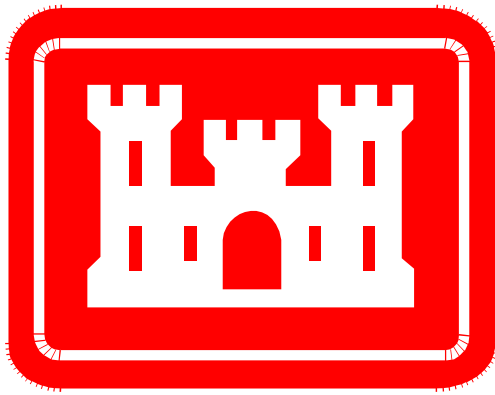


***U.S. ARMY CORPS OF ENGINEERS***

***REPORT TO CONGRESS***

**HOPPER DREDGES**



**3 June 2005**

## TABLE OF CONTENTS

<u>Section</u>	<u>Page No.</u>
<b>EXECUTIVE SUMMARY</b> .....	<b>iii</b>
<b>INTRODUCTION</b> .....	<b>1</b>
<b>Objectives</b> .....	<b>2</b>
<b>Mission</b> .....	<b>2</b>
<b>Data</b> .....	<b>2</b>
<b>Requirement</b> .....	<b>2</b>
<b>Capability</b> .....	<b>3</b>
<b>Corps-Owned Fleet</b> .....	<b>4</b>
<b>Previous restrictions on Corps Hopper Dredges</b> .....	<b>4</b>
<b>Environmental Constraints and Other Considerations</b> .....	<b>5</b>
<b>Current Conditions</b> .....	<b>6</b>
<b>CORPS HOPPER DREDGE CONCERNS</b> .....	<b>7</b>
<b>The Issue</b> .....	<b>7</b>
<b>The Problem</b> .....	<b>7</b>
<b>PL 95-269</b> .....	<b>7</b>
<b>Industry Hopper Dredge Fleet</b> .....	<b>7</b>
<b>Limited Number of Hopper Dredges</b> .....	<b>7</b>
<b>CURRENT OPERATIONAL PRACTICE</b> .....	<b>9</b>
<b>Adjust Operating Days</b> .....	<b>9</b>
<b>Ready Reserve</b> .....	<b>9</b>
<b>ASSUMPTIONS</b> .....	<b>10</b>
<b>Strategic Ports</b> .....	<b>10</b>
<b>Contingency Operations</b> .....	<b>10</b>
<b>Worst Case Scenario</b> .....	<b>11</b>
<b>Combined Corps Hopper Dredge Fleet</b> .....	<b>11</b>
<b>Benefits of Corps Hopper Dredges</b> .....	<b>13</b>
<b>OPTIONS</b> .....	<b>14</b>
<b>Definitions</b> .....	<b>14</b>
<b>Retire</b> .....	<b>14</b>
<b>Costs of Options</b> .....	<b>14</b>
<b>One Time Costs</b> .....	<b>14</b>
<b>Options Summary</b> .....	<b>14</b>
<b>EVALUATION OF OPTIONS</b> .....	<b>17</b>
<b>Corps Daily Rates</b> .....	<b>17</b>
<b>Industry Daily Rates</b> .....	<b>17</b>

Analysis of Options .....	17
<b><u>Section</u></b>	<b><u>Page No.</u></b>
Status Quo .....	18
Option 1.....	18
Option 2.....	19
Option 3.....	19
Option 4.....	19
Option 5.....	19
Option 6.....	20
Option 7.....	20
Option 8.....	20
Option 9.....	20
Option 10.....	20
Option 11.....	20
Minimizing Risk .....	21
<b>RECOMMENDATION .....</b>	<b>22</b>
<b>BASELINE .....</b>	<b>22</b>
<b>APPENDIX A DETAILED OPTIONS ANALYSIS.....</b>	<b>25</b>
<b>APPENDIX B COST OF OPTIONS .....</b>	<b>37</b>
<b>APPENDIX C COMMENTS TO THE DRAFT REPORT .....</b>	<b>39</b>

**TABLES**

<b><u>Table</u></b>	<b><u>Page No.</u></b>
Table 1 Corps and Industry Dredging History .....	2
Table 2 Dredging Workload FY 03 .....	2
Table 3 Total Hopper Dredge Fleet – 19 Hopper Dredges .....	4
Table 4 Industry Workload .....	6
Table 5 Excerpts from Public Law 95-269(1978) .....	7
Table 6 Awarded Contracts FY 1990 – 2004 .....	8
Table 7 Hopper Dredge Workload ..	9
Table 8 Potential Impacts to Industry Fixed Costs .....	12
Table 9 Options Summary.....	16
Table 10 Impact of Options on Daily Rate .....	17
Table 11 Comparison of Daily Rate Between Industry and Corps .....	18
Table 12 Cost and Workload Comparison of Options .....	21
Table 13 Comparison of Total Hopper Quantity to Industry Quantity and Corps Total Days Worked .....	24
Table C-1 Hopper Dredge Age, Expected Life, and Major Rehabilitation ...	40

## EXECUTIVE SUMMARY

The Conference Report for the 2004 Energy and Water Appropriations Act directed the Corps of Engineers to report to the Appropriations Committees with a detailed plan of how it intends to rectify the issues raised in the March 2003 GAO report entitled "Effects of Restrictions on Corps' Hopper Dredges Should be Comprehensively Analyzed". The plan is to include how the Corps intends to establish a baseline for determining the appropriate use of the Corps hopper dredge fleet in the future. The conferees also requested that the Corps include a comprehensive analysis of the costs and benefits of the existing and proposed restrictions on the use of the fleet, expected the Corps to put in place measures by which better investment decisions regarding the fleet can be made.

The goal of this analysis was to identify the best business case that can ensure the ability to provide an acceptable level of service to the ports and users of the Nation's waterborne transportation system. The degree of change and configuration of the Corps minimum hopper dredge fleet was determined by resolving an acceptable level of risk both to the industry and to the ports, Corps partners and maritime users. In order to ensure that the industry dredges are consistently available to support the dredging requirements of the Navigation Program, there must be a reasonable ability to realize a return on investment that will keep the vessels and equipment fully operational.

This report explains the navigation mission, the dredging environment, current problems, and issues concerning management of the four hopper dredges in the Corps minimum dredge fleet and the combined industry and Corps hopper dredge fleet. The data management issues raised in the GAO report are addressed and the improvements described. The analysis of costs and benefits of existing and proposed restrictions on the use of Corps hopper dredges is presented and the results are presented in terms of evaluations of twelve options.

The recommended option would schedule the Corps hopper dredge *Essayons* for 215 days, schedule the *Yaquina* for 178 days, keep the *Wheeler* in ready reserve, retire the *McFarland*, and continue with the initiatives from the Industry Corps Hopper Dredge Management Group. This Option would result in a \$10.1 million net reduction in the total cost for hopper dredging, offer approximately 55 days additional work to industry, ensure that there is a viable reserve capability ready to respond to unforeseen requirements, and ensure that Federal projects requiring hopper dredging can be accomplished in a timely manner and at reasonable cost.

## INTRODUCTION

The Fiscal Year 2004 Conference Report for the Energy and Water Appropriations Act made the following statement:

“During fiscal year 2002, the General Accounting Office [GAO] reviewed the benefits and effects of current and proposed restrictions on the Corps of Engineers’ hopper dredge fleet. Congress faces significant future investments in the Corps hopper dredge fleet, as it is rapidly aging. The conferees believe that the investment decisions must take into consideration the subsequent use of the fleet. The final GAO report, released March 2003, reviewed the impacts of operational changes to the fleet since fiscal year 1993. GAO’s findings made it clear to the conferees that additional costs have been imposed upon the Corps with the decreased use of the fleet, but that the benefits have not been realized. Additionally, the GAO found that the Corps’ contracting process for hopper dredges was not effective. Most importantly, the GAO reported that the Corps did not have even a limited system to evaluate the costs and benefits of the varying operational levels of its hopper dredge fleet, nor did it have a means to make maintenance and repair decisions of the fleet taking operational use into consideration. The conferees remain concerned that since 2000, the Corps has provided to Congress, a report which has been found to have no analytical basis, thus calling into question the ready reserve policy.

Therefore, the conferees direct the Corps of Engineers to report to the Appropriations Committees within 6 months of enactment of this Act, with a detailed plan of how it intends to rectify the current situation. The plan is to include how the Corps intends to establish a baseline for determining the appropriate use of the Corps hopper dredge fleet in the future. Finally, the Corps shall include a comprehensive analysis of the costs and benefits of the existing and proposed restrictions on the use of the fleet. Overall, the conferees expect the Corps to put in place measures by which better investment decisions regarding the fleet can be made.”

This report presents the U.S. Army Corps of Engineers response to Congress and response to the findings of the referenced March 2003 GAO report entitled “Effects of Restrictions on Corps’ Hopper Dredges Should be Comprehensively Analyzed”.

The analysis must take into account all of the variables affecting the hopper dredge requirements and capabilities, and must consider the costs of the equipment, the long-term costs, and the risks associated with each alternative. The analysis should also take into account that congressional direction and resultant Corps policy has been to move to greater use of the private sector. This analysis must begin with the premise that the results should improve the ability to perform the navigation mission in the most effective and efficient manner. This is not about Corps dredges or commercially owned and operated industry dredges, but about the combined fleet of hopper dredges comprised of Corps and industry. The goal of this analysis should be to identify the best business case that can ensure the ability to provide an acceptable level of service to the ports and users of the Nation’s waterborne transportation system. The degree of change and configuration of the Corps minimum hopper dredge fleet will be determined by resolving an acceptable level of risk both to the industry and to the ports, Corps partners and maritime users. The majority of the hopper dredges in the combined fleet are owned by industry. It is important that the industry dredges are consistently available to support the dredging requirements of the Navigation Program. In order to ensure the availability of the industry, there must be a reasonable ability to realize a return on investment that will keep the vessels and equipment fully operational. The Corps must seek a way to schedule the industry work first, and stand ready to respond to peak workloads, emergency, and national defense needs. This determination is not founded in data or cost analysis alone, but must be considered in light of significant expectations

for consistent maintenance of justified channel dimensions, and the fact that there is great variability in the dredging requirements in any given year. To expect industry to build a fleet that will ensure capability under the most extreme dredging demands is not an acceptable level of risk to impose upon the industry, nor is it a cost level that taxpayers would be willing to bear. This capability to deal with the peaks in workload is the primary objective of the Government's minimum dredge fleet. The challenge is to determine at what level of workload industry can not be relied on to perform at reasonable cost and in a timely manner, how likely and how frequently that workload can be expected to occur, and what the lowest possible number of Federal dredges is necessary to fill any gaps that industry can not handle.

**Objectives.** The objectives of this report are to:

- Explain the mission, dredging environment, problems, and issues concerning the management of the four hopper dredges in the Corps minimum dredge fleet.
- Present the actions implemented to improve the hopper dredge data and information.
- Describe the results of analyses of costs and benefits of existing and proposed restrictions on the uses of Corps hopper dredges.
- Propose and evaluate options.
- Recommend the appropriate investment decisions regarding Corps hopper dredges.

**Mission.** The Corps navigation mission is to provide safe, reliable, efficient, effective and environmentally sustainable waterborne transportation systems for movement of commerce and national security needs. The program includes 25, 000 miles of commercially navigable channels, 627 shallow harbors, and 299 deep-draft harbors. The navigation program is a vital link to waterborne commerce and handles much of the nation's international trade (2.4 billion tons of commerce, of which 1.1 billion tons are foreign commerce).

**Data.** The Dredging Information System (DIS) was used as the data source for Corps dredging contracts. Several discrepancies were found and a data call was initiated to have the data corrected. The DIS has been modified to contain the data fields considered relevant, important and useful for the management of the Corps dredging program. On 17 February 2004, the modified DIS was put into production. Some of the pick lists have been expanded and two new data fields have been added to the selection screens. The data has been screened, reviewed and accepted as correct by all Corps of Engineer districts and by the dredging industry.

**Requirement.** While the volume of dredged material varies annually because of natural forces and man-made limits, the Federal dredging workload has averaged 266 million cubic yards, from FY 1993 to FY 2004, as shown in Table 1.

