Waukegan Approach Channel Monitoring 2010
And
Contaminant Determination for Dredging and Open Water Disposal

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1. Introduction

This report documents the collection, analysis, and results of the July and August 2010 maintenance dredging monitoring for the Waukegan Harbor Advance Maintenance Area. All activities for these sampling events were performed in accordance with *the Great Lakes Dredged Material Testing and Evaluation Manual* (1998) and the *Evaluation of Dredged Material Proposed for Discharge in Waters of the U.S.* (Inland Testing Manual, 1998).

The following document also serves as a contaminant determination report prepared by the U.S. Army Corps of Engineers (USACE) Chicago District for the maintenance dredging at the Advance Maintenance Area and Approach Channel of Waukegan Harbor for the spring to fall dredging season of 2011. This document satisfies the requirements of the conditions of the Illinois Environmental Protection Agency (IEPA) Permit #2005-LM-2830 dated February 1, 2005 and its three revisions dated June 28, 2005; April 1, 2008; and March 6, 2009.

1.1 Project Description

Waukegan Harbor is located in Waukegan, Illinois approximately 40 miles north of downtown Chicago, Illinois. The Chicago District is responsible for all maintenance dredging within the federal navigation channel of Waukegan Harbor. Contamination, most notably polychlorinated biphenyls (PCBs), was discovered in the Inner Harbor sediments during the 1970s and was traced to a local industry. A Superfund clean-up project in the 1990s removed the most heavily contaminated sediment from the inner harbor. Dredging operations in the inner Waukegan Harbor have been suspended due to the disposal issues associated with the contaminated sediments. The contamination in the harbor has not migrated to the Approach Channel and this area is still dredged on a regular basis (see **Figure 1** for locations of the Approach Channel, the Advance Maintenance Area, and the inner confines of Waukegan Harbor). The sediment in the Approach Channel is primarily littoral drift sand from north of the harbor.

1.2 Historical Data

Table 1 provides a cursory comparison of the sediment quality in the Waukegan Inner Harbor and the Approach Channel. The Inner Harbor data are an average of sediment samples collected in 1995, 1996, and 1997. The Approach Channel data were taken from the Tier I analysis and represents data from 1985 through 1995. It is important to note that these averages do not take into account non-detectable data points. Many data points collected from the Approach Channel returned non-detectable results whereas none of the samples collected from the Inner Harbor returned non-detectable results. **Table 1** clearly shows significantly higher levels of contamination within the Inner Harbor and indicates that there has not been contaminant migration that has impacted sediment in the Approach Channel.

Table 1: Inner Harbor/Approach Channel Average Sediment Concentrations

Parameters	Inner Harbor (mg/kg)	Approach Channel (mg/kg)
PCBs	14.5	0.2
Ammonia	254	6.5
Arsenic	25.3	1.5
Iron	14800	3276

Table 2 displays more recent data from samples collected in the Approach Channel and Advance Maintenance Area in preparation for maintenance dredging. This table supports the conclusion that migration of material from the inner harbor to the approach channel is not taking place. There were only two PCB detections slightly above the detection limit in 1997 and non-detect since, except in 2008 when there were two detections above reporting limits but below the calculated historic mean of 0.2 mg/kg and well below the TSCA-regulated level of 50 mg/kg for PCB-contaminated material. Only trace amounts of asbestos were detected on two occasions (1999 and 2000), and the fines concentration has always been low.

Table 2: Approach Channel Sediment Data, 1997 – 2009

Sample Number	Sample Date	PCB Concentration (mg/kg)	Asbestos Concentration[1] (%)	Grain Size (% fines)[2]
WH-SED-1027-1	10/27/09	<0.0216	ND	16
WH-SED-1027-2		<0.0216	ND	2.8
WH-SED-1027-3		<0.0216	ND	3.1
WAM-1008-001	10/08/08	0.080 (PCB-1248)	ND	0.73
WAM-1008-002		0.049 (PCB-1248)	ND	0.57
WAM-1008-003		<0.017	ND	0.53
WAM-0905-001	09/05/07	<0.0269	ND	1.4
WAM-0905-002		<0.0264	ND	0.5
WAM-0905-003		<0.0289	ND	4.2
WAM-1005-001	10/27/05	<0.0324	ND	4.5
WAM-1005-002		<0.0340	ND	6.5
WAM-1005-003		<0.0411	ND	3
WAM-0804-001	08/16/04	<0.0336	ND	1.1
WAM-0804-002		<0.0313	ND	3.9
WAM-0804-003		<0.0310	ND	1.2
WUD-1003-001	10/27/03	<0.0336	ND	0.4
WAM-1003-001		<0.0336	ND	6.4
WAM-1003-002		<0.0336	ND	4.0
WAM-1003-003		<0.0336	ND	0.8
WAM-1003-COMP		-- [3]	ND	--
WUD-1002-001	10/10/02	<0.0388	ND	1.7
WAM-1002-001		<0.0388	ND	0.8
WAM-1002-002		<0.0388	ND	17.3
WAM-1002-003		<0.0388	ND	8
WAM-1002-COMP		--	ND	--
WUD-1001-001	10/23/01	< 0.025	ND	5.8
WAM-1001-001		< 0.025	ND	5.2
WAM-1001-002		< 0.025	ND	4.9
WAM-1001-003		< 0.025	ND	17.6
WAM-1001-COMP		--	ND	--
WAM-1000-001	10/17/00	< 0.025	ND	3.7
WAM-1000-002		< 0.025	ND	3.6
WAM-1000-003		< 0.025	ND	2.8
WAM-1000-004		< 0.025	ND	3.4
WAM-1000-005		< 0.025	ND	3.2
WAM-1000-006		< 0.025	ND	3.9

Sample Number	Sample Date	PCB Concentration (mg/kg)	Asbestos Concentration[1] (%)	Grain Size (% fines)[2]
WAM-1000-COMP		--	Trace	--
WAUK-AM-1	9/23/99	< 0.025	ND	1.4
WAUK-AM-2		< 0.025	Trace	6.0
WAUK-AM-3		< 0.025	ND	5.5
WAUK-AM-COMP		--	ND	--
WAM-1198-001	11/24/98	< 0.05	ND	1.2
WAM-1198-002		< 0.05	ND	0.6
WAM-1198-003		< 0.05	ND	0.6
WAM-1198-COMP		--	ND	--
WOH-1297-001	12/17/97	0.074	ND	0.8
WOH-1297-002		< 0.05	ND	0.3
WOH-1297-003		0.08	ND	1.0

Notes:

1) 2005 – 2009 asbestos analyses were performed by Polarized Light Microscopy (PLM) and Transmission Electron Microscopy (TEM). All previous asbestos analyses were performed by PLM except for the six composites, which were performed using TEM.
2) "% fines" indicates the percentage of particles passing through a #230 sieve.
3) "—" indicates that the sample was not analyzed for the parameter.

1.3 Dredging Activities

Through December 2003 all dredging activities in the Approach Channel and Advance Maintenance Area were performed in accordance with the Section 401 Ten Year Maintenance Dredging Permit No. 284 LM that was issued on April 5, 1993 and expired on December 31, 2003. The current certification and final determination was issued by IEPA on February 1, 2005. It was then revised on June 28, 2005; April 1, 2008; and again on March 6, 2009. This certification and final determination expires December 31, 2014. The current 10-year dredging permit was issued by IDNR on February 22, 2005 and expires on December 31, 2015. Recent correspondence with IEPA and IDNR concerning dredging activities is located in **Appendix A** of this report.

Dredging activities in the Advance Maintenance Area and Approach Channel have taken place annually or biannually since 1985. The last time dredging took place was summer 2010, and the next dredging event is scheduled for the spring of 2011. Because dredged materials from these areas have been disposed of in open water, water quality certification pursuant to Section 401 of the Clean Water Act and Section 39 of the Illinois Environmental Protection Act is required every year that material is disposed.

Two documents serve as the primary guidance for disposing of dredged materials (*Great Lakes Dredged Material Testing and Evaluation Manual* and the *Evaluation of Dredged Material Proposed for Discharge in Waters of the U.S.* or Inland Testing Manual). These guidance documents were prepared by USACE and the U.S. Environmental Protection Agency (USEPA). The *Great Lakes Dredged Material Testing and Evaluation Manual* was created to provide specific guidance for disposal within the Great Lakes and is structured similarly to the Inland Testing Manual. Both manuals present a tiered, integrated testing approach that complies with the requirements of Section 404(b)1 of the Clean Water Act (CWA).

The Tier I and Tier II requirements provided in these manuals were satisfied for this project by documents completed by USACE in October 1995 and April 1996, respectively. These documents were submitted to the IEPA Division of Water Pollution Control and the USEPA Planning and Management Division. IEPA approval of the Tier I and Tier II evaluations was provided in correspondence dated November 28, 1995 and May 30, 1996 respectively (see **Appendix A**). Since no substantial changes have occurred in sediment quality or potential contaminant sources since the preparation of these documents, they continue to remain valid.

The area proposed for dredging in spring 2011 is the same as prior years, in the Approach Channel and Advance Maintenance Area (**Figure 1**). The region extends approximately 1400 ft east from the east end of the north breakwater, and extends about 650 ft south toward the east-west line extension from the U.S. South Pier. The total area being considered for the 2011 dredging operations is approximately 910,000 (1400 X 650) sq. ft. This area is within the federal navigation channel and the Advance Maintenance Area. Soundings will be performed prior to dredging to determine precise regions of shoaling.

Between 1995 and 1998, sediment was disposed of in an area 1 mile south of Waukegan Harbor (Disposal Location 1) as shown on **Figure 2**. In 2003, this disposal location was moved further away from the shore, shifting the western-most edge of the site from 1,000 to 2,000 feet out from the shoreline. This new boundary for Disposal Location 1 has been used from 2003 to 2010. From 1999 to 2002 and in 2005, 2008 and 2009, dredged material was used as beach nourishment at two different locations along Illinois Beach State Park (IBSP) (Disposal Locations 2 and 3) as presented on **Figure 3**. In the most recent dredging event (2010) 60,890 cubic yards of mechanically dredged material was placed in Disposal Location 1. Disposal Locations 1, 2, and 3 are potential sediment disposal sites for the 2011 dredging event.

2. Water Quality Monitoring during Dredging Operations

Water samples are taken in Lake Michigan during sediment disposal operations for the purpose of monitoring water quality. Water quality monitoring samples were collected during dredging as required by Special Condition #7 of Permit # 2005-LM-2830 dated February 1, 2005 and its three revisions dated June 28, 2005; April 1, 2008; and March 6, 2009.

Samples were taken twice weekly during the first week of dredging, and weekly thereafter for the duration of dredging operations. Disposal samples are taken 500' downstream of the discharge point at one hour and four hours after sediment is disposed. For the 2010 operation, downstream was determined to be south of the discharge point. A background sample is also collected at 1,000' upstream of the disposal on the same day and in the same time frame as the disposal samples. At each location (disposal and background) samples were collected at the surface and at mid-depth of the water column. See **Water Quality Monitoring Maps #1 – 6** for the locations of samples for each sampling event and specific GPS points. Amount of sediment disposed at each discharge point can be found in the field logs included in **Appendix B**. Details of the sampling and results are given below.

2.1 Water Quality Monitoring Methods

Water quality monitoring sample collection was performed from 13 July 2010 through 06 August 2010. Exact dates for the sample collections can be viewed in **Table 3**.

Table 3: Water Quality Monitoring Sampling Dates

Date of Collection	Sample Types
July 13, 2010	Background Water Samples Blind Duplicate
July 16, 2010	Disposal Site Water Samples Background Water Samples Blind Duplicate
July 19, 2010	Disposal Site Water Samples Background Water Samples Blind Duplicate
July 21, 2010	Disposal Site Water Samples Background Water Samples Blind Duplicate
July 29, 2010	Disposal Site Water Samples Background Water Samples Blind Duplicate
August 06, 2010	Disposal Site Water Samples Background Water Samples Blind Duplicate

Water quality monitoring samples were collected and evaluated for chloride, ammonia, phosphorus, hardness, total suspended solids (TSS), pH, and temperature. Of these parameters chloride, ammonia, phosphorus, and TSS results are the focus for this dredging event. **Figure 2** shows the sediment disposal area used in 2010, Disposal Location 1.

2.2 Water Quality Monitoring Results

Background water samples are included in the review of all analytical results. Analytical results from the laboratory are included as **Appendix B**.

Concentrations of ammonia were evaluated for collected samples. According to Special Condition #11 ammonia concentration is not to exceed 0.02 mg/L or the background concentrations measured during monitoring. Total average per day results were below 0.02 mg/L and the background sample results except on 08/06/2010. To assess impacts of the dredging on Lake Michigan the Analyze-It statistical software was used for analysis. Daily average and background sample results were compared using the Mann-Whitney test and Kruskal-Wallis test. Neither test showed a statistically significant difference (within a 95% confidence interval) between daily average and background concentrations. **Figure 4** and **Table 4** both display the daily average concentration of ammonia for all samples collected and analyzed. Surface and mid-depth concentrations can be seen in **Tables 5** and **6**. Graphical

comparisons are shown in **Figures 5** and **6**. Based on the data there is no evidence that Waukegan Harbor sediment disposal is impacting ammonia concentrations at the disposal site.

Concentrations of phosphorus were evaluated for collected samples. According to Special Condition #11 phosphorus concentration is not to exceed 0.007 mg/L or the background concentrations measured during monitoring. Total average per day results were below 0.007 mg/L except on 07/19/2010, 07/29/2010, and 08/06/2010. On 07/29/2010 the background concentration was also above 0.007 mg/L. This parameter was not analyzed using the Analyze-It statistical software because over 35% of the results were below the reporting limit so any analysis would not yield significant results. **Figure 7** and **Table 7** both display the daily average concentration of ammonia for all samples collected and analyzed. Surface and mid-depth concentrations can be seen in **Tables 8** and **9**. Graphical comparisons are shown in **Figures 8** and **9**. Based on the data there is no evidence that Waukegan Harbor sediment disposal is impacting phosphorus concentrations at the disposal site

Concentrations of chloride were evaluated for collected samples. According to Special Condition #11 chloride concentration is not to exceed 12 mg/L or the background concentrations measured during monitoring. Total average per day results were all below 12 mg/L. To assess impacts of the dredging on Lake Michigan the Analyze-It statistical software was used for analysis. Daily average and background sample results were compared using the Mann-Whitney test and Kruskal-Wallis test. Neither test showed a statistically significant difference (within a 95% confidence interval) between daily average and background concentrations. **Figure 10** and **Table 10** both display the daily average concentration of chloride for all samples collected and analyzed. Surface and mid-depth concentrations can be seen in **Tables 11** and **12**. Graphical comparisons are shown in **Figures 11** and **12**. Based on the data there is no evidence that Waukegan Harbor sediment disposal is impacting chloride concentrations at the disposal site.

Concentrations of total suspended solids were evaluated for collected samples. There is no Water Quality Standard for TSS. National Pollutant Discharge Elimination System (NPDES) issues permits with TSS limits based on the industry, location, etc. These limits can range from but are not limited to 12 mg/L and up to 40 mg/L. None of the samples collected during sediment disposal exceeded 12 mg/L. The daily average TSS concentrations of water samples collected for this dredging event ranged from Non-Detect (reporting limit 0.5 mg/L) to 2.75 mg/L. The average background TSS concentrations of water samples ranged from 0.5 mg/L to 1.0 mg/L. Average daily and background TSS concentrations are shown in **Table 13** and **Figure 13**. Surface and mid-depth concentrations can be seen in **Tables 14** and **15** respectively. Graphical comparisons of surface and mid-depth results are shown in **Figures 14** and **15** respectively. Based on this data there is no evidence that Waukegan Harbor sediment disposal is impacting TSS concentrations at the disposal site.

2.3 Conclusion Regarding Monitoring

Water Quality Monitoring during sediment disposal for Waukegan Harbor Approach Channel was completed. Statistical comparisons between background and monitoring sample results did not indicate any difference between the data sets. Based on the results, sediment disposal operations are not having an impact on water quality in Lake Michigan.

3. Sediment Sampling for 2011 Dredging

In accordance with Special Condition #5, sampling and analysis must be conducted prior to each dredging event for a minimum of three samples from the dredge cut. The purpose of this sampling is to obtain and characterize material that is representative of the dredge area, in advance of the 2011 dredging operation. On 10 August 2010, the following samples were collected; three sediment samples from the Waukegan Harbor Advance Maintenance Area, and two water samples and three sediment samples from the Illinois Beach State Park reference site.

3.1 Determining Advance Maintenance Area Sample Locations

The EPA publication "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", commonly referred to as SW-846, is the EPA's official compendium of analytical and sampling methods that have been evaluated and approved for use in complying with the RCRA regulations. SW-846 functions primarily as a guidance document setting forth acceptable, although not required, methods for the regulated and regulatory communities to use in responding to RCRA-related sampling and analysis requirements. SW-846 is commonly used as a reference for other non-RCRA projects due to its conservative qualities and universal applicability to environmental work. Both the Inland and Great Lakes Testing Manuals include SW-846 as a reference in their texts, which means it is a suitable reference for dredging projects such as the work at Waukegan Harbor. To obtain sampling accuracy, SW-846 recommends the use of a variety of random sampling methods depending on the characteristics of the sampling area. Chapter 9 of SW-846, titled "Sampling Plan," describes simple random sampling as follows:

> *"If a batch of waste is randomly heterogeneous with regard to its chemical characteristics and that random chemical heterogeneity remains constant from batch to batch, accuracy and appropriate precision can usually be achieved by simple random sampling. In that type of sampling, all units in the population (essentially all locations or points in all batches of waste from which a sample could be collected) are identified and a suitable number of samples is randomly selected from the population."*

Random chemical heterogeneity implies that any contamination may occur at any point within the sample location; there is no bias for sampling from one point or another. This fits the description of the Advance Maintenance Area and Approach Channel. The sediment in these areas is deemed generally homogeneous and any contamination could occur at any point.

