US ARMY CORPS OF ENGINEERS
NEW ENGLAND DISTRICT

Total Environmental Restoration Contract
USACE CONTRACT NUMBER: DACW33-03-D-0006
Task Order No. 0007

2012 DREDGE SEASON DATA SUBMITTAL
NEW BEDFORD HARBOR SUPERFUND SITE

May 2013

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ACE-J23-35BG0708-M17-0015

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ACRONYMS AND ABBREVIATIONS

AAR	After Action Report
Cd	cadmium
Cr	chromium
CRE	CR Environmental, Inc.
CSO	combined sewer overflow
Cu	copper
cy	cubic yard
DDA	debris disposal area
DSR	Data Summary Report
EPA	U.S. Environmental Protection Agency
Fathom	Fathom Research, LLC.
ft	foot/feet
GAC	granulated activated carbon
GIS	geographic information systems
GPS	Global Positioning System
HDPE	High Density Polyethylene
in	inch/inches
ISC3	Industrial Source Complex Model
Jacobs	Jacobs Engineering Group, Inc.
mg/kg	milligrams per kilogram
NAE	U.S. Army Corps of Engineers - New England District
NBH	New Bedford Harbor Superfund Site
ng/m^3	nanograms per cubic meter
OL	organic silt
Pb	lead
PCB	polychlorinated biphenyl
PETS	Public Exposure Tracking System
PPE	personal protective equipment
QC	quality control
ROD	Record of Decision

ACRONYMS AND ABBREVIATIONS

SCR	submerged cultural resource
SES	Sevenson Environmental Services, Inc.
T&D	transportation and disposal
TCLP	Toxicity Characteristic Leaching Procedure
TSCA	Toxic Substances Control Act
WHG	Woods Hole Group
WWTP	Wastewater Treatment Plant
μg/L	Micrograms per liter

EXECUTIVE SUMMARY

September 7, 2012 marked the successful completion of the ninth season of full-scale remedial dredging at the New Bedford Harbor Superfund Site (NBH). As in previous dredge seasons, the Jacobs Engineering Group, Inc. (Jacobs) and Sevenson Environmental Services, Inc. (SES) team performed the cleanup work under contract to the U.S. Army Corps of Engineers – New England District (NAE) with direction provided by the U.S. Environmental Protection Agency (EPA) in NBH's Upper Harbor.

During the design phase of the NBH project an archaeological survey was conducted to identify any submerged cultural resources (SCRs). This survey, conducted in the late 1990's and early 2000's utilized modern survey equipment at the time. Following the 2009 discovery of a shipwreck in an active dredge area it was decided by EPA that a supplemental survey be performed in 2011 and 2012 using more advanced remote sensing technology than had been previously available during the initial survey. The supplemental surveys and associated follow-up investigations revealed no submerged cultural resources in the areas designated as 2012 dredge areas.

Utilizing hydraulic dredging, the Jacobs/SES team dredged a total of 19,502 cubic yards of polychlorinated biphenyl (PCB) - contaminated sediment from the upper harbor portion of the NBH site, as determined by bathymetry. The dredged sediment (slurry) contains gravel, sand, silt, clay and harbor water. Based on production data, it is estimated that the slurry contained approximately 16,997 tons of damp solids.

Consistent with past hydraulic dredging efforts at NBH, sediment was hydraulically dredged from the upper harbor and pumped to the Sawyer Street Desanding Facility, Area C. Desanding operations removed 3,779 tons of material (primarily gravel and sand) from the dredge slurry. Analytical testing determined that 749 tons of the material could be disposed of as non-hazardous material, and the remainder exceeded the Toxic Substances Control Act (TSCA) threshold for PCBs. The TSCA material was disposed of in a licensed and approved TSCA landfill. The non-TSCA material was disposed of in an approved landfill.

The desanded dredge slurry was pumped from Area C to the Area D Dewatering Facility located on the shore of the lower harbor portion of NBH. From the transferred slurry, dewatering operations removed the contaminated sediment from the dredge slurry at Area D. 13,630 tons of contaminated filter cake was produced in 2012 at Area D and disposed of in an approved TSCA landfill.

The water removed from the dredge slurry at Area D was treated to meet Record of Decision (ROD) discharge goals (Table 8 of the ROD, Action Specific ARARs) and Massachusetts Class SB water standards prior to discharge back into the harbor. Routine periodic testing confirmed that the waste water treatment plant was functioning as intended. 26,853,400 gallons of water were treated and discharged to the harbor during the course of 2012 dredge operations.

Jacobs continued to perform ambient air monitoring for PCBs similar to previous seasons. Analytical results and modeling efforts demonstrated that the NBH remedial dredging program is not causing ambient PCB levels to exceed established thresholds.

Jacobs estimates that 1.7 tons of PCBs were removed and disposed of with the contaminated dredged materials during the 2012 season. Remedial dredging by the Jacobs/SES team at NBH has removed an estimated 53.0 tons of PCBs since 2004.

In addition to remedial dredging at NBH, Jacobs conducted routine facility maintenance at both Areas C and D and performed a variety of non-dredging but complimentary tasks.

1.0 INTRODUCTION

The purpose of this *2012 Data Summary Report* (2012 DSR) is to summarize key activities associated with the remediation of the New Bedford Harbor Superfund Site (NBH) during the 2012 field season. After Action Reports (AAR) were generated for the 2004 (Jacobs 2005) and 2005 (Jacobs 2006) seasons to fully document the respective dredge seasons. From 2006 to 2010 the U.S. Environmental Protection Agency (EPA) and the U.S. Army Corps of Engineers - New England District (NAE) had requested that a scaled back data summary report be prepared annually to document field activities. In 2011 and 2012, EPA and NAE requested that the annual document contain more detailed text information specific to the corresponding field season. This 2012 DSR documents dredging and associated programmatic activities.

Activities performed by the Jacobs Engineering Group, Inc. (Jacobs)/Sevenson Environmental Services, Inc. (SES) team during the 2012 field season are documented in Section 2.0 as the 2012 Scope of Work Performed. Section 2.0 is further broken down into the following six sub-sections:

- Project Planning (Section 2.1)
- Mobilization (Section 2.2)
- Project Execution (Section 2.3)
- Air Monitoring (Section 2.4)
- Demobilization (Section 2.5)
- Post-Dredge Activities (Section 2.6)

Section 3.0 presents a discussion on mass balance calculations derived from 2012 production data. The mass balance calculations provide a measure of process inputs, process outputs, as well as intermediate processes.

Section 4.0, Lessons Learned, presents observations on methods to improve production, safety or quality. Improvements presented in Section 4.0 were either implemented in 2012 or may be utilized when applicable on the project in the future.

Section 5.0 briefly describes work performed at NBH by the Jacobs/SES team related to the remediation efforts that were non-dredging in scope. Examples of work included in Section 5.0 are maintenance of intuitional controls and improvements to existing facilities.

Section 6.0 provides a tabulated chronology of events at NBH during 2012.

Section 7.0 provides a list of reference documents used in the preparation of this DSR.

1.1 PROJECT BACKGROUND

The 1998 *Record of Decision for the Upper and Lower Harbor Operable Unit New Bedford Harbor Superfund Site, New Bedford, Massachusetts* (ROD) (EPA 1998) delineates the NBH site into three geographical areas based on physical features as well as contaminant concentration gradients. Figure A-1 illustrates this delineation showing NBH divided into the upper harbor, lower harbor and outer harbor. The upper harbor starts in the northern reaches of the Acushnet River, north of the Wood Street Bridge and extends south to the Route 195 Bridge. The lower harbor begins at the Route 195 Bridge to the north and continues south to the New Bedford hurricane barrier. The outer harbor begins at the hurricane barrier and encompasses the area bound on the south by an imaginary line drawn from Rock Point in Fairhaven southwesterly to Buoy C3, continuing westerly to Mishaum Point in Dartmouth. Buoy C3 is a United States Coast Guard (USCG) navigational buoy used to mark the approach to the New Bedford Harbor Channel. Figure A-2 identifies areas requiring dredging to remove polychlorinated biphenyl (PCB) - contaminated sediment as identified in the 1998 ROD.

Since the initiation of full scale dredging activities by the Jacobs/SES team in 2004, remediation efforts have focused on the Upper Harbor. Figure A-3 shows areas dredged by the Jacobs/SES team since 2004 as well as earlier cleanup efforts by others. The apparent patchwork of dredge areas is by design. Dredge areas were designed by considering geographical features, material types, tidal conditions, contaminant mass, dredge technology and future use requirements. An important consideration in designing a dredge area is contaminant mass with the intention to remove the most contaminated sediment first (mass removal). The majority of cleanup efforts by the Jacobs/SES team have utilized hydraulic dredging as the preferred method. A limited amount of mechanical dredging has been conducted at NBH in relatively small dredge areas. Mechanical dredging is selected typically due to material type such as contaminated gravel or cobbles where hydraulic dredging would be inefficient or ineffective. There were no mechanical dredging activities conducted during 2012.

Since 2004 all material hydraulically dredged at NBH has been disposed of at approved, off-site landfills following gravity or plate and frame filter press dewatering. All of the water recovered during the dewatering process has been treated to the project effluent water quality criteria as described in the ROD and discharged back to the harbor.

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2.0 2012 SCOPE OF WORK PERFORMED

2.1 PROJECT PLANNING

2.1.1 Pre-Dredge Archaeology

In 1999 a marine archaeological survey was conducted in the upper harbor by John Milner & Associates, Inc. and Dolan Research, Inc. (Dolan 2000). Most of the upper harbor was surveyed with a side scan sonar, sub-bottom profiler and magnetometer. Due to the technology available at the time and limited water depth, some areas of the upper harbor were only able to be surveyed with a magnetometer while others were not surveyed at all.

Following the unanticipated 2009 discovery of shipwreck remains during debris removal operations in an active dredge area, it was decided that a supplemental marine archaeological survey would be conducted in areas anticipated to be dredged in 2011. The survey was conducted utilizing a side scan sonar, magnetometer and sub-bottom profiler by CR Environmental, Inc. (CRE) and Fathom Research, LLC. (Fathom). Prior to the initiation of 2012 mobilization activities, EPA and NAE requested that a survey similar in scope to the 2011 survey be conducted in areas anticipated to be dredged in the year's field season. Additionally EPA requested that Area H, dredged in 2007, be re-surveyed for temporal comparison purposes.

Dredge Area P, located adjacent to and south of Dredge Area L, was surveyed in preparation for 2012 dredge activities. Additionally a 16.2 acre area located just south of Area P was surveyed for supplemental pre-dredge archaeological assessment purposes. This 16.2 acre area was referred to as Area R. Survey data collected in Dredge Area P was processed and reviewed by a certified hydrographer and marine archaeologist. Survey data collected in Area R has been electronically archived for future processing, assessment and reporting.

Initially the survey in Area P identified four targets as potential submerged cultural resources (SCRs). A follow-up video hydro-probe investigation by CRE/Fathom determined that the targets were not actually SCRs, and subsequently, the areas were cleared for dredging to proceed.

In response to stakeholder concerns about the potential for erosion of dredged areas covering potentially archaeologically sensitive resources, EPA and NAE elected to perform a bathymetric survey of previously dredged Area H. Dredge Area H was dredged in 2007. A routine post-dredge bathymetric survey was performed following dredging. The data collected in the 2007 survey was compared to the 2012 survey and evaluated. Based on the Area H surveys, CRE concluded sediment had accumulated in Area H from 2007 to 2012. Given this conclusion, it has been surmised that in this central portion of the Upper Harbor, erosion of any sediments providing protection to buried archaeologically sensitive features is not likely.

Detailed information on the 2012 archaeological survey work is available in the document *Technical Memorandum Supplemental Marine Archaeological Investigations New Bedford Harbor Superfund Site Dredge Area P and Dredge Area H* (Fathom, 2013).

2.1.2 Dredge Plan Development

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2.1.3 Minimization of Dredge Related Impacts to Wildlife

The Jacobs document *Final 2012 Fish Migration Impact Plan, New Bedford Harbor Remedial Action* (Jacobs 2012c) is updated annually with the cooperation of the Massachusetts Division of Marine Fisheries and NAE. This document, referred to as the

Fish Plan, considers the effects that dredging related activities could have on both the migratory fish that use NBH as a pathway to their spawning grounds in the Acushnet River as well as resident fish. The Fish Plan details the planned pipeline routes and dredge area logistics. The plan also describes the preventative measures that the Jacobs/SES team would undertake during the season to minimize or eliminate dredging related negative impacts to the fish. The Fish Plan also provides a communication matrix if negative impacts are observed. There were no instances of documented dredging related negative impacts to resident or migratory fish populations during the 2012 season at NBH.

2.2 MOBILIZATION

Full-scale mobilization activities for the 2012 season commenced on May 30, 2012 and continued until June 22, 2012. Major tasks performed during mobilization included:

- re-assembling dredge pipelines;
- set-up of booster pump stations;
- replacement of all press cloths in filter presses;
- service and calibration of on-site truck scales;
- set-up of dredge area sheet piles and cables;
- inspection and repair if necessary of facilities and equipment;
- deployment of oil boom around dredge areas;
- launching and installation of dredges in two dredge areas;
- set up, calibration and testing of health and safety monitoring equipment;
- system test; and
- re-energizing and testing of major electrical systems and motors by electrician.

Figure A-4 illustrates the pipeline, dredge areas, booster pump station and ferric sulfate injection system as it was setup for 2012.

Figure A-5 is an as-built of the 2012 Manomet Street booster pump station. This station included the ferric sulfate injection system.