**TABLE 1 Corps and Industry Dredging History**  
**Dollars (millions)      Quantity (million cubic yards)**

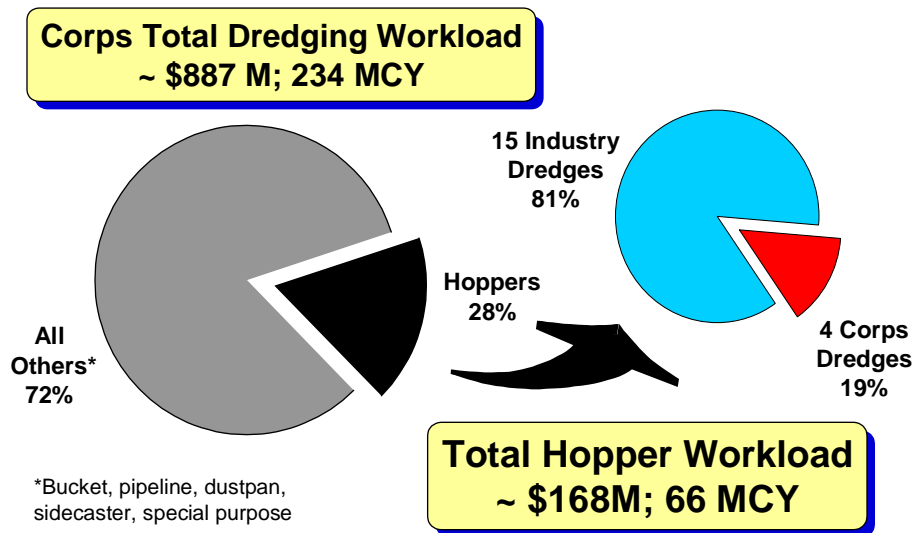
<b>Fiscal Year</b>	<b>Dollars (millions)</b>			<b>Quantity (million cubic yards)</b>		
	<b>Maint</b>	<b>New</b>	<b>Total</b>	<b>Maint</b>	<b>New</b>	<b>Total</b>
1993	\$410.23	\$104.66	\$514.88	235.51	33.50	269.00
1994	\$426.71	\$100.82	\$527.53	264.71	36.96	301.67
1995	\$408.19	\$122.84	\$531.03	217.13	33.99	251.12
1996	\$425.02	\$89.74	\$514.77	234.28	24.37	258.64
1997	\$494.45	\$127.48	\$621.93	252.74	32.18	284.93
1998	\$532.50	\$178.00	\$710.50	211.30	27.30	238.60
1999	\$580.10	\$232.20	\$812.30	241.70	42.10	283.90
2000	\$541.00	\$280.70	\$821.70	226.70	58.60	285.30
2001	\$557.00	\$310.70	\$867.80	217.60	50.80	268.50
2002	\$558.70	\$364.20	\$922.90	204.50	44.10	248.60
2003	\$597.20	\$290.10	\$887.30	191.00	42.80	233.80
2004	\$617.10	\$284.52	\$903.13	222.88	51.13	274.24

Source: Corps Continuing Cost data

Almost 30 percent (66 MCY) of the total dredging performed in FY 2003 was hopper work, mostly done in ocean entrances of large harbors and large rivers. The workload varies by region, with nearly 80 percent of the workload in the Atlantic and Gulf regions. This regional workload also varies throughout the year. Projected additional hopper dredging requirements associated with major deepening projects underway and planned throughout the United States will influence regional demands on the hopper dredge fleet. Non-Federal hopper dredge requirements also represent an impact on workload demands. There may be some adjustment in requirements that results in increased workload, but the additional 18% increase in industry capability with the November launching of the 12,000 cubic yard Manson hopper dredge will most likely be able to cover additional capability requirements.

## Dredging Workload FY03

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**TABLE 2**

**Capability.** The Corps contracts for the services of the U.S. private industry and uses its Corps-owned hopper dredges to accomplish the workload. The size and capability of each hopper dredge must be considered when assigning or procuring work. For example, a large hopper dredge, due to its size and draft will not be able to do work in a shallow-draft project. Conversely, a small hopper dredge may not be an efficient and effective choice for a deep-draft project with a long haul distance to a disposal site.

Industry accomplishes more than 80 percent of the hopper dredge workload. Currently, five companies own the 15 industry hopper dredges used by the Corps, as shown in Table 3. Manson Construction Company has commenced construction of a 12,000 cubic yard hopper dredge, the *Glenn Edwards*, that will be ready in November 2005, thus increasing industry capacity by 18%.

**Total Hopper Dredge Fleet - 19 Hopper Dredges  
(15 Industry Dredges/5 Companies; 4 Corps Dredges)**

CLASS	INDUSTRY, OWNER	CORPS, DISTRICT
<b>LARGE HOPPER (6000 – 12,000 cy)</b>	<i>Liberty Island, Great Lakes Stuyvesant, Bean/Stuyvesant Eagle 1, Bean/Stuyvesant</i>	<i>Wheeler, New Orleans Essayons, Portland</i>
<b>MEDIUM HOPPER (3000 – 6000 cy)</b>	<i>Bayport, Manson Columbia, B+B B.E. Lindholm, Weeks Marine R.N. Weeks, Weeks Marine Newport, Manson Dodge Island, Great Lakes Manhattan Island, Great Lakes Padre Island, Great lakes Sugar Island, Great Lakes</i>	<i>McFarland, Philadelphia</i>
<b>SMALL HOPPER (0-3000cy)</b>	<i>Northerly Island, Great Lakes Westport, Manson Atchafalaya, B+B</i>	<i>Yaquina, Portland</i>

**TABLE 3**

**Corps-Owned Fleet.** The four Corps hopper dredges were designed and built as ocean going dredges. The *Essayons*, *Wheeler*, and *Yaquina* were launched in the early 1980s, and the *McFarland* was launched in 1966.

While the table above reflects separate columns for the Corps and industry hopper dredges, the ability to accomplish the dredging requirements of the navigation mission is dependent upon the operation of the entire fleet of hopper dredges, as described above.

**Previous Restrictions On Corps Hopper Dredges.** Prior to Fiscal Year 1992, the four Corps hopper dredges worked approximately 230 days each. Beginning in Fiscal Year 1993 restrictions were placed on the operation of the Corps hopper dredges.

(A) The Energy and Water Development Appropriations Act, 1993, required the Corps to advertise for competitive bid at least 7.5 million cubic yards of the hopper dredge volume accomplished with Government-owned dredges in Fiscal Year 1992. This requirement was included in each subsequent Appropriations bill, through the FY 1997 Act, and industry demonstrated they could perform in a timely manner and at a reasonable cost, as evidenced by the bidding results and contract performance. The Corps subsequently acknowledged Congress' intent and reduced the Government hopper dredges annual operations to 180 dredging days.

(B) Section 237 of the Water Resources Development Act of 1996, directed the Secretary of the Army to initiate a program to increase the use of private-industry hopper dredges for the construction and maintenance of Federal navigation channels. In order to carry out this requirement, the following actions were required:

- Place the Federal hopper dredge *Wheeler* in ready-reserve status effective 1 October 1997.



- Develop and implement procedures to ensure private-industry hopper dredge capacity is available to meet routine and time-sensitive dredging needs.
- Limit active Federal hopper dredges to no more work than the average assigned in the past three fiscal years, and no less availability and utilization than that which occurred in fiscal year 1996.

The *Wheeler* has been in ready reserve since 1 October 1997, and has been used in conjunction with the combined industry and Corps hopper dredge fleet during peak workload conditions. The implementation of the Industry–Corps Hopper Dredge Management Group (ICHDMG) has successfully demonstrated the ability to manage the dredging requirements with the existing Corps and industry hopper dredge fleet. The ICHDMG is a chartered operations working group comprised of all hopper dredge using districts and divisions and members from all five hopper dredge owning companies. Frequent meetings and weekly tracking of all hopper dredges ensure timely resolution of issues and consistent knowledge of hopper dredge capability. The ICHDMG has established a formal notification and decision process for time-sensitive, urgent, and emergency dredging requirements. This process ensures that industry has an opportunity to perform this critical work, and the navigation mission requirements are accomplished effectively.

(C) The Energy and Water Development Appropriations Act of 2002, further limited the Corps hopper dredge *McFarland* to 85 days of work in the Delaware River. Most of the work in the Delaware River was removing spot shoals in areas requiring pumpout of the dredged material in upland disposal sites. This work has historically been performed by bucket dredges or pipeline dredges. Subsequent appropriations acts did not contain the same restrictions, and in Fiscal Year 2004, the Corps scheduled 140 days of hopper dredging work for the dredge.

**Environmental Constraints and Other Considerations.** All dredging operations must comply with environmental laws and regulations and must be consistent with applicable state water quality and coastal management criteria. Many navigation projects have specific environmental windows during which dredging cannot be performed.

There are also other environmental restrictions governing the Atlantic, Pacific, and Gulf Coasts, the Great Lakes and inland waterways. Because of concern for endangered and threatened species of sea turtles, the Corps agreed to limit hopper dredging in the Southeast to a window of 4 months – December through March. The concern for right whales, sturgeon, and migrating fish imposed additional restrictions including limiting dredging to certain windows and reducing dredge operating speeds. Other inefficiencies are created when hopper overflow is restricted or when hauling or pumping distances are increased to reach an environmentally acceptable disposal site.

Environmental dredging windows require the Corps to use industry or Corps dredges at only certain times of the year. In some cases, competition is limited because only certain dredges meet the environmental considerations. Ongoing environmental negotiations indicate that the number of resulting operational restraints will continue to increase.

There are several other considerations. Weather plays a significant role as to when dredging can be done. There are also economic considerations. Beach nourishment work is normally done in the winter to prepare for the summer tourist season. Sometimes there are legal considerations, where litigation may dictate when dredging can or cannot be done. Under these conditions, managing the national dredging assets to meet national and regional requirements is increasingly challenging. The net effect of these constraints is the requirement to accomplish hopper dredging in several projects all at the same time. This has resulted in peak workload demands on the entire hopper dredge fleet and can significantly impact hopper dredge availability.

**Current Conditions.** In Fiscal Year 2003, 66 million cubic yards were dredged by the combined Corps and industry fleet of 19 hopper dredges at a cost of \$168 million. The Corps performed approximately 19% of the work by volume, dredging 506 days with its 4 hopper dredges, and five private contractors performed the other 81% with 15 hopper dredges. One of the Corps hopper dredges, the *Wheeler*, in a ready reserve status, only dredged 58 days. The Corps hopper

dredge *McFarland* was limited to 85 days of work in the Delaware River as a result of the 2002 Energy and Water Development Appropriations Act. The other two Corps hopper dredges, the *Essayons* and *Yaquina*, worked 185 and 178 days respectively. Industry hopper dredges worked a combined total of 3581 days during Fiscal Year 2003. For Fiscal Year 2004, the industry worked a total of 2842 days, which is 79 percent of the FY 2003 workload. This low utilization is due to unusually reduced dredging requirements and constrained budgets. Most of this work occurred during the winter months, and many of the hopper dredges were subsequently idle. The Corps hopper dredges worked 565 days, with the *Wheeler* working 55 days, the *Essayons* working 192 days, the *Yaquina* working 178 days, and the *McFarland* working 140 days. The industry workload in the table below includes Federal maintenance and new work, beach nourishment, and private work.

<b>INDUSTRY WORKLOAD</b>					
<b>DAYS WORKED</b>					
<b>DREDGE</b>	<b>FY 00</b>	<b>FY01</b>	<b>FY02</b>	<b>FY 03</b>	<b>FY 04</b>
<b>ATCHAFALAYA</b>	<b>283</b>	<b>278</b>	<b>205</b>	<b>250</b>	<b>207</b>
<b>BAYPORT</b>	<b>249</b>	<b>167</b>	<b>352</b>	<b>286</b>	<b>206</b>
<b>COLUMBIA</b>	<b>293</b>	<b>281</b>	<b>263</b>	<b>278</b>	<b>321</b>
<b>DODGE ISLAND</b>	<b>308</b>	<b>310</b>	<b>199</b>	<b>262</b>	<b>108</b>
<b>EAGLE</b>	<b>351</b>	<b>283</b>	<b>324</b>	<b>324</b>	<b>279</b>
<b>LIBERTY ISLAND</b>	<b>--</b>	<b>--</b>	<b>153</b>	<b>197</b>	<b>167</b>
<b>LINDHOLM</b>	<b>217</b>	<b>304</b>	<b>246</b>	<b>290</b>	<b>209</b>
<b>MANHATTAN ISLAND</b>	<b>279</b>	<b>343</b>	<b>223</b>	<b>173</b>	<b>171</b>
<b>NEWPORT</b>	<b>143</b>	<b>230</b>	<b>272</b>	<b>252</b>	<b>222</b>
<b>NORTHERLY ISLAND</b>	<b>208</b>	<b>67</b>	<b>85</b>	<b>150</b>	<b>0</b>
<b>PADRE ISLAND</b>	<b>133</b>	<b>329</b>	<b>295</b>	<b>313</b>	<b>116</b>
<b>R.N. WEEKS</b>	<b>250</b>	<b>275</b>	<b>279</b>	<b>280</b>	<b>251</b>
<b>SUGAR ISLAND</b>	<b>305</b>	<b>287</b>	<b>317</b>	<b>208</b>	<b>181</b>
<b>STUYVESANT</b>	<b>279</b>	<b>302</b>	<b>235</b>	<b>236</b>	<b>293</b>
<b>WESTPORT</b>	<b>122</b>	<b>67</b>	<b>191</b>	<b>82</b>	<b>111</b>
<b>TOTAL DAYS</b>	<b>3420</b>	<b>3523</b>	<b>3639</b>	<b>3581</b>	<b>2842</b>

Source: Data submitted by 5 hopper dredging companies

**TABLE 4**

## CORPS HOPPER DREDGE CONCERNS

**The Issue.** There is concern regarding the existing and proposed restrictions on the use of the Corps hopper dredge fleet.

**The Problem.** The composition of the minimum fleet is based on four provisions of Public Law 95-269, enacted 26 August 1978.

**PL 95-269.** The first provision directs the Corps to use private industry when it has the capability to do the work at reasonable prices and in a timely manner. The second provision directs the Corps to retire dredges when industry demonstrates capability, timeliness, and reasonable prices. The third provision indicates that the Corps may retain only the minimum federally owned fleet to carry out emergency and national defense work. The Corps may set aside work as reasonably necessary to keep this minimum fleet fully operational. The fourth provision indicates that the Corps may retain enough of the federally owned fleet to ensure sufficient capability of the combined Federal and private industry to carry out the workload. These four provisions are used as the basis and focus for the analysis.