SW-846 describes the selection of sampling locations using a random sampling grid. The following excerpt was taken from Chapter 9 of SW-846:

> *"One of the commonest methods of selecting a random sample is to divide the population by an imaginary grid, assign a series of consecutive numbers to the units of the grid, and select the numbers (units) to be sampled through the use of a*

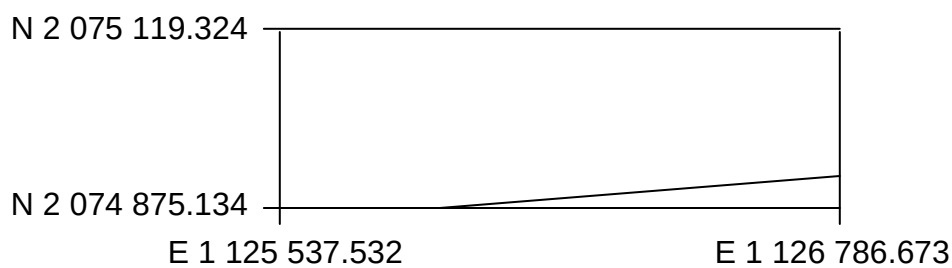
random-numbers tables (such a table can be found in any text on basic statistics). It is important to emphasize that a haphazardly selected sample is not a suitable substitute for a randomly selected sample. That is because there is no assurance that a person performing undisciplined sampling will not consciously or subconsciously favor the selection of certain units of the population, thus causing the sample to be unrepresentative of the population."

Further guidance for random sampling was found in the EPA document "Methods for Evaluating the Attainment of Cleanup Standards Volume 1: Soils and Solid Media". This document details among other things, a method for determining sample locations for the simple random sampling method.

Before exact sample locations could be determined the area from which the samples would be taken had to be determined. Because of historical dredging work, temporal movement of sediments in the area is known. The littoral drift along the West Coast of Lake Michigan is in the southerly direction, meaning that sediments accumulate in the northerly Advance Maintenance Area prior to the southerly Approach Channel. Prior to dredging, soundings are made of these two regions and areas of shoaling requiring dredging are determined. For recent dredging events, most of this shoaling has occurred in the Advance Maintenance Area, which is why sampling has been relegated to this region.

After the sampling areas were determined the next step was to establish a grid of the sampling area. Using the EPA guidance document listed above, a grid was established for the Advance Maintenance Area using the state plane coordinates. **Diagram 1** below is a representation of the sampling grid that was used:

Diagram 1: Sampling Area Grid



Once the sampling grid was established, the set of equations listed below were used to determine the coordinates for the sampling points:

$$X = X_{\min} + \left(X_{\max} - X_{\min}\right) * RAND$$
$$Y = Y_{\min} + \left(Y_{\max} - Y_{\min}\right) * RAND$$

Where X and Y are the coordinates, X_{min} and X_{max} are the limits of the grid on the X axis (1 125 537.532 to 1 126 786.673), and Y_{min} and Y_{max} are the limits of the Y axis (2 074 875.134 to 2 075 119.324). RAND is a random number between 0 and 1 and is generated from a random number generator function in Microsoft Excel. Viewing **Diagram 1**, it is apparent that the

Advance Maintenance Area does not fit squarely into the grid. The lower right hand corner is inset slightly, which leaves open the possibility of a generated sample coordinate being located outside of the Advance Maintenance Area. The EPA guidance document suggests that generated sample coordinates that fall outside of the intended sample boundary simply be omitted and another set of coordinates generated.

Prior to the event, sufficient shoaling for sampling was identified in the NE of the Advance Maintenance Area and a list of 13 possible points was generated (See **Table 16** below). A large number of sampling locations is necessary in case access is limited to a certain area or in case shoaling is not present in some of the locations. Historical patterns of sediment accumulation are known, however exact conditions can vary. This entire list of points was plotted (see **Figure 16**) to see if any of the points were located outside of the sampling area. Points which fell in the area outside of the Advance Maintenance Area were omitted.

Table 16: List of Possible Sample Locations – Advance Maintenance Area

	Longitude	**Latitude**
pt 1	-87.80783365	42.36305991
pt 2	-87.80823738	42.36269483
pt 3	-87.80806248	42.36301231
pt 4	-87.80820838	42.36275026
pt 5	-87.80787744	42.36292720
pt 6	-87.80786991	42.36275077
pt 7	-87.80768774	42.36306892
pt 8	-87.80833069	42.36286732
pt 9	-87.80770141	42.36261088
pt 10	-87.80834045	42.36264731
pt11	-87.80777396	42.36271982
pt12	-87.80754367	42.36257777
pt13	-87.80825033	42.36270227

3.2 Advance Maintenance Area Sediment Samples

Three sediment samples were collected from three random locations inside the Advance Maintenance Area on 10 August 2010. Possible sample locations were determined prior to the sampling event using a scientific method recommended by the USEPA and detailed in the previous section. Points which fell outside of the Advance Maintenance Area were eliminated from consideration. Additionally sediment samples for 2011 dredging could not come from a location which was dredged as a part of the 2010 dredging project. **Figure 16** shows the locations of the 13 points, with the final sample locations labeled as Sample #1-3.

The sampling locations were approached in numerical order using a Global Positioning System (GPS) unit with an accuracy of 15 feet. The coordinates at which the samples were collected may vary slightly from the coordinates originally chosen. In each instance, the sampling team positioned the sampling bucket as close as possible to the specified sampling location however

wind and current at the time can cause some drift of the sampling vessel. The three harbor locations that were used for this sampling event are listed in **Table 17**.

Table 17: Actual Sample Locations – Advance Maintenance Area

Sample	Corresponding Point
2011 Dredging Sediment – Sample #1	Point 11
2011 Dredging Sediment – Sample #2	Point 12
2011 Dredging Sediment – Sample #3	Point 13

After arriving at each sample location, the dredging or sample depth was determined. Dredging in the Advance Maintenance Area and Approach Channel of Waukegan Harbor is authorized to a depth of -22 feet LWD, plus there is potentially an additional two feet that may be dredged due to the allowance for over-depth dredging. Since the sediment samples need to represent the composition of the dredged material, samples were collected to approximately -24 feet LWD to include the potential for over-depth dredging.

Composite samples were collected using a mechanical dredging bucket. The dredging bucket was lowered to the sediment surface where it collected a bucket of sediment. The bucket was then raised to the deck of the barge where representative samples were collected and placed in a large stainless steel mixing bowl. When the sampling was complete, the bucket was emptied away from the original sampling spot and, if necessary, it was lowered again to the site of the original sample where it collected additional sediment. This procedure was repeated until the bottom of the dredging depth was reached. All sampling points required three buckets of material be retrieved to reach -24 feet LWD. The samples that were collected at each depth were then mixed in the stainless steel bowl and measured into sample jars. **Figures 17-19** show photos of the samples from the Advance Maintenance Area.

3.3 Illinois Beach State Park Sediment Samples

On 10 August 2010, three sediment grab samples were also collected at the IBSP reference site north of the North Point Marina (see **Figure 3**). The *Great Lakes Dredged Material Testing and Evaluation Manual* recommends selecting a reference site separate from the disposal area when the disposal area has already been used. The intent is to obtain sediment samples that are representative of the general area where disposal will occur, but to avoid sampling disposed dredged material from a previous dredging event. These samples were taken approximately 300 feet from each other near to the water's edge. A hand scoop was used to collect the samples from the top of the sediment surface. **Table 18** shows the collection locations of the three reference samples, as given by a hand-held GPS with an accuracy of approximately 15 feet.

Table 18: IBSP Reference Sample Locations

Sample	Longitude	Latitude
Beach Sediment #1	87.802417	42.490083
Beach Sediment #2	87.802556	42.492000
Beach Sediment #3	87.802000	42.490000

In all of the samples that were collected the sediment was a medium to fine brown sand, with a trace of silt and clay. No visual contamination or noticeable odor was present in the samples. Samples collected from each location were homogenized using decontaminated stainless steel mixing equipment, and placed in containers provided by the analytical laboratory. **Figures 20-22** show photos of the IBSP reference site samples.

3.4 Illinois Beach State Park Water Samples

Two water samples (Beach Water 1 and Beach Water 2) were collected from one location at the Illinois Beach State Park reference site. These samples are part of Special Condition #5 for supernatant testing requirements for open water placement of dredged material.

Dredging sediment from a waterway can generate concern about the release of contaminates to the water column. A supernatant test involves mixing sediment and site water, allowing the particles to settle, and analyzing the supernate for contaminants. Supernate is the liquid above the sediment that has settled out. The supernatant test on the August 2010 samples was conducted twice; once at "zero hours" equivalent to just after mixing, and once at four hours after mixing. Sample Beach Water 2 was used for the supernatant test. The sediment used was a composite of the three Advance Maintenance Area sampling locations. The second water sample (Beach Water 1) was the reference water sample and was analyzed for the same parameters. Water temperature on site was recorded as 26.1 ^{o}C and pH was 8.53.

3.5 Sediment Sampling Results

All six sediment samples were analyzed for PCBs (Method 8082), asbestos (polarized light microscopy (PLM) and transmission electron microscopy (TEM)), and grain size (in accordance with the protocol required by the IEPA for Section 39 water quality certification). Results for the PCB and asbestos analysis can be found in **Table 19**. The complete lab report containing all analytical results is located in **Appendix B**.

Table 19: Sediment PCB and Asbestos Results

	2011 Dredging Sediment			Beach Sediment			PCB Reporting Limit (mg/kg)[2]
	1	2	3	1	2	3	
PCB-1016	ND[1]	ND	ND	ND	ND	ND	0.00271
PCB-1221	ND	ND	ND	ND	ND	ND	0.00271
PCB-1232	ND	ND	ND	ND	0.0131	ND	0.00271
PCB-1242	ND	ND	ND	ND	ND	ND	0.00271
PCB-1248	ND	ND	ND	ND	ND	ND	0.00271
PCB-1254	ND	ND	ND	ND	ND	ND	0.00271
PCB-1260	ND	ND	ND	ND	ND	ND	0.00271
Asbestos-PLM (%)	ND	ND	ND	ND	ND	ND	
Asbestos-TEM (%)	ND	ND	ND	ND	ND	ND	

Note:
1) ND indicates the contaminants were not present above the stated reporting limit
2) PCB Reporting Limit shown is highest value when reporting limit varied between samples

3.6 Sediment PCB Analysis

As part of a Tier 1 analysis performed by USACE in 1995, data were collected from past sampling events in the Advance Maintenance Area and Approach Channel and a mean concentration for PCBs was computed. In determining the mean concentration, non-detect data was assumed to be equal to the reporting limit. The average total PCB concentration of the historic samples, which includes samples from 1985-1995, was calculated to be 0.2 mg/kg, with individual values as high as 0.6 mg/kg total PCBs (USACE 1995). **Table 2** contains more recent PCB results for sediment collected from the Advance Maintenance Area and Approach Channel between 1997 and 2009. As shown in **Table 19**, all sediment samples from the recent August 2010 event were non-detect for each PCB aroclors except background Beach Sediment Sample #2 for PCB-1232, which at 0.0131 mg/kg is below the calculated historic mean of 0.2 mg/kg and well below the TSCA-regulated level of 50 mg/kg for PCB-contaminated material.

3.7 Sediment Asbestos Analysis

Due to asbestos findings around the IBSP, USACE began to analyze samples for asbestos in 1997. Results from the sampling events in 1997-1998 and 2001-2009 have shown no evidence of asbestos (USACE 2009). One sample from both the 1999 and 2000 sessions detected a trace amount of asbestos, but not at a concentration high enough to classify it as asbestos containing material (ACM).

As mentioned previously, the sediment samples were analyzed using two asbestos analytical methods: PLM and TEM. The PLM method evaluates the sediment for asbestos containing building material and asbestos fibers/bundles/matrices and has the ability to detect fibers greater than or equal to 5 microns. The TEM method uses a more sophisticated technology that can analyze fibers greater than or equal to 0.5 microns. None of the samples analyzed using the PLM and TEM methods showed signs of asbestos.

3.8 Grain Size Analysis

According to Title 35 of the Illinois Administrative Code (Subtitle C, Chapter 2, Part 395), a particle size analysis is required to evaluate the potential for water pollution due to the discharge of dredge and fill. According to Special Condition #6, particle size tests that show 20% or more material passing through a #230 U.S. Standard sieve require notice to IEPA. All of the samples collected during this sampling event show greater than 20% of material passing such a sieve. Dredging sediment samples had results consistent with background beach sample results (see **Table 20**).

Table 20: Sediment Grain Size Analysis

	2011 Dredging Sediment			Background Beach Sediment		
	1	2	3	1	2	3
% particles smaller than #230 sieve	25	33	30	25	24	23

3.9 Water Sampling Results

Both water samples were analyzed for total suspended solids (TSS), total volatile solids (TVS), ammonia-nitrogen (as N), phosphorus (as P), total dissolved solids (TDS), sulfate, chloride, lead (total), zinc (total), and total polychlorinated biphenyls (PCBs). Sample Beach Water #1 is the reference water sample. Zero hour and four hour supernatant tests were run with sample Beach Water #2. Results for these analyses can be found in **Table 21**. The complete lab report containing all analytical results is located in **Appendix B**.

Table 21: Water Sample Results

	Beach Water #2 (Elutriate)		Beach Water	Lab
	Zero Hour	Four Hour	#1 (Ref.)	Reporting Limit
Total Suspended Solids (TSS)	27000 mg/L	1540 mg/L	7.5 mg/L	0.5 mg/L
Total Volatile Solids (TVS)	35 mg/L	9.14 mg/L	5.72 mg/L	1.0 mg/L
Total Dissolved Solids (TDS)	194 mg/L	185 mg/L	173 mg/L	1.0 mg/L
phosphorus (as P)	0.0205 mg/L	ND	0.0361 mg/L	0.005 mg/L
ammonia-nitrogen (as N)	0.542 mg/L	0.440 mg/L	0.052 mg/L	0.01 mg/L
sulfate	36 mg/L	28 mg/L	29 mg/L	1.0 mg/L
chloride	17.9 mg/L	18.6 mg/L	15.1 mg/L	0.5 mg/L
lead (total)	0.258 mg/L	0.0291 mg/L	ND	0.0001 mg/L
zinc (total)	0.716 mg/L	0.101 mg/L	ND	0.003 mg/L
PCB-1016	0.023 ug/L	ND[1]	ND	0.02 ug/L
PCB-1221	ND	ND	ND	0.02 ug/L
PCB-1232	ND	ND	ND	0.02 ug/L
PCB-1242	ND	ND	ND	0.02 ug/L
PCB-1248	ND	ND	ND	0.02 ug/L
PCB-1254	ND	ND	ND	0.02 ug/L
PCB-1260	ND	ND	ND	0.02 ug/L

Note: 1) ND indicates the contaminants were not present above the stated reporting limit

Special Condition #7 lists limits for the 4-hr supernatant test for ammonia-nitrogen (as N), chloride, phosphorus, total PCBs and total suspended solids (TSS). **Table 22** shows these amounts. As stated in the condition, if the 4-hr supernatant test results exceed the levels shown, then monitoring during the next dredging event needs to be conducted for those parameters.

Table 22: IEPA Permit Limits for 4-hr Supernatant Test

	IEPA Permit Limits	
Total PCBs	0.1	ug/L
phosphorus (as P)	0.007	mg/L
ammonia-nitrogen (as N)	0.02	mg/L
chloride	12	mg/L
Total Suspended Solids	15	mg/L

When comparing **Table 21 (Water Sample Results)** with **Table 22 (IEPA Permit Limits for 4-hr Supernatant Test),** total PCBs and phosphorus were below the IEPA permit limit. Because total PCB supernatant results were below the listed amounts and consistently non-detect during monitoring, this parameter will not be monitored for the spring/summer 2011 dredging event. Phosphorus 4-hr supernatant results were below the IEPA permit limit; however since a few monitoring events had results above background, USACE will continue to monitor for phosphorus for the 2011 dredging. Based on these results, phosphorus, ammonia-nitrogen (as N), chloride, and total suspended solids will be monitored in accordance with the permit for the spring/summer 2011 dredging event.

4. Conclusion

Sampling was conducted to obtain and characterize material that is representative of the dredge area, in advance of the 2011 dredging operation. According to Special Condition #6, particle size tests that show 20% or more material passing through a #230 U.S. Standard sieve require notice to IEPA. All of the samples collected during this sampling event show greater than 20% of material passing such a sieve. Because dredging sediment samples had results consistent with background beach sample results, impacts are not anticipated.

The results of this sampling event show no level of contamination that would cause environmental impacts related to water quality. The historical and current data show that the sediment and elutriate results have been consistent over time. Water quality impacts have not been noted in the past. Based on the similarity of current results with historical data, water quality impacts are not anticipated. Therefore, sediments in the Approach Channel and Advance Maintenance Area should be acceptable for disposal off shore of IBSP, or at the open water disposal site south of Waukegan Harbor.