The final portion of mobilization is the shakedown period. Shakedown involves filling the treatment system with water, pressure testing all pipelines and valves, and operating the system until three press drops of filter cake are produced. Shakedown was completed on June 22, 2012.

2.3 PROJECT EXECUTION

Following a successful shakedown period, full scale dredging was initiated on June 25, 2012. Debris removal crews began systematically removing obstructions to dredging while hydraulic dredging commenced in areas previously cleared of debris.

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The physical removal of contaminated sediment from the harbor begins when the cutter head for an operating dredge is lowered into the sediment. As the spinning auger breaks up the sediment, the material is mixed with harbor water to create a slurry. The dredge pump then moves the slurry from the dredge to the shore based booster pump station through a flexible floating pipeline. The booster pump station is required to offset hydraulic head losses caused by the relatively long pipeline run to the Desanding Building.

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From the booster pump station, the slurry is pumped to the Area C Desanding Facility. At the Desanding Facility, hydrocyclones and vibratory inclined screens remove sand, gravel and other relatively coarse materials from the slurry. This removed material is allowed to gravity drain, chemically tested, and stockpiled according to the Toxic Substances Control Act (TSCA) classification at Area C to await disposal. Once a sufficient quantity of material has been stockpiled at Area C, trucks are loaded and weighed on-site, and the material is transported to the appropriate contracted landfill.

The remaining dredge slurry, a mixture of water and contaminated silt and clay, is pumped from Area C to the Area D Dewatering Facility via pipeline. At Area D the slurry is pumped directly into a set of mix tanks, which keep the solids in the slurry suspended. Feed pumps attached to the mix tanks transfer the slurry to a bank of filter presses. Polymer is added to the slurry during the transfer process to enhance the dewatering efficiency of the filter presses. The filter presses remove the majority of the water in the dredge slurry with smaller amounts being entrained in sand, gravel and filter cake. The water removed by the filter presses is pumped through an on-site waste water treatment plant where it is treated and then discharged back into the harbor. The filter cake is chemically tested and stockpiled to await disposal. Filter cake generated at Area D is loaded and weighed on-site, then transported off-site for disposal in a licensed and approved TSCA landfill.

2.3.1 Debris Removal Activities

Prior to hydraulic dredging, dredge areas are typically cleared of debris. This process involves systematically raking sediment, removing debris, and repositioning the debris removal equipment until the entire dredge area has been covered. Debris removal was conducted by a Komatsu® PC-220 excavator fitted with an Add-A-Stick® boom extension and a hydraulic rake attachment. The excavator was mounted on a 40-ft by 40-ft barge equipped with spuds to maintain position. Forty-ft by 20-ft scows were used to contain recovered debris during activities. The scows were brought to the Area C dock for unloading as needed. Following the unloading process, the size of debris was reduced if necessary and then stockpiled for disposal.

Debris removal activities began on June 25, 2012. During the 2012 season the majority of debris removal activities were conducted in the western halves of both dredge areas. The bulk of debris removed included a derelict wooden structure from the northwestern corner of Area L and CSO related debris (primarily brick and concrete) from the western shoreline of Area P. As noted in Section 2.1.2, the sediment in the northwestern corner of Area L contained relatively high amounts of oils and PCBs. In anticipation of the release of oils when disturbing the sediment during either debris removal or dredging, a supplemental second string of oil boom was installed around the area. By moderating the pace of work in this area, regularly maintaining the boom, and monitoring the site conditions, any oil sheen developed during work was effectively controlled and captured.

2.3.2 Hydraulic Dredging

2012 hydraulic dredging operations were conducted utilizing similar means and methods as previous seasons. During mobilization, sheet piles were installed along the perimeter of each area to be dredged. Sheet piles installed at the two edges of a dredge area perpendicular to the direction of dredge travel had a cable strung between the sheets, typically one to two ft above high tide, providing anchoring points for the dredge traverse cable. The dredge traverse cable, attached to two opposing sides of a dredge area, is utilized for dredge propulsion. The traverse cable is run through a set of pulleys and a winch on the dredge. This allows the dredge operator to pull the dredge back and forth over the length of the cable. Lateral movement of the dredge is accomplished by relocating the ends of the traverse cable. The actual dredging is performed by the dredge cutter head, an eight ft long horizontal auger partially encased in a shroud on the end of a hydraulically articulated boom. The boom is lowered and raised to control the depth of the cutter head and, hence, the dredge cut. The auger, in conjunction with an on-board pump, breaks up the sediment, mixes it with harbor water to form a slurry, and moves the material from the harbor bottom into the floating dredge pipeline, towards the booster pump station. The booster pumps provide additional hydraulic head to move the dredge slurry to the desanding facility.

Hydraulic dredging operations commenced on June 25, 2012. Two Ellicot Mudcat MC2000 dredges were initially installed in Dredge Areas L and, P. At the beginning of the 2012 season, hydraulic dredging efforts focused on the west side of Area L and the east side of Area P.

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Periodically, a progress bathymetric survey was conducted in the active dredge areas to assess in-situ volume dredged, compliance with the dredge plan and completeness of coverage.

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Progress bathymetric surveys were conducted July 7, July 21, August 4, and August 18, 2012.

2.3.3 Desanding Operations

2012 Desanding operations were conducted similarly to previous seasons.

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The pipeline reports the slurry onto an inclined, vibratory coarse shaker screen where solids larger than ¼ inches (in) are removed. The removed material is referred to as "oversize" and is dropped from the shaker onto an asphalt pad for stockpiling and draining. The remaining slurry is pumped through a hydrocyclone and an inclined, vibratory fine shaker screen. The fine screen removes solids larger than 200 mesh, primarily sand. The sand, like the oversize, is stockpiled to drain on the asphalt pad. The remaining desanded slurry is retained in an agitated mix tank and is transferred to the dewatering facility via a pump once a sufficient slurry volume has accumulated in the tank.

In preparation for disposal, the materials generated in the desanding process are characterized. All oversize material is assumed to be TSCA based on historical analytical results. Once approximately 100 tons (estimated by stockpile size) of sand has accumulated in a stockpile, it is sampled and analyzed for disposal purposes (PCB Aroclors, metals, oil and grease, and reactive cyanide). Every other time a sand sample is collected for chemical analysis a portion of the sample is submitted for grain size analysis. The grain size test gives an indication of the performance of the desanding operation. At NBH the sand is segregated by PCB TSCA determination. If a sand sample has been characterized as TSCA, the sand pile is mixed with the oversize material and stockpiled in the TSCA pile in the Debris Disposal Area (DDA). If the sand sample is non-TSCA (< 50 milligrams per kilogram [mg/kg] total PCB Aroclors) it is stockpiled in the non-TSCA pile in the DDA. In the final weeks of the season transportation and disposal (T&D) operations were commenced for the material generated at Area C. The T&D activities extended into the demobilization period until all the stockpiles had been disposed. A summary of all the routine chemical tests performed on the sand is presented as Table B-1. A summary of sand grain size results is presented on Table B-2.

2.3.4 Dewatering Operations

2012 Dewatering operations were conducted similarly to previous seasons. Desanded slurry is transferred from the Area C Desanding Facility via dual wall HDPE pipeline to the Area D Dewatering Facility using a Caterpillar C-9 275 horsepower booster pump. At Area D the slurry is stored in a series of agitated mix tanks, which keep the solids in suspension. Feed pumps transfer the slurry from the tanks to one of a bank of six plate and frame filter presses. Polymer is added to the slurry during the transfer process to enhance dewatering. The filter presses remove the majority of the water from the sediment producing a dewatered sediment referred to as filter cake. The water removed from the filter cake is pumped to a holding tank for treatment by the on-site waste water treatment plant. Once sufficient water has been removed from the filter cake CBI , the cake is dropped from the press onto a series of conveyors and transported to the load out area where it is stockpiled for transportation and disposal.

Production data can be found on the Sevenson Operational Monitoring Data table (Attachment C). A brief summary of filter cake production follows.

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Prior to the initiation of disposal activities a filter cake sample is collected and submitted to a laboratory for toxicity characteristic leaching procedure (TCLP) analysis, total PCB Aroclors, and RCRA characteristics. The TCLP results are reviewed and incorporated into the waste profile, the profile must be approved for the facility to accept the waste.

In order to create a running waste profile composite samples of the filter cake were collected and analyzed at a frequency of approximately one sample every 550 tons. The composite filter cake sampleswere analyzed for PCB Aroclors, metals, oil and grease, and reactive cyanide. Filter cake analytical results are summarized on Table B-4.

Samples were submitted for grain size analysis at a frequency of approximately one sample every 1,100 tons. Filter cake grain size results are reported on Table B-2.

2.3.5 Waste Water Treatment Plant Operations

2012 waste water treatment plant operations were conducted similarly to previous dredge seasons.

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As has been the practice since 2004, WWTP samples were collected and analyzed throughout the dredge season. The sampling frequency, methods and locations are described in detail in the Jacobs document *Field Sampling Plan New Bedford Harbor Superfund Site* (Jacobs 2012a). The basic sampling scheme involves intensive sampling at startup with the effort scaled back as the system proves to be effective and operating as designed. The influent and effluent samples were analyzed for PCB Aroclors, copper (Cu), chromium (Cr), cadmium (Cd), and lead (Pb). The midpoint sample, collected between the lead and lag GAC vessels, is analyzed for PCB Aroclors and Cu. Analytical results are presented on Table B-5. Water quality parameters are monitored, recorded and evaluated throughout the sampling process. Water quality parameters are measured with a calibrated YSI brand water quality meter equipped with a flow-through cell. Discrete midpoint and influent water quality parameters are collected manually just prior to sample collection. Effluent water quality parameters are collected every 15 minutes and stored electronically via the YSI auto logging feature during an effluent sampling event. Tabulated effluent water quality parameters are presented as Table B-6, and midpoint and influent water quality parameters are presented as Table B-7. Only the final stabilized influent and midpoint parameters collected just prior to sampling are tabulated. Water quality parameters monitored include temperature, specific conductivity, dissolved oxygen, pH and turbidity.

Influent analytical results and water quality parameters are evaluated to aid in determining GAC loading and to assess the performance of the dewatering process. Midpoint data is used to monitor the performance of the WWTP system prior to the lag GAC vessel. Elevated PCBs or other contaminants would indicate a treatment issue such as breakthrough or carbon channeling and would trigger further investigation by project engineers and WWTP personnel. Effluent data is compared to ROD project effluent water quality criteria (values listed in footer of Table B-5) and Massachusetts Class SB water quality parameters (applicable values listed in footer of Table B-6).

Influent - Influent analytical results and water quality parameters were similar to what has been observed in previous seasons. The influent sample is collected as a grab sample and therefore reflects conditions at the time of sampling.

Midpoint - Midpoint analytical testing during the 2012 season showed that Aroclors and Cu were present sporadically in the wastewater following the lead GAC vessels. It is suspected that some channeling of the carbon had occurred allowing contaminants to pass through untreated. An aggressive backwash regimen was performed on the vessels to correct any channeling. Following the aggressive backwash the WWTP system was returned to service. PCB Aroclor concentrations of 0.0077 and 0.015 micrograms per liter (µg/L) were again detected in the midpoint wastewater on July 19 and July 23, 2012, respectively. In an attempt to identify the vessel or vessels responsible for the Aroclor concentrations, the four GAC vessels were sampled on August 08, 2012. All sample results were below detection concentrations. Aggressive backwashing of the carbon vessels continued weekly until the completion of the dredging season. As effluent analytical testing indicated that treatment through the lag carbon vessels remained effective at reducing contaminant concentrations below project effluent water quality criteria, it was decided that no further corrective action was necessary to correct the midpoint breakthrough until the conclusion of 2012 activities. The midpoint sample is collected as a distinct grab sample and therefore reflects conditions at the time of sampling.

Effluent - Effluent analytical testing demonstrated that the WWTP system was performing as designed. Aroclor results were below detection limits for all sampling rounds. Metals results returned a few detections; however, with the exception of the first sample collected on June 25, 2012, all detections were below the ROD project effluent discharge criteria. The June 25 sample contained a Cr concentration of 118 µg/L (the limit is 50 µg/L). It is assumed that the elevated chromium was due to the use of City water to fill and flush the WWTP system at startup, since this same phenomenon has occurred at the startup of previous dredge seasons. Following the first effluent sample, all subsequent effluent samples contained metal concentrations below the ROD project effluent water quality criteria, and no corrective actions were deemed necessary. It should be noted that some turbidity values observed were negative. This does not necessarily reveal an issue with the water quality meter, as a negative turbidity value indicates that the water being measured is clearer than the water used as a zero turbidity standard during calibration. Prior to discharge the effluent is collected in a large volume equalization tank. This practice typically results in little variability with regards to effluent water quality. The observation of short duration spikes in turbidity, dissolved oxygen or other parameters may be indicative of air bubbles in the flow through cell. This should be investigated before any corrective action is taken on parameters alone. Table B-6 summarizes the 2012 effluent water quality data. A number of short duration spikes in the data are noted, and in order to identify statistical outliers, the Walsh's test for large sample sizes (EPA 2000) was used. The outliers are shaded red and have not been included in the calculation of the daily averages. Effluent samples are collected via a compositing auto-sampler programmed to collect sub-samples at discrete intervals over the course of a work day.

