the wave criteria previously established in Section 5 of Appendix A along the floats inside the harbor basin. The breakwaters were positioned to reduce incident wave heights from the various directions of exposure to acceptable levels. The maximum wave heights in the mooring areas, based on the 50-year design incident wave, were calculated to be 1 foot and less. Progressively smaller wave heights would occur farther into the harbor mooring area, as shown in the diffraction diagrams in figures 17 and 18 of Appendix A for Alternative 1A. Predicted wave heights inside the harbor under design conditions are calculated by multiplying the incident design wave height by the coefficient (K') indicated. All directions of wave exposure were taken into account in determining the highest wave heights in the mooring area; however, the northeast was the most critical.

Circulation. This alternative would not fully enclose a harbor basin proper since the proposed rubblemound breakwater would be located outside and offset from the existing harbor, similar to Alternative 1A. All circulation parameters calculated for Alternative 1A would apply to Alternative 1C. It is estimated that the exchange of water in the harbor mooring area would be similar to that of the existing harbor during each tide cycle. The aspect ratio of the basin is 1.2. The ratio of the basin planform area (A) to the entrance cross-sectional area (a) is 61. The areas of potentially low exchange were checked to ensure that no more than 5 percent of the total area had exchange coefficients less than 0.15. All parameters meet the harbor design criteria for water quality and circulation.

Shoaling. Shoaling of the entrance channel would not be expected since there is no evidence of significant shoaling of sediments at the existing entrance channel. There are no significant sources of sediment such as major rivers or creeks in the area. A small fillet of gravel and sandy material is present along the shoreline at the existing breach, indicating some accumulation of material from the northeast. The eastern shoreline is rocky and fairly abrupt with little accumulation of sediments. This material would not be expected to reach the entrance channel or mooring basin. The existing entrance channel has not required maintenance dredging and is not expected to with this alternative.

Construction Dredging. No dredging would be required for Alternative 1C.

Maintenance Dredging. Maintenance dredging would be expected to be minimal or not necessary at all in the future. Dredging has not been required in the existing harbor since its initial construction. Littoral transport of sediments generally appears to be from northeast to southwest along the shoreline and the existing breakwater. The source of much of this material is believed to be dredged material from the initial dredged entrance channel that was disposed of on the seaside of the main breakwater. A decrease in deposition of this material has been observed every year to the point of being minimal at present.

Breakwaters. The positioning of the new northeast rubblemound breakwater would create an entrance channel alignment allowing access from the northeast to the basin similar to Alternative 1A. Maximum depths of water are –18 feet MLLW along the alignment of the new breakwater at the head. Foundation materials would be sand, gravel, and rock that would serve as a suitable base for the rubblemound structure. The existing main breakwater would be extended to the west to reduce the width of the existing breach along the western shoreline. A gap of 30 feet would be retained at an elevation 5 feet MLLW from the toe of the breakwater extension to the toe of the shoreline riprap. This would provide for continued fish passage along the shoreline and through the harbor.

The existing concrete ladder type floating breakwater segments would remain and provide for wave protection from the southeast. They are positioned at depths of approximately –11 feet MLLW along the southwestern boundary of the mooring basin.

Rubblemound Breakwater Design. The breakwater design methodology described for Alternative 1A is the same as that for Alternative 1C. Methods described in the established guidance using Hudson's equation were used to determine armor stone sizes for the new rubblemound breakwater and existing breakwater extension. Stone size for the rubblemound breakwater was determined using the significant wave heights presented in table 4 of Appendix A, along with a sea-side side slope of 2H:1V and harbor-side slope side slope of 1.5H:1V, and a K_d value of 4 for a non-breaking wave. A stone specific gravity of 2.72 was used in the calculations. Armor stone (A1 rock) with a range of sizes from 6,100 pounds maximum weight, 4,900 pounds average weight, to 3,650 pounds minimum weight would be used on the face of the breakwater. Secondary stone (B1 rock) would range from 3,650 pounds maximum weight, 490 pounds average, to 360 pounds minimum weight. Core1 material would range from 360 pounds maximum, 49 pounds average, to 1 pound minimum. Armor stone thickness would be 6.5 feet and secondary stone thickness would be 3 feet. The armor stone on the existing main breakwater has an average weight of 3,850 pounds. Since the existing main breakwater has been stable since its reconstruction in the early 1980's, the existing stone size is appropriate for the breakwater extension to constrict the fish passage gap. This armor stone (A4 rock) would have a range of sizes from 4,810 pounds maximum, 3,850 pounds average, to 3,080 pounds minimum weight. Secondary stone (B4 rock) would range from 3,080 pounds maximum weight, 385 pounds average, to 300 pound minimum weight. Core4 material would range from 300 pounds maximum, 39 pounds average, to 1 pound minimum.