*“The Secretary shall have dredging and related work done by contract if he determines private industry has the capability to do such work and it can be done at reasonable prices in a timely manner.”*

*“As private industry reasonably demonstrates its capability...to perform the work done by the federally owned fleet, at reasonable prices and in a timely manner, the federally owned fleet shall be reduced in an orderly manner, as determined by the Secretary, by retirement of plant.”*

*To carry out emergency and national defense work the Secretary shall retain only the minimum federally owned fleet capable of performing such work and he may exempt...such amount of work as he determines to be reasonably necessary to keep such fleet fully operational.”*

*“...the Secretary may retain so much of the federally owned fleet as he determines necessary, for so long as he determines necessary, to insure the capability of the Federal Government and private industry together to carry out projects for improvements of rivers and harbors.”*

### Excerpts From Public Law 95-269 (1978) TABLE 5

**Industry Hopper Dredge Fleet.** Encouraged by Congress in 1978 with the passage of PL 95-269, industry has built 15 hopper dredges to perform work formerly done exclusively by the Government fleet. The policy established by PL 95-269 has been supported by every succeeding Administration and Congress through legislative and regulatory actions, including WRDA 92 and WRDA 96. With this Congressional incentive, industry has responded as desired, increasing investment and adding capacity in significant measure. Appendix C, Table C-1, displays the dates of introduction of each hopper dredge in the fleet.

**Limited Number of Hopper Dredges.** There is a limited number (15) of hopper dredges owned by 5 companies in private industry to perform work by contract. A limited resource (capability)

impacts timeliness and costs in an open marketplace. For example, there is an inverse relationship between the number of bidders and contract cost. The greater the number of bidders, the more likely that the contract will be awarded at or below the Government cost estimate. Single-bid contract awards are likely to be above the Government estimate. Over the last four fiscal years, 2001 through 2004, the winning bid as a percentage of the Corps estimate for the most frequent type of single-bid projects, those on the Mississippi River, have been 8.5 percent above the Government estimate. The following table lists the industry hopper dredging contract bidding information from FY 1990 through FY 2004. The table compares the total of all winning bids with the total of the Government Estimates for each year, and shows the average number of bids per contract. Since fiscal year 1998 when the *Wheeler* went into ready reserve, the average winning bid as a percentage of the Government estimate has been below the Government estimate.

**TABLE 6**

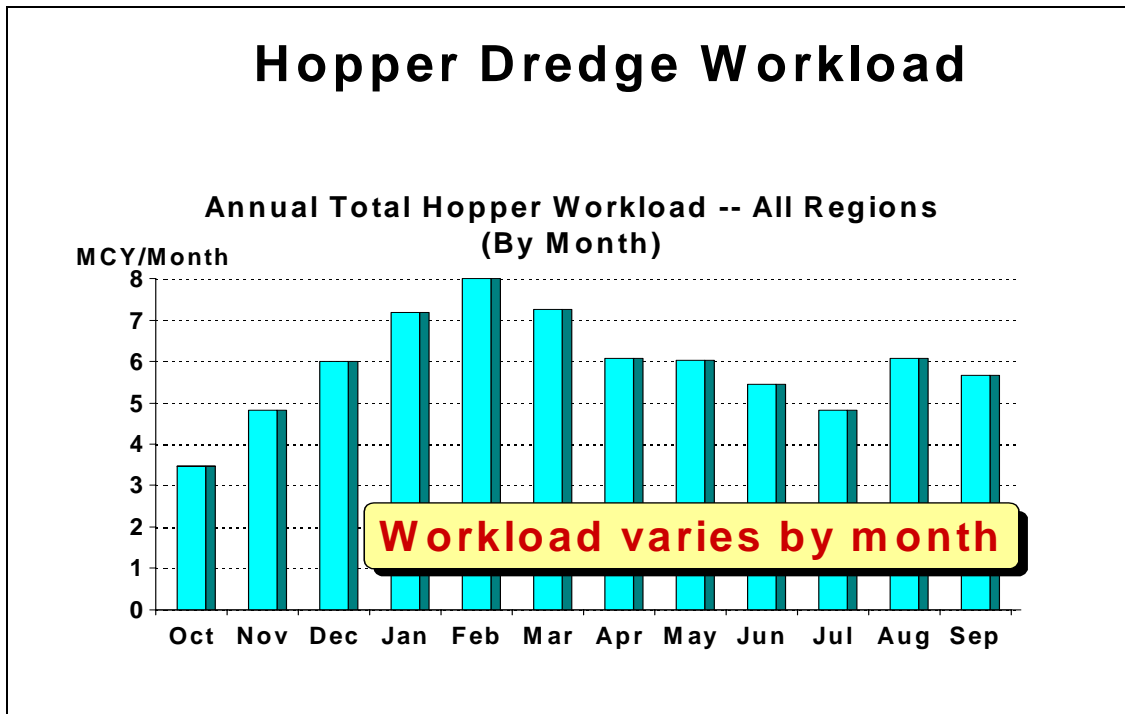
<b>Awarded Contracts FY 1990 - 2004</b>						
<b>For Hopper Dredging</b>						
<b>FY</b>	<b>Awarded Cubic yards</b>	<b>Average No bids</b>	<b>Total of Winning Bids</b>	<b>Total of Government Estimate</b>	<b>Percent of Government Estimate</b>	<b>Percent of Government Allowable *</b>
1990	52,310,270	3.0	\$72,508,932	\$80,582,866	90%	72%
1991	42,786,187	3.2	\$42,283,989	\$54,589,333	77%	62%
1992	33,953,905	2.6	\$45,892,132	\$54,588,397	84%	67%
1993	47,021,989	2.6	\$72,262,468	\$80,966,780	89%	71%
1994	63,002,356	2.3	\$138,038,626	\$157,804,394	87%	70%
1995	43,388,000	2.4	\$92,925,222	\$88,333,538	105%	84%
1996	46,009,910	2.7	\$111,834,196	\$123,976,115	90%	72%
1997	62,399,556	2.1	\$107,360,401	\$103,493,270	104%	83%
1998	61,044,341	1.9	\$115,337,432	\$116,394,700	99%	79%
1999	64,293,329	2.3	\$112,224,650	\$115,571,760	97%	78%
2000	40,675,200	3.1	\$79,574,628	\$105,537,766	75%	60%
2001	58,633,532	3.1	\$94,839,621	\$118,194,152	80%	64%
2002	70,986,830	2.6	\$146,167,793	\$155,148,478	94%	75%
2003	61,282,300	2.4	\$89,491,574	\$102,559,105	87%	70%
2004	38,551,000	3.9	\$40,210,195	\$64,208,034	63%	50%

\* Award can be 125% of Government Estimate.

Source: DIS

Hopper dredge workload varies from month to month and peak workload demands can occur in any month depending upon the requirements. Generally, the combined industry-Corps hopper fleet has been able to meet the workload. However, industry alone has not been able to meet peak demands. This is especially a concern when an industry dredge is committed to a long-term contract, when a dredge does not have capability (e.g., the dredge requires more depth than the authorized channel) for the job, or in the case of the West Coast where there may only be one industry hopper dredge available.

# Hopper Dredge Workload



**TABLE 7**

The peaks on this graph can vary from month to month and recently seem to be more concentrated in the winter months. Two major factors are the winter sea turtle dredging window in the Southeast and the high water season in the lower Mississippi River. When these two coincide, all available hopper dredging capacity may be required. This table demonstrates that the requirement to accomplish hopper dredging in several projects at the same time results in peak workload demands on the entire hopper dredge fleet that significantly impact hopper dredge availability.

## **CURRENT OPERATIONAL PRACTICE**

**Adjust Operating Days.** In order to comply with existing legislation as discussed earlier, the Corps is currently operating with reduced schedules. Further reductions would offer additional workload to industry, which would encourage investment, and would increase the daily operating rates of the Corps hopper dredges. Increasing the scheduled work for the Corps dredges would reduce the daily rates, however, industry utilization costs would be reduced, with resulting unrecoverable fixed costs, increased operating costs, potential loss of capacity, and reduced competition.

**Ready Reserve.** The *Wheeler* was placed in ready reserve status on October 1, 1997, in accordance with Public Law 104-303, Water Resources Development Act of 1996 (WRDA 96), Section 237. As specified in WRDA 96, one of two circumstances must exist before the *Wheeler* may be activated from ready reserve status for an urgent dredging assignment:

1. Private industry failed to submit a responsive and responsible bid for advertised work.
2. A private industry contractor failed to comply with contract specifications.

WRDA 96 states that the Secretary may place the *Wheeler* in active status when either of the conditions described in the previous section are satisfied. The procedure for activation of the *Wheeler* uses notification and feedback from the Industry–Corps Hopper Dredge Management Group (ICHDMG), a group of Corps and private industry hopper dredge managers and representatives. This information is used as input to a formal “Raise the Flag” procedure for hopper dredge management. This procedure includes the following:

- a) When a Corps district recognizes a possible future need for a hopper dredge, a “Yellow Flag” notice is distributed via electronic mail to all ICHDMG recipients.
- b) During the “Yellow Flag” phase, the ICHDMG members may provide their input to Corps Headquarters regarding possible alternative solutions for supplying a hopper dredge or for ready reserve activation of the *Wheeler*.
- c) If the District’s need for hopper dredging services becomes imminent, the “Red Flag” notice is distributed via electronic mail to all ICHDMG recipients.
- d) After distribution of the “Red Flag” notice, the ICHDMG members are again given the opportunity to provide input to Corps Headquarters.
- e) If no alternative solutions are chosen, and the WRDA 96 conditions for activation have been satisfied, Corps Headquarters will activate the *Wheeler*.

This concept implies that any Corps dredge in a ready reserve status would be at the dock awaiting assignment, except during periodic training days. The *Wheeler* schedules 55 training days per year performing dredging in projects. An appropriate analogy is a community fire engine awaiting the bell. An advantage of this concept is that the Corps would be prepared to meet peak requirements and unforeseen situations. All industry dredges are currently under basic ordering agreements known as the Corps of Engineers Reserve Fleet (CERF). Under CERF, the Government can obtain the use of an industry dredge working on a non-urgent project to work on an urgent project. On the other hand, this concept presents some financial difficulties. If the dredge is sitting at the dock for a large portion of the year, a subsidy is required to fund the costs of crew and to be fully ready to respond. In the case of the *Wheeler*, this subsidy is \$8 million per year. One alternative would be for the industry to provide a ready reserve dredge and seek to arrange for a less expensive reserve capability.

## ASSUMPTIONS

**Strategic Ports.** There are 14 designated Strategic Ports in the United States, all of which are Federally authorized deep-draft navigation projects. During mobilization operations, these ports are given highest priority to be maintained to support overseas transportation requirements. Monitoring channel conditions and dredging requirements of Strategic Ports has always been assumed to be an integral part of Corps operations. Procedures developed in the Industry Corps Hopper Dredge Management Group (ICHDMG) are in place to rapidly respond to any unforeseen requirements that may occur. Consideration of capability requirements for these Strategic Ports has been included in the risk assessment for the ports, harbors and navigation projects.

**Contingency Operations.** The Corps Government hopper dredge fleet represents a national asset that could be mobilized to support military contingency operations. However, in recent years there has been discussion on the use of the government hopper dredges for this purpose including for potential use in military operations at the Port of Umm Qasr in Iraq. In this instance, foreign and domestic capability from the private sector were more than sufficient to meet operational requirements within the theater of operations. In this instance, there was a great reluctance to dispatch Government hopper dredges critical to dredging in the lower Mississippi River or the Northwest abroad to support contingency operations.

This report does not assume potential use of the government hopper dredge fleet in direct support of contingency operations based upon foreign and American owned hopper dredge capabilities, political considerations of removing the hopper dredge fleet from domestic waters in

their support to the civil works mission, and the historical experience of the existing hopper dredge fleet never participating in such operations. Should the Government hopper dredge fleet be utilized it would be in U.S. waters in backfilling private dredges deployed overseas. However, the management practice would be for the Corps to work with the Department of Defense, private dredging industry, and the Congress to ensure sufficient dredging capability was available to perform the civil works mission. Therefore, contingency operations are not considered to be an issue that would affect the size, configuration, or utilization of the Government's hopper dredge fleet.

**Worst Case Scenario** - A worst case scenario was developed to evaluate options and help put risk factors in proper perspective. It was not necessary to create a hypothetical version, because circumstances that occurred in late Fiscal Year 2004 and early Fiscal Year 2005 offered a real worst case condition that substantially challenged the industry and Corps hopper dredge fleet. The scenario began with the onslaught of four consecutive hurricanes striking Florida, causing substantial shoaling in several major navigation projects and severe beach erosion in a number of localities. As surveys were completed and the scope of the hurricanes' impacts were realized, emergency procurements were issued for beach renourishment work and dredging navigation channels that were best accomplished by hopper dredges. At this same time, late fall of 2004, the river stage on the Mississippi River below New Orleans began to rise, resulting in increased shoaling in Southwest Pass, requiring immediate response by hopper dredges. The winter hopper dredging window, December through March, for dredging Federal projects in the Southeast Atlantic affected by endangered and threatened sea turtles, was about to open. By mid-January 2005, all industry hopper dredges on the Atlantic and Gulf Coasts were engaged (except the small hopper *Northerly Island*), the *McFarland* was in the shipyard, and the *Wheeler* was working in Southwest Pass. There was additional emergency beach work best suited for hopper dredges that needed to be accomplished, but was able to be deferred without being vulnerable to environmental window issues. During this peak workload scenario, the largest industry hopper dredge, the *Stuyvesant*, experienced engine trouble and had to stop work, creating a capability shortfall. A series of adjustments resulted, including subcontracting to other industry hopper dredge owners to complete critical work, and some delays in starting other work. Subsequent to this event, increased shoaling in Mobile Harbor created the need for an additional hopper dredge, resulting in calling out the *Wheeler*, as the *McFarland* was also fully engaged in work in the Gulf. While there were additional procurement and operational issues, this synopsis of a worst case scenario adequately describes an extreme case as a result of four consecutive hurricanes, high water in the Mississippi River, substantial shoaling in various navigation channels, the need to dredge South Atlantic ports during the winter turtle dredging window, and the operational vulnerabilities of fully utilized equipment. However, the likelihood of such a scenario occurring must be balanced with the evaluation of what is a reasonable capability to respond to unforeseen peak workload requirements. It is also necessary to evaluate the sequential response capability afforded by having a ready reserve capability and a flexible industry capability. The likelihood of this worst-case scenario occurring is relatively low. Having four hurricanes in a row with the extent and magnitude of damages experienced is not a common occurrence. The ability to use the combined hopper dredge fleet to respond to this extraordinary workload was helped by the reserve capability of the *Wheeler*, and its ability to rapidly respond when the need arose. Accordingly, the industry demonstrated that they could effectively respond, and had the flexibility to adjust to ever changing requirements and challenges.