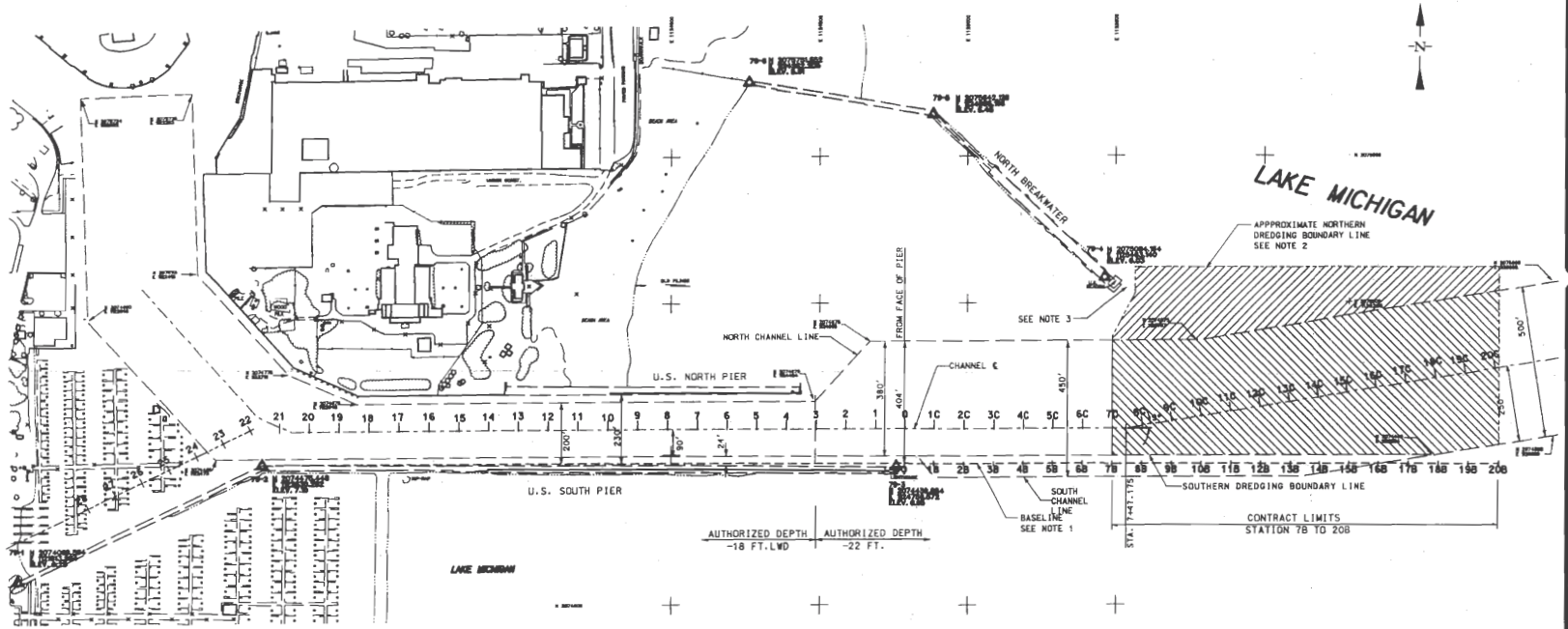
5. References

USACE. Waukegan Harbor Approach Channel Dredging: Tier 1 Sediment Evaluation. Chicago, Illinois. October 1995.

35 Illinois Administrative Code. Environmental Regulations for the State of Illinois.

Figures and Tables

FIGURE 1: WAUKEGAN HARBOR
ADVANCE MAINTENANCE AND MAINTENANCE AREAS
WAUKEGAN, ILLINOIS



DATUM AND BENCHMARKS

ALL ELEVATIONS ARE IN FEET AND ARE REFERENCED TO LOW WATER DATUM (LWD), LAKE MICHIGAN. 0.0 FEET LWD HAS AN ELEVATION OF 577.84 FEET (INCLUDES +0.34' CORRECTION FACTOR) ABOVE THE REFERENCE PLANE AT RIMOUSKI, QUEBEC, INTERNATIONAL GREAT LAKES DATUM (IGLD) 1985. ALL COORDINATES ARE REFERENCED TO ILLINOIS STATE PLANE COORDINATE SYSTEM, EAST ZONE, 1983 NORTH AMERICAN DATUM (FT).

NOTES:

1. THE BASELINE IS OFFSET 2.3± ft. NORTH OF THE NORTH FACE OF THE SOUTH PIER. STATION 0+00 IS THE EAST FACE OF THE SOUTH PIER.

2. THE NORTHERN MOST DREDGING BOUNDARY LINE IS SHOWN FOR REFERENCE ONLY. THIS LINE WILL BE ADJUSTED BY THE COR BASED ON THE PRIOR SURVEYS.

3. NO DREDGING IS TO BE PERFORMED WITHIN 50 FEET OF THE NORTH BREAKWATER.

SURVEY CONTROL

POINT	NORTHING	EASTING	ELEV.
79-1	2074089.564	1121813.884	6.25
79-2	2074475.448	1122630.282	7.10
79-3	2074459.884	1124758.572	6.95
79-4	2075084.164	1125463.140	6.03
79-5	2075642.128	1124885.196	6.48
79-6	2075751.652	1124262.205	5.61

DREDGE LIMITS

150 0 150 300

SCALE IN FEET

LEGEND/SYMBOLS

- CHANNEL LINE
- CHANNEL ℄
- DREDGING BOUNDARY LINE
- BASELINE
- ADVANCE MAINTENANCE AREA
- MAINTENANCE AREA

US Army Corps of Engineers Chicago District

U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS CHICAGO, ILLINOIS

DATE: SEPTEMBER 2004
SCALE: AS SHOWN
DESIGNED BY: JAK
DRAWN BY: DB
CHECKED BY: KJM
SOLICITATION NUMBER:
SUBMITTED BY:

WAUKEGAN HARBOR MAINTENANCE DREDGING WAUKEGAN, ILLINOIS LAKE MICHIGAN

DREDGE LIMITS

SHEET REFERENCE NUMBER:

SHEET OF 3

Figure 2: Disposal Location 1

This sediment disposal site (Disposal Location 1) is located 1 mile south of Waukegan Harbor. It was originally located approximately 1000 feet offshore, and was used for dredging operations between 1995 and 1998. In 2003 the area was shifted 1000 feet lakeward, and has been used for every dredging event since then.

Figure 3: Disposal Locations 2 & 3

Disposal Locations 2 and 3 have been used in the past for beach nourishment at Illinois Beach State Park (IBSP). Disposal Location 2 was used between 1999 and 2001, and in 2005, 2008, and 2009. Disposal Location 3 was used in 2002. These sites are potential disposal locations for 2011.

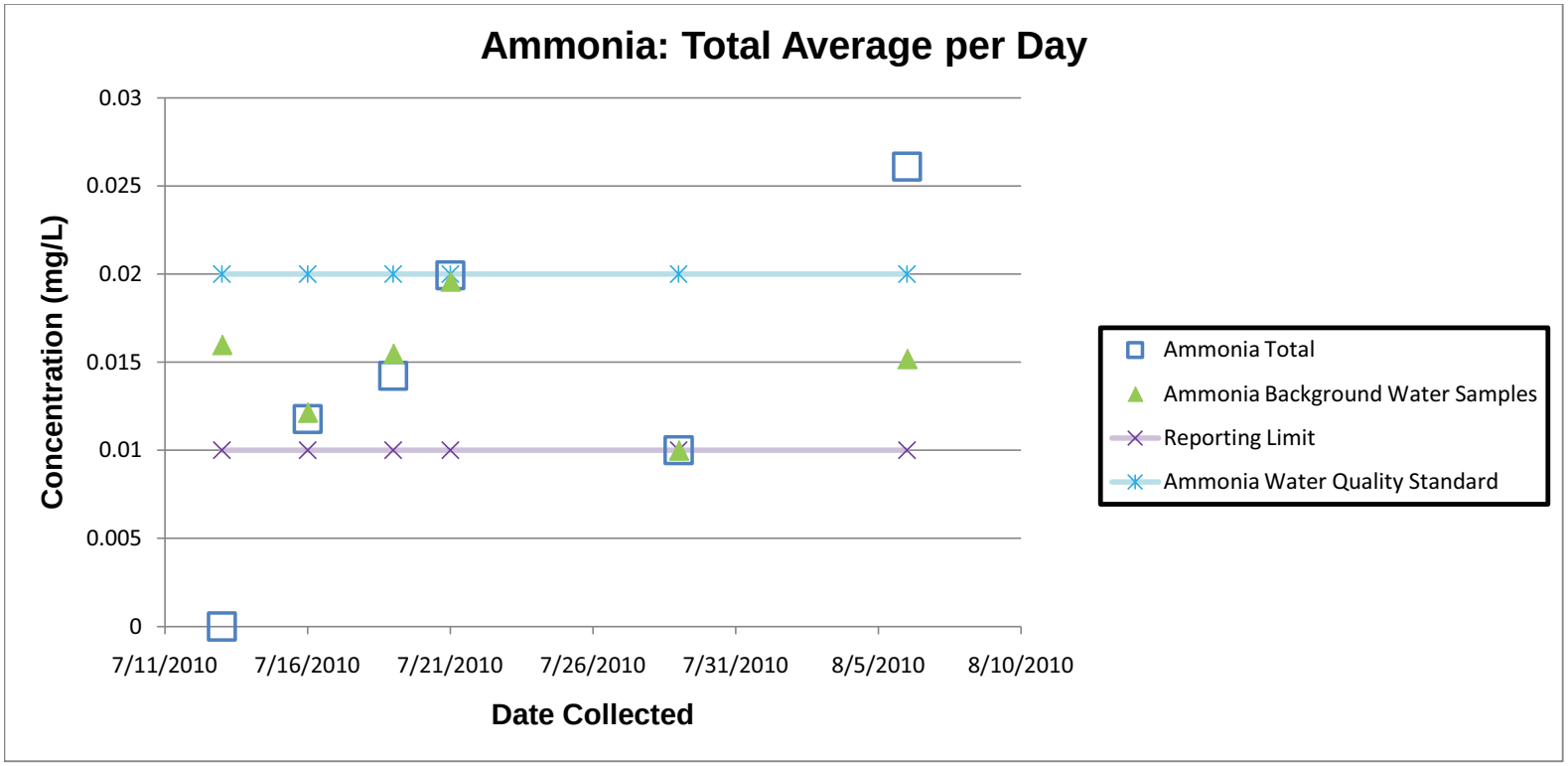


Figure 4: Ammonia Concentrations - Daily Average (3)

Table 4: Concentrations of Ammonia - Total Daily Average (mg/L)

Date Collected	Ammonia Total	Ammonia Background Water Samples	Reporting Limit	Water Quality Standard(2)
7/13/2010	NA(1)	0.016	0.01	0.02
7/16/2010	0.012	0.012	0.01	0.02
7/19/2010	0.014	0.016	0.01	0.02
7/21/2010	0.020	0.020	0.01	0.02
7/29/2010	ND	ND	0.01	0.02
8/6/2010	0.026	0.015	0.01	0.02

(1) NA - Not Applicable. Sample not collected

(2) Water Quality Standard from Environmental Regulations for the State of Illinois, Title 35 of the Illinois Administrative Code

(3) Concentrations that are ND - Not Detected are shown as the Reporting Limit on the figure

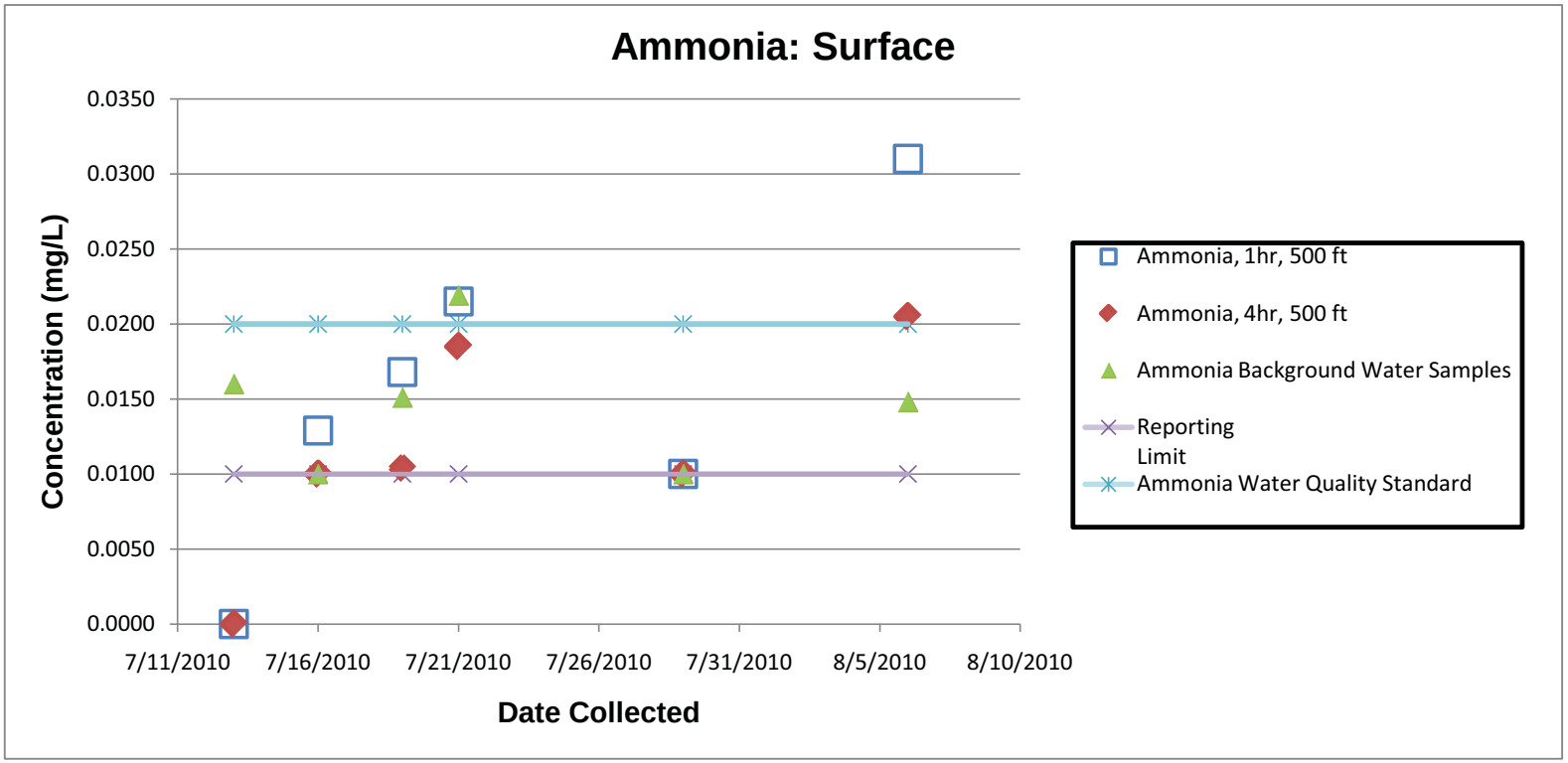


Figure 5: Ammonia Concentrations - Surface Collections (3)

Table 5: Concentrations of Ammonia - Surface Collections (mg/L)

Date Collected	Ammonia, 1hr, 500 ft	Ammonia, 4hr, 500 ft	Ammonia Background Water Samples	Reporting Limit	Water Quality Standard(2)
7/13/2010	NA(1)	NA	0.016	0.01	0.02
7/16/2010	0.013	ND	ND	0.01	0.02
7/19/2010	0.017	0.010	0.015	0.01	0.02
7/21/2010	0.022	0.019	0.022	0.01	0.02
7/29/2010	ND	ND	ND	0.01	0.02
8/6/2010	0.031	0.021	0.015	0.01	0.02

(1) NA - Not Applicable. Sample not collected

(2) Water Quality Standard from Environmental Regulations for the State of Illinois, Title 35 of the Illinois Administrative Code

(3) Concentrations that are ND - Not Detected are shown as the Reporting Limit on the figure

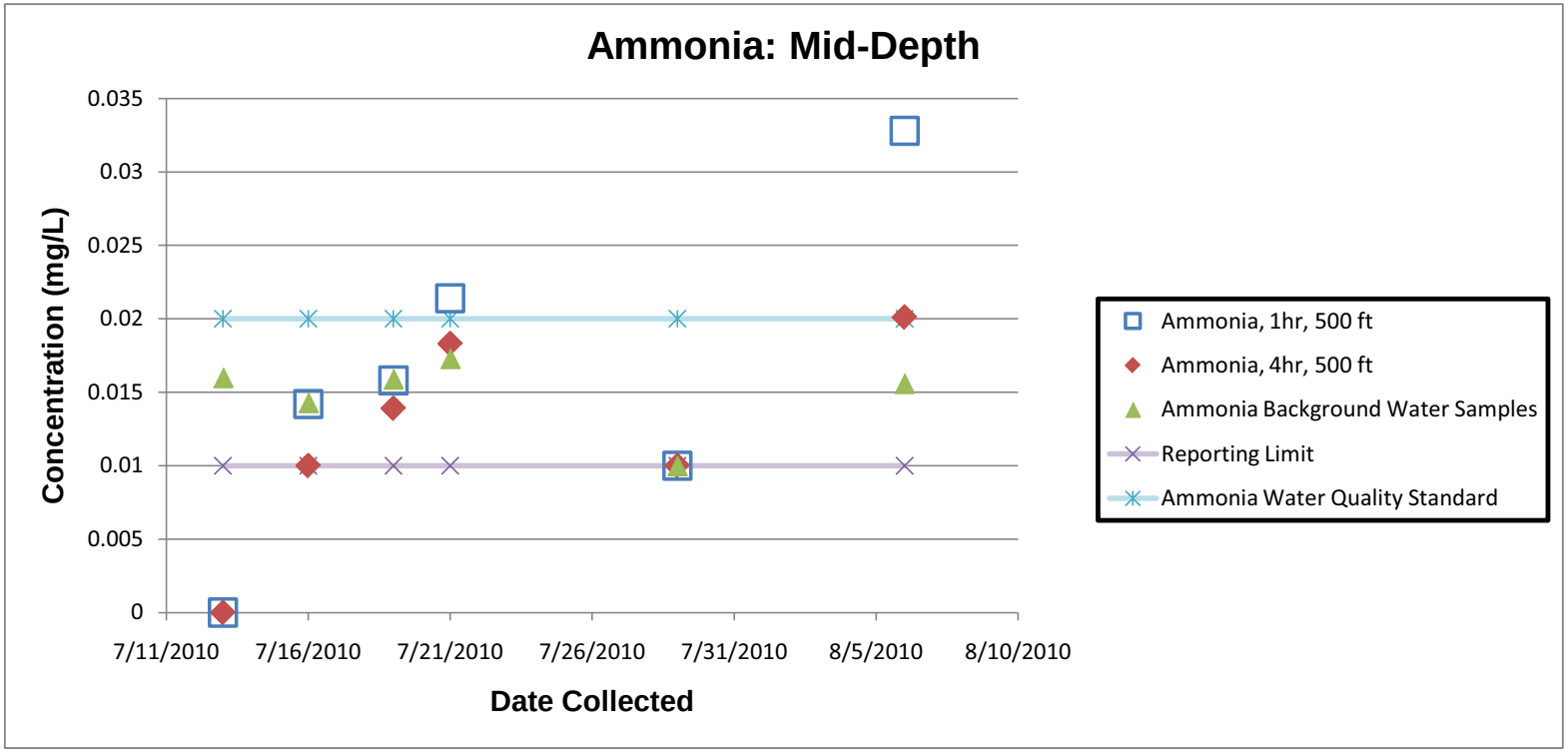


Figure 6: Ammonia Concentrations - Mid-Depth Collections (3)