The crest elevation for the new breakwater was determined by considering wave run-up, storm surge, and extreme high tides. Several methods were used to calculate wave run-up that resulted in an average value of 9.5 feet, including storm surge during design storm wave conditions. Using a still water level of 9.6 feet MLLW, a crest elevation of 19 feet MLLW was calculated. Therefore, the new breakwater crest elevation would be 19 feet MLLW. For consistency, the existing breakwater extension crest elevation would be 20 feet MLLW. A crest width of 10 feet was selected based on the armor size and constructability considerations.
The A1 rock would extend down the seaside slope to a 6.5-foot-wide toe configuration at the base of the breakwater. The harbor side A1 rock would extend to a minimum elevation of 0 foot MLLW.

The fill and armor section at the barge landing area was designed with a similar cross-section as that of the main breakwater extension. An excavated toe was used instead of a buttressed toe due to the requirement to maintain adequate width for barge access. Cross sections for the new rubblemound breakwater, breakwater extension, and fill and armor area are shown in figures 19 and 20 of Appendix A.

A total of 19,600 cubic yards (cy) of A1 rock, 12,900 cy of B1 rock, and 25,900 cy of Core1 rock would be required for construction of the breakwater. A total of 900 cy of A4 rock, 850 cy of B4 rock, and 1,400 cy of Core4 rock would be required for construction of the breach constriction.

Existing Floating Breakwater. The existing floating breakwater segments provide wave protection for the harbor from the southwest and will remain. Since the feasibility study for navigation improvements was completed in 2005, ownership of the floating breakwater segments has been turned over to the City of Port Lions from the ADOTPF.

Uplands. No additional uplands would be provided for alternative 1C. Existing uplands are sufficient for current and future anticipated harbor operations and support. Local interests could expand the existing uplands in the future by excavating into the adjacent slope if necessary. Given the total harbor area of 10 acres, uplands to total harbor area ratio of 0.15 would apply to this alternative.

Entrance Channel Navigation. The proposed breakwater alignment would create an entrance channel with an effective width of 450 feet at project depth between the breakwater heads. This width exceeds the minimum width needed for the design vessel. It would, however, increase tidal velocities above the existing conditions by pinching off the flow path into and out of the back bay of Settler Cove. Calculations were performed to estimate this increase due to the constriction. It is estimated that the peak velocity at the inflection point of the ebb tide curve would be 0.80 foot-per-second (fps) for the existing condition and 0.96 fps for the Alternative 1A entrance configuration. This represents a 20 percent increase in velocity and would not significantly affect navigation. Numerous harbors in the State of Alaska have velocities greater in magnitude. It is anticipated that the design vessel and other vessels in the fleet using the harbor would have little difficulty navigating the new entrance to the harbor even under storm and extreme tide conditions. The existing 150-foot-wide dredged entrance would remain

unchanged and continue to be used as it is presently used. It would, however, be considerably less affected by incident wave action from the northeast.

Inner Harbor Facilities. The City of Port Lions has replaced a portion of the existing floats in the harbor (Phase I). They have plans to replace the remainder of the existing float system (Phase II) following construction of the new rubblemound breakwater. The Phase II float replacement project for the inner harbor calls for construction of a heavy duty float (essentially a floating breakwater) to be placed along the southeasterly perimeter of the harbor to provide temporary wave protection from the northeast. This feature would not necessarily be needed with the construction of the new northeast rubblemound breakwater; therefore, it could be eliminated from the Phase II project with construction of Alternative 1C.