2.3.6 Transportation and Disposal

Transportation and disposal of waste generated at NBH has been conducted via truck and rail since 2005. Due to the anticipated 2012 season length it was decided that shipping via truck to rail was the most cost effective option. All material generated by dredging in 2012 at NBH was transported and disposed of by H&S Environmental, Inc. and their subcontractor, EQ Northeast, Inc.

TSCA sand and oversize material generated at Area C was loaded from gravity drained stockpiles into trucks at Area C in preparation for transportation to a rail trans-load facility in Worcester, MA. From Worcester the material was shipped under manifest via rail to an approved TSCA landfill in Romulus, Michigan. A total of 90 trucks were loaded with TSCA sand at Area C for transportation to Worcester during 2012. A summary of 2012 TSCA waste shipments from Area C is provided as Table D-1.

Non-TSCA sand generated at Area C was loaded from gravity drained stockpiles into trucks at Area C for transportation to a rail trans-load facility in Worcester, MA. From Worcester the material was shipped under manifest via rail to an approved non-hazardous landfill in Niagara Falls, New York. A total of 21 trucks were loaded with non-hazardous sand at Area C for transportation to Worcester during 2012. A summary of 2012 non-TSCA waste shipments from Area C is provided as Table D-2.

TSCA waste generated at the Area D Dewatering Facility was loaded from filter cake stockpiles into trucks at Area D for transportation to a rail trans-load facility in Worcester, MA. From Worcester the material is shipped under manifest via rail to an approved TSCA landfill in Romulus, Michigan. A total of 384 trucks were loaded with filter cake at Area D for transportation to Worcester during 2012. A summary of 2012 TSCA waste shipments from Area D is provided as Table D-3.

2.4 AIR MONITORING

Ambient air monitoring was conducted during 2012, similarly to how it has been conducted from 2004 to 2012. Ambient air samples were collected by EPA Method TO-10A. The samples were then analyzed by EPA Method 1668A for PCB Homologues via high resolution gas chromatography/mass spectroscopy.

The air quality monitoring program in 2012 was conducted to monitor remedial activities which included hydraulic dredging in Areas L and P. Based on the dredging locations and activities, various locations were selected for air monitoring. Figure E-1 shows the monitoring locations used for the 2012 season. Station locations used for the 2012 dredging season included: 24 (Aerovox), 55 (Aerovox West), 30 (Fibre Leather), 42 (NSTAR North), 43 (Veranda Avenue), 46 (Coffin Avenue), 49 (Area C Downwind), 50 (Area D Downwind), 53 (Dredge), 62 (Century House), 25 (Manomet Street), and 27 (Porter Street). The new location (27) was added for the 2012 season at the request of EPA to monitor ambient PCB concentrations on the east side of Areas L and P. The 24-hour time-weighted average PCB concentrations were collected from all locations with the exception of the dredging station (53), which was sampled during the dredging hours to a maximum of eight hours for the day. The air sampling at the monitoring stations began during the day's dredging activities, and terminated the next day (24 hours later).

One round of pre-dredge sampling was completed before the 2012 season mobilization activities on May 21, 2012 at Stations 24, 25, 27, and 62. Two monthly rounds of samples were collected in 2012 during hydraulic dredging activities on the following dates: July 16, and August 21. A post-dredge round of samples was collected at all locations except 53 on October 1, 2012, after the completion of the dredging season, demobilization and winterization activities.

Air monitoring data collected as part of the 2012 dredging season show that in general the most elevated concentrations of total PCBs were detected during the periods of active dredging (Table E-1). The highest concentrations were found at the air monitoring stations on the dredge (53) and Aerovox (24) with maximum concentrations of 280 and 220 nanograms per cubic meter of air (ng/m^3), respectively. Air monitoring from the previous season was documented in the Jacobs document *Draft 2011 Ambient Air Monitoring Report, New Bedford Harbor Superfund Site* (Jacobs 2013). The air monitoring report includes an assessment of worker and public exposure to PCBs at a number of air sampling stations. The exposure is measured by the EPA developed Public Exposure Tracking System (PETS) curves.

Modeling of PCB concentrations in air has also been performed as a means of quantifying the impacts of ambient PCBs on air quality. The modeling effort, at the direction of EPA, is a continuation of modeling efforts by Jacobs (since 2004) and previously by other contractors. NBH modeling utilizes sampling and meteorology data as inputs to the EPA developed Industrial Source Complex Model (ISC3) to predict the dispersion of PCBs in air from such scenarios as dredging activities, proposed CAD cell development, and continued exposure of tidal mud flats. The most recent summarization of NBH air modeling is documented in the Jacobs August 2012 document *Draft Air Dispersion Modeling of 2012 Dredging Operations, New Bedford Harbor Superfund Site, MA* (Jacobs 2012e).

2.5 DEMOBILIZATION

Demobilization activities commenced on September 10, 2012 and were completed on September 19, 2012. Demobilization was conducted similar to past seasons.

A brief list of the major activities conducted as a part of demobilization is presented below:

- flushing all dredge lines;
- disassembly and storage of all booster pump related equipment and materials;
- restoration to pre-dredge conditions at booster pump site;

- removal and storage of all cables from dredge areas;
- removal and storage of select sheet piles from the harbor;
- disassembly and storage of all dredge pipelines up to the Area C fence line;
- removal of all boats, scows and dredges from the water;
- flushing of the WWTP system;
- wash down of Desanding plant;
- wash down of Dewatering plant; and
- draining of all piping systems that are not in a heated area or freeze protected.

2.6 POST-DREDGE ACTIVITIES

2.6.1 Post-Dredge Bathymetric Survey

Following the cessation of dredge activities in a dredge area for a field season a post-dredge bathymetric survey is typically conducted. The purpose of a post-dredge bathymetric survey is to assess the compliance of the actual field work with the dredge plan and to calculate the volume of in-situ material removed.

CRE performed the post-dredge bathymetric surveys in a manner similar to post-dredge surveys performed in the past for Jacobs at NBH.

The post-dredge bathymetric survey was conducted in Dredge Areas L and P on September 20 and September 21, 2012. The dredge plan compliance and final in-situ volume dredged were calculated and reported in a project Quality Control Report, *Final Dredge Accuracy 2012 New Bedford Harbor Superfund Site* (Attachment A-1).

2.6.2 Post-Dredge Sediment Sampling

Post-dredge sediment samples are collected and analyzed following dredging to assess the amount of residual PCB contamination remaining in situ (typically the surficial 0.5 ft). Sediment samples are also evaluated and described geologically for soil types, color and consistence.

Post-dredge sediment cores were collected from Dredge Areas P and L by Woods Hole Group (WHG) for NAE on October 15 through October 18, 2012. The majority of the 2012 post-dredge cores were collected at locations where pre-dredge samples had been collected. Following the collection of the cores, WHG split, described and sampled the cores for PCB congener analysis. The analytical results and OL thicknesses are illustrated on Figures A-10 and A-11. More detailed information on post-dredge sediment cores collected in 2012 by WHG can be found in the upcoming WHG document *Draft Sediment Monitoring Summary Report, 2012 Remedial Dredging, New Bedford Harbor Superfund Site*

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3.0 MASS BALANCE

The 2012 mass balance calculations represent a high level assessment of the primary treatment process conducted at NBH, dredging contaminated sediment and separating the solids from the liquids for further treatment or disposal. The major components of this process are as follows:

- dredge and pump sediment slurry from the dredge areas via slurry pipeline to Area C;
- inject ferric sulfate into slurry pipeline to treat hydrogen sulfide gas;
- introduce City water to the process from booster pump seal water, wash down water and polymer make-up water;
- separate wet solid oversize material from slurry using desander coarse screen shaker (≥ 1/4 in);
- separate wet solid sand from the slurry using desander hydrocyclones that report wet solids (primarily sand) from slurry onto the desander 200-mesh screens;
- separate wet sand (≥ 0.0029 in) from residual silt and clays on the 200-mesh inclined vibratory screens, the sand passes over the screens and drops to the floor for stockpiling, finer materials pass through the screen with the water and the resultant slurry is pumped to the Dewatering Facility;
- add polymer flocculent to increase dewatering efficiency;
- separate wet solid sediment from slurry using Dewatering Facility filter presses; and
- separate residual solids from waste water using the Area D WWTP, recycling solids back to the filter press feed tanks, and discharging treated water to New Bedford Harbor.

The information used to present and calculate the mass balance data is derived from a number of sources. The monitoring data such as totalized flow meter readings, percent solids measurements, solids quantity estimates and chemical additive quantities is based on the Sevenson Operational Monitoring Data table (Attachment C). The table is updated and distributed daily throughout the dredge season. Water balance information is based on flow meter readings and usage estimates from historical measurements. Water added to the treatment system is tabulated by use and points of addition (Table F-1). Solids balance information is based on Area C weigh scale data and filter cake production (Attachment C). It should be noted that the sand weights in Attachment C differ from those presented in Attachment D, and that the Attachment C weights are that of the sand as it is removed from the Desanding Facility for stockpiling. The Attachment D weights are the weights at the time of disposal.

3.1 SOLID BALANCE

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3.2 WATER BALANCE

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3.3 PREDICTED PRODUCTION QUANITITIES VERSUS ACTUAL PRODUCTION QUANTITIES

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3.4 PCBS REMOVED

Table F-4 provides an estimate of the mass of PCB Aroclors removed from the harbor by dredging in 2012. The following paragraph describes how the amount of PCBs removed is calculated. First, the average PCB Aroclor concentrations and average percent solids values used for the calculation were determined from the analytical data presented in Table B-1 (sand) and Table B-4 (filter cake). Using the average percent solids value for a particular material and the scale weighed wet weight (Attachment D) of that material the dry weight is calculated. The next step is to take the dry material weight and average material Aroclor concentration and convert all values to similar units (kilograms). The dry weight of material and average Aroclor concentration are then multiplied to yield kilograms of PCB Aroclors. This value is then converted to tons. The PCB mass removed calculations have been performed for previous dredge seasons. Table F-5 provides a cumulative summary of PCB Aroclors removed via dredging by the Jacobs team since 2004.

While it is believed that the methods used to determine the amount of PCBs removed is accurate, there are several factors that may bias the measurement:

- the oversize material generated on the coarse screen is not analyzed for PCBs; for estimating purposes, its weight is added to the sand and the average sand PCB concentration is applied;
- concentration variations inherent in sampling or compositing;
- PCBs removed by the WWTP are not measured;
- variations in material affecting percent solids;
- differences in the material weight due to draining or evaporation between the time of sample collection and weighing of trucks.

Attachment G provides a brief summary of NBH production metrics; Table G-1 summarizes 2012 production while Table G-2 provides a production summary since the beginning of NBH dredging activities by the Jacobs/SES team in 2004.

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4.0 LESSONS LEARNED

This section evaluates the field execution of the project and different ways that improvements can be made to enhance safety, efficiency or reliability. The inclusion of an idea as a lesson learned does not guarantee that it will be carried forth but means that it warrants closer examination. Only after evaluating the cost, implementability and practicality can it be determined if a lessons learned will become a routine practice at the site. A tabulated list of lessons learned developed over the 2012 season is included as Attachment H.

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5.0 NON-DREDGING SCOPE OF WORK

5.1 AREA D IMPROVEMENTS

5.1.1 Building Lighting

Prior to the initiation of mobilization activities, the ceiling lights in the dewatering building above the filter presses were removed and replaced. The original sodium vapor lights, while effective, required a warm up period to reach full brightness and consumed more power than equivalent systems now available. A new fluorescent lighting system was installed over the presses. These lights were found to consume significantly less power, reach full brightness instantly, and provide better lighting. Following the 2012 dredge season Jacobs has begun work on replacement of the lighting system in the load-out and WWTP portions of the building.

5.1.2 Building Maintenance

During the off season Jacobs performed routine building maintenance at the Area D building. Work included repainting the floor in the load-out area, reapplying non-skid paint in walking areas, and repairing or replacing of facilities equipment as needed.

5.1.3 Maintenance of Institutional Controls

As a part of the Superfund remedy, institutional controls such as fencing, informational kiosks and signage are installed at access points to the harbor around the NBH site. Jacobs, at the direction of EPA/NAE, routinely replaces damaged or missing signage, repairs fencing and gates, and updates information on the kiosks. The institutional controls are maintained under the NBH Operations and Maintenance contract.

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6.0 SUMMARY OF 2012 ACTIVITIES

Attachment I provides a detailed list of major events, submittals and activities conducted by Jacobs at NBH during the 2012 calendar year.