**Combined Corps Hopper Dredge Fleet.** Unfortunately, there are competing concerns among the many interests involved. Most of the concerns can be grouped into three areas – the dredging requirement, the capability to satisfy the requirement, and the cost of doing business. The industry has 15 hopper dredges and seeks to fully utilize these high cost vessels to ensure recouping their fixed costs. If existing policy underlying almost thirty years of legislation were dismissed and all restrictions were removed from the Corps hopper dredges, then these four dredges would be scheduled first and industry would get the remaining work. If the Corps dredges were fully utilized or even heavily utilized, they would offer no resources for peak or unforeseen demand. Industry could be placed in the position of having to supply all peak and unforeseen demand, and if there were low demand, industry would have to absorb the impact.

The following table shows the relationship of Corps scheduled work under various options and the potential impact on industry's ability to recoup their fixed costs.

	Status quo*	FY04**	180 days/dredge	Maximum***
Corps ops	503 days	565 days	720 days	885 days
<b>Industry lost Fixed costs (3581 days FY03)</b>	<b>0%</b>	<b>-2%</b>	<b>-6%</b>	<b>-11%</b>
<b>Industry lost Fixed costs (2842 days FY04)</b>	<b>-19%</b>	<b>-21%</b>	<b>-25%</b>	<b>-30%</b>
*Wheeler 55 days, McFarland 85 days, Yaquina 178 days, Essayons 185 days				
**Wheeler 55 days, McFarland 140 days, Yaquina 178 days, Essayons 192 days				
*** Wheeler 245 days, McFarland 230 days, Yaquina 195 days, Essayons 215 days				

**TABLE 8**

If all restrictions were removed and all four Corps hopper dredges worked the maximum possible time and the dredging requirements are as low as FY04, it is assumed that industry would potentially not be able to recoup 30 percent of their fixed costs, which could result in a 30 percent reduction in plant. The table above shows the potential percentage impact to industry's ability to recoup fixed costs using the FY 03 total days of 3581 as the basis. As the Corps scheduled workload increases, the added Corps days are subtracted from the 3581 days to derive a percentage decrease. For the abnormally low utilization realized in FY 04, the percentage is computed against the FY 03 basis of 3581 days. Initially industry would seek to increase their costs to recoup additional costs and may minimize maintenance expenditures of operating dredges. However, if this trend continued, industry may be forced to either seek additional work outside the United States, which could jeopardize their ability to return because of Jones Act requirements, or they may have to reduce the number of dredges in their fleets. Either action would result in loss of capacity. There could be a significant reduction in private plant, particularly if the Corps should increase use of its own fleet. When peak workload demands did occur, subsequent to this reduced capacity, there would not be enough capacity to respond to the requirements. This is a qualitative analysis and does not represent actual industry fixed costs. The table reflects relative impacts to the industry based on an assumption that FY03 workloads would be the basis for recouping all fixed costs. The industry data used in this report is not used to make conclusions, but is used for relative comparisons for analyses of workload and cost



impacts. To verify the industry data would require extensive auditing and is beyond the scope of this report.

**Benefits of Corps Hopper Dredges.** The Corps hopper dredges are not only critical to the accomplishment of the hopper dredging requirements of the Navigation Program but serve other important roles as well. First, they serve as the Nation's hopper dredge response fleet, ready to respond to emergency and National Defense needs. In this role, they are the marine transportation fire engine awaiting the bell. Second, they serve as a source of knowledge and expertise for the Corps of Engineers, ensuring that the Corps has the depth of understanding and technical expertise to negotiate and manage the industry hopper dredge operations and contracts. In this role, the operation of the Corps hopper dredges serve to provide the knowledge base of Corps operations managers beyond just the textbooks and guidance documents. Third, the Corps hopper dredges serve to ensure that costs will be reasonable. With such a limited number of vessels in the fleet, and during peak workload periods when only one bidder may be available, there is a tendency to exercise the principles of supply and demand, and costs will rise. The Corps presence will serve as a deterrent for potential cost increases. A current example is the Wheeler being called out in February 2005, to perform work in the Mississippi River when a single industry bid exceeded the awardable amount.

## OPTIONS

The following 12 options were considered in evaluating the configuration of the Corps hopper dredges: Status Quo (FY03); Maximum Use of All 4 Corps Dredges; Operating the *McFarland* 140 days, the *Essayons* 215 days, the *Yaquina* 195 days and the *Wheeler* in Ready Reserve; Retiring the *McFarland*, operating the *Wheeler* 180 days, the *Essayons* 215 days, and the *Yaquina* 178 days; Retiring the *McFarland*, operating the *Wheeler*, *Essayons* and *Yaquina* the maximum days; Operating the *Wheeler* and *McFarland* 140 days, the *Essayons* 185 days, and the *Yaquina* 178 days; *McFarland* and *Wheeler* in Ready Reserve, operating the *Essayons* 215 days, and the *Yaquina* 178 days; Retire the *McFarland*, *Wheeler* in Ready Reserve, operating the *Essayons* 215 days, and the *Yaquina* 178 days; Retire the *McFarland*, place other 3 Corps dredge in ready reserve; Retire all 4 Corps dredges; Retire the *McFarland*, *Wheeler* and *Yaquina* in Ready reserve, operating the *Essayons* 215 days; and Retire the *McFarland*, *Wheeler* in Ready Reserve, operating the *Essayons* 185 days, and the *Yaquina* 178 days.

**Definitions.** Terms used in the Options summary table below are defined and explanations of the one-time costs and assumptions are addressed below.

**Retire.** The Corps dredge would be declared excess to the Corps needs and retired, at a considerable financial loss of sunk costs. After cleaning and decontaminating the dredge, the Corps would relinquish ownership. If no other Government agency had a need for the vessel, it would probably be sold as scrap or sold overseas to partially offset sunk costs. The Water Resources Development Act of 1986 prohibits excess Corps dredges from being used in the United States as dredges.

**Costs of Options.** Costs of alternatives can be grouped into three categories: costs associated with the disposition of the Corps dredge (one time cost), costs associated with any change in operation of the Corps hopper dredges (change in status, operating days), and costs associated with contracting work previously performed by Corps hopper dredges or no longer performed by industry. The contracting costs reflect the change in cost for the respective option as compared with Status Quo.

Several options were considered to evaluate the cost of fully operating the Corps dredges and other scenarios with various restrictions in scheduled working days. The costs do not reflect the long-term costs to the industry for those options that substantially reduce the utilization of the industry hopper dredges. Such costs could only be attained by audit of the industry. Any option that includes the use of the Corps hopper dredge *McFarland* must include the rehabilitation and repowering costs estimated to be \$20 million. Any option that reflects retiring the *McFarland* includes one-time costs of \$22 million for separation of crew costs, clean-up, and pay off of the remaining corpus.

**One Time Costs.** Options proposing retiring Corps dredges show the one time costs in parentheses. These costs include preparing the vessel for disposition, and include cleaning and decontamination, and the costs associated with crew separation, including retraining, change in station, reduction-in-force benefits, payoff of the remaining corpus and administration.

**Options Summary.** The following table is a summary of all 12 options. All of the options are compared against the costs reflected for the Status Quo (FY03) Option. The Total Corps Work Days is the annual accumulation of all dredging days performed, or proposed, by all 4 Corps hopper dredges. The Government cost is the total annual cost to operate the 4 Corps hopper dredges, including any subsidies. One-time costs are shown in parentheses. The Contracting cost for the Status Quo Option is the actual cost of all industry hopper dredge work performed on Corps projects in FY 03, and is the estimated total cost for the other options. The Total cost is the sum of the Government annual costs and the Contracting costs. For a detailed analysis of each option see Appendix A. Appendix B details the costs associated with each option.

OPTION	Total Corps Work days	COSTS		
		GOVERNMENT	CONTRACTING	TOTAL
Status Quo: 55 days for <i>Wheeler</i> , 85 days for <i>McFarland</i> , 178 days for <i>Yaquina</i> and 185 days for <i>Essayons</i>	503	\$49.1M (\$20 M rehab for <i>McFarland</i> )	\$118.7 M	\$167.8M
Opt 1: Maximum days for all 4 Corps dredges <i>Wheeler</i> 245 days, <i>McFarland</i> 230 days, <i>Essayons</i> 215 days, <i>Yaquina</i> 195 days	885	\$56.7M (\$20 M rehab <i>McFarland</i> )	\$100.5M	\$157.2M
Opt 2: 140 days <i>McFarland</i> , 55 days for <i>Wheeler</i> , 178 days for <i>Yaquina</i> , 192 days for the <i>Essayons</i>	565	\$47.8M (\$20 M rehab <i>McFarland</i> )	\$116.8 M	\$164.6M
Opt. 3: Retire <i>McFarland</i> , 180 days for <i>Wheeler</i> , 215 days for <i>Essayons</i> , 178 days for <i>Yaquina</i>	563	\$40.7M (\$22 M retirement costs)	\$112.6M	\$153.3M
Opt 4: Retire <i>McFarland</i> , <i>Wheeler</i> 245 days, <i>Essayons</i> 215 days, <i>Yaquina</i> 195 days	655	\$41.9M (\$22 M retirement costs)	\$107.7M	\$149.6M
Opt 5: <i>McFarland</i> & <i>Wheeler</i> 140 days, <i>Essayons</i> 185 days, <i>Yaquina</i> 178 days	643	\$50.7M (\$20 M rehab <i>McFarland</i> )	\$111.2M	\$161.9M
Opt 6: <i>McFarland</i> & <i>Wheeler</i> ready reserve, <i>Essayons</i> 215 days, <i>Yaquina</i> 178 days	533	\$49.5M (\$20 M rehab <i>McFarland</i> )	\$118.7M	\$168.2M

OPTION	Total Corps	COSTS		
	Work days	GOVERNMENT	CONTRACTING	TOTAL
Opt 7: Retire McFarland, Wheeler ready reserve, Essayons 215 days, Yaquina 178 days	448	\$37.0M (\$22 M retirement costs)	\$120.8M	\$157.7M
Opt 8: Retire McFarland, Wheeler, Essayons, & Yaquina in ready reserve	165	\$36.6M (\$22 M retirement costs)	\$132.9M	\$169.5M
Opt 9: Retire McFarland, Wheeler, Essayons, and Yaquina	0	\$0M (\$178 M retirement costs)	\$142.6M	\$142.6M
Opt 10: Retire McFarland, Wheeler and Yaquina in ready reserve, Essayons 215 days,	325	\$36.6M (\$22 M retirement costs)	\$125.2M	\$161.8M
Opt 11: Retire McFarland, Wheeler in ready reserve, Essayons 185 days, and Yaquina 178 days	418	\$36.6M (\$22 M retirement costs)	\$120.8M	\$157.4M

**OPTIONS SUMMARY  
TABLE 9**

## EVALUATION OF OPTIONS

In evaluating the various options, the changes in daily operating costs become a significant factor in developing the best business case for the configuration of Corps hopper dredges. The following discussion regarding daily rates and comparisons with industry daily rates is a preamble to the evaluation of the options. The analysis will consider costs, risks to industry viability, and risks to the ability of the Corps to be responsive to the needs of ports, users and stakeholders of the Federal projects.

**Corps Daily Rates.** Changing the scheduled days for the Corps hopper dredges affects the daily rate accordingly. The figure below describes the differences in daily rates for the options. The *Wheeler* daily rate in ready reserve is held at \$75,000 to minimize impacts to those projects where the dredge performs its training. Accordingly, the *McFarland* daily rate operating under the 85 day restriction had its daily rate held at \$65,000 per day, and required a \$7 million subsidy to fund being tied at the dock. All other daily rates are computed based on total costs divided by the number of scheduled days. The 140-day scenario for the *McFarland* and the *Wheeler* represents the maximum days the dredges can work with a reduced crew and the minimum days the dredge can work without requiring a subsidy.

<b>Dredge</b>	<b>Status Quo</b>	<b>Maximum Days Option 1</b>	<b>Other Option</b>	<b>Other option</b>
<i>Wheeler</i>	\$75,000 for 55 days (\$8 million subsidy) \$12.3 million	\$68,415 for 245 days \$16.8 million	\$88,150 for 180 days \$15.9 million	\$99,500 for 140 days \$ 13.9 million
<i>Essayons</i>	\$87,000 for 185 days \$16.1 million	\$76,607 for 215 days \$16.5 million	\$84,304 for 192 days \$16.2 million	\$87,000 for 55 days (\$11.3 million subsidy) \$16 million
<i>Yaquina</i>	\$47,000 for 178 days \$8.4 million	\$44,655 for 195 days \$8.7 million	none	\$47,000 for 55 days (\$5.8 million subsidy) \$8.3 million
<i>McFarland</i>	\$65,000 for 85 days (\$7 million subsidy) \$12.5 million	\$64,000 for 230 days \$14.7 million	\$87,925 for 140 days \$12.3 million	

**IMPACT OF OPTIONS ON DAILY RATE  
TABLE 10**

**Industry Daily Rates.** In order to evaluate the options, and the cost impacts, the relationship between Corps daily rates and comparable industry dredge daily rates must be considered. This comparison is difficult and there is no absolute data set that can be used. The comparisons below are derived from information supplied by the industry and daily rental rates from previous bids from industry. Industry contracts normally include a separate bid item for mobilization and demobilization. This cost can range from \$0 to several hundred thousand dollars, or more in the case of some West Coast bids. This cost would have to be applied to the total number of days the dredge worked to properly determine the daily rate of the industry dredge. However, a review of industry mobilization costs, exclusive of West Coast contracts, beach nourishment and new

work, reveals that the addition to the industry daily rate for mobilization will average approximately \$3,700 per day (based on an average of 52 contracts). For West Coast contracts, the average daily rate for mobilization is approximately \$15,800 per day for a medium class dredge (based on an average of 7 contracts), however, this number is abnormally high and could substantially decrease with an industry presence on the West Coast. The industry rates in TABLE 11 include the additional average daily rate for mobilization.