Table 6: Concentrations of Ammonia - Mid-Depth Collections (mg/L)

Date Collected	Ammonia, 1hr, 500 ft	Ammonia, 4hr, 500 ft	Ammonia Background Water Samples	Reporting Limit	Water Quality Standard
7/13/2010	NA(1)	NA	0.016	0.01	0.02
7/16/2010	0.014	ND	0.014	0.01	0.02
7/19/2010	0.016	0.014	0.016	0.01	0.02
7/21/2010	0.021	0.018	0.017	0.01	0.02
7/29/2010	ND	ND	ND	0.01	0.02
8/6/2010	0.033	0.020	0.016	0.01	0.02

(1) NA - Not Applicable. Sample not collected
(2) Water Quality Standard from Environmental Regulations for the State of Illinois, Title 35 of the Illinois Administrative Code
(3) Concentrations that are ND - Not Detected are shown as the Reporting Limit on the figure

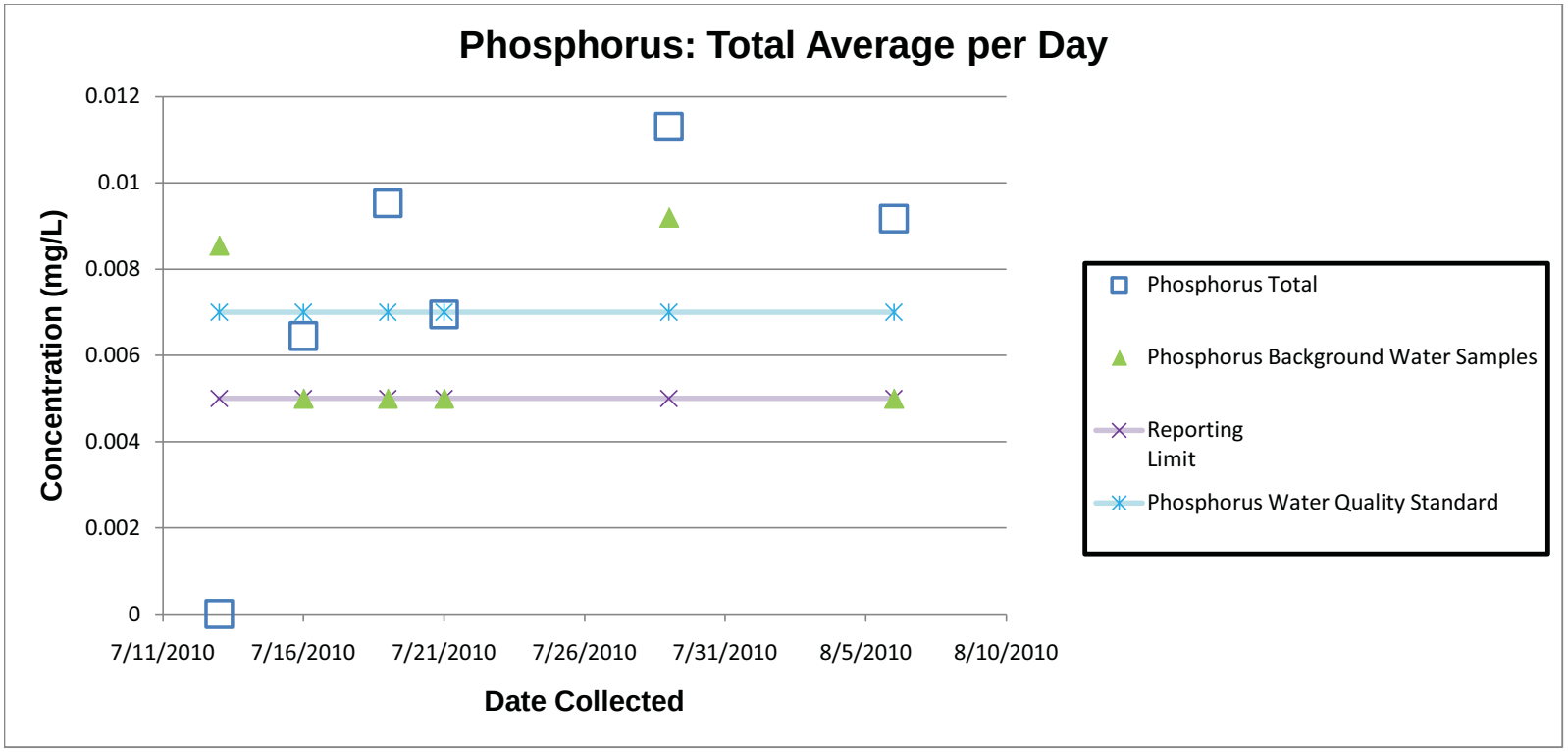


Figure 7: Phosphorus Concentrations - Daily Average (3)

Table 7: Concentrations of Phosphorus - Total Daily Average (mg/L)

Date Collected	Phosphorus Total	Phosphorus Background Water Samples	Reporting Limit	Water Quality Standard(2)
7/13/2010	NA(1)	0.00855	0.00500	0.007
7/16/2010	0.00645	ND	0.00500	0.007
7/19/2010	0.00953	ND	0.00500	0.007
7/21/2010	0.00695	ND	0.00500	0.007
7/29/2010	0.011305	0.00920	0.00500	0.007
8/6/2010	0.00917	ND	0.00500	0.007

(1) NA - Not Applicable. Sample not collected

(2) Water Quality Standard from Environmental Regulations for the State of Illinois, Title 35 of the Illinois Administrative Code

(3) Concentrations that are ND - Not Detected are shown as the Reporting Limit on the figure

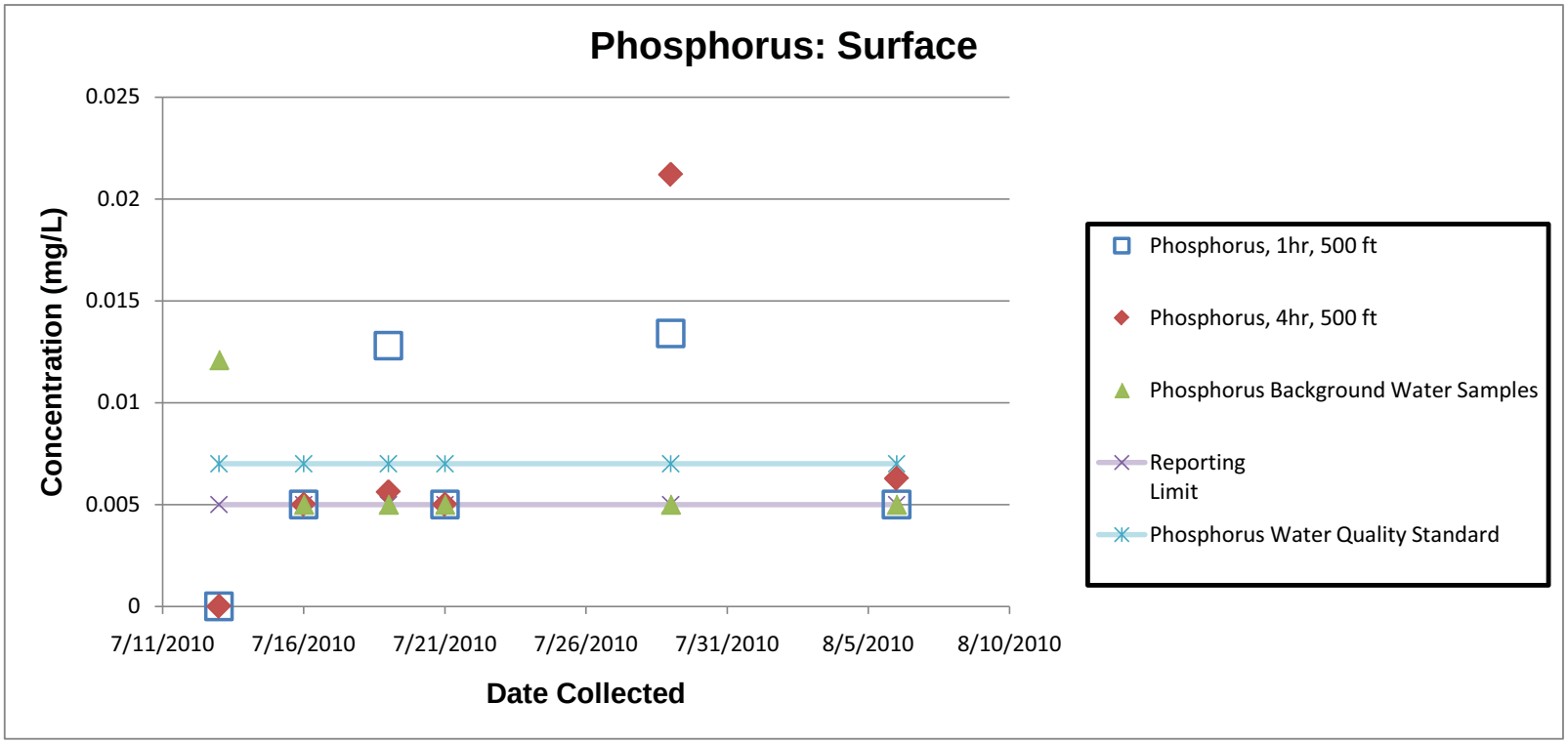


Figure 8: Phosphorus Concentrations - Surface Collections (3)

Table 8: Concentrations of Phosphorus - Surface Collections (mg/L)

Date Collected	Phosphorus, 1hr, 500 ft	Phosphorus, 4hr, 500 ft	Phosphorus Background Water Samples	Reporting Limit	Water Quality Standard(2)
7/13/2010	NA(1)	NA	0.01210	0.00500	0.007
7/16/2010	ND	ND	ND	0.00500	0.007
7/19/2010	0.01280	0.00562	ND	0.00500	0.007
7/21/2010	ND	ND	ND	0.00500	0.007
7/29/2010	0.01340	0.02120	ND	0.00500	0.007
8/6/2010	ND	0.00628	ND	0.00500	0.007

(1) NA - Not Applicable. Sample not collected
(2) Water Quality Standard from Environmental Regulations for the State of Illinois, Title 35 of the Illinois Administrative Code
(3) Concentrations that are ND - Not Detected are shown as the Reporting Limit on the figure

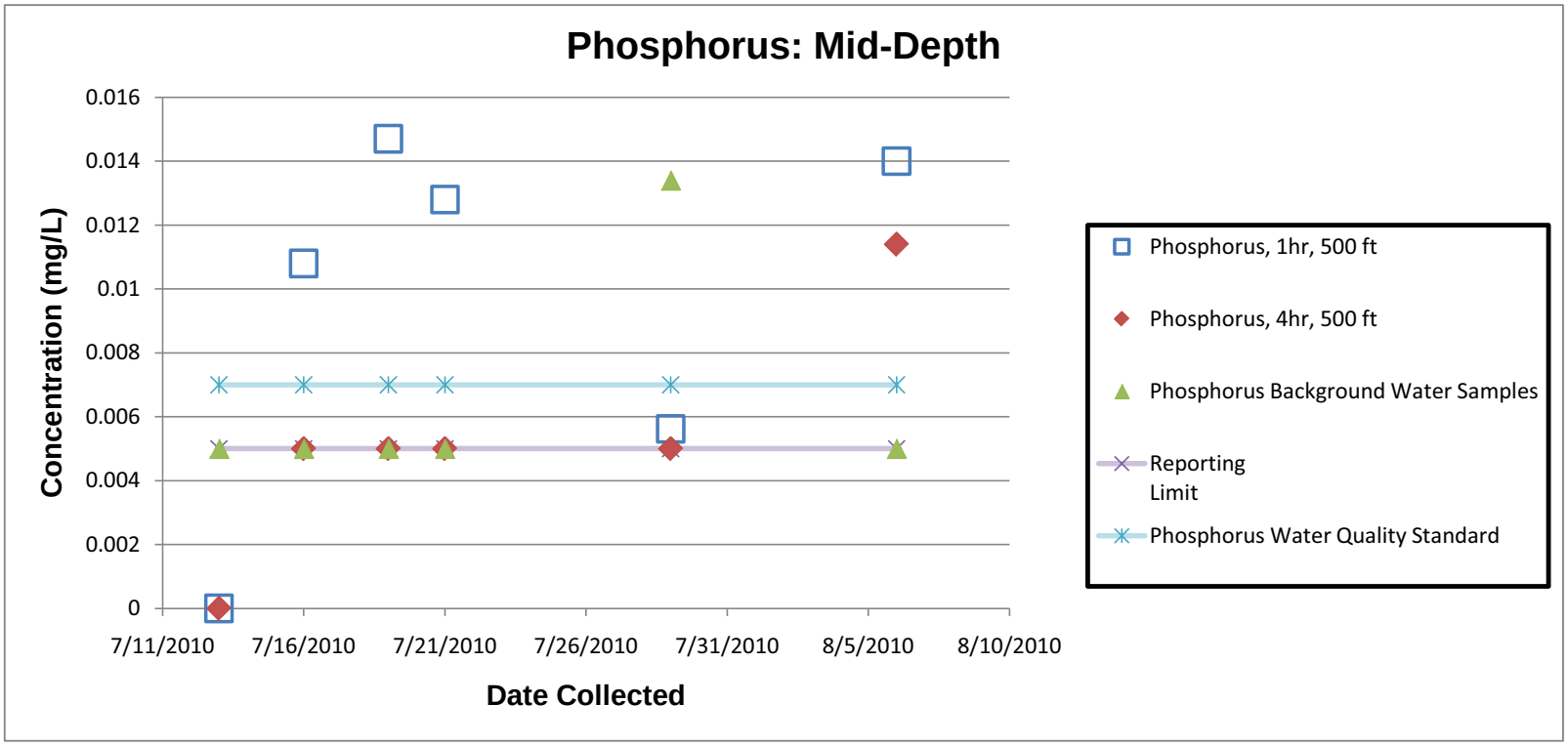


Figure 9: Phosphorus Concentrations - Mid-Depth Collections (3)

Table 9: Concentrations of Phosphorus - Mid-Depth Collections (mg/L)

Date Collected	Phosphorus, 1hr, 500 ft	Phosphorus, 4hr, 500 ft	Phosphorus Background Water Samples	Reporting Limit	Water Quality Standard(2)
7/13/2010	NA(1)	NA	ND	0.00500	0.007
7/16/2010	0.0108	ND	ND	0.00500	0.007
7/19/2010	0.01470	ND	ND	0.00500	0.007
7/21/2010	0.01280	ND	ND	0.00500	0.007
7/29/2010	0.00562	ND	0.0134	0.00500	0.007
8/6/2010	0.01400	0.01140	ND	0.00500	0.007

(1) NA - Not Applicable. Sample not collected

(2) Water Quality Standard from Environmental Regulations for the State of Illinois, Title 35 of the Illinois Administrative Code

(3) Concentrations that are ND - Not Detected are shown as the Reporting Limit on the figure