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7.0 REFERENCES

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ATTACHMENT A
Figures

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ATTACHMENT B

Analytical Data Summary

Table B-1
2012 Summary of Area C Sand Analytical Data

Sample ID	Control Number	Total Aroclors (mg/kg)	Oil and Grease (ppm)	Antimony (mg/kg)	Arsenic (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Thallium (mg/kg)	Zinc (mg/kg)	Total Cyanide (mg/kg)	% Solids
V1-062912	NB-P012201	5.5J	380	0.05U	1.2	0.11J	0.23J	9.9	30.2	42.9	0.06	4.6	0.12U	0.09J	0.1U	38.1	0.22U	84
V1-071012	NB-P012301	7.8J	340	0.05UJ	1.3	0.1J	0.16J	7.9	21.4	13.9J	0.03	2.6	0.12U	0.06J	0.06U	26.2	0.22U	90
V1-071312	NB-P013201	8.3J	360	0.06UJ	1.7	0.12J	0.22J	9.5	19.4	11.5	0.05	3.0	0.16UJ	0.16J	0.09J	28.8	0.22U	84
V1-071712	NB-P013301	12.3J	610	0.05U	1.7	0.14J	0.44	15.5	30.6	24.0	0.06	5.6	0.34U	0.21U	0.19J	45.2	0.27U	80
V1-072012	NB-P013901	25J	2500	0.29J	2.8	0.21J	0.88	45.5	104	164	0.48	13.5	0.17U	0.85J	0.13J	172	0.6	83
V1-073112	NB-P014001	42	2200	0.75	2.5	0.24J	0.84	29.3	90.2	144	0.40	11.4	0.56J	0.73J	0.07UJ	158	0.22U	82
V1-080812	NB-P014601	15	2100	4.2	2.4	0.16J	0.64	16.5	184	537	1.6	10.5	0.65U	0.83J	0.14J	224	0.22U	84
V1-081712	NB-P015101	13.9	1500	14.8	3.2	0.20J	0.64	20.0	198	637	0.19J	9.8	0.15U	0.44J	0.13U	333	0.24U	86
V1-082512	NB-P015201	47	3400	0.81	2.4	0.23J	1.8	37.9	97.1	320	0.27	15.7	0.51J	0.81J	0.07UJ	211	0.29UJ	77
V1-083012	NB-P015301	28J	2100	0.6UJ	2.2	0.16J	0.51	18.5	165	144J	0.02J	9.8	0.30J	0.24J	0.09J	104	0.22UJ	90
V1-091012	NB-P015401	4.8	730	0.14J	1.2	0.13J	0.3J	10.7	38.2	59.9	0.07	5.2	0.13U	0.14J	0.06U	55.6	0.22U	88

Notes:
Composite sand samples collected approximately every 100 tons.
Oil and grease originally reported on a percent by weight basis; converted to parts per million (ppm).
"J" qualifier indicates estimated data.
"U" qualifier indicates analyte not detected above method detection limit (MDL).
"UJ" qualifier indicates analyte not detected above estimated MDL.
mg/kg = milligrams per kilogram
ppm = parts per million
% = percent

NA = data not yet available

Table B-2
2012 Area C and D Sieve Samples Geotechnical Summary

Area C			
Desander Spoils			
Sample ID	% Gravel	% Sand	% Silt and Clay
V1-071012	4.1	85.3	10.6
V1-071712	0.3	79.3	20.4
V1-072012	0.5	84.2	15.3
V1-080812	0.2	81.0	18.8
V1-082512	0.6	85.0	14.4
V1-091012	0.2	92.2	7.6
Average	**1.0**	**84.5**	**14.5**

Area D			
Filter Cake			
Sample ID	% Gravel	% Sand	% Silt and Clay
V2-062812	0.0	3.6	96.4
V2-070312	0.0	4.9	95.1
V2-071012	0.0	4.6	95.4
V2-071612	0.0	3.7	96.3
V2-072012	0.0	3.4	96.6
V2-072612	0.0	2.1	97.9
V2-080112	0.0	3.9	96.1
V2-080712	0.0	6.9	93.1
V2-081312	0.0	3.4	96.6
V2-081712	0.0	8.0	92.0
V2-082312	0.0	3.4	96.6
V2-090712	0.0	3.2	96.8
Average	**0.0**	**4.3**	**95.7**

Notes:
Samples evaluated via ASTM method D422.
Desander spoils refers to material generated on the #200 mesh shaker screen.
% = percent

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Table B-4
2012 Summary of Analytical Data for Area D Filter Cake

Sample ID	Control Number	Drops		Total Aroclors (mg/kg)	Oil and Grease (ppm)	Antimony (mg/kg)	Arsenic (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Thallium (mg/kg)	Zinc (mg/kg)	Total Cyanide (mg/kg)	% Solids
V2-062712	NB-P011701	1	55	78J	4,100	0.19U	9.9	0.80	6.2	184	462	252	0.01U	37.9	1.6	2.1	0.56U	660	0.29U	62
V2-062812	NB-P011801	56	110	92J	3,200	0.24U	10.9	0.83	7.7	216	586	325	1.7	46.6	1.6	2.6	0.38U	866	0.33U	60
V2-063012	NB-P011901	111	165	144J	7,800J	0.3UJ	14.6	0.93	12.8	349	1020	584	2.3	63.4	1.4J	4.4	0.86U	1,590	0.36U	60
V2-070312	NB-P012001	166	220	183J	7,200J	0.36U	12.5	0.84	11.4	277	784	481	2.0J	54.3	1.1J	3.0	0.89U	1,210	0.33U	62
V2-070612	NB-P012101	221	275	130J	5,700J	0.38U	11.1	0.81	8.1	230	600	326	1.5J	41.0	1.5	2.1	0.36J	861	0.33U	64
V2-071012	NB-P012901	276	330	65	1,300	0.1U	9.8	0.87	5.0	154	294	143	0.5	29.6	0.79J	1.0J	0.22U	399	0.29U	64
V2-071112	NB-P013001	331	385	60J	1,000	0.13UJ	10.0	0.87	4.0	125	210	95.9	0.31	27.6	0.32U	1.3J	0.44J	271	0.31U	64
V2-071612	NB-P013101	386	440	43J	2,300	0.08UJ	10.7	0.89	5.4	170	335	156	0.66	33.2	0.97J	1.6	0.17J	452	0.33U	64
V2-071712	NB-P013401	441	495	115J	5,200	0.16UJ	12.4	0.90	8.7	260	541	265	0.93	46.9	0.41J	2.7	0.37J	689	0.36U	62
V2-072012	NB-P013501	496	550	70J	2,200	0.08UJ	11.5	0.95	7.0	213	473	266	1.0	42.9	1.0U	2.2	0.1U	636	0.33U	62
V2-072312	NB-P013601	551	605	124	6,500	0.65J	11.4	0.86	11.6	285	656	452	2.1	63.3	0.39J	3.3	1.2U	1,050	0.36U	61
V2-072612	NB-P014101	606	660	187J	10,000	1.2	13.4	0.84	15.3	362	950	656	3.0	72.5	0.79J	4.1	1.3J	1,640	0.36U	60
V2-073012	NB-P014201	661	715	97	6,200	0.84	3.7	0.35J	1.3	40.1	153	198	0.55	18.7	0.98UJ	0.73J	0.19J	240	0.33U	61
V2-080112	NB-P014301	716	770	43	2,600	0.62U	12.4	0.88	7.1	206	425	216	1.0	38.9	0.87J	2.0	0.38U	567	0.31U	63
V2-080312	NB-P014401	771	825	106J	680	0.33U	11.2	0.88	4.7	152	254	102	0.41	29.0	1.1J	1.6	0.28U	301	0.33U	64
V2-080712	NB-P014501	826	880	44	9,100	2.6	16.2	0.89	13.1	295	927	791	2.7	60.7	1.6	3.8	0.56U	1,650	0.31U	62
V2-080912	NB-P015701	881	935	155J	6,200	3.6	17.5	0.97	13.1	303	969	965	3.4	64.9	1.9	4.1	0.65U	1,780	0.42U	55
V2-081312	NB-P015801	936	990	118J	6,600	3.4J	14.8	0.89	9.8	238	750	818	1.8J	52.5	2.2	2.9J	0.68U	1,330	0.36U	61
V2-081512	NB-P015901	991	1045	136J	7,100	3.5J	15.1	0.94	10.8	263	779	763	1.9J	56.0	2.0	3.0J	0.69U	1,380	0.36U	62
V2-081712	NB-P016001	1046	1100	119	6,600	2.4J	13.8	0.89	9.6	254	717	580	1.6J	49.4	2.0	2.8J	0.73J	1,180	0.33U	63
V2-082112	NB-P016101	1101	1155	176J	9,600	1.4	12.5	0.83	17.9	434	960	494	2.1	74.3	1.1J	4.5	0.69U	1,340	0.77J	62
V2-082312	NB-P016201	1156	1210	266J	16,000	1.8	14.4	0.87	23.9	576	1280	634	2.2	98.0	1.4	5.8	0.85U	1,720	1.3J	62
V2-082912	NB-P016301	1211	1265	305J	12,000	1.1J	15.2J	0.93	24.7	549J	1270	841J	0.17	112J	1.7J	5.6	0.58J	1,940J	0.91J	63
V2-090712	NB-P016401	1266	1320	76	3,900	0.95J	12.4	0.89	10.6	290	625	387	1.3	56.6	0.51J	2.5	0.20UJ	790	0.36U	64
V2-091012	NB-P016501	1321	1357	35	910	0.27J	10.0	0.87	5.3	179	356	124	0.45	31.8	0.93J	1.2J	0.10UJ	356	0.36U	63

Notes:
Composite filter cake samples collected approximately every 550 tons.
Oil and grease originally reported on a percent by weight basis; converted to parts per million (ppm).
"J" qualifier indicates estimated data.
"U" qualifier indicates analyte not detected above method detection limit (MDL).
"UJ" suffix indicates analyte not detected above estimated MDL.
mg/kg = milligrams per kilogram
ppm = parts per million
% = percent

Table B-5
2012 Summary of Waste Water Treatment Plant Analytical Results

Sample Date	COC #	Influent					Midpoint		Effluent				
		Aroclor (µg/L)	Cu (µg/L)	Cd (µg/L)	Cr (µg/L)	Pb (µg/L)	Aroclor (µg/L)	Cu (µg/L)	Aroclor (µg/L)	Cu (µg/L)	Cd (µg/L)	Cr (µg/L)	Pb (µg/L)
6/25/2012	NB-P0112	2.1	28.6	1.6J	5.5J	10.5	0.048U	3.7J	0.048U	2.8J	1.5J	118	5.4U
6/26/2012	NB-P0113								0.048U	2.0J	1.4J	8.3J	5.4U
6/27/2012	NB-P0114	2.1	9.3J	1.3J	0.62J	5.4U	0.028J	3.8J	0.047U	1.8J	1.7J	8.0J	5.4U
6/28/2012	NB-P0115								0.047U	1.8J	1.8J	4.5J	5.4U
6/29/2012	NB-P0116	3.0	8.3J	1.1J	3.1J	6.2J	0.038J	4.8J	0.048U	2.0J	1.3J	3.5J	5.4U
7/3/2012	NB-P0126						0.049U	2.3J	0.048U	2.2J	1.2J	2J	5.4U
7/9/2012	NB-P0128						0.047U	2.3J	0.047U	2.2J	0.046U	5.5	0.21U
7/19/2012	NB-P0137						0.0077J	3J	0.048U	1.9J	1.3J	21.9	5.4U
7/23/2012	NB-P0138						0.015J	2.3J	0.048U	2.2J	1.2J	2J	5.4U
8/15/2012	NB-P0148	4.2J	7.9J	1J	2J	6J	0.048U	3.4J	0.048U	2.3J	1.1J	4.5J	5.4U
9/5/2012	NB-P0173	3.3	4.9J	1.9J	0.84U	5.1J	0.26	4.3U	0.048U	4.3U	1.0J	0.84U	9.8U
Field Duplicate													
7/3/2012	NB-P0126								0.048U	2.5J	1.4J	7.9J	5.4U

ROD discharge goals:
PCB Aroclor = 0.065 µg/L
Cu = 5.6 µg/L
Cd = 9.3 µg/L
Cr = 50 µg/L
Pb = 8.5 µg/L
Discharge limits applied to the monthly average.

Notes:
"J" qualifier indicates estimated data.
"U" qualifier indicates analyte not detected above method detection limit (MDL).
µg/L = micrograms per liter

Table B-6
2012 WWTP Effluent Water Quality

Date	Time	Temperature (ºC)	Specific Conductivity (µS/MS)[1]	pH	Turbidity (NTU)[1]	Dissolved Oxygen (mg/L)[1]
6/25/2012	8:16	24.50	NA[2]	6.62	-2.7	6.06
6/25/2012	8:31	24.86	NA	6.61	-3.5	5.97
6/25/2012	8:46	24.90	NA	6.60	-3.6	5.69
6/25/2012	9:01	25.00	NA	6.75	-3.0	7.84
6/25/2012	9:03	24.95	NA	6.56	22.1	5.84
6/25/2012	9:18	24.97	NA	6.53	-4.5	5.90
6/25/2012	9:33	24.95	NA	6.53	18.5	5.99
6/25/2012	9:48	24.91	NA	6.54	-4.0	5.75
6/25/2012	10:03	24.91	NA	6.55	-3.8	5.77
6/25/2012	10:18	24.95	NA	6.56	-3.6	7.70
6/25/2012	10:33	24.98	NA	6.57	91.7	5.95
6/25/2012	10:48	25.04	NA	6.57	-3.6	5.84
6/25/2012	11:03	25.06	NA	6.58	-3.6	5.68
6/25/2012	11:18	25.17	NA	6.59	-3.5	5.69
6/25/2012	11:33	25.12	NA	6.59	-3.8	5.66
6/25/2012	11:48	25.09	NA	6.59	-3.8	5.69
6/25/2012	12:03	25.00	NA	6.59	-3.8	5.66
6/25/2012	12:37	24.90	NA	6.64	-4.1	5.90
6/25/2012	12:52	25.06	NA	6.61	-3.9	5.73
6/25/2012	13:07	24.98	NA	6.60	-3.9	5.66
6/25/2012	13:22	24.90	NA	6.60	7.0	5.69
6/25/2012	13:37	24.83	NA	6.60	-3.9	5.60
6/25/2012	13:52	24.74	NA	6.60	-3.9	5.56
Daily Average		**24.95**	**NA**	**6.59**	**2.99**	**5.95**