<b>Dredge</b>	<b>Daily rate Status Quo</b>	<b>Daily rate of Comparable Industry Hopper dredge</b>	<b>Corps daily rate for maximum use (Option 1)</b>
<i>McFarland</i>	<b>\$65,000</b>	<b>\$34,905</b>	<b>\$64,000</b>
<i>Wheeler</i>	<b>\$75,000</b>	<b>\$65,700</b>	<b>\$68,415</b>
<i>Essayons</i>	<b>\$87,000</b>	<b>\$59,192</b>	<b>\$76,607</b>
<i>Yaquina</i>	<b>\$47,000</b>	<b>\$35,800</b>	<b>\$44,655</b>

**COMPARISON OF DAILY RATE BETWEEN INDUSTRY AND CORPS**  
**TABLE 11**

If one just looks at the comparisons of daily rates between industry and the Corps, it is clear that similarly sized industry dredges can operate at less cost than Corps dredges. These rates reflect the current restricted operating days of Corps hopper dredges. However, there are other factors to consider such as capability, workload variability, and reduced work schedules of Corps vessels, and the fact that these dredges were not designed to be competitive with industry dredges. The Corps dredges were built to last longer periods of time, have much larger crew complements, and have different construction standards than commercial vessels. As an example, the cost differences between the McFarland and a comparable industry dredge can be attributed to labor costs (47 crew for McFarland and average 28 crew for industry), annual repair costs for the McFarland of approximately \$5 million, higher depreciation rates, and the fact that crews are full time employees, where industry only employs most of their crew when working.

**Analysis of Options.** The various options discussed in this report indicate that selected changes in the number of Corps hopper dredges could result in some small annual savings. However, one of the options could reflect the greatest reduction in long-term capability, thus the greatest risk. The options and associated cost comparisons are not the only means of accomplishing the challenges mentioned above. The following discussion describes the potential risk of each option, including the Status Quo condition:

**Status Quo.** Status Quo offers the opportunity for industry to operate sufficient days to realize full funding of fixed costs. However, during a low shoaling year, such as FY04, industry could have as much as a 19 percent reduction in earnings. The Corps dredges would work the minimum number of days at 503 days. The *Wheeler* and *McFarland* would require subsidies of \$8 million and \$7 million respectively. The *McFarland* would require rehabilitation and modernization at an estimated cost of \$20 million. The risk of not having available capacity is relatively low.

**Option 1.** Option 1 represents the greatest impact to the potential workload of the industry hopper dredges and may result in substantial long-term risk due to a loss of industry capability. Working the Corps hopper dredges the maximum possible days will result in an additional 382 days of scheduled work for Corps hopper dredges above status quo. The net reduction in costs is \$10.7 million. Increasing the workload of the *Yaquina* beyond 178 days will result in this small class hopper dredge performing work normally best accomplished by more efficient medium class

hopper dredges. There is a risk that scheduling the maximum amount of work for both the *Yaquina* and the *Essayons* will result in loss of industry capability on the West Coast. However, the additional days for the *Essayons* are not expected to impact industry workload, as anticipated longer haul distances to ocean disposal sites will add time to both industry and Corps operating requirements. Working all four Corps dredges the maximum days creates the scenario industry is most concerned about- the Corps schedules its dredges first, and industry gets what's left. Industry contends this option would result in substantial underutilization of their dredges, will result in some hopper dredges being tied up or scrapped, will create an inability to interest investors in building replacement dredges, and will cause a significant loss of ability to earn fixed costs for their dredges. As dredges are taken out of the market as a result of the workload decrease, the number of potential bidders will diminish, resulting in higher bids for work, as a result of loss of competition and higher costs for operation. If there are unforeseen dredging requirements, there will be little additional dredge availability to support a subcontract to ensure timely completion. This lack of ability to complete the work is a substantial risk to ports and maritime users. Because of environmental windows, there could be a potential for less than justified project dimensions for as much as 6 months. The *McFarland* would require rehabilitation and modernization at an estimated cost of \$20 million. The risk of not having available capacity is relatively high.

**Option 2.** Option 2 is similar to status quo, and reflects the FY 04 scheduled work for the Corps dredges, which includes operating the *McFarland* at 140 days to preclude the need for a \$7 million subsidy. This option, if implemented, would require a \$20 million investment in rehabilitating and modernizing the *McFarland*. The total days scheduled for Corps hopper dredges is 565 days and offers industry an opportunity to operate sufficient days to realize full funding of fixed costs. The net reduction in costs is \$3.2 million. The risk of not having available capacity is low.

**Option 3.** The *Essayons* will schedule 215 days, and the *Yaquina* will continue to operate for 178 days. The *Wheeler* will be scheduled for 180 days and no longer require a subsidy. The *McFarland* will be retired. There will be some reduced capability as a result of retiring the *McFarland*. There will be one-time costs of \$22 million to clean up and dispose of the vessel, pay off the remaining revolving fund corpus on the dredge, and for crew and employee separation costs. Corps dredges will work 563 days. The work performed by the *McFarland* is assumed to equate to 60 days by industry, but may not be all done by a hopper dredge. There will be 125 days of industry work added to the *Wheeler* scheduled work. These changes result in a \$14.5 million reduction in costs. The additional days of scheduled work for the *Essayons* will not effectively reduce industry workdays on the West Coast. This option offers industry an opportunity to operate sufficient days to realize full funding of fixed costs. While there is a risk of lost capability in retiring the *McFarland*, the additional industry capability available and pending can accomplish the work. Retiring the *McFarland* will result in the loss of 47 dredge personnel and 30 district support personnel in the Philadelphia District. Scheduling the *Wheeler* for 180 days will substantially impact industry workload, and there will be no ready reserve capability to respond to peak workload demands. There will be some risk of not having available response capability.

**Option 4.** Option 4 would retire the *McFarland* and work the *Essayons*, *Wheeler* and *Yaquina* the maximum possible days, resulting in an additional 152 days of scheduled work for Corps hopper dredges above Status Quo. The net reduction in costs is \$18.2 million. The \$149.6 million total cost is one of the lowest cost options. There will be some reduced capability as a result of retiring the *McFarland*. There will be one-time costs of \$22 million to clean up and dispose of the vessel, pay off the remaining corpus on the dredge and for crew and employee separation costs. The work performed by the *McFarland* is assumed to equate to 60 days by industry, but may not be done by a hopper dredge. There is a risk that scheduling the maximum amount of work for both the *Yaquina* and the *Essayons* will result in loss of industry capability on the West Coast. Increasing the workload of the *Yaquina* beyond 178 days will result in this small class hopper dredge performing work normally best accomplished by more efficient medium class hopper dredges. Scheduling the *Wheeler* for 245 days will substantially impact industry workload,

and there will be no ready reserve capability to respond to peak workload demands. There will be some risk of not having available response capability.

**Option 5.** Option 5 would work the *Wheeler* and *McFarland* 140 days, the *Essayons* 185 days and the *Yaquina* 178 days, resulting in an additional 140 days of scheduled work for the Corps hopper dredges above status quo. The net reduction in total costs is \$5.9 million. There would be no subsidies for Corps hopper dredges, however the daily rates for the *Wheeler* and *McFarland* would be \$99,500 and \$87,925 respectively. Operating the *Wheeler* and *McFarland* for 140 days can be done with reduced crews, and does not require any subsidy, however, the ability to respond to additional unforeseen requirements may be impacted by the reduced crew size. This could offer some risk to navigation projects.

**Option 6.** Option 6 would keep the *Wheeler* in ready reserve, place the *McFarland* in ready reserve, and operate the *Essayons* for 215 days and the *Yaquina* for 178 days. This option is very similar to Status Quo except the *Essayons* would work an additional 30 days. This is one of the highest cost options at \$168.2 million. The parameters and risk factors are basically the same as Status Quo, and there would be \$15 million subsidy required for the *Wheeler* and *McFarland*.

**Option 7.** Option 7 would keep the *Wheeler* in ready reserve, retire the *McFarland*, and operate the *Essayons* at 215 days and the *Yaquina* for 178 days, resulting in a reduction in the Corps workload of 55 days. There would be an \$8 million subsidy for the *Wheeler* in ready reserve. The total annual costs would be \$157.7 million, and there would be a one-time cost for retiring the *McFarland* of \$22 million. This option results in very low Government costs at \$37.0 million. The risk of not having available capacity is low.

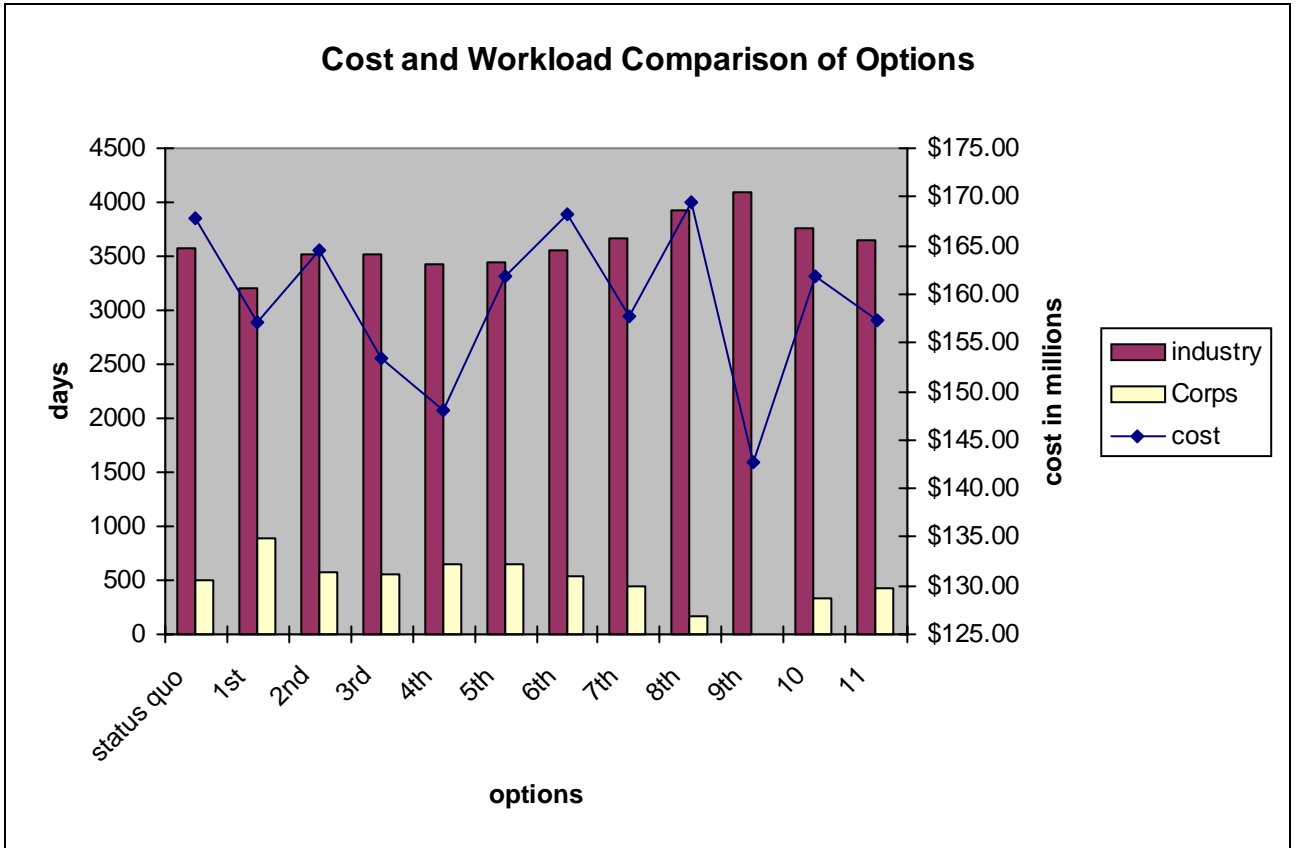
**Option 8.** Option 8 retires the *McFarland* and places the other three Corps hopper dredges in ready reserve, resulting in a substantial reduction in Corps works to a total of 165 days. This will result in a subsidy for the three ready reserve Corps dredges of \$25 million, and one time retirement costs for the *McFarland* of \$22 million. This option will require two medium to large sized hopper dredges on the West Coast, plus at least one small class hopper dredge. This shift in dredge capability to the West Coast will offer moderate risk to navigation projects in the Gulf and Atlantic with the existing industry fleet, however, with the addition of the Manson hopper dredge and the three ready reserve Corps dredges, some risk is mitigated. There is a potential for less than acceptable competition for West Coast work, and costs could increase. This option has the highest total cost at \$169.5 million.

**Option 9.** Option 9 is the most extreme option, retiring all four Corps hopper dredges, which results in one-time retirement costs of \$178 million, and will substantially impact the Corps revolving fund income. The resultant total contract costs are \$142.6 million, which does not adequately reflect the need for additional industry dredges to respond to peak workload demands. This option does not comply with the basic tenants of Public Law 95-269 to retain a Federal minimum fleet capability to ensure industry and the Corps together can carry out projects for improvements to rivers and harbors. This option reflects the highest risk to navigation projects, and the actual computed contract costs may not reflect true costs of not having any Corps hopper dredges.

