Sevenson Environmental Services, Inc.

JACOBS

US ARMY CORPS OF ENGINEERS
NEW ENGLAND DISTRICT
Total Environmental Restoration Contract
USACE Contract Number: DACW33-03-D-0006
Task Order No. 0007

FINAL 2012 FISH MIGRATION IMPACT PLAN, NEW BEDFORD HARBOR REMEDIAL ACTION

New Bedford Harbor Superfund Site
New Bedford, MA

June 2012

Prepared by
Jacobs Engineering Group
6 Otis Park Drive
Bourne, MA 02532-3870

ACE-J23-35BG0708-M1-0006

TABLE OF CONTENTS

Figures

ACRONYMS AND ABBREVIATIONS

HDPE	high density polyethylene
Jacobs	Jacobs Engineering Group
MADMF	Massachusetts Division of Marine Fisheries
NAE	U.S. Army Corps of Engineers – New England District
PCB	polychlorinated biphenyl
POC	point of contact
SES	Sevenson Environmental Services
WHG	Woods Hole Group

1.0 INTRODUCTION

The purpose of this document is to detail the measures that the Jacobs Engineering Group (Jacobs) and Sevenson Environmental Services (SES) team in coordination with the U.S. Army Corps of Engineers – New England District (NAE) will undertake during the 2012 dredge season to avoid impacting the annual fish migration as well as resident fish populations in the Upper New Bedford Harbor.

2.0 2012 DREDGING ACTIVITIES

In 2012, dredging activities will be conducted in two adjacent Dredge Areas, L and P, both of which are located in the Upper Harbor portion of New Bedford Harbor. The 2012 dredge areas and associated pipelines are shown on Figure 1. CBI

The following section provides a brief description of the dredging methods and means that the Jacobs/SES team have used since 2004 to remove polychlorinated biphenyl (PCB)-contaminated sediments from the New Bedford Harbor Superfund Site. The descriptions focus on activities that might pose negative impacts to resident and migratory fish in the Acushnet River.

2.1 DESCRIPTION OF DEBRIS REMOVAL ACTIVITIES

As in previous years' dredging actions, debris removal will occur ahead of dredging operations to remove scrap, trash, boulders, and clumps of vegetation that have the potential to impair dredging production or damage the equipment by becoming entangled or lodged in the dredge equipment. In dredge areas requiring debris removal, the activity will be carried out mechanically using an excavator equipped with an ADD-A-STICK® extension and a rake attachment with a hydraulic thumb. The rake and thumb squeeze out sediment and maintain larger debris in the rake. This rake and thumb system has been utilized with success since 2005. The excavator is supported on a 40-foot by 40-foot barge which is constructed of modular flexi floats and equipped with spuds. In

addition to the excavator platform, a 20-foot by 40-foot scow will be staged at the debris removal sites for collection and transport of recovered debris to Area C.

Progressing methodically, the barge mounted excavator will probe for and clear debris by securing debris between the fingers of the rake and thumb and then placing the recovered debris into the adjacent scow. Once a scow is loaded, it is transported by work boat to the Area C dock for unloading and eventual disposal of collected material.

Debris removal activities will be conducted in undredged areas prior to dredging. In previously dredged areas debris removal will only be conducted on an as-needed basis if debris is encountered. Section 3.0 will discuss specific activities planned for each dredge area and the potential impacts to fish and fish migration.

2.2 DESCRIPTION OF DREDGING METHODS

2.2.1 Hydraulic Dredging Methods

Hydraulic dredge areas are set-up prior to dredging with a perimeter of sheet piles. All hydraulic dredging is conducted within the sheet piles using a cabling system on which the dredge pulls itself back and forth within the dredge area. The dredge travel direction is decided based on bathymetry, shoreline geography, pipeline routing, and wind exposure. Sheet piles will be spaced at approximate 50-foot intervals on the perimeter of the dredge area perpendicular to dredge travel, and at approximate 100-foot intervals on the perimeter parallel to dredging. The sheet piles will be used to anchor the dredge traverse cable system. The piles will form anchors which will support a $^{5}/_{8}$-inch steel cable around the perimeter of the dredge area. This perimeter cable is utilized as an anchoring point for the dredge traverse cable. The elevation of the cable is nominally at the water line during high tide and flagged for visibility. A photograph illustrating the sheet pile and cable configuration is shown in Figure 2. The sheet piles are also used as attachment points for the perimeter oil boom deployed prior to any debris removal or dredging activities.