Table B-6
2012 WWTP Effluent Water Quality

Date	Time	Temperature (ºC)	Specific Conductivity (µS/MS)[1]	pH	Turbidity (NTU)[1]	Dissolved Oxygen (mg/L)[1]
6/26/2012	8:00	24.42	NA	6.59	-2.00	6.22
6/26/2012	8:15	24.39	NA	6.66	-2.90	6.03
6/26/2012	8:30	24.34	NA	6.66	-2.80	6.03
6/26/2012	8:45	24.53	NA	6.67	5.80	6.31
6/26/2012	9:00	24.64	NA	6.65	-2.70	6.04
6/26/2012	9:15	24.69	NA	6.63	-3.00	5.86
6/26/2012	9:30	24.76	NA	6.61	-2.60	6.09
6/26/2012	9:45	24.71	NA	6.61	-2.90	5.92
6/26/2012	10:00	24.63	NA	6.61	-3.10	6.01
6/26/2012	10:15	24.52	NA	6.60	-2.50	6.00
6/26/2012	10:30	24.41	NA	6.61	35.90	6.00
6/26/2012	10:45	24.34	NA	6.61	9.10	6.11
6/26/2012	11:00	24.29	NA	6.61	13.50	5.84
6/26/2012	11:15	24.25	NA	6.62	-3.50	5.89
6/26/2012	11:30	24.21	NA	6.64	91.10	5.83
6/26/2012	11:45	24.20	NA	6.64	-3.40	5.82
6/26/2012	12:00	24.17	NA	6.66	3.70	5.86
6/26/2012	12:15	24.19	NA	6.67	57.10	5.80
6/26/2012	12:30	24.20	NA	6.68	80.30	5.76
6/26/2012	12:45	24.24	NA	6.71	-0.90	5.70
6/26/2012	13:00	24.26	NA	6.75	-3.00	5.71
6/26/2012	13:15	24.17	NA	7.21	-2.20	8.00
6/26/2012	13:30	24.26	NA	6.80	-2.30	5.65
6/26/2012	13:45	24.26	NA	6.82	-1.70	5.63
6/26/2012	14:00	24.27	NA	6.82	44.40	5.51
6/26/2012	14:15	24.26	NA	6.84	67.40	5.60
6/26/2012	14:30	24.24	NA	6.86	-0.60	5.57
6/26/2012	14:45	24.26	NA	6.86	-0.20	5.62
6/26/2012	15:00	24.28	NA	6.86	2.80	5.51
6/26/2012	15:15	24.30	NA	6.87	0.00	5.52
6/26/2012	15:30	24.32	NA	6.88	-0.30	5.44
6/26/2012	15:45	24.30	NA	6.88	-0.20	5.41
6/26/2012	16:00	24.30	NA	6.89	77.70	5.49
6/26/2012	16:15	24.28	NA	6.90	-1.20	5.47
6/26/2012	16:30	24.32	NA	6.91	-1.40	5.46
6/26/2012	16:45	24.37	NA	6.92	6.30	5.49
6/26/2012	17:00	24.37	NA	6.94	-0.80	5.52
6/26/2012	17:15	24.38	NA	6.96	-1.20	5.47
6/26/2012	17:30	24.34	NA	6.98	0.50	5.51
6/26/2012	17:45	24.27	NA	6.99	0.80	5.45
6/26/2012	18:00	24.25	NA	7.05	1.60	5.43
6/26/2012	18:15	24.23	NA	7.03	7.30	5.62
6/26/2012	18:30	24.19	NA	7.04	2.30	5.56
Daily Average		**24.34**	**NA**	**6.79**	**10.70**	**5.79**

Table B-6
2012 WWTP Effluent Water Quality

Date	Time	Temperature (ºC)	Specific Conductivity (µS/MS)[1]	pH	Turbidity (NTU)[1]	Dissolved Oxygen (mg/L)[1]
6/27/2012	7:43	23.77	NA	6.99	1.5	5.99
6/27/2012	7:58	23.68	NA	7.21	-0.1	8.28
6/27/2012	8:13	23.90	NA	6.95	2.6	5.94
6/27/2012	8:28	23.85	NA	6.95	15.1	5.93
6/27/2012	8:43	23.87	NA	6.93	4.4	5.82
6/27/2012	8:58	23.75	NA	6.94	4.6	5.84
6/27/2012	9:13	23.77	NA	6.94	5.6	5.83
6/27/2012	9:28	23.73	NA	6.93	104.4	6.01
6/27/2012	9:43	23.71	NA	6.93	6.2	5.80
6/27/2012	9:58	23.73	NA	6.94	6.6	5.81
6/27/2012	10:13	23.71	NA	6.95	101.0	5.87
6/27/2012	10:28	23.69	NA	6.96	5.1	5.85
6/27/2012	10:43	23.68	NA	6.95	3.2	5.72
6/27/2012	10:58	23.70	NA	6.97	2.3	5.88
6/27/2012	11:13	23.78	NA	6.95	1.3	5.75
6/27/2012	11:28	23.84	NA	6.95	0.8	5.75
6/27/2012	11:43	23.87	NA	6.95	0.5	5.78
6/27/2012	11:58	23.85	NA	6.95	8.5	5.82
6/27/2012	12:13	23.81	NA	6.95	-0.4	5.76
6/27/2012	12:28	23.74	NA	6.96	-1.1	5.81
6/27/2012	12:43	23.68	NA	6.95	-1.5	5.81
6/27/2012	12:58	23.62	NA	6.96	-2.0	5.81
6/27/2012	13:13	23.57	NA	6.96	-1.9	5.84
6/27/2012	13:28	23.54	NA	6.97	11.2	5.93
6/27/2012	13:43	23.52	NA	6.98	-2.2	5.81
6/27/2012	13:58	23.53	NA	7.09	0.0	8.15
6/27/2012	14:13	23.57	NA	6.99	-2.2	5.84
6/27/2012	14:28	23.62	NA	6.99	-2.2	5.82
6/27/2012	14:43	23.66	NA	7.00	-2.4	5.75
6/27/2012	14:58	23.77	NA	7.01	119.1	5.84
6/27/2012	15:13	23.87	NA	7.02	-2.1	5.87
6/27/2012	15:28	23.94	NA	6.98	-2.7	5.71
6/27/2012	15:43	24.01	NA	6.95	-2.8	5.63
6/27/2012	15:58	24.07	NA	6.93	-2.9	5.63
6/27/2012	16:40	24.22	NA	6.93	12.1	5.78
6/27/2012	16:40	24.22	NA	6.93	13.6	5.76
6/27/2012	16:55	24.28	NA	6.91	-4.6	5.54
6/27/2012	17:10	24.35	NA	6.92	-4.5	7.44
6/27/2012	17:25	24.44	NA	6.92	-4.4	5.54
6/27/2012	17:40	24.49	NA	6.92	-4.4	5.32
6/27/2012	17:55	24.52	NA	6.93	-4.1	5.51
6/27/2012	18:10	24.52	NA	6.94	-3.5	5.52
Daily Average		**23.87**	**NA**	**6.96**	**8.99**	**5.93**

Table B-6
2012 WWTP Effluent Water Quality

Date	Time	Temperature (^oC)	Specific Conductivity (µS/MS)[1]	pH	Turbidity (NTU)[1]	Dissolved Oxygen (mg/L)[1]
6/28/2012	7:40	24.19	NA	7.05	10.7	5.87
6/28/2012	7:55	24.22	NA	7.08	-1.6	5.71
6/28/2012	8:10	24.21	NA	7.06	-0.9	5.65
6/28/2012	8:25	24.22	NA	7.05	0.4	5.66
6/28/2012	8:40	24.23	NA	7.00	0.0	5.65
6/28/2012	8:55	24.20	NA	6.98	-0.4	5.57
6/28/2012	9:10	24.20	NA	6.96	3.8	5.60
6/28/2012	9:25	24.19	NA	6.95	0.2	5.85
6/28/2012	9:40	24.18	NA	6.93	-1.3	5.51
6/28/2012	9:55	24.19	NA	6.92	-1.1	5.54
6/28/2012	10:10	24.18	NA	6.92	-1.2	5.50
6/28/2012	10:25	24.20	NA	6.92	-1.1	5.45
6/28/2012	10:40	24.23	NA	6.91	-1.2	5.48
6/28/2012	10:55	24.25	NA	6.92	13.3	5.55
6/28/2012	11:10	24.26	NA	6.92	-1.1	5.48
6/28/2012	11:25	24.29	NA	6.91	-1.3	5.46
6/28/2012	11:40	24.28	NA	7.04	-1.3	7.91
6/28/2012	11:55	24.38	NA	6.91	-1.2	5.44
6/28/2012	12:10	24.41	NA	6.95	10.0	5.67
6/28/2012	12:25	24.50	NA	6.91	-1.1	5.41
6/28/2012	12:40	24.54	NA	6.91	-1.2	5.37
6/28/2012	12:55	24.57	NA	6.91	12.4	5.39
6/28/2012	13:10	24.59	NA	6.91	-1.3	5.34
6/28/2012	13:25	24.64	NA	6.90	0.6	5.35
6/28/2012	13:40	24.68	NA	6.90	-1.5	5.33
6/28/2012	13:55	24.74	NA	6.90	-1.6	5.31
6/28/2012	14:10	24.82	NA	6.89	-1.5	5.32
6/28/2012	14:25	24.89	NA	6.89	-2.0	5.28
6/28/2012	14:40	24.94	NA	6.88	-1.9	5.30
6/28/2012	14:55	24.98	NA	6.88	-2.2	5.25
6/28/2012	15:10	25.02	NA	6.89	-2.4	5.27
6/28/2012	15:25	25.06	NA	6.89	-2.3	5.28
6/28/2012	15:40	25.09	NA	6.90	23.9	5.33
6/28/2012	15:55	25.12	NA	6.94	3.8	7.35
6/28/2012	16:10	25.17	NA	6.91	-2.5	5.30
6/28/2012	16:25	25.21	NA	6.92	-2.3	5.31
6/28/2012	16:40	25.28	NA	6.92	223.5	5.39
6/28/2012	16:55	25.33	NA	6.90	-2.5	5.20
6/28/2012	17:10	25.33	NA	6.90	-2.5	5.14
6/28/2012	17:25	25.26	NA	6.90	-2.3	5.16
6/28/2012	17:40	25.20	NA	6.89	-2.1	5.22
6/28/2012	17:55	25.22	NA	6.89	-2.0	5.18
6/28/2012	18:10	25.25	NA	6.89	-2.1	5.13
6/28/2012	18:25	25.30	NA	6.89	-2.1	5.10
Daily Average		**24.66**	**NA**	**6.93**	**5.67**	**5.51**

Table B-6
2012 WWTP Effluent Water Quality

Date	Time	Temperature (°C)	Specific Conductivity (µS/MS)[1]	pH	Turbidity (NTU)[1]	Dissolved Oxygen (mg/L)[1]
6/29/2012	7:35	24.65	40636	6.87	0.2	5.93
6/29/2012	7:50	25.02	39718	6.99	126.3	6.55
6/29/2012	8:05	25.07	40294	7.00	-1.5	6.86
6/29/2012	8:20	25.08	38899	6.98	-1.4	6.54
6/29/2012	8:35	25.05	40698	6.98	-1.6	6.46
6/29/2012	8:50	25.04	40018	6.95	43.6	6.64
6/29/2012	9:05	25.02	39771	6.93	-1.8	6.46
6/29/2012	9:20	25.04	40042	6.92	2.6	6.43
6/29/2012	9:35	25.03	40026	6.92	-2.1	6.44
6/29/2012	9:50	25.04	39316	6.91	3.6	6.72
6/29/2012	10:05	25.00	39	7.10	-2.2	7.45
6/29/2012	10:20	25.07	38818	6.91	-2.0	6.47
6/29/2012	10:35	25.08	40366	6.93	12.7	6.92
6/29/2012	10:50	25.14	40130	6.92	-2.0	6.41
6/29/2012	11:05	25.16	40275	6.93	-2.2	6.42
6/29/2012	11:20	25.19	39829	6.94	-1.8	6.42
6/29/2012	11:35	25.18	39654	6.95	56.3	6.41
6/29/2012	11:50	25.18	40123	6.98	-1.9	6.48
6/29/2012	12:05	25.17	39214	6.99	-1.3	6.46
6/29/2012	12:20	25.16	39237	7.00	3.8	6.44
6/29/2012	12:35	25.15	39996	7.01	811.6	6.48
6/29/2012	12:51	25.14	39517	7.02	-0.3	6.50
6/29/2012	13:06	25.13	39594	7.02	23.2	6.46
6/29/2012	13:21	25.11	39886	7.03	8.7	6.46
6/29/2012	13:36	25.10	39820	7.04	3.4	6.44
6/29/2012	13:51	25.10	39577	7.04	5.6	6.46
6/29/2012	14:06	25.09	39531	7.03	330.3	6.49
6/29/2012	14:21	25.09	39808	7.03	68.4	6.53
6/29/2012	14:36	25.13	39472	7.03	35.2	6.43
6/29/2012	14:51	25.13	39664	7.02	140.5	6.38
6/29/2012	15:26	25.05	39649	6.99	3.4	5.91
6/29/2012	15:41	25.05	39230	7.01	1252.0	5.57
6/29/2012	15:56	25.18	39464	6.95	3.5	4.42
6/29/2012	16:11	25.09	39635	6.94	3.5	3.62
6/29/2012	16:26	25.23	39546	6.93	3.6	3.19
6/29/2012	16:41	25.17	39597	6.93	3.6	2.68
6/29/2012	16:56	25.29	39423	6.92	3.7	2.17
6/29/2012	17:11	25.31	39530	6.92	3.6	1.90
6/29/2012	17:26	25.22	39492	6.92	3.7	1.90
6/29/2012	17:41	25.36	39452	6.92	3.6	1.43
6/29/2012	17:56	25.29	39494	6.92	3.4	1.31
6/29/2012	18:11	25.43	39493	6.92	3.3	1.07
6/29/2012	18:26	25.48	39514	6.92	3.1	1.09
Daily Average		**25.13**	**39701**	**6.97**	**13.85**	**5.39**