**Option 10.** Option 10 operates the *Essayons* for 215 days, places the *Wheeler* and *Yaquina* in ready reserve and retires the *McFarland*, resulting in a reduction in the Corps hopper dredge workload of 178 days. There will be one-time retirement costs of \$22 million for the *McFarland* and there will be a subsidy of \$13.8 million for the *Wheeler* and *Yaquina* in ready reserve. The total cost of this option is \$161.8 million. There is little risk associated with this option.

**Option 11.** Option 11 maintains the Status Quo and retires the *McFarland*. There will be one-time retirement costs of \$22 million for the *McFarland* and there will be a subsidy of \$8 million for the *Wheeler* in ready reserve. However, the net change in the cost of the program is a reduction of \$10.4 million from the Status Quo, which covers the subsidy and increases work for industry. There is little risk associated with this option.





**TABLE 12**

**Minimizing Risk.** If the options are considered in conjunction with management initiatives discussed in this report, there are opportunities for changes that may minimize the risk while improving the efficiency and effectiveness of the combined Corps and industry hopper dredge fleet. The Industry-Corps Hopper Dredge Management Group (ICHDMG) has identified initiatives that will help increase hopper dredge availability by reducing the number and duration of options in contracts, the development of a centralized scheduling and information system, and improved industry and Corps communication. A “Raise-the-Flag” procedure has been developed that ensures rapid information sharing, enhanced communication among industry and Corps districts and divisions, and the ability to make informed decisions regarding movement of hopper dredges for emergency response. This procedure has been successfully exercised several times. At any given time there is a high probability that at least two hopper dredges are capable of being mobilized to respond for a short period (no more than 30 days) to an emergency dredging requirement. This can be done with little impact to the projects from which the dredges are moved.

## RECOMMENDATION

From the above discussion, the most reasonable option would be Option 7, which would schedule the *Essayons* for 215 days, operate the *Yaquina* for 178 days, keep the *Wheeler* in ready reserve, retire the *McFarland*, and continue with the initiatives from the ICHDMG. While there is a tendency to go to the least cost option, Option 9, this option does not offer the least risk to the ports and would result in no Federal dredge capability. Option 7 would result in a \$10.1 million net reduction in the total cost for hopper dredging, offer approximately 55 days additional work to industry, ensure that there is a viable reserve capability ready to respond to unforeseen requirements, and ensure that Federal projects requiring hopper dredging can be accomplished in a timely manner and at reasonable cost.

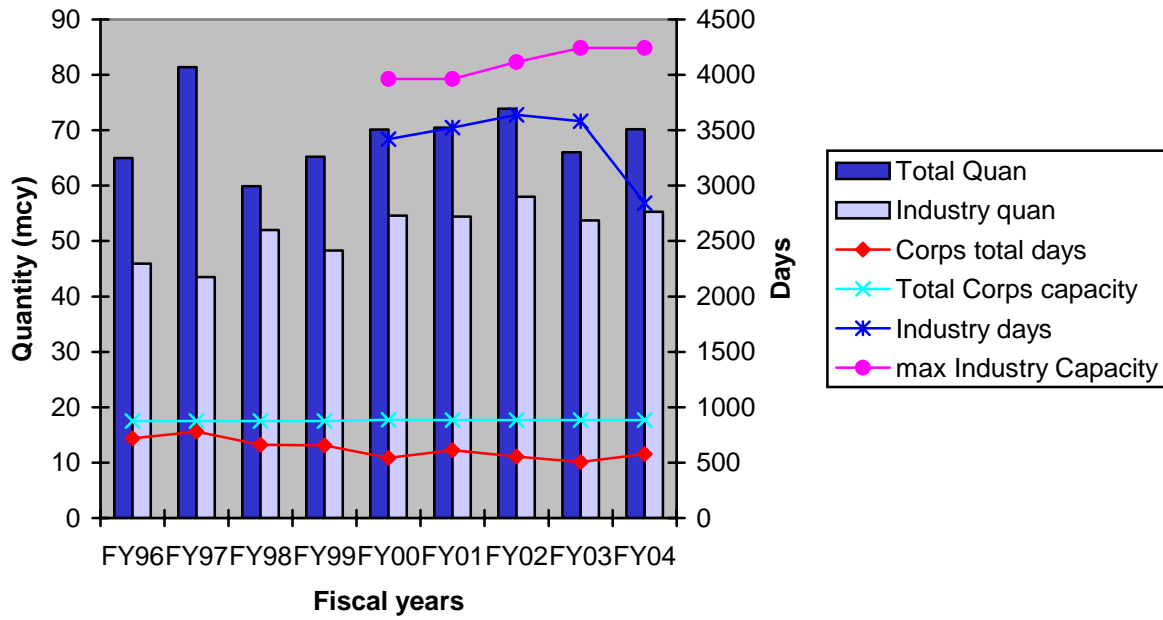
Keeping the *Wheeler* in ready reserve is critical to ensure a capability is available and not scheduled when unforeseen requirements occur. The ready reserve process has successfully worked since 1997, and continuation, is therefore recommended. Scheduling the *Wheeler* for 180 days would offer very little additional capability to respond to unforeseen and peak workload requirements. Putting the *Wheeler* back to work will substantially impact industry workload. The addition of the 12,000 cubic yard hopper dredge, *Glenn Edwards*, scheduled for launching in November 2005, will add an additional 18% capability to the industry fleet, and current excess capability does not justify changing the ready reserve status of the *Wheeler*.

Operating the *Essayons* for 215 days ensures the ability to maintain the West Coast navigation projects with the anticipated longer transit distances to ocean disposal sites, and will not impact west coast industry workload requirements.

Increasing the workload of the *Yaquina* beyond the Status Quo will result in this small class hopper dredge performing work normally accomplished by medium class hopper dredges in deep draft navigation projects. This would not be the most cost effective manner to maintain the ports, harbors and channels of the Pacific coast.

Retiring the *McFarland* will result in some lost capability, however the addition of Manson's 12,000 cubic yard hopper dredge, *Glenn Edwards*, scheduled for launch in November 2005, will more than offset this capability. Other types of dredges have historically performed the majority of the work in the Delaware River, and it is expected that sufficient industry hopper dredge capability exists to perform the requirements that may occur in the Delaware River. The *McFarland* generally dredges spot shoals in the Delaware River, and seeks to keep full project dimensions at all times. Even if the scheduled work for the *McFarland* were maximized, the reduction in daily rate would still be almost double the daily rate of a comparable industry hopper dredge. From a business case, the *McFarland* is the oldest dredge in the fleet, and operates at a daily rate that substantially exceeds comparable industry medium class hopper dredges. If the *McFarland* were to be kept in the Minimum Fleet it would have to be rehabilitated and repowered at a cost of approximately \$20 million. If Congress accepts these recommendations, the Corps would propose a timeline of two years for retirement of the *McFarland*. There will be a substantial impact to the Philadelphia District staff if the *McFarland* is retired. Approximately 80 people will be directly impacted. Every effort would be made to minimize the impacts to the affected employees. One-time retirement costs will require an additional \$22 million be budgeted.

### Comparison of Total Hopper Quantity to Industry Quantity and Corps Total Days Worked



**TABLE 13**

## BASELINE

The baseline for determining the appropriate use of the Corps hopper dredge fleet is based on a risk management approach and balances operational flexibility and response with maintenance of a viable private hopper dredge industry capability. The basic tenet for establishing the baseline is the language in Public Law 95-269, “...*the Secretary may retain so much of the federally owned fleet as he determines necessary, for so long as he determines necessary, to insure the capability of the Federal Government and private industry together to carry out projects for improvements of rivers and harbors.*” Appropriate use of Corps hopper dredges must be predicated on a sound business case, and could include fully operating a Federal hopper dredge, or placing the dredge in a ready reserve status. The goal should be to identify the best business case that can ensure the ability to provide an acceptable level of service to the ports and users of the Nation’s waterborne transportation system. As a result of the analyses and consideration of all the options, the baseline should schedule work for two Corps hopper dredges on the West Coast, maintain a Corps hopper dredge in the Gulf in Ready Reserve, continue to maintain the Industry Corps Hopper Dredge Management Group, seek to schedule approximately 450 days of work for Corps hopper dredges, and keep Government costs under approximately \$40 million. The Corps must monitor the capacity of the industry fleet, and ensure that work can be accomplished in a timely manner and at reasonable cost, planned workloads do not exceed capability, and some excess industry and Corps capability is maintained for unforeseen requirements and peak workload demands. The reliability and safety of our Nation’s ports and harbors must be maintained.

The following table, Table 13, portrays the annual workload for industry and the Corps by quantity dredged and by workdays. The graph also tracks the total Corps capacity and total industry capacity from FY 2000 through FY 2004. The total capacity for the Corps hopper dredges is 885 days as reflected in Option 1. The total industry capacity is estimated by adding a reasonable maximum capability as reflected in the actual workloads of the individual industry hopper dredges. In some cases the maximum workload of an industry dredge may be unusually high, and a previous years maximum may be used to reflect a realistic maximum. While this approach is not exact, it develops a reasonable baseline ceiling to manage potential capability versus actual workload. With the launching of the additional 12,000 cubic yard hopper dredge, scheduled for November 2005, there will be even more surplus capability.

**APPENDIX A  
DETAILED OPTIONS ANALYSIS**

**OPTION – STATUS QUO**

**Wheeler in ready reserve with 55 training days, McFarland restricted to 85 days, Yaquina works 178 days, and Essayons works 185 days**

**(Note: McFarland and Wheeler daily rates held at previous daily rates prior to reduced operating restrictions)**

<b>DREDGE</b>	<b>Days</b>	<b>Daily Rate</b>	<b>Subsidy</b>	<b>One Time Costs</b>
<b>WHEELER</b>	<b>55</b>	<b>\$75,000</b>	<b>\$8 million</b>	<b>0</b>
<b>MCFARLAND</b>	<b>85</b>	<b>\$65,000</b>	<b>\$7 million</b>	<b>\$20 million rehab</b>
<b>ESSAYONS</b>	<b>185</b>	<b>\$87,000</b>	<b>0</b>	<b>0</b>
<b>YAQUINA</b>	<b>178</b>	<b>\$47,000</b>	<b>0</b>	<b>0</b>
<b>GOVERNMENT COSTS &amp; USAGE</b>		<b>\$49.1 million</b>	<b>503 days</b>	
<b>CONTRACT COSTS</b>		<b>\$118.7 million</b>		
<b>TOTAL PROGRAM COSTS</b>		<b>\$167.8 million</b>		
<b>RISK</b>				
<b>NAVIGATION</b>	<b>Low</b>			
<b>INDUSTRY</b>	<b>Low</b>			
<b>COMMENTS</b>				

**OPTION – 1**

**All Corps dredges work maximum number of days**

<b>DREDGE</b>	<b>Days</b>	<b>Daily Rate</b>	<b>Subsidy</b>	<b>One Time Costs</b>
<b>WHEELER</b>	<b>245</b>	<b>\$68,415</b>	<b>0</b>	<b>0</b>
<b>MCFARLAND</b>	<b>230</b>	<b>\$64,000</b>	<b>0</b>	<b>0</b>
<b>ESSAYONS</b>	<b>215</b>	<b>\$76,607</b>	<b>0</b>	<b>0</b>
<b>YAQUINA</b>	<b>195</b>	<b>\$44,655</b>	<b>0</b>	<b>0</b>
<b>GOVERNMENT COSTS &amp; USAGE</b>		<b>\$56.7 million</b>	<b>885 days</b>	
<b>CONTRACT COSTS</b>		<b>\$100.5 million</b>		
<b>TOTAL PROGRAM COSTS</b>		<b>\$157.2 million</b>		
<b>RISK</b>				
<b>NAVIGATION</b>	<b>Moderate Risk</b>			
<b>INDUSTRY</b>	<b>High Risk</b>			
<b>COMMENTS: Uncertain workload may result in lost capability of industry dredges. Ability to respond to peak workload demands would be diminished.</b>				

**OPTION – 2**

**FY 2004 Experience. Wheeler in ready reserve, McFarland worked 140 days, Essayons worked 192 days, Yaquina worked 178 days**

<b>DREDGE</b>	<b>Days</b>	<b>Daily Rate</b>	<b>Subsidy</b>	<b>One Time Costs</b>
<b>WHEELER</b>	<b>55</b>	<b>\$75,000</b>	<b>\$8 million</b>	<b>0</b>
<b>MCFARLAND</b>	<b>140</b>	<b>\$87,925*</b>	<b>0</b>	<b>\$20 million rehab</b>
<b>ESSAYONS</b>	<b>192</b>	<b>\$84,304</b>	<b>0</b>	<b>0</b>
<b>YAQUINA</b>	<b>178</b>	<b>\$47,000</b>	<b>0</b>	<b>0</b>
<b>GOVERNMENT COSTS &amp; USAGE</b>		<b>\$47.8 million</b>	<b>565 days</b>	
<b>CONTRACT COSTS</b>		<b>\$116.8 million</b>		
<b>TOTAL PROGRAM COSTS</b>		<b>\$164.6 million</b>		
<b>RISK</b>				
<b>NAVIGATION</b>	<b>Low</b>			
<b>INDUSTRY</b>	<b>Low</b>			
<b>COMMENTS: If this option were chosen, the McFarland would be repowered and rehabbed at a cost of approximately \$20 million from revolving fund account (PRIP). *( Note: Actual daily rate for McFarland in FY 04 was \$79,500 due to carryover of surplus funds.)</b>				