In 2012, two "Mudcat" MC 2000 sediment dredges will be deployed. A photograph of a "Mudcat" MC 2000 dredge is presented in Figure 3.

CBI

As the 2012 dredge season progresses, both dredges will be moved laterally to their direction of travel after completion of a run, this ensures complete coverage of a dredge area. CBI

The dredged sediment slurry, which consists of harbor water and sediment, is transported from the dredges through floating pipelines to a booster pump and then to the Area C desanding plant. A photograph of a booster pump station is shown as Figure 4.

CBI

The floating pipeline from the dredge consists of multiple sections of 10-inch high density polyethylene (HDPE) pipe with attached flotation and flexible hose connections. The combination of rigid floating sections and hose connections results in an articulated pipeline that follows the dredge as it traverses the dredge area. This articulated set-up allows for back and forth movement of the dredge within the dredge areas. An example of the dredge and associated articulated floating pipeline that trails behind the dredge is illustrated in Figure 5.

2.3 TIMELINE OF THE 2012 DREDGING ACTIVITIES AND FISH MIGRATION

It is anticipated that the 2012 dredging activities will occur from June through September. The goal of the 2012 dredge season is to perform mass removal of all sediments in Areas P and L contaminated with over 10 milligrams per kilogram of PCBs. CBI

Both dredge areas have similar bathymetric and geologic properties; they are

predominantly subtidal, and have historically been developed along the western shoreline. Remnants of these developments remain in the way of urban fill, anthropogenic debris, derelict wood pilings and an active combined sewer overflow. The shallower, eastern side of both dredge areas borders an undeveloped wetland.

CBI

Dredging activities will be coordinated to minimize any potentially negative impacts to migratory fish. The water quality monitoring program established for this project will be implemented during all dredging and excavation activities to ensure that turbidity levels do not exceed the established criteria. Water quality monitoring and fisheries observations conducted during debris removal and dredging activities are intended to document effects of activities as well as minimize the potential for negative impacts. Routine water quality monitoring in 2012 will be conducted by Woods Hole Group (WHG) an independent contractor working directly for NAE as has been the practice during previous hydraulic dredge seasons. Project specific water quality monitoring criteria and monitoring methods are documented in the WHG June 2011 plan *Final Water Quality Monitoring Field Sampling Plan New Bedford Harbor Superfund Site, OU #1* (WHG 2011).

The annual fish migration on the Acushnet River takes place in the following two stages:

- The "**In-Migration**" of Alewife and Blueback Herring in the Acushnet River upstream towards the up-river spawning grounds occurs approximately from April 1st through June 15th; and
- The "**Out-Migration**" of the Alewife and Blueback Herring in the Acushnet River downstream towards the ocean occurs approximately from September 1st through November 15th.

In the early portion of the 2012 dredge season (through the middle of June), the In-Migration of fish will be occurring. The fish will migrate from the ocean upstream (north) through the dredge areas to the Acushnet River. During the later portion of the 2012 dredging season (September) the Out-Migration of fish will occur. The fish will migrate downstream (south) through the dredge areas towards the ocean.

Section 3.0 outlines the potential impacts to the fish (resident and migratory) in each dredge area and the steps that the Jacobs/SES team will take to lessen these potentially negative impacts.

3.0 POTENTIAL IMPACTS TO FISH MIGRATION AND MITIGATION MEASURES

Two potential impacts to the upstream and downstream fish migration during the 2012 season have been identified. The primary concern is the potential for the floating dredge pipelines to obstruct the fish migration during periods of low tide. In prior coordination with the Massachusetts Division of Marine Fisheries (MADMF), it was determined that a minimum of 6 inches of clearance between the bottom of the pipeline and the harbor bottom must be maintained for fish passage. This approach was successfully used in prior years' dredging in these same areas. The second concern is the potential impact of elevated turbidities from dredging and debris removal activities on fish migration. In addition to the mitigation measures taken by the Jacobs team to prevent negative impacts to fish and wildlife, WHG will periodically conduct fish, wildlife, and water quality monitoring throughout the 2012 dredge season. WHG will report any potentially negative effects caused by dredge related activities directly to NAE.