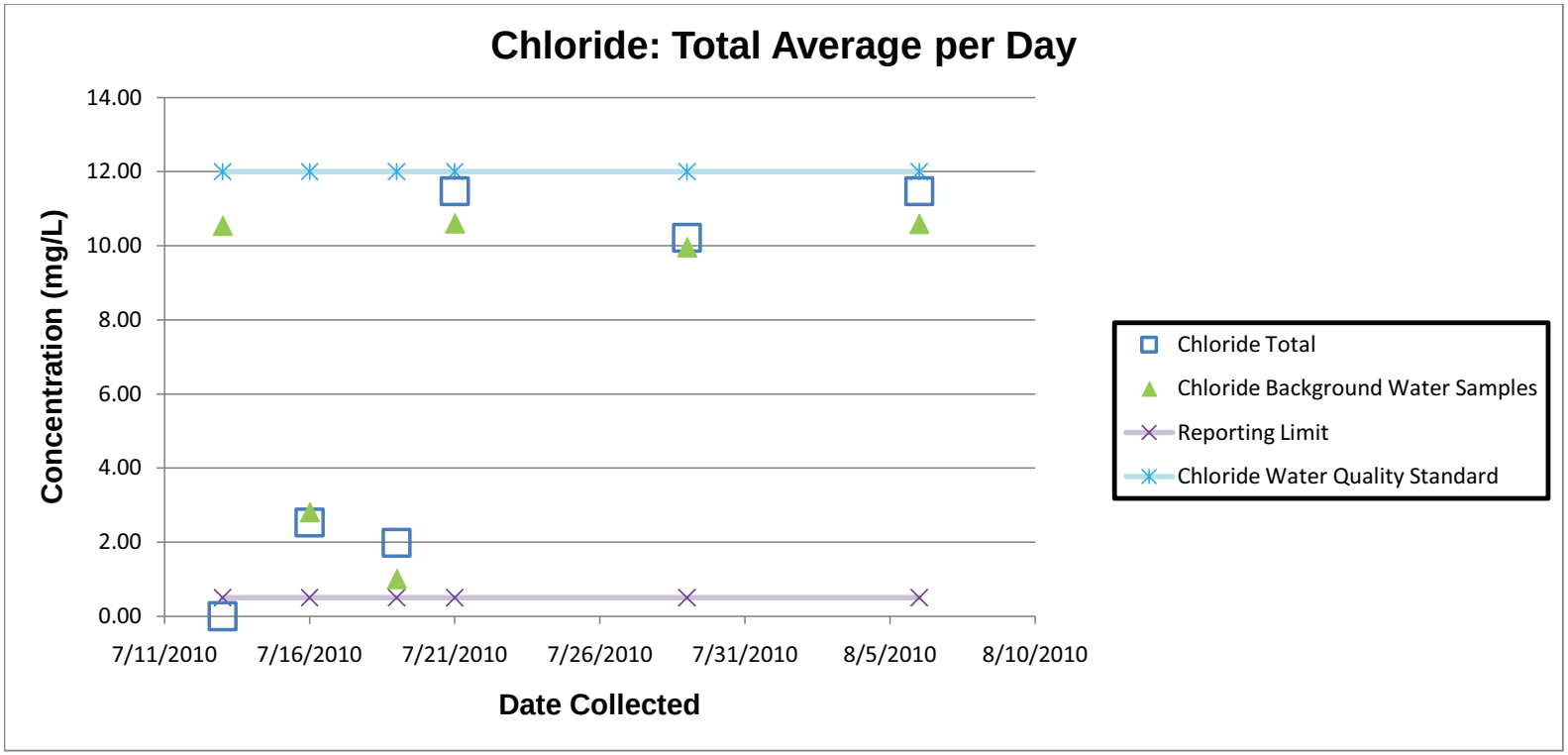


Figure 10: Chloride Concentrations - Daily Average (3)

Table 10: Concentrations of Chloride - Total Daily Average (mg/L)

Date Collected	Chloride Total	Chloride Background Water Samples	Reporting Limit	Chloride Water Quality Standard(2)
7/13/2010	NA(1)	10.55	0.5	12
7/16/2010	2.53	2.82	0.5	12
7/19/2010	1.99	1.01	0.5	12
7/21/2010	11.48	10.62	0.5	12
7/29/2010	10.21	9.97	0.5	12
8/6/2010	11.48	10.60	0.5	12

(1) NA - Not Applicable. Sample not collected

(2) Water Quality Standard from Environmental Regulations for the State of Illinois, Title 35 of the Illinois Administrative Code

(3) Concentrations that are ND - Not Detected are shown as the Reporting Limit on the figure

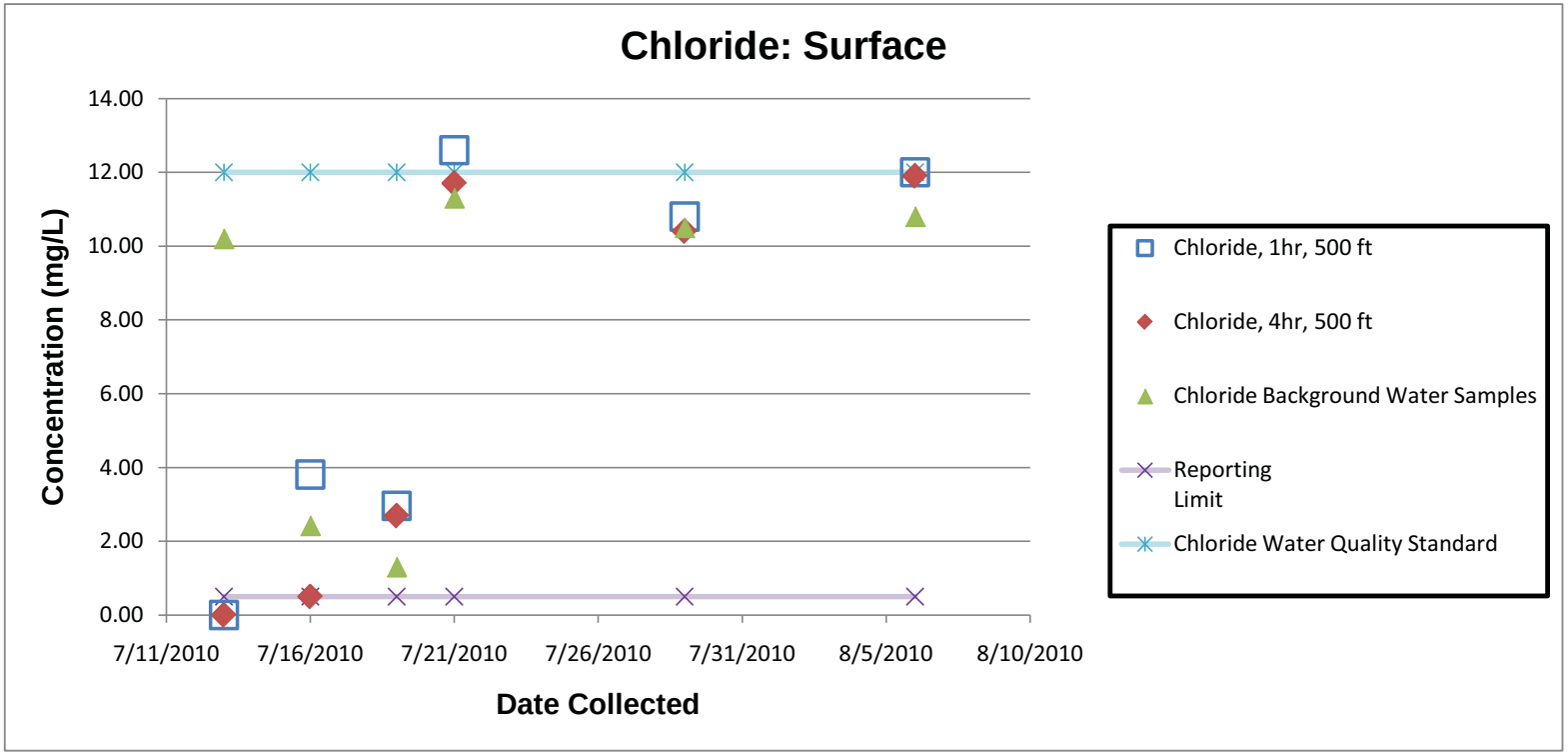


Figure 11: Chloride Concentrations - Surface Collections (3)

Table 11: Concentrations of Chloride - Surface Collections (mg/L)

Date Collected	Chloride, 1hr, 500 ft	Chloride, 4hr, 500 ft	Chloride Background Water Samples	Reporting Limit	Chloride Water Quality Standard(2)
7/13/2010	NA(1)	NA	10.20	0.5	12
7/16/2010	3.81	ND	2.42	0.5	12
7/19/2010	2.96	2.69	1.30	0.5	12
7/21/2010	12.60	11.70	11.30	0.5	12
7/29/2010	10.80	10.40	10.50	0.5	12
8/6/2010	12.00	11.90	10.80	0.5	12

(1) NA - Not Applicable. Sample not collected

(2) Water Quality Standard from Environmental Regulations for the State of Illinois, Title 35 of the Illinois Administrative Code

(3) Concentrations that are ND - Not Detected are shown as the Reporting Limit on the figure

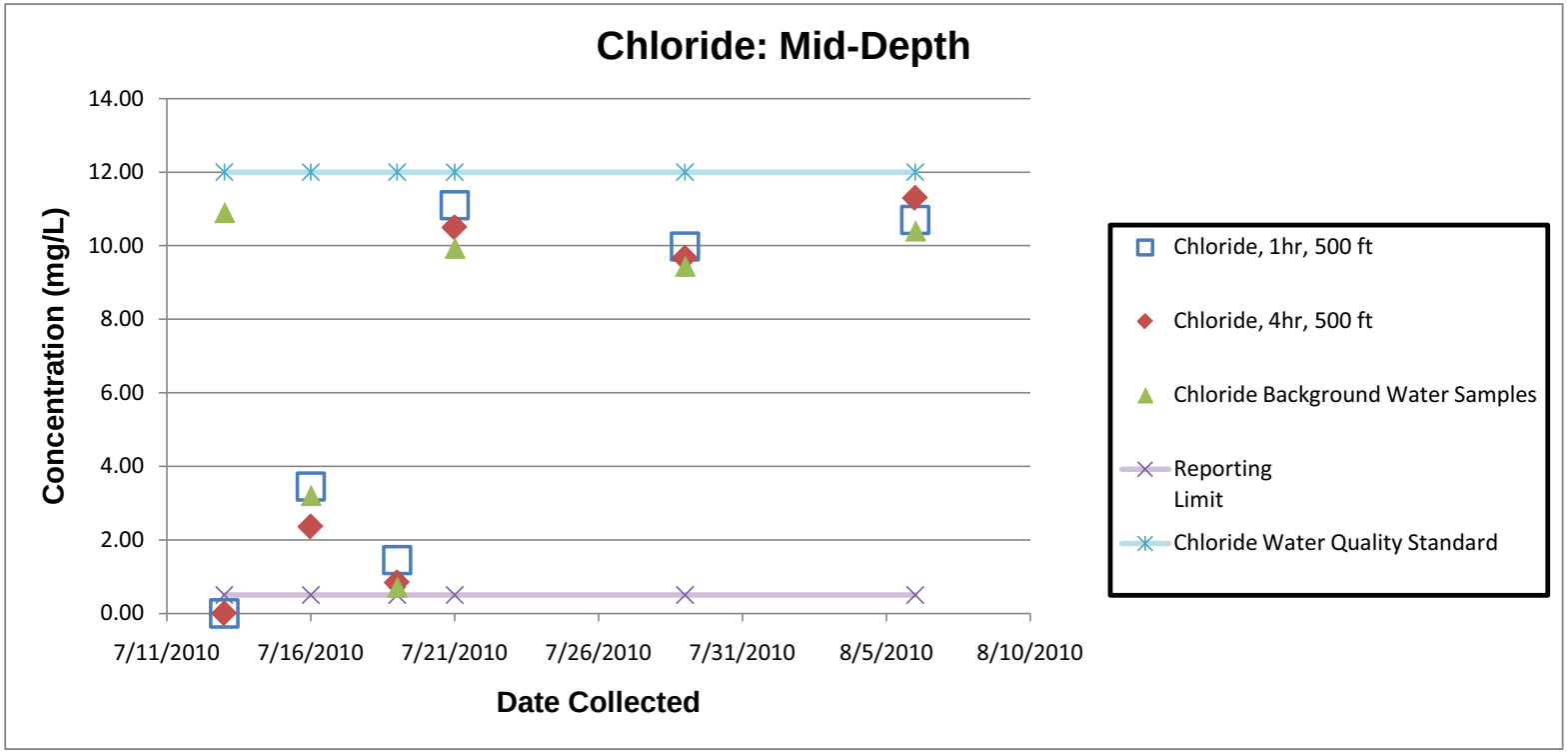


Figure 12: Chloride Concentrations - Mid-Depth Collections (3)

Table 12: Concentrations of Chloride - Mid-Depth Collections (mg/L)

Date Collected	Chloride, 1hr, 500 ft	Chloride, 4hr, 500 ft	Chloride Background Water Samples	Reporting Limit	Chloride Water Quality Standard(2)
7/13/2010	NA(1)	NA	10.90	0.5	12
7/16/2010	3.45	2.36	3.21	0.5	12
7/19/2010	1.45	0.84	0.72	0.5	12
7/21/2010	11.10	10.50	9.93	0.5	12
7/29/2010	9.98	9.67	9.44	0.5	12
8/6/2010	10.70	11.30	10.40	0.5	12

(1) NA - Not Applicable. Sample not collected

(2) Water Quality Standard from Environmental Regulations for the State of Illinois, Title 35 of the Illinois Administrative Code

(3) Concentrations that are ND - Not Detected are shown as the Reporting Limit on the figure

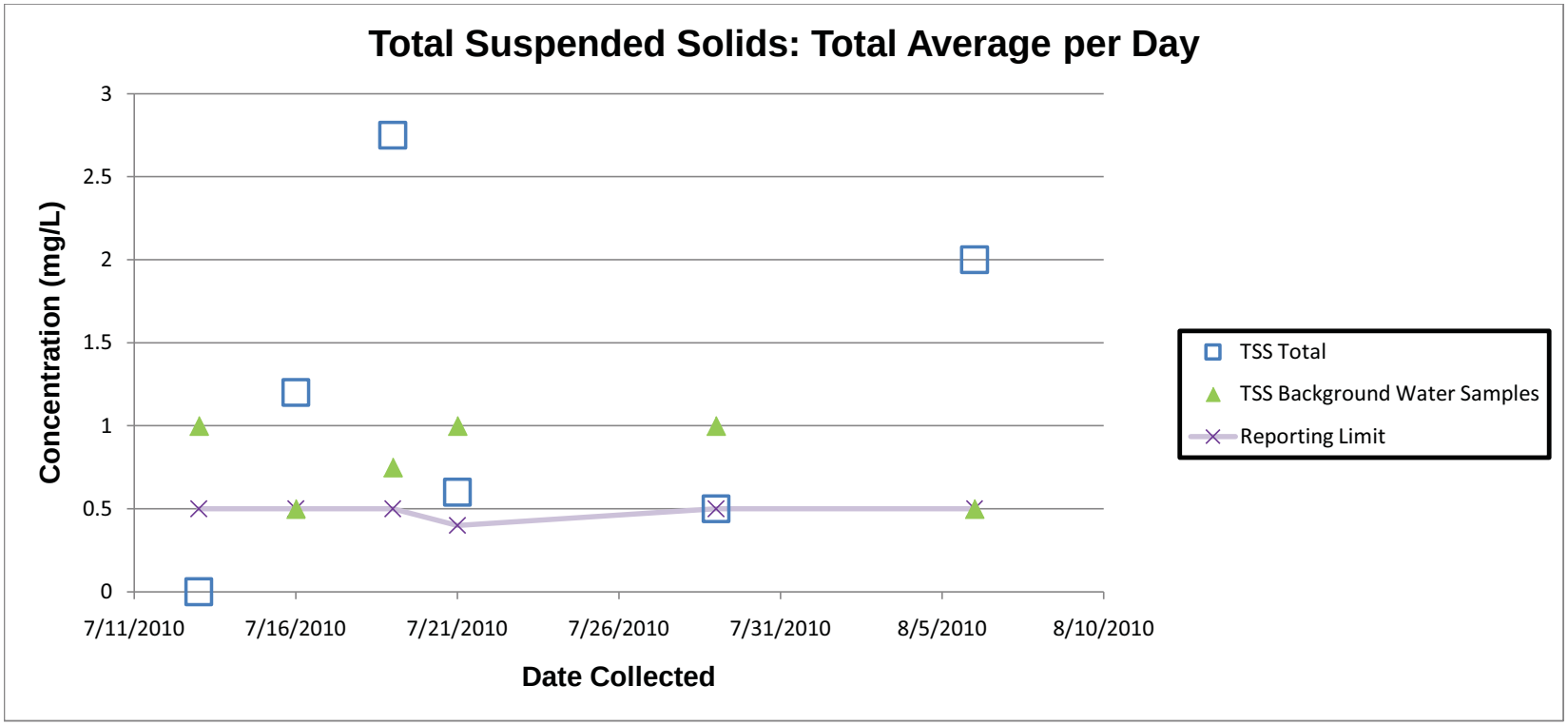


Figure 13: Total Suspended Solids Concentrations - Daily Average (2)

Table 13: Concentrations of Total Suspended Solids - Total Daily Average (mg/L)

Date Collected	TSS Total	TSS Background Water Samples	Reporting Limit
7/13/2010	NA(1)	1.00	0.50
7/16/2010	1.20	0.50	0.50
7/19/2010	2.75	0.75	0.50
7/21/2010	0.60	1.00	0.40
7/29/2010	ND	1.00	0.50
8/6/2010	2.00	0.50	0.50

(1) NA - Not Applicable. Sample not collected

(2) Concentrations that are ND - Not Detected are shown as the Reporting Limit on the figure