Harbor Resonance. Alternative 1C was analyzed for harbor resonance using the methods specified in the EM 1110-2-1100 Part II-7-5 (Coastal Engineering Manual). The configuration of the harbor can be represented by the "open basin" condition. A rectangular basin with length of approximately 985 feet and forcing mechanism through the entrance channel from the northeasterly waves coming off the Gulf of Alaska were used. A low tide water level was used in computing the depth parameter. Fundamental, second, and third modes of oscillation were calculated for the basin as follows: T0 = 182.0 sec, T1 = 60.2 sec, and T = 36.4 sec. The maximum horizontal velocity was calculated as: Vmax = 0.73 ft/sec for standing wave at a node. Maximum horizontal particle excursion at a node was calculated as: X = 42.4 feet. Average horizontal velocity was determined to be 0.12 ft/sec for node 0.

The strength and period of the first two resonant modes were then determined using Figure II-7-31 in EM 1110-2-1100. For the fundamental mode, an amplification factor of 3.0 and a relative harbor length at resonance of 0.7 was determined. For the second mode, values of 3.4 and 1.6, respectively, were determined. The resonant periods were then calculated as 292 seconds and 60 seconds, respectively.

Harbor resonance is not expected to be an issue with the configuration for Alternative 1C. Amplification factors are relatively low (less than 5), and the resonant periods for the harbor are not expected to coincide with the design wave period conditions. Also, the proposed new detached breakwater would block wave energy from directly entering the mooring basin from the northeast. Therefore, any wave reflection off of the existing floating breakwater's northerly face and into the mooring basin would be essentially eliminated. Diffracted wave energy from around the new and existing breakwater heads would propagate through the harbor entrance but with its magnitude significantly reduced. Long period oscillations in the existing mooring basin have not been observed in the past and are not be expected for the proposed Alternative 1C.

4.0 OPERATIONS AND MAINTENANCE

This Section corresponds to Section 7.2 of Appendix A in the 2005 Feasibility Report.

Operation and maintenance requirements for Alternative 1C would be similar to that for Alternative 1A except that maintenance of the existing floating breakwater segments would be a local responsibility. Condition of the concrete, flotation, connections, anchoring system, and cathodic protection would be evaluated and maintenance requirements would be determined by the City of Port Lions during periodic inspections. It is estimated that the service life of the existing floating breakwater segments would be extended with the construction of the new northeast rubblemound breakwater. The northeast rubblemound breakwater would significantly reduce the wave action from the northeast, which currently causes damage and long term wear-and-tear on the floating breakwaters.

Operation of the existing mooring area portion of the project would remain the City of Port Lions' and State of Alaska's responsibility. The Federal Government would be responsible for the rubblemound breakwaters and the entrance channel portions of the project. The Alaska District, Corps of Engineers, would visit the site periodically to inspect the breakwaters and perform hydrographic surveys at 3- to 5-year intervals for the dredged areas. The surveys would be used to verify whether maintenance dredging is warranted. Maintenance requirements for the rubblemound breakwaters would be determined from the surveys and inspections. Local and Federal dredging requirements, if necessary, would probably be combined, so there would be only a single mobilization and demobilization cost.

Minimal maintenance dredging is anticipated with Alternative 1C. It is estimated that essentially no maintenance dredging in the entrance channel and mooring basin would be necessary over the remaining 30-year project life. Additionally, minimal maintenance would be anticipated over another 20 years beyond that. The existing project has shown that it is essentially maintenance free with respect to the entrance channel and mooring area depths.

Any additional shoaling in the breach would be similar for Alternative 1C as with the other alternatives.

No significant loss of stone from the new rubblemound structure is expected over the life of the project. It is estimated that at the worst case, 3 percent of the armor stone would be replaced every 15 years. Since stone quality would be strictly specified in the contract, little to no armor stone degradation is anticipated. The armor stone on the existing breakwater was inspected in 2002 and found to be in excellent condition with no visible signs of degradation, fracture, or slaking.

Maintenance of the existing floating breakwater would continue to be a Local responsibility.

5.0 REFERENCES

U.S. Army Corps of Engineers (USACE). 2008. “Coastal Engineering Manual” - Part II. Engineer Manual EM 1110-2-1100.

USACE. 2005. “Navigation Improvements Draft Feasibility Report and Environmental Assessment, Port Lions, Alaska” – Appendix A Hydraulic Analysis.