3.1 DREDGE AREAS L AND P

Dredge areas L and P are continuous north to south and span from the western to the eastern shore. Dredge Area L has been partially dredged in previous seasons. When the dredge is located on the eastern side of either dredge area, the pipeline spans the river from the eastern shoreline to the Booster Pump located on the western bank, potentially affecting fish migration (Figure 1).

3.1.1 Potential Impacts

There is concern that the fish traveling north during the In-Migration may follow the dredge pipeline running from the Manomet Street booster pump station to the dredge when it is located on the eastern side of Dredge Areas L and P. The fish may get

"herded" by the pipeline to the eastern shoreline where they may get trapped in the shallows between the dredge pipeline and the eastern shoreline on an out-going tide.

There are similar concerns that the fish traveling south on the outgoing tide during the Out-Migration may get trapped in the shallows between the dredge, dredge pipeline and the eastern shoreline.

In both cases of In- and Out-Migration, there is concern that as the water level drops during the outgoing tide, fish may become either trapped or highly stressed. The trapping of the fish on the exposed intertidal surface may result in a fish kill.

Also, the turbidity created by the dredging and debris removal activities represents a potential hazard to fish in the dredge areas.

3.1.2 Mitigation Measures

To minimize the potential for negative impacts to any resident or migratory fish, as low tide approaches, dredging operations will be moved away from the shoreline to allow adequate depth/clearance for the fish to pass either around the dredge or underneath the pipeline. In addition, to ensure adequate depth/clearance, dredging operations will not be conducted directly adjacent to the eastern shoreline during periods of low tide.

To minimize the potential for negative impacts to resident or migratory fish from elevated turbidities, the WHG water quality team will make periodic observations within and in the immediate vicinity of the dredge areas, watching for signs of stressed or dead fish. In addition, periodic water quality data (dissolved oxygen and turbidity) will be monitored around the dredge areas to identify any project related impacts that could affect the fish population as a whole. Verbal and written reports will be provided following each monitoring event to the onsite NAE point of contact (POC). The Jacobs field crew will make daily inspections of active dredge areas and observations of stressed or dead fish will be recorded and reported to the on-site NAE POC. Corrective action will be taken as directed by the on-site NAE POC in the event of an undesirable condition. The frequency and intensity of WHG's water quality monitoring efforts will be determined by NAE.

3.2 POTENTIAL IMPACTS OF DEBRIS REMOVAL ACTIVITIES

3.2.1 Potential Impacts

During the 2005 dredge season, turbidity levels above the project action levels were detected when debris removal activities were conducted in mudflat areas at or near low tide conditions (ENSR 2006). There is concern that these high turbidity areas could act as a barrier to the migrating fish.

3.2.2 Mitigation Measures

As a result of the observed 2005 turbidity levels, debris removal activities have been curtailed during periods of low tide in mudflats or intertidal portions of dredge areas. In deeper water portions of dredge areas debris removal activities will continue through all tide cycles if turbidity levels remain within project specific criteria.

Additional actions to reduce turbidity or its effects during debris removal include slower more deliberate debris removal actions by the excavator operator, and moving scows or the barges at periods of higher tides. To minimize the potential for negative impacts to resident or migratory fish from elevated turbidities, the WHG water quality team will make periodic observations within and in the immediate vicinity of the dredge area watching for signs of stressed or dead fish. In addition, periodic water quality data (dissolved oxygen and turbidity) will be evaluated around the dredge areas during debris removal to identify any project related impacts that could affect the fish population as a whole. Verbal and written reports will be provided following each monitoring event to the onsite NAE point of contact (POC). The Jacobs field crew will make daily inspections of active debris removal areas; observations of stressed or dead fish will be recorded and reported to the on-site NAE POC. Corrective action will be taken as directed by the on-site NAE POC in the event of an undesirable condition. The frequency and intensity of WHG's water quality monitoring efforts will be determined by NAE.