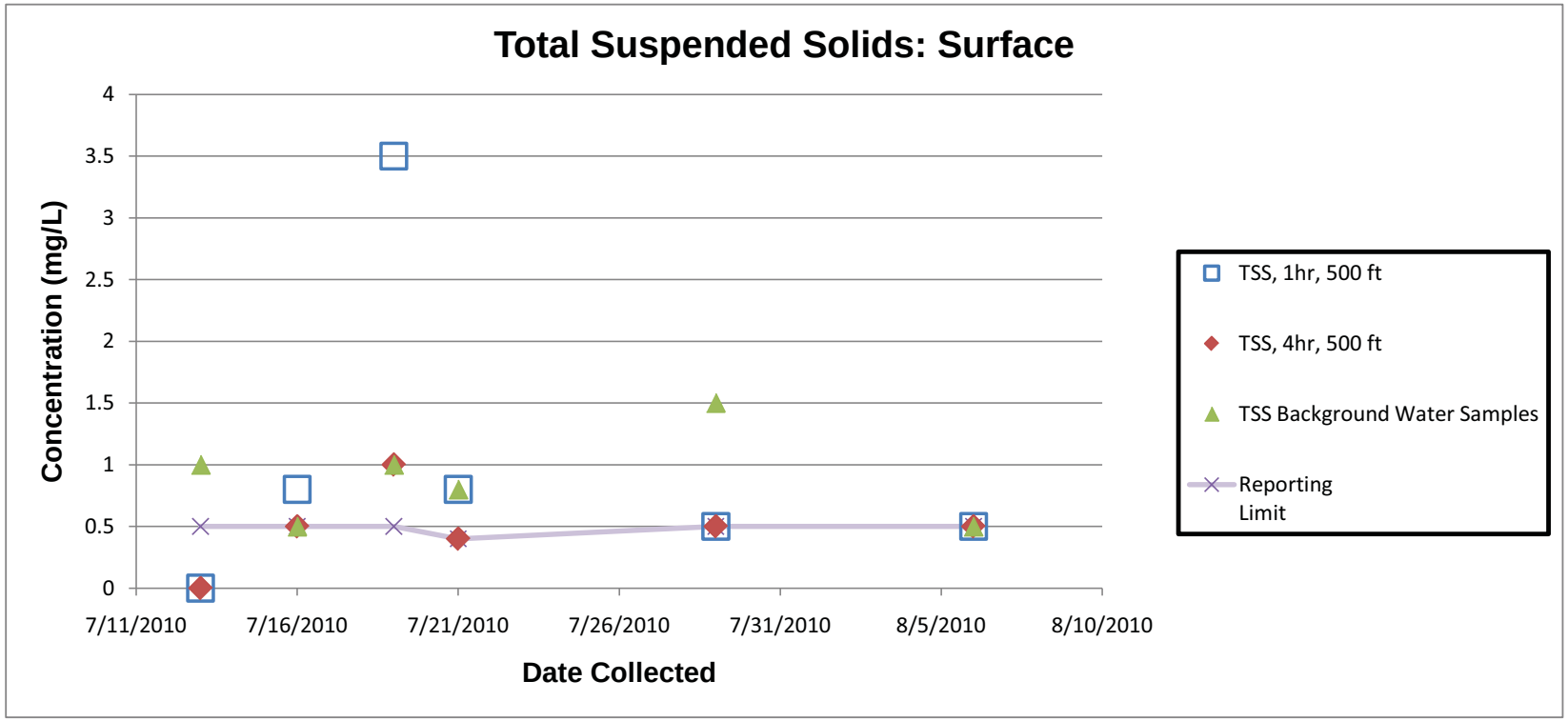


Figure 14: Total Suspended Solids Concentrations - Surface Collections (2)

Table 14: Concentrations of Total Suspended Solids - Surface Collections (mg/L)

Date Collected	TSS, 1hr, 500 ft	TSS, 4hr, 500 ft	TSS Background Water Samples	Reporting Limit
7/13/2010	NA(1)	NA	1.00	0.50
7/16/2010	0.80	0.50	0.50	0.50
7/19/2010	3.50	1.00	1.00	0.50
7/21/2010	0.80	ND	0.80	0.40
7/29/2010	ND	ND	1.50	0.50
8/6/2010	0.50	ND	0.50	0.50

(1) NA - Not Applicable. Sample not collected

(2) Concentrations that are ND - Not Detected are shown as the Reporting Limit on the figure

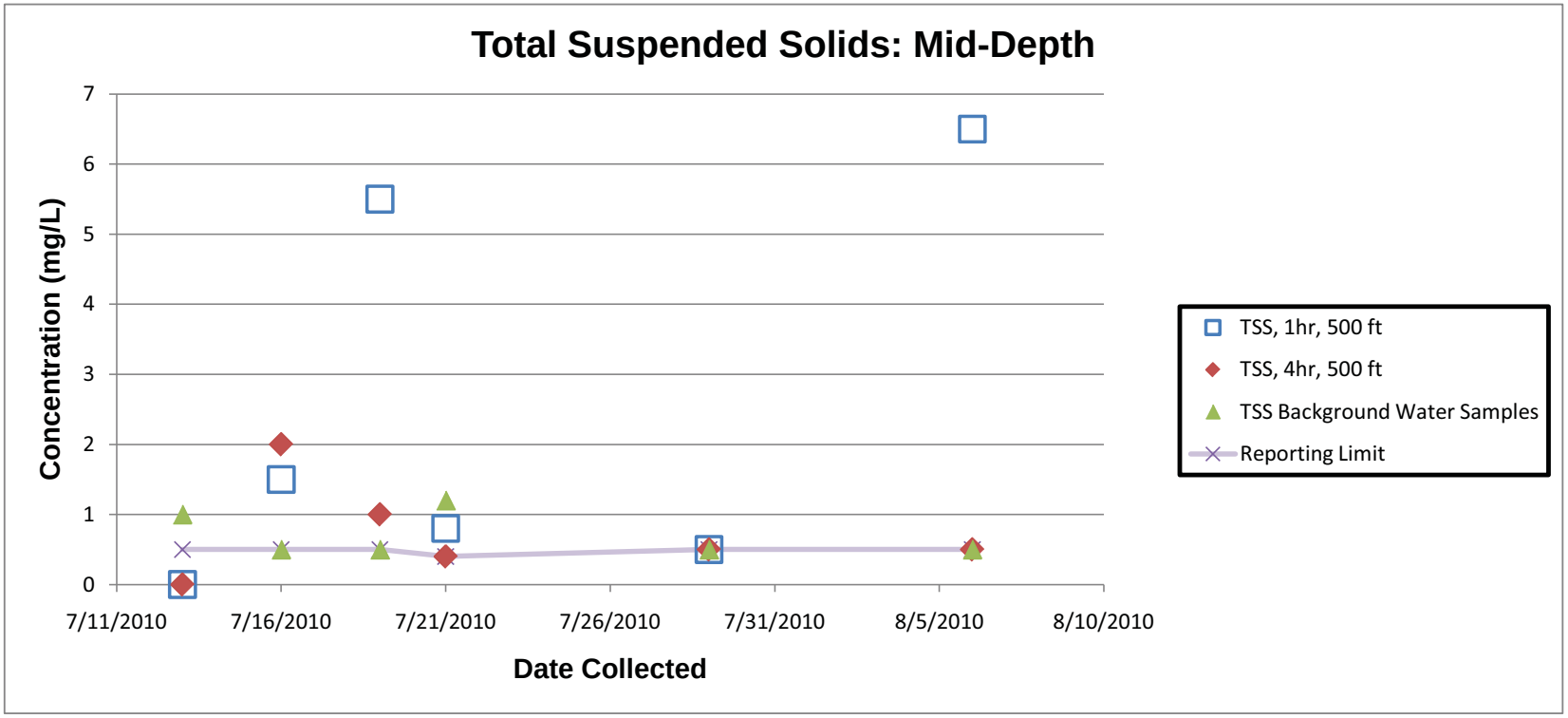


Figure 15: Total Suspended Solids Concentrations - Mid-Depth Collections (2)

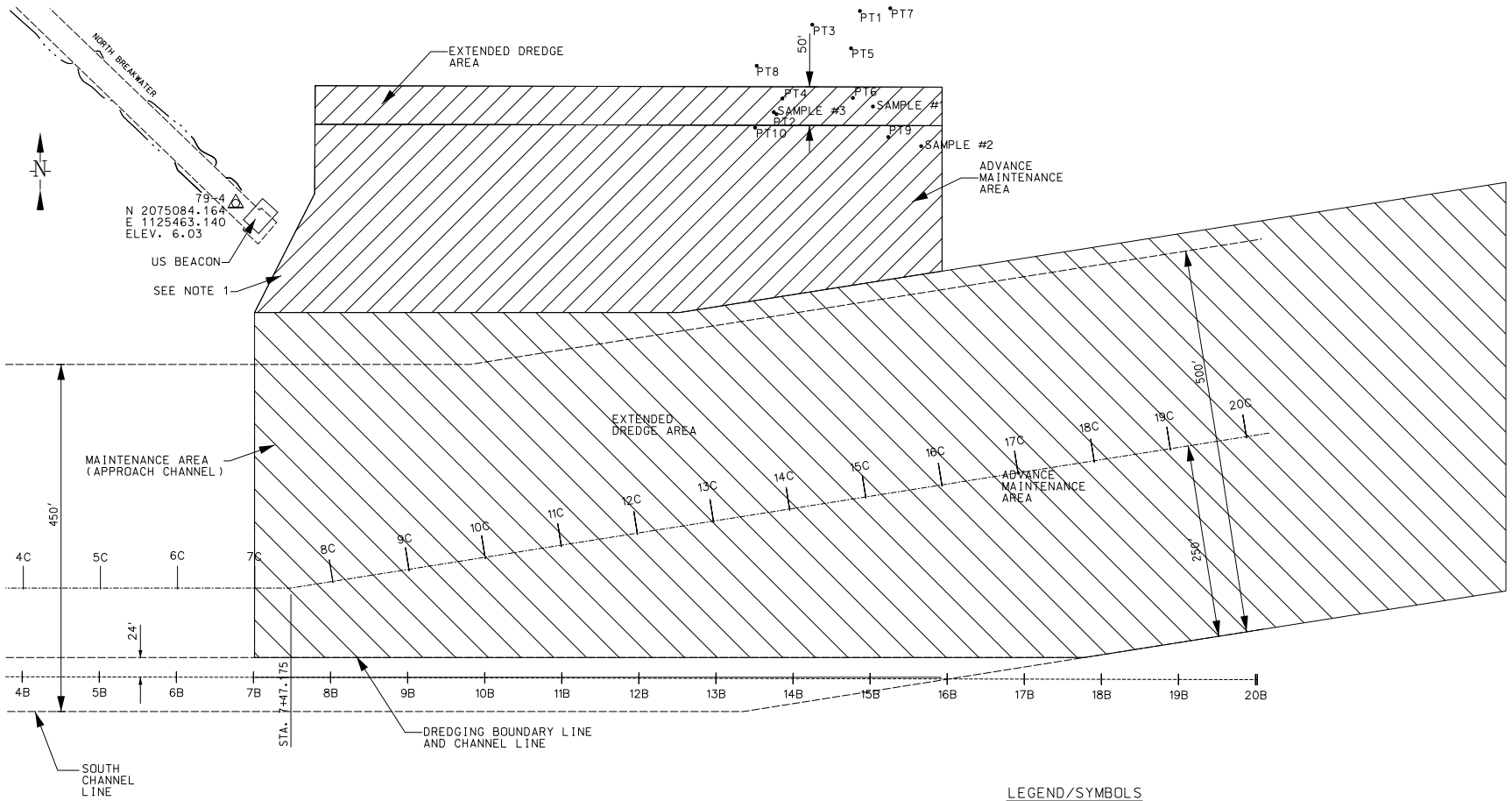
Table 15: Concentrations of Total Suspended Solids - Mid-Depth Collections (mg/L)

Date Collected	TSS, 1hr, 500 ft	TSS, 4hr, 500 ft	TSS Background Water Samples	Reporting Limit
7/13/2010	NA(1)	NA	1.00	0.50
7/16/2010	1.50	2.00	0.50	0.50
7/19/2010	5.50	1.00	0.50	0.50
7/21/2010	0.80	0.40	1.20	0.40
7/29/2010	ND	ND	0.50	0.50
8/6/2010	6.50	ND	0.50	0.50

(1) NA - Not Applicable. Sample not collected

(2) Concentrations that are ND - Not Detected are shown as the Reporting Limit on the figure

FIGURE #16 : WAUKEGAN HARBOR ADVANCE MAINTENANCE AREA SEDIMENT SAMPLE LOCATIONS, FY10



NOTES:

1. NO DREDGING IS TO BE PERFORMED WITHIN 50 FEET OF THE NORTH BREAKWATER.
2. REFER TO THE DRAWINGS FOR MORE DETAILS ON THE DREDGE AREA.
3. REFER TO TABLE 1 IN SECTION 01 35 45, SEDIMENTS SAMPLING, FOR THE HORIZONTAL COORDINATES OF THE SEDIMENT SAMPLING LOCATIONS.

60 0 60 120
SCALE IN FEET

LEGEND/SYMBOLS

- CHANNEL LINE
- CHANNEL ℄
- DREDGING BOUNDARY LINE
- BASELINE
- ADVANCE MAINTENANCE AREA
- MAINTENANCE AREA (APPROACH CHANNEL)
- •# SEDIMENT SAMPLING LOCATION

US Army Corps of Engineers
Chicago District

SYMBOL	AMENDMENT DESCRIPTION	DATE APPROVED SYMBOL	DESCRIPTION	DATE APPROVED

DESIGNED BY: ZAL
DATE: 11 JUNE 2010
DRAWN BY: ZAL
SCALE: AS SHOWN
CHECKED BY: JAG
CONTRACT NO.: W91XK-09-D-0002
SUBMITTED BY: JOHN GROBOSKI, P.E.
DATE:

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
CHICAGO, ILLINOIS

WAUKEGAN HARBOR APPROACH
MAINTENANCE DREDGING FY10
WAUKEGAN, IL

SEDIMENT SAMPLE LOCATION

SHEET REFERENCE NUMBER:
FIG. 1
SHEET 01 OF

PLOT DATE: 12/28/2010
FILENAME: waukegan sampling locations_12072010.dgn

Figure 17: Sediment for 2011 Dredging #1

Photo A

Photo B

Figure 18: Sediment for 2011 Dredging #2

Photo A

Photo B

Figure 19: Sediment for 2011 Dredging #3

Photo A

Photo B

Figure 20

Beach Sediment 1—Photo A

Beach Sediment 1—Photo B

Figure 21

Beach Sediment 2—Photo A

Beach Sediment 2—Photo B

Figure 22

Beach Sediment 3—Photo A

Beach Sediment 3—Photo B

Water Quality Monitoring Maps

Water Quality Monitoring Map #1

Initial Samples—Placement Area 1
7/13/10

REVISED 8/31/10

Water Quality Monitoring Map #2

Week 1, Event 1
7/16/10

REVISED 9/1/10

Water Quality Monitoring Map #3

Week 1, Event 2
7/19/10

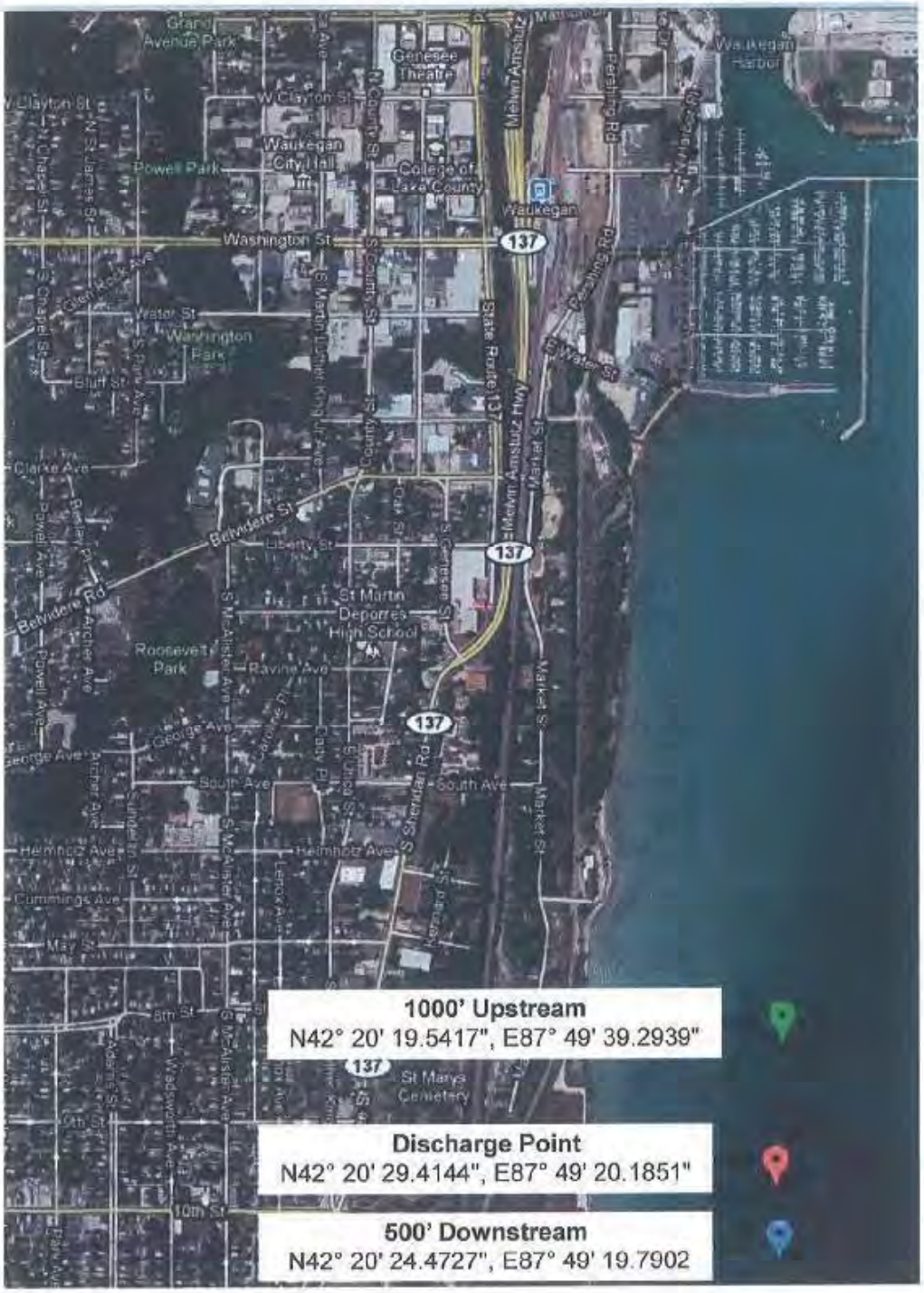
REVISED 9/1/10

Water Quality Monitoring Map #4

Week 2, Event 1
7/21/10

Water Quality Monitoring Map #5

Week 3, Event 1
7/29/10



Water Quality Monitoring Map #6

Week 4, Event 1
8/6/10

Appendix A
and
Appendix B

(on enclosed CD)

Appendix A

Permits

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 - (217) 782-2829
JAMES R. THOMPSON CENTER, 100 WEST RANDOLPH, SUITE 11-300, CHICAGO, IL 60601 - (312) 814-6026

DOUGLAS P. SCOTT, DIRECTOR

217/782-3362

March 6, 2009

Mike Nguyen
Planning Programs and Project Management Division
Project Management Branch
Chicago District
U.S. Army Corps of Engineers
111 North Canal Street
Chicago, IL 60606-7206

Re: Chicago District, U. S. Army Corps of Engineers – Waukegan Harbor Approach Channel and Advanced Maintenance Area
Permit # 2005 -LM-2830-3
Log # 2095-2009

Gentlemen:

This Agency has reviewed the information in your letter and supporting documentation dated December 22, 2008 concerning the referenced project. The original application was received on January 24, 2003 for annual dredging of up to 75,000 cubic yards of sediment from the Waukegan Harbor Approach Channel and Advanced Maintenance Area in Lake Michigan and approved under Section 401 of the Clean Water Act and Section 39 of the Illinois Environmental Protection Act on February 1, 2005. Supplemental permits for this project were issued by the Illinois EPA on June 28, 2005 and April 1, 2008. We offer the following comments in response to your request to modify the certification/permit.