**OPTION – 3**

**Wheeler works 180 days, Essayons works 215 days, Yaquina works 178 days, and McFarland retired**

<b>DREDGE</b>	<b>Days</b>	<b>Daily Rate</b>	<b>Subsidy</b>	<b>One Time Costs</b>
<b>WHEELER</b>	<b>180</b>	<b>\$88,150</b>	<b>0</b>	<b>0</b>
<b>MCFARLAND</b>	<b>0</b>	<b>\$87,925</b>	<b>0</b>	<b>\$22 million retirement costs</b>
<b>ESSAYONS</b>	<b>215</b>	<b>\$76,607</b>	<b>0</b>	<b>0</b>
<b>YAQUINA</b>	<b>178</b>	<b>\$47,000</b>	<b>0</b>	<b>0</b>
<b>GOVERNMENT COSTS &amp; USAGE</b>		<b>\$40.7 million</b>	<b>563 days</b>	
<b>CONTRACT COSTS</b>		<b>\$112.6 million</b>		
<b>TOTAL PROGRAM COSTS</b>		<b>\$153.3 million</b>		
<b>RISK</b>				
<b>NAVIGATION</b>	<b>Moderate Risk</b>			
<b>INDUSTRY</b>	<b>Moderate Risk</b>			
<b>COMMENTS: No subsidy for Corps dredges, full crew required for Wheeler, Wheeler work will impact industry workload, no ready reserve capability to respond to unforeseen peak workload requirements</b>				



**OPTION – 4**

**Operate Wheeler, Essayons and Yaquina maximum days, Retire McFarland**

<b>DREDGE</b>	<b>Days</b>	<b>Daily Rate</b>	<b>Subsidy</b>	<b>One Time Costs</b>
<b>WHEELER</b>	<b>245</b>	<b>\$68,415</b>	<b>0</b>	<b>0</b>
<b>MCFARLAND</b>	<b>0</b>	<b>\$87,925</b>	<b>0</b>	<b>\$22 million retirement costs</b>
<b>ESSAYONS</b>	<b>215</b>	<b>\$76,607</b>	<b>0</b>	<b>0</b>
<b>YAQUINA</b>	<b>195</b>	<b>\$44,655</b>	<b>0</b>	<b>0</b>
<b>GOVERNMENT COSTS &amp; USAGE</b>		<b>\$41.9 million</b>	<b>655 days</b>	
<b>CONTRACT COSTS</b>		<b>\$107.7 million</b>		
<b>TOTAL PROGRAM COSTS</b>		<b>\$149.6 million</b>		
<b>RISK</b>				
<b>NAVIGATION</b>	<b>Moderate Risk</b>			
<b>INDUSTRY</b>	<b>Medium Risk</b>			
<b>COMMENTS: Reduced West Coast workload for industry, increased excess industry capability, Wheeler workload substantially impacts industry</b>				

**OPTION – 5**

**Wheeler and McFarland work 140 days, Essayons works 185 days, Yaquina works 178 days**

<b>DREDGE</b>	<b>Days</b>	<b>Daily Rate</b>	<b>Subsidy</b>	<b>One Time Costs</b>
<b>WHEELER</b>	<b>140</b>	<b>\$99,500</b>	<b>0</b>	<b>0</b>
<b>MCFARLAND</b>	<b>140</b>	<b>\$87,925</b>	<b>0</b>	<b>\$20 million rehab</b>
<b>ESSAYONS</b>	<b>185</b>	<b>\$87,000</b>	<b>0</b>	<b>0</b>
<b>YAQUINA</b>	<b>178</b>	<b>\$47,000</b>	<b>0</b>	<b>0</b>
<b>GOVERNMENT COSTS &amp; USAGE</b>		<b>\$50.7 million</b>	<b>643 days</b>	
<b>CONTRACT COSTS</b>		<b>\$111.2 million</b>		
<b>TOTAL PROGRAM COSTS</b>		<b>\$161.9 million</b>		
<b>RISK</b>				
<b>NAVIGATION</b>	<b>Moderate Risk</b>			
<b>INDUSTRY</b>	<b>Moderate Risk</b>			
<b>COMMENTS: High daily rates for Wheeler and McFarland, reduced crew operations limits performing additional work, industry workload reduced</b>				

**OPTION – 6**

**Wheeler and McFarland in ready reserve, Essayons works 215 days, Yaquina works 178 days**

<b>DREDGE</b>	<b>Days</b>	<b>Daily Rate</b>	<b>Subsidy</b>	<b>One Time Costs</b>
<b>WHEELER</b>	<b>55</b>	<b>\$75,000</b>	<b>\$8 million</b>	<b>0</b>
<b>MCFARLAND</b>	<b>85</b>	<b>\$65,000</b>	<b>\$7 million</b>	<b>\$20 million rehab</b>
<b>ESSAYONS</b>	<b>215</b>	<b>\$76,607</b>	<b>0</b>	<b>0</b>
<b>YAQUINA</b>	<b>178</b>	<b>\$47,000</b>	<b>0</b>	<b>0</b>
<b>GOVERNMENT COSTS &amp; USAGE</b>		<b>\$49.5 million</b>	<b>533 days</b>	
<b>CONTRACT COSTS</b>		<b>\$118.7 million</b>		
<b>TOTAL PROGRAM COSTS</b>		<b>\$168.2 million</b>		
<b>RISK</b>				
<b>NAVIGATION</b>	<b>Low</b>			
<b>INDUSTRY</b>	<b>Low</b>			
<b>COMMENTS: \$15 million subsidy for ready reserve vessels</b>				

**OPTION – 7**

**Wheeler in ready reserve, McFarland retired, Essayons works 215 days, Yaquina works 178 days**

<b>DREDGE</b>	<b>Days</b>	<b>Daily Rate</b>	<b>Subsidy</b>	<b>One Time Costs</b>
<b>WHEELER</b>	<b>55</b>	<b>\$75,000</b>	<b>\$8 million</b>	<b>0</b>
<b>MCFARLAND</b>	<b>0</b>	<b>\$87,925</b>	<b>0</b>	<b>\$22 million retirement costs</b>
<b>ESSAYONS</b>	<b>215</b>	<b>\$76,607</b>	<b>0</b>	<b>0</b>
<b>YAQUINA</b>	<b>178</b>	<b>\$47,000</b>	<b>0</b>	<b>0</b>
<b>GOVERNMENT COSTS &amp; USAGE</b>		<b>\$37.0 million</b>		<b>448 days</b>
<b>CONTRACT COSTS</b>		<b>\$120.8 million</b>		
<b>TOTAL PROGRAM COSTS</b>		<b>\$157.7 million</b>		
<b>RISK</b>				
<b>NAVIGATION</b>	<b>Low</b>			
<b>INDUSTRY</b>	<b>Low</b>			
<b>COMMENTS: Low Government costs, increased work for industry</b>				

**OPTION – 8**

**Wheeler, Essayons and Yaquina in ready reserve, McFarland is retired**

<b>DREDGE</b>	<b>Days</b>	<b>Daily Rate</b>	<b>Subsidy</b>	<b>One Time Costs</b>
<b>WHEELER</b>	<b>55</b>	<b>\$75,000</b>	<b>\$8 million</b>	<b>0</b>
<b>MCFARLAND</b>	<b>0</b>	<b>\$87,925</b>	<b>0</b>	<b>\$22 million retirement costs</b>
<b>ESSAYONS</b>	<b>55</b>	<b>\$87,000</b>	<b>\$11.3 million</b>	<b>0</b>
<b>YAQUINA</b>	<b>55</b>	<b>\$47,000</b>	<b>\$5.8 million</b>	<b>0</b>
<b>GOVERNMENT COSTS &amp; USAGE</b>		<b>\$36.6 million</b>	<b>165 days</b>	
<b>CONTRACT COSTS</b>		<b>\$132.9 million</b>		
<b>TOTAL PROGRAM COSTS</b>		<b>\$169.5 million</b>		
<b>RISK</b>				
<b>NAVIGATION</b>	<b>Medium Risk</b>			
<b>INDUSTRY</b>	<b>Low</b>			
<b>COMMENTS: \$25.1 million subsidy for ready reserve vessels, substantial additional work for industry, will require an additional large class industry hopper dredge on West Coast.</b>				

**OPTION – 9**

**Retire all Corps dredges**

<b>DREDGE</b>	<b>Days</b>	<b>Daily Rate</b>	<b>Subsidy</b>	<b>One Time Costs</b>
<b>WHEELER</b>	<b>0</b>	<b>\$75,000</b>	<b>0</b>	<b>\$65 million retirement costs</b>
<b>MCFARLAND</b>	<b>0</b>	<b>\$87,925</b>	<b>0</b>	<b>\$22 million retirement costs</b>
<b>ESSAYONS</b>	<b>0</b>	<b>\$87,000</b>	<b>0</b>	<b>\$69 million retirement costs</b>
<b>YAQUINA</b>	<b>0</b>	<b>\$47,000</b>	<b>0</b>	<b>\$22 million retirement costs</b>
<b>GOVERNMENT COSTS &amp; USAGE</b>		<b>0</b>	<b>0 days</b>	
<b>CONTRACT COSTS</b>		<b>\$142.6 million</b>		
<b>TOTAL PROGRAM COSTS</b>		<b>\$142.6 million +</b>		
<b>RISK</b>				
<b>NAVIGATION</b>		<b>High Risk</b>		
<b>INDUSTRY</b>		<b>Medium Risk</b>		
<b>COMMENTS: \$178 million retirement costs for Corps dredges, major impact to PRIP revolving fund account income, Industry must build excess capability, take all risk, navigation projects vulnerable, does not comply with Minimum Fleet legislation. Contract/Program costs will probably be more.</b>				

**OPTION – 10**

**Wheeler and Yaquina in ready reserve, Essayons works 215, McFarland retired**

<b>DREDGE</b>	<b>Days</b>	<b>Daily Rate</b>	<b>Subsidy</b>	<b>One Time Costs</b>
<b>WHEELER</b>	<b>55</b>	<b>\$75,000</b>	<b>\$8 million</b>	<b>0</b>
<b>MCFARLAND</b>	<b>0</b>	<b>\$87,925</b>	<b>0</b>	<b>\$22 million retirement costs</b>
<b>ESSAYONS</b>	<b>215</b>	<b>\$87,000</b>	<b>0</b>	<b>0</b>
<b>YAQUINA</b>	<b>55</b>	<b>\$47,000</b>	<b>\$5.8 million</b>	<b>0</b>
<b>GOVERNMENT COSTS &amp; USAGE</b>		<b>\$36.6 million</b>	<b>325 days</b>	
<b>CONTRACT COSTS</b>		<b>\$125.2 million</b>		
<b>TOTAL PROGRAM COSTS</b>		<b>\$161.8 million</b>		
<b>RISK</b>				
<b>NAVIGATION</b>	<b>Low</b>			
<b>INDUSTRY</b>	<b>Low</b>			
<b>COMMENTS: \$13.8 million subsidy for Corps ready reserve vessels, increased workload for industry.</b>				

**OPTION - 11**

**Wheeler is in ready reserve, Essayons works 185 days, Yaquina works 178 days and McFarland is retired**

<b>DREDGE</b>	<b>Days</b>	<b>Daily Rate</b>	<b>Subsidy</b>	<b>One Time Costs</b>
<b>WHEELER</b>	<b>55</b>	<b>\$75,000</b>	<b>\$8 million</b>	<b>0</b>
<b>MCFARLAND</b>	<b>0</b>	<b>\$87,925</b>	<b>0</b>	<b>\$22 retirement costs</b>
<b>ESSAYONS</b>	<b>185</b>	<b>\$87,000</b>	<b>0</b>	<b>0</b>
<b>YAQUINA</b>	<b>178</b>	<b>\$47,000</b>	<b>0</b>	<b>0</b>
<b>GOVERNMENT COSTS &amp; USAGE</b>		<b>\$36.6 million</b>	<b>418 days</b>	
<b>CONTRACT COSTS</b>		<b>\$120.8 million</b>		
<b>TOTAL PROGRAM COSTS</b>		<b>\$157.4 million</b>		
<b>RISK</b>				
<b>NAVIGATION</b>	<b>Low</b>			
<b>INDUSTRY</b>	<b>Low</b>			
<b>COMMENTS</b>				