3.3 COMMUNICATION OF POTENTIALLY NEGATIVE FISH IMPACTS

In the unlikely event of a fish kill or if it is suspected that the fish are being negatively impacted in some manner, the following notifications will be made in the following order:

1. **Initial Notification of Fish Kill or Negative Fish Impact:** If such an observation is made by either WHG or the Jacobs field team they will contact Mr. Paul L'Heureux, the on-site NAE Project Engineer at 978-318-8242, or his cell at 508-294-9859. The WHG is the field team responsible for water quality monitoring and fish and wildlife observations during dredging and debris removal activities throughout the dredging period. On those days that WHG is not conducting field operations, the Jacobs field team will be responsible for notifying Mr. L'Heureux.

   If the dredging subcontractor, SES, observes any dead fish or negative fish impact, they will contact Mr. Mark Gouveia (Jacobs Site Manager) on his cell phone at 508-802-2197. Mr. Gouveia, will in turn, contact Mr. L'Heureux. If Mr. Gouveia is unavailable SES will contact Mr. Joshua Cummings (Jacobs Environmental Scientist) on his cell phone at 508-916-1719 who will in turn contact Mr. L'Heureux.
2. **Second Level of Notification:** Mr. L'Heureux will contact Mr. Todd Randall, Marine Ecologist, NAE Environmental POC at the New England District office, Concord, Massachusetts, at 978-318-8518 (office) or 603-702-3887 (cell). Mr. Randall will assess the situation and will notify Mr. John Sheppard at the MADMF at 508-990-2860 extension 109 to discuss the event and determine what corrective actions should be taken, if any.

4.0 SUMMARY

The Jacobs/SES team in coordination with the NAE will schedule or coordinate activities to reduce any potential negative impacts to migratory or resident fish by taking the following steps:

- Curtail debris removal activities in intertidal areas during periods of low tide.
- Avoid dredging along the shorelines during periods of low tide.
- Avoid moving debris removal barge or scows during periods of low tide.
- Maintain a minimum clearance of 6 inches below the pipeline to prevent fish herding or stranding.
- Exhibit extra vigilance during those periods of unfavorable seasonal environmental conditions (e.g., low dissolved oxygen during the warm summer months).

5.0 REFRENCES

ENSR. 2006 (August). *Final Water Quality Monitoring Summary Report, Fall 2005 Remediation Dredging*, *New Bedford Harbor Superfund Site – New Bedford, Massachusetts.* **09000-350-1340.**

Woods Hole Group (WHG). 2011 (June). *Final Water Quality Monitoring Field Sampling Plan New Bedford Harbor Superfund Site, OU#1*, **W912WJ-09-D-001.**

(intentionally blank)

FIGURES

CBI

JACOBS™

Dredge Sheet Pile Network

New Bedford Harbor Superfund Site
New Bedford, Massachusetts

4/16/09cr Fig2_SES_sheet_pile.cdr

Figure 2

Y:\NBH\Projects\35BG0702\20090416\Graphics\Fig2_SES_sheet_pile.cdr

JACOBS™

Mudcat MC 2000 Dredge

New Bedford Harbor Superfund Site
New Bedford, Massachusetts

4/16/09cr Fig3_mudcat.cdr

Figure 3

Y:\NBH\Projects\35BG0702\20090416\Graphics\Fig3_mudcat.cdr

JACOBS™

Dredge and Pipeline Configuration

New Bedford Harbor Superfund Site
New Bedford, Massachusetts

4/16/09cr Fig5_pipeline_config.cdr | Figure 5

Y:\NBH\Projects\35BG0702\20090416\Graphics\Fig5_pipeline_config.cdr

JACOBS™

Booster Pump Set-Up

New Bedford Harbor Superfund Site
New Bedford, Massachusetts

4/16/09cr Fig4_booster_pump.cdr | Figure 4

Y:\NBH\Projects\35BG0702\20090416\Graphics\Graphics\Fig4_booster_pump.cdr

JACOBS™

Dredge and Pipeline Configuration

New Bedford Harbor Superfund Site
New Bedford, Massachusetts

4/16/09cr Fig5_pipeline_config.cdr | Figure 5

Y:\NBH\Projects\35BG0702\20090416\Graphics\Fig5_pipeline_config.cdr