The annual mechanical maintenance dredging of Waukegan Harbor Approach Channel and Advanced Maintenance Area specified in your letter of December 24, 2009 is hereby approved in accordance with the following specified conditions .

Conditions 1 though 11 of the final determination Log Nos. 2005-LM-2830, 2005-LM-2830-1, and 2005-LM-2830-2 have been replaced with the following:

1. The applicant shall not cause:
   a. violation of applicable water quality standards of the Illinois Pollution Control Board, Title 35, Subtitle C: Water Pollution Rules and Regulation;
   b. water pollution defined and prohibited by the Illinois Environmental Protection Act;
   c. violation of applicable provisions of the Illinois Environmental Protection Act; or
   d. interference with water use practices near public recreation areas or water supply intakes.

2. The applicant shall provide adequate planning and supervision during the project construction period for implementing construction methods, processes and cleanup procedures necessary to prevent water pollution and control erosion.

3. For open water disposal, the dredge material shall be placed in the water in a manner to minimize re-suspension of sediment material and contaminants by utilizing techniques including careful placement methods, disposal during favorable weather conditions that minimize turbulence and transport of suspended contaminants and other methods such as turbidity curtains should be used as necessary to minimize re-suspension of sediment material.

4. The applicant shall not place or discharge dredge material into Lake Michigan or into waters of the State for beach nourishment or other purposes without written approval from the Illinois EPA for the particular dredge cut location. For any new proposed dredge area not previously approved by the Illinois EPA, the applicant shall provide the data and information of Condition 5 prior to the initial dredging event for the dredge cut location.

5. Prior to each dredging event or placement of dredged material during the term of this authorization, the following sampling and analysis shall be conducted on a representative number of samples from the dredge cut (minimum of 3 samples analyzed separately):
   a. A particle size distribution.
   b. Analysis of asbestos by the following appropriate method(s):
      i) For material to be placed below the Ordinary High Water Mark (OHWM), Polarized Light Microscopy (PLM) and Transmission Electron Microscopy (TEM) methods shall be used for asbestos testing. All samples shall be analyzed by each asbestos test method.
      ii) For each new dredge material source location, for material to be placed on the beach or in waters for beach nourishment, the modified Superfund method as described in Condition 8 shall be conducted at least one time for each dredge area location. After the initial modified Superfund testing is conducted, any future Superfund testing requirements for dredge material at that same location will be determined after Illinois EPA review considering existing data, regulations, Illinois Pollution Control Board orders or judicial orders regarding asbestos. The advanced maintenance area and approach channel location tested in the report of the Illinois Attorney General's Task Force on Asbestos Contamination at Illinois Beach State Park and in Lake Michigan dated June 20, 2006 fulfills this condition 4 (c).
   c. For hydraulic dredging or open water placement of dredged material, analysis of the supernatant to be reported in mass per volume for the following parameters: total suspended solids (TSS), total volatile solids (TVS), ammonia-nitrogen (as N), phosphorus (as P), total dissolved solids (TDS), sulfate, chloride, lead (total), zinc (total), and total polychlorinated biphenyls (PCBs).
   d. For hydraulic dredging or open water placement of dredged material, analysis of the supernatant shall be based on a zero (0) and four (4) hour settling periods and reported in mass per volume.

6. Should any of the results from condition 5 meet the following, the applicant shall submit the results to the Agency for approval 90 days prior to proposed dredging.
   a. Material with greater than 20% passing a #230 U.S. sieve.
   b. Material with greater than 1% ACM reported from the PLM or TEM test.
   c. Material tested for asbestos using the Superfund method that exceeds a mean value of 6.23 Ms/g PM_{10} and a 95% upper confidence limit (UCL) of 12.58 Ms/g PM_{10} for the 12 or more samples using the sum of the Protocol and NIOSH 7402 test methods of condition 8.
   d. Material for new dredge cut locations not previously reviewed and approved for dredge material discharge.
   e. The submittal shall include a map with sampling locations and the methods/procedures including reporting limits for the parameters analyzed. The laboratory analysis sheets shall be included in the submittal. The reporting limits shall be in compliance with condition 9.

7. If the 4 hour supernatant test results of the dredge material exceed the following, monitoring shall be conducted in the case of open water disposal of the dredged materials: 0.02 mg/L ammonia-nitrogen (as N), 12 mg/L chloride, 0.007 mg/L phosphorus, 0.1 ug/L total PCBs and 15 mg/L of total suspended solids (TSS). The following parameters shall be monitored on a twice weekly basis in the first week of the dredging event and weekly thereafter and reported in mg/L: total suspended solids (TSS), ammonia-nitrogen (as N), phosphorus (as P), chloride and total PCBs. The sampling shall be conducted in accordance with the following:
   a. A sample of the water quality at the dredge disposal site shall be collected prior to the start of dredging activities, at surface and mid-depth elevations consisting of water hardness, water pH, and water temperature in addition to the above listed parameters.
   b. Samples shall be collected at surface and mid-depth elevations at a representative location approximately 500 feet from the discharge point.
   c. Samples shall be taken at each location, at approximately one (1) hour and four (4) hours after a representative hopper barge of dredge material is deposited in the lake or hydraulic discharge begins.

8. For new dredge cut locations as specified in Special Condition 4 and 5, for areas to be dredged from Lake Michigan for material to be placed on the beach or in waters for beach nourishment, the applicant shall submit sediment sample results at a minimum of 12 sites for each potential nutrient sand source. Samples shall be prepared in accordance with the most current version of the Superfund Method for the Determination of Releasable Asbestos in Soils and Bulk Materials (U.S. EPA 540-R-97-028, 1997) and modified in the Draft Modified Elutriator Method for the Determination of Asbestos in Soils and Bulk Material (Berman and Kolk, May 2000) and additional modifications necessary to obtain the necessary samples of PM_{10} in accordance with the Illinois Attorney General's Task Force Report. Sampling shall utilize a grid sampling system with equally spaced samples. Samples analyzed for asbestos shall be analyzed by Transmission Electron Microscopy (TEM) and for both the NIOSH 7402 (PCME) method and Protocol Structures method. The aforementioned sampling and analysis shall be conducted in accordance with the recommendations specified in the document entitled "Illinois Beach State Park (IBSP): Determination of Asbestos Contamination in Sand Used for Beach Nourishment, Final Recommendations," dated December 29, 2003, prepared by the University of Illinois at Chicago, Center of Excellence in Environmental Health, Health Hazard Evaluation Program for the Illinois Attorney General's Task Force that was formed to address asbestos contaminated at Illinois Beach State Park (IBSP). An initial report for the initial dredging event containing the sampling results, methods, locations and depths, laboratory analysis reports and a discussion of the findings shall be submitted to the Agency. The Illinois EPA will reevaluate the need for future sampling, analysis and reporting, and will issue necessary additional conditions based upon the results of the sampling, analysis and reports required by this condition.

9. All parameters tested in accordance with condition 5, 7 and 8 shall be tested by methods in accordance with 40CFR136 with reporting limits that do not exceed the following values:

a.	Ammonia-Nitrogen (as N)	0.02 mg/L
b.	Chloride	12 mg/L
c.	Lead (total)	0.05 mg/L
d.	Phosphorus	0.007 mg/L
e.	Sulfate	24 mg/L
f.	Total Dissolved Solids (TDS)	180 mg/L
g.	Zinc (total)	0.159 mg/L
h.	Polarized Light Microscopy (PLM)	1% ACM
i.	Transmission Electron Microscopy (TEM)	1% ACM
j.	Superfund Method	2 Ms/g PM_{10}
k.	Total polychlorinated biphenyls (PCBs)	0.1 ug/L
l.	Total Suspended Solids	15 mg/L

10. Any material with PLM or TEM values exceeding 1% of asbestos containing material (ACM) shall be disposed in a properly permitted landfill.

11. The permittee shall monitor in accordance with condition 7. The permittee shall operate the dredge and disposal such that the surface water at 500 feet from the discharge point does not exceed 0.02 mg/L ammonia-nitrogen (as N), 12 mg/L chloride, 0.05 mg/L lead (total), 0.007 mg/L phosphorus, 24 mg/L sulfate, 180 mg/L total dissolved solids (TDS), 0.159 mg/L zinc (total), and 0.1 ug/L total polychlorinated biphenyls (PCBs) or does not exceed the background concentrations measured under condition 7 and otherwise complies with the water quality standards of 35 Ill. Adm. Code, Subtitle C.

12. For sediment testing results that are not approved by IEPA prior to dredging all test results and sampling information obtained under condition 5 shall be submitted to the IEPA 60 days after completion of the dredging event in a dredging event report. Surface water monitoring results of condition 7, drawings depicting the location of each collected surface water sample point, the volume of dredge material discharged, method of dredging (e.g.) mechanical or hydraulic, the depth of water at the dredge disposal location and the dredge disposal location shall be submitted in a dredging event report 60 days after completion of each dredging event. The dredging event report shall provide the data and method of determining downstream surface water sampling locations. The date, time, location, and individual(s) who performed the sampling shall be included in the sediment and surface water testing reports. The laboratory analysis sheets shall be included in the reports. The date and time that discharge begins and ends for the barge load or the hydraulic dredging event shall be recorded and included in the dredging event report. If no dredging occurs in a calendar year a report shall be submitted to IEPA by January 15th of the following year indicating no dredge material discharge occurred.

13. The Illinois EPA may reopen and revise this certification and final determination based on the findings, recommendations and health risk criteria developed by and published in the final report of the Illinois Attorney General's Task Force on asbestos contamination at Illinois Beach State Park and in Lake Michigan, or due to new additional information regarding asbestos contamination of dredge materials and beaches, or to conform to new state or federal regulations, Illinois Pollution Control Board orders or judicial orders.

14. For any hydraulically dredged material placed in a constructed upland area, a construction and operation permit issued by the Agency under 35 Il. Adm. Code Section 309.202 and 309.203 must be obtained and any conditions thereof complied with.

15. The mechanical dredging and dredge material placement in the waters of Lake Michigan for 2009 is approved based on the sampling plan and sediment results submitted prior to the issuance of this approval. The mechanical dredging and dredge material placement in the waters of Lake Michigan is approved for future dredging events in accordance with the terms of this certification/permit.

16. Sediment testing results of condition 5 must be submitted for approval by IEPA prior to any proposed hydraulic dredging and discharge of dredge material to waters of the State. The submittal must include documentation that shows that the proposed hydraulic dredge material discharge to waters of the State will meet water quality standards.

Sincerely,

Alan Keller

Alan Keller, P.E.
Manager, Permit Section
Division of Water Pollution Control

SAK:DLH/20952009lm.doc

cc:IEPA, Records Unit
IEPA, DWPC, FOS, Des Plaines
CoE, Chicago District
IDNR, OWR, Chicago
USEPA, Region 5

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

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ROD R. BLAGOJEVICH, GOVERNOR DOUGLAS P. SCOTT, DIRECTOR

217/782-3362

April 1, 2008

Jennifer Raber
Planning, Programs and Project Management Division
Chicago District
Corps of Engineers
111 North Canal Street
Chicago, IL 60606-7206

Re: Chicago District, U.S. Army Corps of Engineers – Waukegan Harbor Approach Channel and Advanced Maintenance Area
Permit # 2005-LM-2830-2
Log # LM 0228-08

Dear Ms. Raber:

This Agency has reviewed the information contained in your letter of November 16, 2007 concerning the referenced project. The original application was received on January 24, 2003 for annual dredging of up to 75,000 cubic yards of sediment from the Waukegan Harbor Approach Channel and Advanced Maintenance Area in Lake Michigan and approved under Section 401 of the Clean Water Act and Section 39 of the Illinois Environmental Protection Act on February 1, 2005. Supplemental permit for this project was issued by the Illinois EPA on June 28, 2005. We offer the following comments in response to your request to modify that certification/permit.

The dredging specified in your letter is hereby approved, as required under Special Condition 8 of Permit # 2005-LM-2830-1 issued June 28, 2005 and in accordance with the following conditions:

Condition 3 of Permit # 2005-LM-2830-1 has been revised as follows:

3. Beginning with the 2009 dredge season, each dredging event or placement of dredged material during the term of this authorization, the following sampling and analysis shall be conducted:
   a. A representative number of samples from the dredge cut.
   b. A particle size distribution for each sample.
   c. Analysis of asbestos by the following appropriate method(s):
      i) For material to be placed below the Ordinary High Water Mark (OHWM), Polarized Light Microscopy (PLM) and Transmission Electron Microscopy (TEM) methods shall be used for asbestos testing. All samples shall be analyzed by each asbestos test method.
      ii) For each dredge material source location, for material to be placed on the beach or in waters for beach nourishment, the modified Superfund method as described in Condition 7 shall be conducted at least one time. After the initial modified Superfund testing is conducted, any future Superfund testing requirements for that material at that same location will be determined considering existing data, regulations, Illinois Pollution Control Board orders or judicial orders regarding asbestos.

d. For hydraulic dredging or open water placement of dredged material, analysis of the supernatant to be reported in mass per volume for the following parameters: total suspended solids (TSS), total volatile solids (TVS), ammonia-nitrogen (as N), phosphorus (as P), total dissolved solids (TDS), sulfate, chloride, lead (total), zinc (total) and total polychlorinated biphenyls (PCBs).
e. For hydraulic dredging or open water placement of dredged material, analysis of the supernatant shall be based on a zero (0) and four (4) hour settling periods and reported in mass per volume.
f. The analyses required herein shall be consistent with the sampling plan required in Condition 6.

Condition 5 of Permit # 2005-LM-2830 has been modified as follows:

5. Beginning with the 2009 dredge season, monitoring shall be conducted in the case of open water disposal of dredged materials. The following parameters shall be monitored on a daily basis and reported in mass per volume: total suspended solids (TSS), total dissolved solids (TDS), lead (total), zinc (total), ammonia-nitrogen (as N), phosphorus (as P), sulfate, and chloride and total polychlorinated biphenyls (PCBs). The sampling shall be conducted in accordance with the following:
    a. A sample of the water quality at the dredge disposal site shall be collected prior to the start of dredging activities, at surface and mid-depth elevations consisting of water hardness, water pH, and water temperature in addition to the above listed parameters.
    b. Samples shall be collected at surface and mid-depth elevations at two representative locations, one at approximately 500 feet from the discharge point and one at approximately 100 feet from the discharge point.
    c. Samples shall be taken at each location daily, at approximately one (1) hour and four (4) hours after a representative hopper barge of dredge material is deposited in the lake or hydraulic discharge begins.
    d. Monitoring results, drawings depicting the location of each collected sample point, the volume of dredge material discharged and the dredge disposal location shall be submitted in a report within one month following the collection of samples. The monitoring report shall provide the data and method of determining downstream sample locations. The date, time, location, and individual(s) who performed the sampling shall be included in the monitoring reports. The laboratory analysis sheets shall be included in the monitoring reports. The date and time that discharge begins and ends for the barge load monitored or the hydraulic dredging event monitored shall be recorded and included in the monitoring report.

Condition 7 of Permit # 2005-LM-2830 has been modified as follows:

7. For areas to be dredged from Lake Michigan for material to be placed on the beach or in waters for beach nourishment, the applicant shall submit sediment sample results at a minimum of 12 sites for each potential nutrient sand source. Samples shall be prepared in accordance with the most current version of the Superfund Method for the Determination of Releasable Asbestos in Soils and Bulk Materials (U.S. EPA 540-R-97-028, 1997) and modified in the Draft Modified Elutriator Method for the Determination of Asbestos in Soils and Bulk Material (Berman and Kolk, May 2000) and additional modifications necessary to obtain the necessary samples of PM_{10} in accordance with the Illinois Attorney General's Task Force Report. Sampling shall utilize a grid sampling system with equally spaced samples. Samples analyzed for asbestos shall be analyzed by Transmission Electron Microscopy (TEM). The aforementioned sampling and analysis shall be conducted in accordance with the recommendations specified in the document entitled "Illinois Beach State Park (IBSP): Determination of Asbestos Contamination in Sand Used for Beach Nourishment, Final Recommendations," dated December 29, 2003, prepared by the University of Illinois at Chicago, Center of Excellence in Environmental Health, Health Hazard Evaluation Program for the Illinois Attorney General's Task Force that was formed to address asbestos contaminated at Illinois Beach State Park (IBSP). An initial report for the initial dredging event containing the sampling results, methods, locations and depths, laboratory analysis reports and a discussion of the findings shall be submitted to the Agency at least 90 days prior to the dredging event. The Illinois EPA will reevaluate the need for future sampling, analysis and reporting, and will issue necessary additional conditions based upon the results of the sampling, analysis and reports required by this condition.