## APPENDIX B COST OF OPTIONS

OPTION	VESSEL	DAYS	DAILY RATE	ANNUAL COST	SUBSIDY	GOV'T COSTS (\$M)	CONTRACT DAYS	DAILY RATE	CONTRACT COSTS (\$M)	TOTAL (\$M)
Q	WHEELER	55	\$75,000	\$4,125,000	\$8,000,000	\$12.1				
Q	ESSAYONS	185	\$87,000	\$16,095,000		\$16.1				
Q	YAQUINA	178	\$47,000	\$8,366,000		\$8.4				
Q	McFARLAND	85	\$65,000	\$5,525,000	\$7,000,000	\$12.5				
<b>\$15,000,000</b>						<b>\$49.1</b>				<b>\$167.8</b>
1	WHEELER	245	\$68,415	\$16,761,675		\$16.8	-190	\$65,700	-\$12.5	
1	ESSAYONS	215	\$76,607	\$16,470,505		\$16.5	0	\$50,705	\$0.0	
1	YAQUINA	195	\$44,655	\$8,707,725		\$8.7	-17	\$35,800	-\$0.6	
1	McFARLAND	230	\$64,000	\$14,720,000		\$14.7	-145	\$34,905	-\$5.1	
<b>\$56.7</b>									<b>-\$18.2</b>	<b>\$157.2</b>
2	WHEELER	55	\$75,000	\$4,125,000	\$8,000,000	\$12.1	0	\$65,700	\$0.0	
2	ESSAYONS	192	\$84,304	\$16,186,368		\$16.2	0	\$50,705	\$0.0	
2	YAQUINA	178	\$47,000	\$8,366,000		\$8.4	0	\$35,800	\$0.0	
2	McFARLAND	140	\$87,925	\$11,130,000		\$11.1	-55	\$34,905	-\$1.9	
<b>\$8,000,000</b>						<b>\$47.8</b>			<b>-\$1.9</b>	<b>\$164.6</b>
3	WHEELER	180	\$88,150	\$15,867,000		\$15.9	-125	\$65,700	-\$8.2	
3	ESSAYONS	215	\$76,607	\$16,470,505		\$16.5	0	\$50,705	\$0.0	
3	YAQUINA	178	\$47,000	\$8,366,000		\$8.4	0	\$35,800	\$0.0	
3	McFARLAND	0	\$87,925	\$0		\$0.0	60	\$34,905	\$2.1	
<b>\$40.7</b>									<b>-\$6.1</b>	<b>\$153.3</b>
4	WHEELER	245	\$68,415	\$16,761,675		\$16.8	-190	\$65,700	-\$12.5	
4	ESSAYONS	215	\$76,607	\$16,470,505		\$16.5	0	\$50,705	\$0.0	
4	YAQUINA	195	\$44,655	\$8,707,725		\$8.7	-17	\$35,800	-\$0.6	
4	McFARLAND	0	\$87,925	\$0		\$0.0	60	\$34,905	\$2.1	
<b>\$41.9</b>									<b>-\$11.0</b>	<b>\$149.6</b>
5	WHEELER	140	\$99,500	\$13,930,000		\$13.9	-85	\$65,700	-\$5.6	
5	ESSAYONS	185	\$87,000	\$16,095,000		\$16.1	0	\$50,705	\$0.0	
5	YAQUINA	178	\$47,000	\$8,366,000		\$8.4	0	\$35,800	\$0.0	
5	McFARLAND	140	\$87,925	\$12,309,500		\$12.3	-55	\$34,905	-\$1.9	
<b>\$50.7</b>									<b>-\$7.5</b>	<b>\$161.9</b>

OPTION	VESSEL	DAYS	DAILY RATE	ANNUAL COST	SUBSIDY	GOVT COSTS (\$M)	CONTRACT DAYS	DAILY RATE	CONTRACT COSTS (\$M)	TOTAL (\$M)	
6	WHEELER	55	\$75,000	\$4,125,000	\$8,000,000	\$12.1	0	\$65,700	\$0.0		
6	ESSAYONS	215	\$76,607	\$16,470,505		\$16.5	0	\$50,705	\$0.0		
6	YAQUINA	178	\$47,000	\$8,366,000		\$8.4	0	\$35,800	\$0.0		
6	McFARLAND	85	\$65,000	\$5,525,000	\$7,000,000	\$12.5	0	\$34,905	\$0.0		
						\$15,000,000				\$49.5	\$168.2
7	WHEELER	55	\$75,000	\$4,125,000	\$8,000,000	\$12.1	0	\$65,700	\$0.0		
7	ESSAYONS	215	\$76,607	\$16,470,505		\$16.5	0	\$50,705	\$0.0		
7	YAQUINA	178	\$47,000	\$8,366,000		\$8.4	0	\$35,800	\$0.0		
7	McFARLAND	0	\$65,000	\$0		\$0.0	60	\$34,905	\$2.1		
						\$8,000,000			\$2.1	\$37.0	\$157.7
8	WHEELER	55	\$75,000	\$4,125,000	\$8,000,000	\$12.1	0	\$65,700	\$0.0		
8	ESSAYONS	55	\$87,000	\$4,785,000	\$11,300,000	\$16.1	130	\$59,192	\$7.7		
8	YAQUINA	55	\$47,000	\$2,585,000	\$5,800,000	\$8.4	123	\$35,800	\$4.4		
8	McFARLAND	0	\$65,000	\$0		\$0.0	60	\$34,905	\$2.1		
						\$25,100,000			\$14.2	\$36.6	\$169.5
9	WHEELER	0	\$75,000	\$0		\$0.0	55	\$65,700	\$3.6		
9	ESSAYONS	0	\$87,000	\$0		\$0.0	185	\$59,192	\$11.0		
9	YAQUINA	0	\$47,000	\$0		\$0.0	178	\$35,800	\$6.4		
9	McFARLAND	0	\$65,000	\$0		\$0.0	85	\$34,905	\$3.0		
									\$23.9	\$0.0	\$142.6
10	WHEELER	55	\$75,000	\$4,125,000	\$8,000,000	\$12.1	0	\$65,700	\$0.0		
10	ESSAYONS	215	\$76,607	\$16,470,505		\$16.5	0	\$50,705	\$0.0		
10	YAQUINA	55	\$47,000	\$2,585,000	\$5,400,000	\$8.0	123	\$35,800	\$4.4		
10	McFARLAND	0	\$65,000	\$0		\$0.0	60	\$34,905	\$2.1		
						\$13,400,000			\$6.6	\$36.6	\$161.8
11	WHEELER	55	\$75,000	\$4,125,000	\$8,000,000	\$12.1	\$0	\$65,700	\$0.0		
11	ESSAYONS	185	\$87,000	\$16,095,000		\$16.1		\$50,705			
11	YAQUINA	178	\$47,000	\$8,366,000		\$8.4		\$35,800			
11	McFARLAND	0	\$65,000				60	\$34,905	\$2.1		
						\$8,000,000			\$2.1	\$36.6	\$157.4

## APPENDIX C

### COMMENTS TO THE DRAFT REPORT

The draft report was sent to all interested parties requesting a review of the facts and submittal of comments. The comments received can be categorized into general topics as follows:

**Aging Industry Fleet** – There are several industry hopper dredges that are in excess of 20 years old, and several commenters expressed concern about potential loss of capability of these dredges. Most of the older dredges have been substantially rehabilitated, and are expected to be fully functioning dredges for some time. If there is a need to replace, or add additional industry hopper dredges, industry has demonstrated that this can be done.

a. What factors go into making the decision to replace antiquated equipment? There are many factors that are considered when making additional capital investments into a market. The industry looks at:

- i. Existing capacity.
- ii. Age of existing capacity.
- iii. Efficiency of existing equipment and what gains in efficiency might be realized with new capital investments.
- iv. Stability of the marketplace, i.e. funding sources, demand for services, volatility of the demand and amplitude of the pricing curve.
- v. Likelihood of competitor investments in the same industry.
- vi. Strength of competitors in adverse market conditions.
- vii. Alternative market regions as fall back under poor market conditions.

b. How do investors view what future workload is needed in order to invest in hopper equipment?

i. This is just one of the factors that are considered. Investors in hopper equipment must take a long-term view, at least 25 years or so. As long as there is a need to continue to transport goods via waterborne means, there will remain a demand for maintenance and improvement of our waterways. There are many mitigating circumstances that affect this demand, e.g. the increasing limitations placed on equipment by environmental windows. The trend has not indicated a relaxation of those restrictions, but a broadening of their application. This will result in more work performed in fewer available days. This will create spikes in demand and result in fewer days in the year to recoup fixed costs.

c. At what threshold would investors make a decision not to invest, and how would investors view a change in the Corps policy?

i. The threshold varies with each individual investor. The decision may depend upon how much the investment represents as a percentage of the overall entity. In the U.S., hopper dredges represent a relatively large percentage of the overall balance sheet and at least with one company, could be the balance sheet. Since the Corps is the largest single customer for the industry fleet, the industry lives and dies by the policy decisions of the Corps.

d. How would investors view a change in Corps policy to increase use of the Corps hopper dredges?


i. There are many decisions made within the Corps that have immediate and direct implication on the industry fleet. One of these decisions is the subject of this report. Since the late 1970s, it has been the intent of Congress through multiple legislative initiatives to have more of the dredging services performed by private industry as industry demonstrated the capability to perform the work in a safe, cost-effective, and timely manner. For over two decades, we, as a

national resource, have made incremental strides in that direction and demonstrated overall success every step of the way. Investment in recent years is a direct result of the confidence industry has developed in the Corps to continue this trend as we continued to demonstrate success. To reverse this trend in the face of the successes we have all enjoyed would stymie further investment in the hopper fleet as a minimum and destroy confidence in the market for future investments, especially in light of such demonstrated success. A shift away from the orderly reduction of work by the Corps dredges would be a reversal of a 27-year program of privatization and would send a clear message to potential investors to avoid investment in private sector dredges.

#### INDUSTRY INVESTMENT IN PHYSICAL PLANT

- Industry has made considerable investments in hopper dredging equipment in order to increase capacity to meet demand. Since 1996, the five existing hopper dredge companies have invested or are investing a total of over \$ 165 M. in physical plant. This includes building of the *Bayport* in 1999, the *Liberty Island* in 2002, the *Glenn Edwards*, scheduled to be operational by late 2005; productivity enhancements to the *Eagle* and *Stuyvesant*; rebuilding of the *Columbia* and *Atchafalaya*; and improvements to the *Island Class* dredges.

Industry has indicated that the typical major refurbishment occurs at about a vessel's twentieth year and costs about one-third of the vessel's market value. Based on this assumption, 10 of 15 industry vessels have undergone major refurbishment at an estimated cost of roughly \$60 million to \$75 million.

TABLE C-1  
HOPPER DREDGE AGE, EXPECTED LIFE, AND MAJOR REHABILITATION 

Dredge/Private (P)_or Corps (C)	Year Built	Age	Years Remaining Based on 35-Year Expected Life/Year	Approximate Major Refurbishment Date
Atchafalaya (P)	1980	25	10 years/2015	2000
Bayport (P)	1999	6	29 years/2034	2019
Columbia (P)	1986	19	16 years/2021	2006
Dodge Island (P)	1980	25	10 years/2015	2000
Eagle 1 (P)	1981	24	11 years/2016	2001
Essayons (C)	1983	22	28 years/2033 (50-yr life)	2008
Glenn Edwards (P)	2005	0	35 years/2040	2025
Liberty Island (P)	2002	3	32 years/2037	2022
Lindholm (P)	1985	20	15 years/2020	2005
Manhattan Island (P)	1977	28	7 years/2012	1997
Newport (P)	1983	22	13 years/2018	2003
McFarland (C)	1967	38	12 years/2017 (50-yr life)	2005 (overdue)
Northerly Island (P)	1983	22	13 years/2018	2003
Padre Island (P)	1981	24	11 years/2016	2001
R.N. Weeks (P)	1987	18	17 years/2022	2007
Sugar Island (P)	1979	26	9 years/2014	1999
Stuyvesant (P)	1982	23	12 years/2017	2002
Westport (P)	1978	27	8 years/2013	1998
Wheeler (C)	1982	23	27 years/2032 (50-yr life)	2007
Yaquina (C)	1981	24	26 years/2031 (50-yr life)	2010

**Industry data not verified** – The industry data used in this report is not used to make conclusions, but is used for relative comparisons in the case of daily rates, and for analyses of workload and cost impacts. To verify the industry data would require extensive auditing and is beyond the scope or need of this report.

**All industry hopper work being taken into account** – All industry hopper dredge work was considered in this report, including private work, beach renourishment, new work and channel maintenance dredging.

**Daily Rate Comparison** – The daily rates for the Corps hopper dredges has mobilization and demobilization included in the rates, while the industry rates generally reflect just the daily operation of the dredge exclusive of mobilization and demobilization. The Dredging Information System (DIS) was queried for these additional costs on industry contracts and it was found that there was a broad range in the costs for mobilization and demobilization. Variables include proximity of the bidders to the work, risk factors, total days on the job, and additional setup and monitoring requirements. These costs ranged from zero to over \$1 million. The average for 52 jobs reviewed, exclusive of West Coast contracts, new construction and beach nourishment, was \$3,697 per day. The average mobilization for the West Coast was \$15,765, and was derived from 7 contracts. This is a qualitative means of developing comparable industry daily costs, but in relative terms, this average could be applied to each of the daily rates reflected in Table 11 above.

**Dredging Requirements** – Future dredging requirements was an issue raised by several commenters. Dredging requirements in previous years have reflected a mix of hopper dredging to maintain existing navigation inlets and channels, beach renourishment, private dredging, and new work construction and port deepening. The dredging requirements in any given year are dependent upon several variables, but is primarily influenced by budgetary constraints, weather related shoaling both from coastal storms and inland rains and flooding, and environmental windows and restrictions. There will be peak workload requirements that will engage all available hopper dredge capability, and may warrant imposing management decisions that relocate hopper dredges from one project to another. However, increased industry capability has effectively reduced the potential for disruption or lack of hopper dredge availability. There is a potential for increased dredging as a result of some of the deepening work, and this additional requirement will be closely monitored. Increased demand will warrant increased investment by the dredging industry in additional hopper dredge capability. Current budget horizons will substantially limit increased requirements, however, some adjustment of workload to hopper work may be expected.

**Establishing a Baseline** – A Baseline discussion has been included in the document

**Risk** – Risks that were considered in developing the options include risk to the projects, ports, and harbors, and risk to the dredging industry. The risks to the projects and ports is considered high if there is not enough capability, or there is a likelihood that dredges may be out of the country or in a lay-up status that requires several weeks to return to service. Risk to the dredging industry is high when there is a likelihood of not having enough work to ensure a viable income to pay fixed costs and properly maintain the dredges. A consistent workload is a key factor when industry seeks investors for constructing new dredges.

**Options** – Initially, only selected Corps options were presented in the draft report, now all options recommended by commenters have been included.

**National Security issues** – There was concern expressed that reduction in current hopper dredge capability could result in the Corps being unable to support Strategic Ports. Monitoring channel conditions and dredging requirements of Strategic Ports has been an integral part of Corps operations and procedures developed in the Industry Corps Hopper Dredge Management Group (ICHDMG) are in place to rapidly respond to any unforeseen requirements that may occur. Consideration of capability requirements for these Strategic Ports has been included in the risk assessment for the ports, harbors and navigation projects.