Table B-6
2012 WWTP Effluent Water Quality

Date	Time	Temperature (ºC)	Specific Conductivity (µS/MS)[1]	pH	Turbidity (NTU)[1]	Dissolved Oxygen (mg/L)[1]
7/2/2012	7:00	26.17	41056	7.11	2.4	6.73
7/2/2012	7:15	26.36	40939	7.18	3.3	7.03
7/2/2012	7:30	26.32	41064	7.18	0.9	6.71
7/2/2012	7:45	26.49	41086	7.16	1.0	6.74
7/2/2012	8:00	26.50	40964	7.14	136.0	6.77
7/2/2012	8:15	26.50	40682	7.11	2.2	6.82
7/2/2012	8:30	26.45	40516	7.09	1.6	7.03
7/2/2012	8:45	26.38	40409	7.09	1.0	6.71
7/2/2012	9:00	26.34	39912	7.08	1.2	6.71
7/2/2012	9:15	26.31	39317	7.06	1.6	6.76
7/2/2012	9:30	26.26	39118	7.04	2.0	6.77
7/2/2012	9:45	26.20	39192	7.03	2.5	6.66
7/2/2012	10:00	26.18	39183	7.02	2.0	6.68
7/2/2012	10:15	26.16	39373	7.01	3.7	6.80
7/2/2012	10:30	26.14	39688	7.04	1.0	6.85
7/2/2012	10:45	26.18	39737	7.01	2.6	6.63
7/2/2012	11:00	26.21	39943	7.01	2.5	6.84
7/2/2012	11:15	26.21	40022	7.02	2.0	6.60
7/2/2012	11:30	26.24	40264	7.02	42.9	6.63
7/2/2012	11:45	26.28	40280	7.01	2.0	6.63
7/2/2012	12:00	26.31	40515	7.01	2.4	6.69
7/2/2012	12:28	26.33	40975	7.01	0.9	6.63
7/2/2012	12:43	26.41	41015	6.99	0.8	6.56
7/2/2012	12:58	26.46	41104	6.98	0.9	6.68
7/2/2012	13:13	26.49	41516	6.98	0.5	6.49
7/2/2012	13:28	26.54	41565	6.97	0.4	6.48
7/2/2012	13:43	26.58	41713	6.97	0.9	6.63
7/2/2012	13:58	26.59	41825	6.98	0.4	6.45
7/2/2012	14:13	26.63	41767	6.98	0.4	6.47
7/2/2012	14:28	26.65	41855	6.99	0.6	6.55
7/2/2012	14:43	26.65	41927	7.00	0.4	6.41
7/2/2012	14:58	26.68	41734	7.01	0.6	6.43
7/2/2012	15:13	26.71	41779	7.02	0.8	6.48
7/2/2012	15:28	26.72	41792	7.03	0.8	6.39
7/2/2012	15:43	26.76	41566	7.04	1.2	6.44
7/2/2012	15:58	26.78	41566	7.05	1.5	6.50
7/2/2012	16:13	26.78	41615	7.05	1.8	6.63
7/2/2012	16:28	26.76	41678	7.06	1.9	6.45
7/2/2012	16:43	26.76	41688	7.07	9.1	6.49
7/2/2012	16:58	26.79	41559	7.07	2.7	6.45
7/2/2012	17:13	26.81	41525	7.08	3.1	6.58
7/2/2012	17:28	26.80	41575	7.08	3.0	6.41
7/2/2012	17:43	26.81	41488	7.09	3.4	6.45
7/2/2012	17:58	26.85	21512	7.10	3.9	7.05
Daily Average		**26.49**	**40886**	**7.05**	**5.84**	**6.63**

Table B-6
2012 WWTP Effluent Water Quality

Date	Time	Temperature (ºC)	Specific Conductivity (µS/MS)[1]	pH	Turbidity (NTU)[1]	Dissolved Oxygen (mg/L)[1]
7/3/2012	7:30	26.48	40964	7.13	-2.8	6.57
7/3/2012	7:45	26.64	39988	7.11	2.5	6.57
7/3/2012	8:00	26.65	40190	7.09	-0.6	6.59
7/3/2012	8:15	26.60	40595	7.08	-1.7	6.49
7/3/2012	8:30	26.61	40415	7.06	4.6	6.52
7/3/2012	8:45	26.60	40502	7.04	0.5	6.72
7/3/2012	9:00	26.61	40324	7.03	-2.3	6.45
7/3/2012	9:15	26.61	40445	7.02	3.2	6.43
7/3/2012	9:30	26.58	40786	7.05	51.5	6.63
7/3/2012	9:45	26.57	40963	7.02	-3.6	6.45
7/3/2012	10:00	26.58	40874	7.02	-2.4	6.47
7/3/2012	10:15	26.56	41020	7.02	49.8	6.50
7/3/2012	10:30	26.55	41073	7.02	8.9	6.54
7/3/2012	10:45	26.53	41210	7.03	-3.9	6.45
7/3/2012	11:00	26.51	41259	7.03	-3.9	6.48
7/3/2012	11:15	26.52	41348	7.03	102.1	6.55
7/3/2012	11:16	26.50	41347	7.03	-4.0	6.50
7/3/2012	11:31	26.51	41209	7.03	5.7	6.48
7/3/2012	11:46	26.50	41497	7.03	9.2	6.66
7/3/2012	12:01	26.49	41603	7.03	-4.4	6.46
7/3/2012	12:16	26.51	41570	7.02	-4.5	6.58
7/3/2012	12:31	26.54	41433	7.01	0.0	6.46
7/3/2012	12:46	26.55	41565	7.02	-4.7	6.39
7/3/2012	13:01	26.57	41460	7.02	12.0	6.45
7/3/2012	13:16	26.58	41405	7.02	0.1	6.45
7/3/2012	13:31	26.57	41570	7.03	-4.8	6.35
7/3/2012	13:46	26.54	41615	7.04	-4.8	6.37
7/3/2012	14:01	26.48	1459	7.46	-4.5	7.86
7/3/2012	14:16	26.51	41451	7.06	-1.8	6.50
7/3/2012	14:53	26.58	41559	7.07	-4.4	6.50
7/3/2012	15:08	26.65	41378	7.06	-3.6	6.61
7/3/2012	15:23	26.68	41464	7.07	-4.1	6.44
7/3/2012	15:38	26.72	41457	7.07	-4.1	6.42
7/3/2012	15:53	26.76	289	7.23	3.4	7.62
7/3/2012	16:08	26.79	41387	7.07	-3.6	6.48
7/3/2012	16:23	26.80	41560	7.10	15.3	6.59
7/3/2012	16:38	26.82	41628	7.08	-4.3	6.51
7/3/2012	16:53	26.91	41449	7.06	-4.1	6.45
7/3/2012	17:08	27.02	41485	7.05	-4.0	6.37
7/3/2012	17:23	27.15	41070	7.04	-3.8	6.36
7/3/2012	17:38	27.17	41042	7.05	-3.9	6.43
7/3/2012	17:53	27.15	41127	7.05	-3.6	6.33
7/3/2012	18:08	27.11	41135	7.05	-4.0	6.41
Daily Average		**26.66**	**41157**	**7.06**	**3.87**	**6.55**

Table B-6
2012 WWTP Effluent Water Quality

Date	Time	Temperature (ºC)	Specific Conductivity (µS/MS)[1]	pH	Turbidity (NTU)[1]	Dissolved Oxygen (mg/L)[1]
7/5/2012	7:08	26.44	39196	7.14	-3.4	6.78
7/5/2012	7:23	26.40	39418	7.19	-3.9	6.70
7/5/2012	7:38	26.53	39567	7.18	-4.4	6.75
7/5/2012	7:53	26.70	39122	7.14	-4.1	6.74
7/5/2012	8:08	26.75	39340	7.11	-4.2	6.74
7/5/2012	8:23	26.75	39552	7.10	-4.5	6.64
7/5/2012	8:38	26.77	38979	7.07	-4.8	6.67
7/5/2012	8:53	26.77	38978	7.05	-4.8	6.68
7/5/2012	9:08	26.77	39105	7.04	-4.6	6.92
7/5/2012	9:23	26.77	39145	7.04	-5.2	6.61
7/5/2012	9:38	26.82	38681	7.02	-5.4	6.62
7/5/2012	9:53	26.86	38837	7.01	-5.4	6.64
7/5/2012	10:08	26.86	39091	7.02	-5.7	6.55
7/5/2012	10:23	26.94	38717	7.01	-5.9	6.58
7/5/2012	10:38	26.99	38945	7.00	-5.9	6.57
7/5/2012	10:53	27.01	39312	7.00	-6.1	6.50
7/5/2012	11:08	27.03	39496	6.99	-6.3	6.53
7/5/2012	11:23	27.06	39335	6.99	-6.5	6.52
7/5/2012	11:38	27.08	39570	6.98	-6.3	6.57
7/5/2012	11:53	27.08	39868	6.99	-6.7	6.51
7/5/2012	12:08	27.11	39643	6.98	-6.6	6.51
7/5/2012	12:23	27.13	39833	6.98	-6.6	6.45
7/5/2012	12:38	27.13	40122	6.98	-6.7	6.38
7/5/2012	13:01	27.15	40210	6.97	-6.7	6.39
7/5/2012	13:16	27.19	39888	6.96	-6.8	6.37
7/5/2012	13:31	27.18	40265	6.96	-6.8	6.31
7/5/2012	13:46	27.20	39962	6.96	-6.9	6.36
7/5/2012	14:01	27.21	40188	6.96	-6.7	6.37
7/5/2012	14:16	27.20	40496	6.97	-6.9	6.33
7/5/2012	14:31	27.23	40194	6.96	-6.8	6.33
7/5/2012	14:46	27.27	40399	6.97	-6.4	6.39
7/5/2012	15:01	27.22	101	7.36	-0.9	7.82
7/5/2012	15:16	27.28	40257	6.99	-6.6	6.31
7/5/2012	15:31	27.28	40535	7.01	-6.9	6.29
7/5/2012	15:46	27.27	147	7.18	30.7	7.59
7/5/2012	16:01	27.29	40536	7.02	-6.8	6.18
7/5/2012	16:16	27.26	40532	7.05	-6.7	6.39
7/5/2012	16:31	27.26	40075	7.05	-6.2	6.40
7/5/2012	16:46	27.28	40189	7.06	-5.9	6.43
7/5/2012	17:01	27.29	40499	7.06	-6.4	6.36
7/5/2012	17:16	27.34	40429	7.07	-6.3	6.38
7/5/2012	17:31	27.36	40003	7.07	-5.9	6.41
7/5/2012	17:46	27.37	40022	7.07	-5.9	6.42
7/5/2012	18:01	27.36	40228	7.09	-6.0	6.31
Daily Average		**27.05**	**39732**	**7.04**	**-4.95**	**6.55**

Table B-6
2012 WWTP Effluent Water Quality

Date	Time	Temperature (^oC)	Specific Conductivity (µS/MS)[1]	pH	Turbidity (NTU)[1]	Dissolved Oxygen (mg/L)[1]
7/6/2012	7:45	27.07	41647	7.11	0.3	6.35
7/6/2012	8:00	27.14	41070	7.09	0.5	6.48
7/6/2012	8:15	27.15	41131	7.08	0.7	6.49
7/6/2012	8:30	27.10	41426	7.08	0.6	6.41
7/6/2012	8:45	27.09	41346	7.07	0.7	6.39
7/6/2012	9:00	27.10	40961	7.07	1.0	6.43
7/6/2012	9:15	27.09	40879	7.07	1.1	6.47
7/6/2012	9:30	27.04	41049	7.07	4.9	6.36
7/6/2012	9:45	27.07	41057	7.08	1.0	6.43
7/6/2012	10:00	27.13	40579	7.07	1.1	6.46
7/6/2012	10:15	27.17	40606	7.06	1.3	6.49
7/6/2012	10:30	27.16	40892	7.07	1.1	6.45
7/6/2012	10:45	27.20	40855	7.07	1.0	6.40
7/6/2012	11:00	27.24	40646	7.06	1.2	6.44
7/6/2012	11:15	27.24	40768	7.06	1.3	6.49
7/6/2012	11:30	27.22	40895	7.06	0.8	6.41
7/6/2012	11:45	27.27	40632	7.04	0.7	6.39
7/6/2012	12:00	27.32	40577	7.02	0.5	6.31
7/6/2012	12:15	27.39	40600	7.01	0.3	6.32
7/6/2012	12:30	27.40	40626	7.00	0.1	6.27
7/6/2012	12:45	27.42	40763	7.00	0.2	6.33
7/6/2012	13:00	27.41	41011	7.00	0.8	6.56
7/6/2012	13:15	27.39	41131	7.01	-0.3	6.29
7/6/2012	13:30	27.36	41218	7.01	-0.4	6.41
7/6/2012	13:45	27.36	40990	7.00	-0.4	6.36
7/6/2012	14:00	27.38	41209	7.00	-0.5	6.25
7/6/2012	14:15	27.43	40814	6.99	-0.6	6.29
7/6/2012	14:30	27.47	40943	6.98	1.2	6.47
7/6/2012	14:45	27.47	41114	6.99	-0.7	6.27
7/6/2012	15:00	27.47	40902	6.98	-0.6	6.30
Daily Average		**27.26**	**40945**	**7.04**	**0.63**	**6.39**

Table B-6
2012 WWTP Effluent Water Quality

Date	Time	Temperature (^oC)	Specific Conductivity (µS/MS)[1]	pH	Turbidity (NTU)[1]	Dissolved Oxygen (mg/L)[1]
7/9/2012	7:18	29.00	35548	7.19	-5.1	6.67
7/9/2012	7:33	29.08	35577	7.20	-5.6	6.63
7/9/2012	7:48	29.10	34542	7.17	-5.5	6.59
7/9/2012	8:03	29.06	35461	7.16	-5.6	6.52
7/9/2012	8:18	29.01	35331	7.13	26.5	6.58
7/9/2012	8:33	28.91	35576	7.11	-5.5	6.53
7/9/2012	8:48	28.78	35989	7.10	-5.7	6.53
7/9/2012	9:03	28.60	36310	7.09	-1.3	6.53
7/9/2012	9:18	28.44	36935	7.08	-4.7	6.53
7/9/2012	9:33	28.20	96	7.33	-4.9	7.63
7/9/2012	9:48	28.11	37451	7.06	-5.8	6.47
7/9/2012	10:03	27.99	38597	7.05	-0.8	6.43
7/9/2012	10:18	27.87	39165	7.04	-5.8	6.39
7/9/2012	10:33	27.80	39182	7.02	-5.8	6.35
7/9/2012	10:48	27.69	40140	7.02	-6.1	6.33
7/9/2012	11:03	27.64	40443	7.02	50.1	6.34
7/9/2012	11:18	27.56	40510	7.03	-5.9	6.34
7/9/2012	11:33	27.53	40999	7.03	-3.3	6.35
7/9/2012	11:48	27.50	41295	7.04	-5.8	6.34
7/9/2012	12:03	27.49	41280	7.05	-5.7	6.35
7/9/2012	12:48	27.53	41590	7.07	-6.1	6.35
7/9/2012	13:03	27.63	41266	7.06	-6.1	6.32
7/9/2012	13:18	27.66	41419	7.06	-5.9	6.32
7/9/2012	13:33	27.67	41329	7.05	-5.9	6.31
7/9/2012	13:48	27.62	41851	7.04	-5.9	6.32
7/9/2012	14:03	27.59	42252	7.04	-6.1	6.25
7/9/2012	14:18	27.55	42355	7.03	-5.9	6.23
7/9/2012	14:33	27.53	42473	7.02	-6.0	6.23
7/9/2012	14:48	27.53	42580	7.02	-6.0	6.17
7/9/2012	15:03	27.53	41864	7.01	-6.0	6.19
7/9/2012	15:18	27.54	42664	7.01	-6.0	6.18
7/9/2012	15:33	27.57	42327	7.00	-5.9	6.18
7/9/2012	15:48	27.59	42259	7.00	-6.0	6.15
7/9/2012	16:03	27.57	354	7.17	-5.1	7.46
7/9/2012	16:18	27.69	42642	7.00	-5.9	6.13
7/9/2012	16:33	27.73	42878	7.00	-6.0	6.13
7/9/2012	16:48	27.78	42992	7.00	-5.7	6.21
7/9/2012	17:03	27.80	43021	7.00	-5.9	6.08
7/9/2012	17:18	27.70	130	7.32	-5.7	7.66
7/9/2012	17:33	27.84	42912	7.00	-6.0	6.03
7/9/2012	17:48	27.85	43307	6.99	-6.2	6.02
7/9/2012	18:03	27.91	43302	6.99	-6.4	6.01
Daily Average		**27.95**	**40195**	**7.07**	**-3.40**	**6.41**

Table B-6
2012 WWTP Effluent Water Quality

Date	Time	Temperature (ºC)	Specific Conductivity (µS/MS)[1]	pH	Turbidity (NTU)[1]	Dissolved Oxygen (mg/L)[1]
7/19/2012	7:38	29.89	42651	7.18	2.4	6.15
7/19/2012	7:53	29.95	42428	7.18	2.0	6.18
7/19/2012	8:08	29.96	42367	7.19	2.1	6.26
7/19/2012	8:23	29.98	42864	7.19	2.0	6.25
7/19/2012	8:38	29.97	42803	7.19	2.1	6.25
7/19/2012	8:53	29.95	42357	7.18	6.5	6.32
7/19/2012	9:08	29.88	42495	7.18	1.9	6.29
7/19/2012	9:23	29.84	42104	7.17	2.0	6.28
7/19/2012	9:38	29.81	41566	7.16	2.0	6.30
7/19/2012	9:53	29.77	41181	7.15	2.7	6.31
7/19/2012	10:08	29.71	41375	7.14	2.0	6.31
7/19/2012	10:23	29.64	41596	7.14	2.0	6.23
7/19/2012	10:38	29.59	41689	7.14	1.9	6.21
7/19/2012	10:53	29.55	41772	7.14	1.8	6.21
7/19/2012	11:08	29.53	41865	7.14	1.7	6.19
7/19/2012	11:23	29.52	41949	7.15	1.9	6.24
7/19/2012	11:38	29.52	41973	7.14	1.7	6.23
7/19/2012	11:53	29.52	42083	7.14	1.7	6.22
7/19/2012	12:08	29.51	42180	7.14	1.8	6.22
7/19/2012	12:23	29.51	42047	7.13	1.7	6.24
7/19/2012	13:15	29.38	42992	7.13	0.6	6.22
7/19/2012	13:30	29.34	42634	7.12	1.0	6.25
7/19/2012	13:45	29.31	43145	7.12	0.9	6.17
7/19/2012	14:00	29.26	43068	7.12	15.6	6.18
7/19/2012	14:15	29.22	43130	7.12	0.7	6.09
7/19/2012	14:30	29.19	43120	7.12	0.7	6.06
7/19/2012	14:45	29.11	43141	7.11	0.7	6.03
7/19/2012	15:00	29.03	43025	7.12	11.6	6.09
7/19/2012	15:15	28.97	43081	7.10	0.7	5.66
7/19/2012	15:30	28.89	43145	7.10	0.7	5.54
7/19/2012	15:45	29.17	43154	7.13	35.0	6.22
7/19/2012	16:00	29.16	43207	7.13	0.7	6.21
7/19/2012	16:15	29.16	42864	7.13	8.6	6.19
7/19/2012	16:30	29.08	42811	7.12	22.0	5.86
7/19/2012	16:45	29.12	43047	7.14	1.1	6.12
7/19/2012	17:00	29.12	43010	7.14	0.7	6.15
7/19/2012	17:15	29.15	42862	7.14	0.6	6.16
7/19/2012	17:30	29.21	42594	7.13	0.7	6.21
7/19/2012	17:45	29.26	42284	7.17	114.3	6.37
7/19/2012	18:00	29.35	42270	7.12	0.6	6.19
Daily Average		**29.45**	**42498**	**7.14**	**6.54**	**6.17**

Table B-6
2012 WWTP Effluent Water Quality

Date	Time	Temperature (ºC)	Specific Conductivity (µS/MS)[1]	pH	Turbidity (NTU)[1]	Dissolved Oxygen (mg/L)[1]
7/23/2012	7:08	27.60	39322	7.33	0.4	6.75
7/23/2012	7:23	27.57	39323	7.37	0.2	6.93
7/23/2012	7:38	27.56	39343	7.37	0.0	6.63
7/23/2012	7:53	27.85	38734	7.34	0.0	6.68
7/23/2012	8:08	27.91	38834	7.32	13.3	6.87
7/23/2012	8:23	27.85	39083	7.32	-0.1	6.50
7/23/2012	8:38	27.85	38938	7.30	-0.2	6.57
7/23/2012	8:53	27.85	38594	7.29	0.1	6.76
7/23/2012	9:08	27.79	38787	7.29	-0.1	6.49
7/23/2012	9:23	27.70	38652	7.28	0.4	6.59
7/23/2012	9:38	27.66	38256	7.27	0.9	6.66
7/23/2012	9:53	27.61	38600	7.27	1.1	6.52
7/23/2012	10:08	27.56	38857	7.27	1.8	6.56
7/23/2012	10:23	27.58	38976	7.26	2.4	6.61
7/23/2012	10:38	27.54	38885	7.26	12.9	6.48
7/23/2012	10:53	27.52	39747	7.27	2.9	6.52
7/23/2012	11:08	27.52	39952	7.26	3.0	6.54
7/23/2012	11:23	27.46	40196	7.22	4.3	6.00
7/23/2012	11:38	27.46	40753	7.26	3.1	6.45
7/23/2012	12:17	27.52	41167	7.25	4.9	6.53
7/23/2012	12:32	27.58	41201	7.25	5.7	6.52
7/23/2012	12:47	27.58	41289	7.25	3.8	6.41
7/23/2012	13:02	27.65	41372	7.25	45.3	6.54
7/23/2012	13:17	27.67	40376	7.27	479.1	6.60
7/23/2012	13:32	27.67	41638	7.26	4.5	6.36
7/23/2012	13:47	27.65	713	7.41	-0.2	7.75
7/23/2012	14:02	27.76	41854	7.25	80.1	6.49
7/23/2012	14:17	27.75	41905	7.26	5.3	6.32
7/23/2012	14:32	27.83	41917	7.26	9.4	6.46
7/23/2012	14:47	27.92	41876	7.25	7.1	6.40
7/23/2012	15:02	27.93	41932	7.26	59.6	6.82
7/23/2012	15:17	27.99	42068	7.25	4.4	6.42
7/23/2012	15:32	28.05	42129	7.25	5.5	6.38
7/23/2012	15:47	28.04	42243	7.25	4.0	6.30
7/23/2012	16:02	28.06	42343	7.25	3.5	6.33
7/23/2012	16:07	28.11	42281	7.25	4.9	6.38
7/23/2012	16:32	28.09	42334	7.23	7.3	6.07
7/23/2012	16:47	28.16	42336	7.25	3.0	6.34
7/23/2012	17:02	28.20	42296	7.25	3.9	6.35
7/23/2012	17:17	28.19	42377	7.25	2.6	6.17
7/23/2012	17:32	28.19	42458	7.25	2.4	6.31
7/23/2012	17:47	28.21	42514	7.25	53.8	6.42
Daily Average		**27.79**	**40628**	**7.27**	**8.96**	**6.52**

Table B-6
2012 WWTP Effluent Water Quality

Date	Time	Temperature (ºC)	Specific Conductivity (µS/MS)[1]	pH	Turbidity (NTU)[1]	Dissolved Oxygen (mg/L)[1]
8/15/2012	7:27	29.19	39689	7.39	-0.9	6.22
8/15/2012	7:42	29.27	39512	7.35	0.3	6.31
8/15/2012	7:57	29.27	39696	7.33	-1.0	6.27
8/15/2012	8:12	29.23	39741	7.31	-1.0	6.09
8/15/2012	8:27	29.25	39729	7.30	-1.1	6.17
8/15/2012	8:42	29.25	39705	7.29	46.4	6.34
8/15/2012	8:57	29.23	39882	7.28	-1.2	6.05
8/15/2012	9:12	29.25	39756	7.28	-1.2	6.20
8/15/2012	9:27	29.27	39641	7.27	-0.6	6.21
8/15/2012	9:42	29.24	39650	7.27	-1.1	6.06
8/15/2012	9:57	29.32	39381	7.27	-1.2	6.16
8/15/2012	10:12	29.34	39459	7.26	-1.2	6.18
8/15/2012	10:27	29.29	39572	7.26	-1.2	6.05
8/15/2012	10:42	29.18	39752	7.39	-0.7	6.54
8/15/2012	10:57	29.22	39722	7.26	-1.2	5.90
8/15/2012	11:12	29.24	39798	7.26	-1.1	6.12
8/15/2012	11:27	29.19	39899	7.27	110.1	6.43
8/15/2012	11:42	29.16	40023	7.27	-1.1	6.07
8/15/2012	11:57	29.18	39964	7.26	-1.1	6.12
8/15/2012	12:12	29.18	39922	7.26	0.2	5.90
8/15/2012	12:27	29.18	39912	7.26	-1.1	6.06
8/15/2012	13:15	29.19	39822	7.26	-0.9	5.99
8/15/2012	13:30	29.19	39864	7.26	-0.9	6.10
8/15/2012	13:45	29.18	39973	7.25	-0.6	6.10
8/15/2012	14:00	29.16	40046	7.25	-1.0	6.00
8/15/2012	14:15	29.16	40100	7.25	1.0	6.11
8/15/2012	14:30	29.17	40018	7.25	-0.9	6.11
8/15/2012	14:45	29.17	40075	7.25	-1.0	5.97
8/15/2012	15:00	29.21	39943	7.25	-1.0	6.08
8/15/2012	15:15	29.24	39891	7.25	5.2	6.14
8/15/2012	15:30	29.24	39903	7.25	-1.0	5.97
8/15/2012	15:45	29.22	695	7.32	22.8	7.26
8/15/2012	16:00	29.30	39764	7.26	44.2	6.07
8/15/2012	16:15	29.30	39751	7.26	-0.9	5.92
8/15/2012	16:30	29.33	39618	7.27	-0.9	6.07
8/15/2012	16:45	29.37	39463	7.27	-0.8	6.06
8/15/2012	17:00	29.36	39442	7.27	43.4	5.96
8/15/2012	17:15	29.41	39240	7.27	-0.9	6.00
8/15/2012	17:30	29.45	39059	7.27	-0.8	6.02
8/15/2012	17:45	29.41	397	7.43	1.4	7.49
8/15/2012	17:46	29.44	39039	7.37	15.5	6.34
8/15/2012	18:01	29.53	38940	7.26	-0.9	5.99
Daily Average		**29.26**	**39709**	**7.28**	**6.19**	**6.17**

Table B-6
2012 WWTP Effluent Water Quality

Date	Time	Temperature (ºC)	Specific Conductivity (µS/MS)[1]	pH	Turbidity (NTU)[1]	Dissolved Oxygen (mg/L)[1]
9/5/2012	7:10	26.63	43252	7.44	-0.5	6.69
9/5/2012	7:25	26.72	43232	7.46	-0.8	6.61
9/5/2012	7:40	26.78	42702	7.44	-0.8	6.60
9/5/2012	7:55	26.83	42627	7.43	-0.4	6.58
9/5/2012	8:10	26.88	42625	7.42	1386.1	6.60
9/5/2012	8:25	26.93	42576	7.40	99.3	6.20
9/5/2012	8:40	26.94	42890	7.40	-0.9	6.49
9/5/2012	8:55	27.01	42827	7.40	-0.9	6.49
9/5/2012	9:10	27.08	42710	7.40	-0.9	6.49
9/5/2012	9:25	27.14	42614	7.40	-0.1	6.50
9/5/2012	9:40	27.21	134	7.40	101.4	7.62
9/5/2012	9:55	27.26	42104	7.40	19.8	6.47
9/5/2012	10:10	27.30	42391	7.39	-0.9	6.37
9/5/2012	10:25	27.29	42393	7.40	-0.9	6.37
9/5/2012	10:40	27.34	42318	7.40	-1.0	6.39
9/5/2012	10:55	27.40	42253	7.41	60.0	6.45
9/5/2012	11:10	27.46	42187	7.41	1.0	6.45
9/5/2012	11:25	27.55	41759	7.40	4.7	6.46
9/5/2012	11:40	27.62	41739	7.40	35.9	6.45
9/5/2012	11:55	27.68	41984	7.39	-0.9	6.35
9/5/2012	12:10	27.67	41957	7.39	-1.0	6.34
9/5/2012	12:25	27.71	41900	7.39	-1.0	6.29
9/5/2012	13:05	27.63	41896	7.38	-0.8	6.20
9/5/2012	13:20	27.59	41832	7.38	-0.8	6.16
9/5/2012	13:35	27.53	41842	7.38	-0.8	6.05
9/5/2012	13:50	27.77	41370	7.41	-0.8	6.34
9/5/2012	14:05	27.82	41556	7.41	1.7	6.36
9/5/2012	14:20	27.81	41689	7.42	-0.8	6.35
9/5/2012	14:35	27.87	41668	7.42	-0.8	6.37
9/5/2012	14:50	27.94	41574	7.42	-0.8	6.38
9/5/2012	15:05	27.91	41526	7.42	-0.8	6.37
9/5/2012	15:20	27.87	41540	7.42	-0.8	6.34
9/5/2012	15:35	27.98	41245	7.42	-0.7	6.38
9/5/2012	15:50	28.02	41346	7.42	-0.5	6.40
9/5/2012	16:05	27.99	41509	7.43	-0.8	6.41
9/5/2012	16:20	28.02	41429	7.43	-0.8	6.38
9/5/2012	16:35	27.97	41420	7.42	-0.8	6.37
9/5/2012	16:50	27.94	41485	7.42	-0.8	6.37
9/5/2012	17:05	28.00	41252	7.38	91.2	4.72
9/5/2012	17:20	28.03	41451	7.43	-0.8	6.37
9/5/2012	17:35	28.12	41220	7.43	-0.8	6.46
9/5/2012	17:50	28.19	40799	7.43	-0.5	6.51
Daily Average		**27.53**	**41968**	**7.41**	**9.52**	**6.39**

Table B-6
2012 WWTP Effluent Water Quality

Notes:
All measurements collected with a YSI 650/6920, calibrated daily.
A flow-through cell connected to WWTP system plumbing was used to collect sample readings.
A negative turbidity reading indicates measured sample exhibited lower turbidity than the 0 NTU calibration standard.

1= Due to the auto logging feature of the YSI and configuration of the flow-through cell measurements are periodically collected when air bubbles are present in the sample. These bubbles are documented to affect the accuracy of water quality measurements. The Walsh's test for large sample sizes (EPA 2000) was used to identify erroneous values as outliers. The outliers are shaded red and are not used in the computation of the daily average. It is believed that some erroneous turbidity values were not able to be excluded from the daily average as outliers and it is likely that some daily average turbidity values are biased high.

2= Specific conductivity probe not functioning properly, parameters not recorded.

°C = degrees Celsius
DO = dissolved oxygen
mg/L = milligrams/liter
µS/cm = microsiemens per centimeter
NA = not analyzed
NTU = nephelometric turbidity units
WWTP = waste water treatment plant

ROD Project Effluent Water Quality Criteria

Temperature	<29.4 ºC
Dissolved Oxygen	≥5.0 mg/L (unless background < 5 mg/L)
pH	6.5 to 8.5
Turbidity	free from color and suspended solids

Table B-7
2012 WWTP Midpoint and Influent Water Quality Data

Influent Water Quality Monitoring						
Date	**Time**	**Temperature (°C)**	**Specific Conductivity (µS/cm)**	**DO (mg/L)**	**pH**	**Turbity (NTU)**
6/25/2012	12:15	25.40	NC	5.67	7.31	60.5
6/27/2012	16:10	24.39	NC	4.96	6.77	-2.6
6/29/2012	15:05	25.15	39412	6.25	7.34	27.2
8/15/2012	12:39	28.89	40003	5.72	7.29	12.4
9/5/2012	12:35	28.29	39315	6.37	7.27	3.6

Midpoint Water Quality Monitoring						
Date	**Time**	**Temperature (°C)**	**Specific Conductivity (µS/cm)**	**DO (mg/L)**	**pH**	**Turbity (NTU)**
6/25/2012	12:30	25.01	NC	4.35	6.86	-7.4
6/27/2012	16:25	24.18	NC	0.53	6.61	-4.8
6/29/2012	15:15	25.10	39709	0.50	6.90	5.7
7/3/2012	14:40	26.61	41400	0.46	6.92	-2.6
7/9/2012	12:28	27.56	41522	2.10	6.96	-4.8
7/19/2012	12:55	29.12	43274	0.81	7.07	2.0
7/23/2012	12:00	27.56	41244	0.39	7.20	6.7
8/15/2012	12:59	29.05	39945	0.34	7.13	-0.3
9/5/2012	12:54	27.58	41511	0.44	6.98	0.3

Notes:
All measurements were collected with a YSI 650/6920, calibrated daily.
A flow-through cell connected to WWTP system plumbing was used to collect sample readings.
A negative turbidity reading indicates measured sample exhibited lower turbidity than the 0 NTU calibration standard.

DO = dissolved oxygen
mg/L = milligrams/liter
NC = not collected
NTU = nephelometric turbidity units
WWTP = waste water treatment plant
µS/cm = microsiemens per centimeter
°C = degrees Celsius

ATTACHMENT C

Sevenson Operational Monitoring Data

CBI

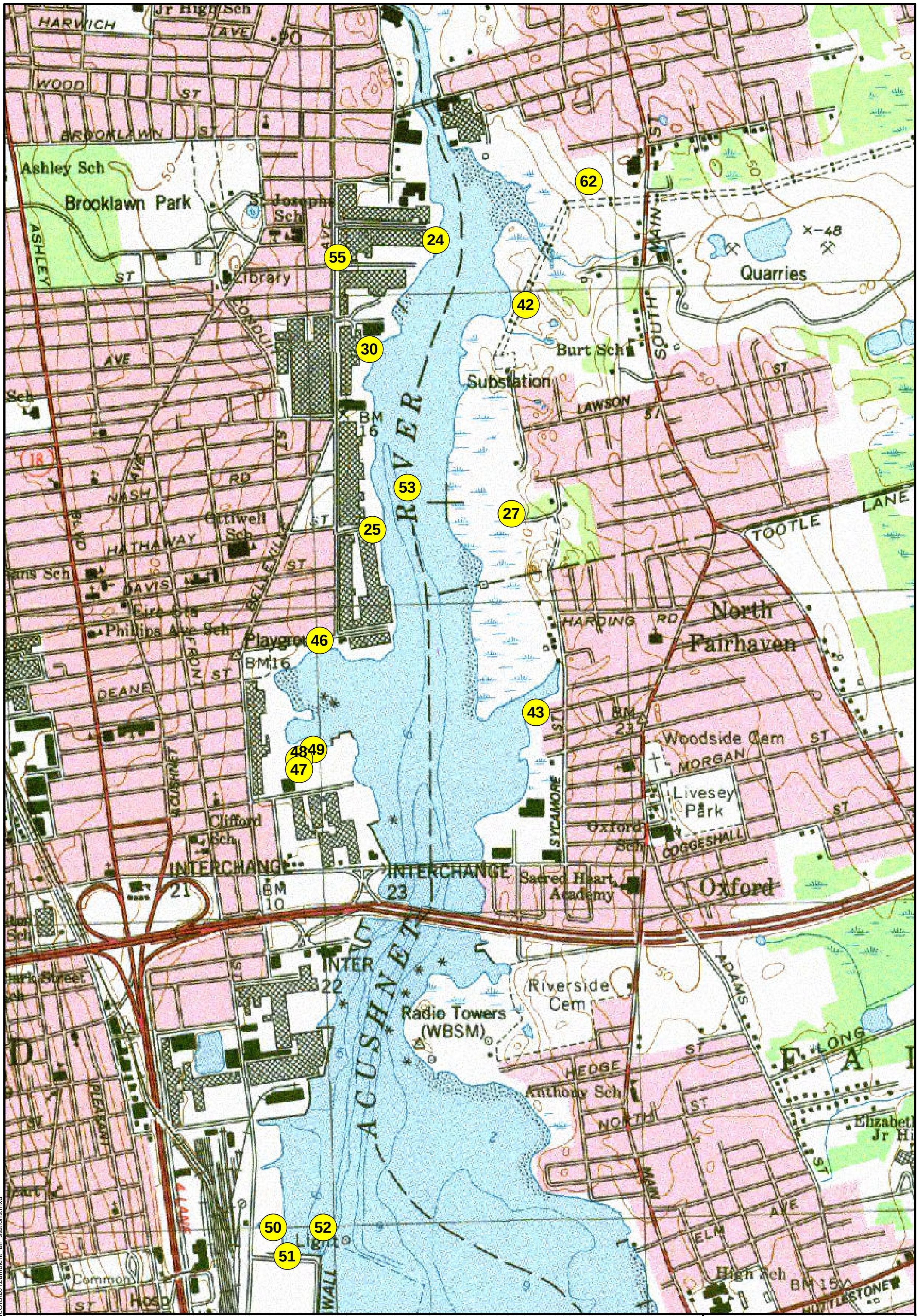
ATTACHMENT D

Transportation and Disposal Reports

CBI

ATTACHMENT E

Ambient Air Monitoring Information



Legend

Ambient Air Sampling Location

0 750 1,500 Feet

1:18,000

N

JACOBS

2012 Ambient Air Sampling Station Locations

New Bedford Harbor Superfund Site

NAME: croberts DATE: 03/07/2012

Figure E-1

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Table E-1
2012 Ambient Air Monitoring Program
Total Detectable PCB Homologues in Air

	Station 24	Station 55	Station 25	Station 30	Station 42	Station 43	Station 46	Station 49	Station 50	Station 53	Station 62	Station 27		
Sampling Period(1)	**Aerovox**	**Aerovox West**	**Manomet Street**	**Fibre Leather**	**NSTAR North**	**Veranda Avenue**	**Coffin Avenue**	**Area C Downwind**	**Area D Downwind**	**Dredge** (2)	**Century House**	**Porter Street**	**Duplicate**	**Comments**
	PCB Concentration (ng/m^3)													
21-May-2012	51	NS	67	NS	NS	NS	NS	NS	NS	NS	0.0029	0.81	66	Duplicate sample
														Manomet Street
16-Jul-2012	220	10	1.2	110	36	140	26	57	10	280	3.3	24	24	Duplicate sample
														Porter Street
21-Aug-2012	67	0.00033	28	17	19	67	14	20	ND	NA	18	23	16	Duplicate Sample
														Coffin Avenue
1-Oct-2012	98	15	18	25	17	87	18	14	0.56	NS	NA	17	18	Duplicate sample
														Porter Street

NA= not analyzed due to insufficient air volume
NS = not sampled
ND = not detected
ng/m^3 = nanograms per cubic meter of air

Notes:
(1) Sampled using EPA method TO-10A, analyzed using EPA method 1668A.
(2) All results reported for 24 hour time-weighted average in nanograms per cubic meter of air (ng/m^3) with the exception of Station 53 (Dredge) which is an 8 hour sample.

ATTACHMENT F

Jacobs Solids and Water Balance, and PCB Mass Removal Calculations

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ATTACHMENT G

2012 Dredge Production Summary

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ATTACHMENT H
2012 Lessons Learned

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ATTACHMENT I
Summary of 2012 Activities

CBI