The following Condition 10 shall be added to Permit #2005-LM-2830:

10. For open water disposal, the dredge material shall be placed in the water in a manner to minimize re-suspension of sediment material and contaminants by utilizing techniques including careful placement methods, disposal during favorable weather conditions that minimize turbulence and transport of suspended contaminants and implementation of other necessary practices such as turbidity curtains.

The following Condition 11 shall be added to Permit #2005-LM-2830:

11. For the 2008 dredge season, monitoring shall be conducted in the case of open water disposal of dredged materials. The following parameters shall be monitored on a weekly basis and reported in mass per volume: total suspended solids (TSS), ammonia-nitrogen (as N), and phosphorus (as P). The sampling shall be conducted in accordance with the following:
    a. A sample of the water quality at the dredge disposal site shall be collected prior to the start of dredging activities, at surface and mid-depth elevations consisting of water hardness, water pH, and water temperature in addition to the above listed parameters.
    b. Samples shall be collected at surface and mid-depth elevations at two representative locations, one at approximately 500 feet from the discharge point and one at approximately 100 feet from the discharge point.
    c. Samples shall be taken at each location weekly, at approximately one (1) hour and four (4) hours after a representative hopper barge of dredge material is deposited in the lake or hydraulic discharge begins.
    d. Monitoring results, drawings depicting the location of each collected sample point, the volume of dredge material discharged and the dredge disposal location shall be submitted in a report within one month following the collection of samples. The monitoring report shall provide the data and method of determining downstream sample locations. The date, time, location, and individual(s) who performed the sampling shall be included in the monitoring reports. The laboratory analysis sheets shall be included in the monitoring reports. The date and time that discharge begins and ends for the barge load monitored or the hydraulic dredging event monitored shall be recorded and included in the monitoring report.

Sincerely,

Alan Keller

Alan Keller, P.E.
Manager, Permit Section
Division of Water Pollution Control

SAK:DLH:JRA

cc: IEPA, Records Unit
IEPA, DWPC, FOS, Des Plaines
CoE, Chicago District
IDNR, OWR, Chicago

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

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ROD R. BLAGOJEVICH, GOVERNOR DOUGLAS P. SCOTT, DIRECTOR

217/782-3362

FEB 28 2007

Monica Ott
Project Manager
Chicago District
Corps of Engineers
111 North Canal Street, 6th floor
Chicago, Illinois 60606

Re: Quality Assurance Project Plan/Field Sampling Plan for the Advanced Maintenance Area and Approach Channel of the Waukegan Harbor, Waukegan, Illinois, Winter 2007

Dear Ms. Ott:

The Agency has reviewed the Quality Assurance Project Plan/Field Sampling Plan (QAPP/FSP) dated November 8, 2006 for the sampling proposed for the Advanced Maintenance Area and Approach Channel of the Waukegan Harbor scheduled for this Winter or Spring 2007. The QAPP/FSP is hereby approved under condition 6 of Permit # 2005-LM-2830-1 (Log # 4582-05) issued by the Illinois EPA on June 28, 2005.

The Illinois EPA awaits the submittal of the Contamination Determination based on the data obtained in accordance with the QAPP/FSP as required by conditions 3 and 8 of Permit # 2005-LM-2830-1 (Log # 4582-05) and condition 4 of Permit # 2005-LM-2830 (Log # 2830-04) issued February 1, 2005. Upon review of the submitted data the Illinois EPA will issue necessary additional conditions to insure compliance with 35 Il. Adm. Code 302.504 and 302.515.

If you have any questions on this matter, please contact Dan Heacock of my staff at the above telephone number and address.

Very truly yours,

Bruce J. Yurdin
Manager, Watershed Management Section
Bureau of Water

BJY:DLH/waukeganqapp2007.doc

cc: IEPA, Records Unit
IEPA, DWPC, FOS, Des Plaines
USEPA, Region 5
COE, Chicago District
Mr. Kallen Mrozek, COE, Chicago District
IDNR, OWR, Chicago

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

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ROD R. BLAGOJEVICH, GOVERNOR RENEE CIPRIANO, DIRECTOR

217/782-3362

JUN 2 8 2005

Ms. Monica Ott
Project Manager
Chicago District, Corps of Engineers
111 North Canal Street, Suite 600
Chicago, Illinois 60606-7206

Re: Chicago District, U.S. Army Corps of Engineers – Waukegan Harbor Approach Channel and Advanced Maintenance Area
Permit # 2005-LM-2830-1
Log # 4582-05

Dear Ms. Ott:

The information submitted in your correspondence dated May 26, 2005, received by the Illinois EPA on May 31, 2005, along with the Quality Assurance Project Plan/Field Sampling Plan (QAPP/FSP) dated August 2004 and the Contaminant Determination dated November 2004 for the Waukegan Harbor Approach Channel and Advanced Maintenance Area received by the Illinois EPA on September 1, 2004 and December 6, 2004, respectively (hereafter referred to as "submitted documents"), satisfy the requirements of conditions 7 and 8 of the water quality certification and final determination issued February 1, 2005 (Permit # 2005-LM-2830) for the 2005 dredging event described in those submitted documents. Dredging events subsequent to the 2005 dredging event described in the submitted documents will need to be conducted in accordance with the conditions found in Permit #2005-LM-2830 issued February 1, 2005 and in accordance with the following conditions:

Condition 3 of Permit #2005-LM-2830 has been revised as follows:

3. Prior to each dredging event conducted during the term of this authorization, sediment analysis shall be conducted for a representative number of core samples from the dredge cut. Analysis shall be conducted for particle size distribution, total polychlorinated biphenyls (PCBs), asbestos and, for hydraulic dredging, supernatant contaminants. Polarized Light Microscopy (PLM) and the Transmission Electron Microscopy (TEM) methods shall be used for asbestos testing. All samples shall be analyzed by each asbestos test method. Analysis of the supernatant shall be based on a zero and four (4) hour settling periods. Parameters analyzed shall include total suspended solids, total volatile solids, ammonia-nitrogen (as N), pH, temperature, phosphorus (as P), total dissolved solids, sulfate, chloride, lead and zinc. The analyses required herein shall be consistent with the Quality Assurance Project Plan/Field Sampling Plan required in Condition 6 below.

Condition 6 of Permit #2005-LM-2830 has been revised as follows:

6. Ninety (90) days prior to sampling, the applicant shall provide a Quality Assurance Project Plan/Field Sampling Plan (QAPP/FSP) for the Waukegan Harbor Advanced Maintenance Area and Approach Channel sediment sampling with regard to the sampling required in Condition 3 above for each dredging event. The QAPP/FSP shall include a review of historical sediment data from the Advanced Maintenance Area and Approach Channel of Waukegan Harbor as well as the proposed methods and procedures for sampling, sampling frequency, parameters to be analyzed in the sediment, methods and procedures of analysis and sample location selection.

Condition 7 of Permit #2005-LM-2830 has been revised as follows:

7. The Illinois EPA will reevaluate the need for future sampling, analysis and reporting, and will issue necessary conditions based upon the results of the sampling, analysis and reports required by this final determination.

Condition 8 of Permit #2005-LM-2830 has been revised as follows:

8. The applicant shall not place or discharge material dredged from the Waukegan Harbor Approach Channel and Advanced Maintenance Area into Lake Michigan or into waters of the State for beach nourishment or other purposes without requesting and receiving written approval from the Illinois EPA prior to such operations. Prior to any dredging event the applicant shall provide data and information to meet the requirements of Condition 3. Illinois EPA will review the data and information and will issue, conditionally issue or deny approval of disposal within Lake Michigan or other waters of the State for each dredging event.

Condition 9 has been added to Permit #2005-LM-2830 as follows:

9. The Illinois EPA may reopen and revise this final determination based on the findings, recommendations and health risk criteria developed by and published in the final report of the Illinois Attorney General's Task Force on asbestos contamination at Illinois Beach State Park and in Lake Michigan, or to conform to new state or federal regulations, Illinois Pollution Control Board orders or judicial orders.

We note that the proposed dredging will be conducted by mechanical methods. Should other methods be used, however, additional analysis, reporting and procedures for monitoring the lake at the disposal site(s) during the alternative operations are specified in the conditions of Permit #2005-LM-2830 and in this modification of Permit #2005-LM-2830.

If you have any questions on these matters, please contact David Ginder at the address or telephone number listed above.

Sincerely,

Bruce J. Yurdin
Manager, Watershed Management Section
Bureau of Water

BY:DPG:2830-041.doc

cc: IEPA, Records Unit
IEPA, DWPC, FOS, Des Plaines
Mr. Dan Injerd, IDNR, OWR, Chicago
Mr. Todd Rettig, INDR
Mr. John Rogner, USFWS
Binds

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

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ROD R. BLAGOJEVICH, GOVERNOR RENEE CIPRIANO, DIRECTOR

217/782-3362

FEB 0 1 2005

Illinois Department of Natural Resources
Office of Water Resources
36 S. Wabash Avenue, Suite 1415
Chicago, IL 60603

Chicago District Corps of Engineers
111 North Canal Street, 6th Floor
Chicago, IL 60606

Re: Chicago District, U.S. Army Corps of Engineers – Waukegan Harbor Approach Channel and Advanced Maintenance Area
Permit # 2005-LM-2830
Log # 2830-04

Gentlemen:

This Agency received a request on January 24, 2003 from the Chicago District of the U.S. Army Corps of Engineers requesting necessary comments concerning the annual maintenance dredging of up to 75,000 cubic yards of sediment from the Waukegan Harbor Approach Channel and Advanced Maintenance Area in Lake Michigan commencing with the 2005 dredging season. We offer the following comments.

Based on the information included in this submittal, it is our engineering judgment that the proposed project may be completed without causing water pollution as defined in the Illinois Environmental Protection Act, provided the project is carefully planned and supervised.

These comments are directed at the effect on water quality of the construction procedures involved in the above described project and are not an approval of any discharge resulting from the completed facility, nor an approval of the design of the facility. These comments do not supplant any permit responsibilities of the applicant toward the Agency.

This Agency hereby issues certification under Section 401 of the Clean Water Act (PL 95-217) and final determination under Section 39 of the Illinois Environmental Protection Act, subject to the applicant's compliance with the following conditions:

1. The applicant shall not cause:

   a. violation of applicable water quality standards of the Illinois Pollution Control Board, Title 35, Subtitle C: Water Pollution Rules and Regulations;

   b. water pollution defined and prohibited by the Illinois Environmental Protection Act; or

c. interference with water use practices near public recreation areas or water supply intakes.

2. The applicant shall provide adequate planning and supervision during the project construction period for implementing construction methods, processes and cleanup procedures necessary to prevent water pollution and control erosion.

3. Prior to each dredging event conducted during the term of this authorization, sediment analysis shall be conducted for a representative number of core samples from the dredge cut. Analysis shall be conducted for particle size distribution, total polychlorinated biphenyls (PCBs), asbestos and, for hydraulic dredging, supernatant contaminants. Samples analyzed for asbestos shall be analyzed by Transmission Electron Microscopy (TEM). Analysis of the supernatant shall be based on a zero and four (4) hour settling periods. Parameters analyzed shall include total suspended solids, total volatile solids, ammonia-nitrogen (as N), pH, temperature, phosphorus (as P), total dissolved solids, sulfate, chloride, lead and zinc. The analyses required herein shall be consistent with the Quality Assurance Project Plan/Field Sampling Plan required in Condition 6 below.

4. All test results from Condition 3 shall be submitted to the Agency prior to each dredging event. Results must indicate compliance with 35 Ill. Adm. Code 302.503, 302.504, 302.515 and 302.535. Upon review of these data the Agency will issue necessary additional conditions to insure compliance with these standards.

5. Monitoring shall be conducted in the case of hydraulic dredging. Monitoring of total suspended solids, total dissolved solids, ammonia-nitrogen (as N), pH, temperature, phosphorus (as P), sulfate and chloride shall be conducted on a daily basis. Samples shall be collected at surface, mid-depth and bottom elevations at four representative locations, two at approximately 600 feet from the discharge pipe and two at approximately 100 feet from the discharge pipe. Monitoring results and the locations of all collected samples shall be submitted within one month following the collection of samples.

6. The applicant shall provide a Quality Assurance Project Plan/Field Sampling Plan (QAPP/FSP) for the Waukegan Harbor Advanced Maintenance Area and Approach Channel sediment sampling with regard to the sampling required in Condition 3 above for each dredging event. The QAPP/FSP shall include a review of historical sediment data from the Advanced Maintenance Area and Approach Channel of Waukegan Harbor as well as the proposed methods and procedures for sampling, sampling frequency, parameters to be sampled in the sediment and sample location selection.

7. Prior to the next dredging event (starting with sampling collected for the 2005 dredging season), the applicant shall submit sediment sample results at a minimum of 12 sites from each potential nutrient sand source and from each of two background locations. Samples shall be prepared in accordance with the most current version of the Superfund Method for the Determination of Releasable Asbestos in Soils and Bulk Materials (U.S. EPA 540-R-97-028, 1997). Sampling shall utilize a grid sampling system with equally spaced samples. Samples analyzed for asbestos shall be analyzed by Transmission Electron Microscopy (TEM). The aforementioned sampling and analysis shall be conducted in accordance with the recommendations specified in the document entitled "Illinois Beach State Park (IBSP): Determination of Asbestos Contamination in Sand Used for Beach Nourishment, Final Recommendations", dated December 29, 2003, prepared by the University of Illinois at Chicago, Center of Excellence in Environmental Health, Health Hazard Evaluation Program for the Illinois Attorney General's Task Force that was formed to address asbestos contamination at Illinois Beach State Park (IBSP). An initial report for the next dredging event containing the sampling results, methods, locations and depths, laboratory analysis reports and a discussion of the findings shall be submitted to the Agency at least 90 days prior to the next dredging event. The Illinois EPA will reevaluate the need for future sampling, analysis and reporting, and will issue necessary additional conditions based upon the results of the sampling, analysis and reports required by this condition.

8. The applicant shall not place or discharge material dredged from the Waukegan Harbor Approach Channel and Advanced Maintenance Area into Lake Michigan or into waters of the State for beach nourishment or other purposes without requesting and receiving written approval from the Illinois EPA prior to such operations. Prior to any dredging event the applicant shall provide data and information to meet the requirements of Conditions 3 and 7. Illinois EPA will review the data and information relative to the findings, recommendations and health risk criteria developed by and published in the final report of the Illinois Attorney General's Task Force on asbestos contamination at Illinois Beach State Park and in Lake Michigan. Illinois EPA will issue, conditionally issue or deny approval of disposal within Lake Michigan or other waters of the State for each dredging event on this basis.

This certification and final determination expires on December 31, 2014.

Required sampling and analysis may be completed by the applicant or its contractor or designee. In fact, the Illinois EPA understands that the Illinois Department of Natural Resources may be completing the sampling and analysis required under this permit, on behalf of the applicant. So long as required sample analysis reports are received by the Illinois EPA, such an arrangement satisfies the applicant's obligations under this permit.

This final determination replaces the final determinations issued June 5, 2003 (Permit # 2003-LM-3067) and April 14, 2004 (Permit # 2003-LM-3067-1).

This certification and final determination becomes effective when the Department of the Army, Corps of Engineers, and the Illinois Department of Natural Resources, Office of Water Resources, includes the above conditions # 1 through # 8 as conditions of the requested permit issued pursuant to Section 404 of PL 95-217, and Section 39 of the Illinois Environmental Protection Act and Chapter 19, par.65, Ill. Rev. Stat.

This certification and final determination does not grant immunity from any enforcement action found necessary by this Agency to meet its responsibilities in prevention, abatement, and control of water pollution.

Sincerely,

Bruce J. Yurdin
Manager, Watershed Management Section
Bureau of Water

BY:DPG:2830-04.doc

cc: IEPA, Records Unit
IEPA, DWPC, FOS, Des Plaines
USEPA, Region 5
Binds
Ms. Monica Ott, CoE, Chicago District

PERMIT NO. LM2005003
DATE: February 22, 2005

State of Illinois
Department of Natural Resources, Office of Water Resources
and
Environmental Protection Agency

Permission is hereby granted to: **U.S. Army Corps of Engineers**
Chicago District
111 N. Canal Street, Suite 600
Chicago, IL 60606-7205

TEN YEAR MAINTENANCE DREDGING

To dredge up to 75,000 cubic yards of sand annually from the Waukegan Harbor approach channel and Advance Maintenance Area and dispose of in Lake Michigan in the Southeast Quarter of Section 22, Township 45 North, Range 12 East, of the 3rd Principal Meridian in Lake County.

In accordance with an **undated** application and the plans and specifications entitled:

WAUKEGAN HARBOR MAINTENANCE DREDGING, SHEETS, G-01, C-01, AND C-02, DATED DECEMBER 2002, RECEIVED FEBRUARY 3, 2003.

PROPOSED DISPOSAL AREAS: STATE PARK AND FOUNDRY SITE, ONE SHEET, UNDATED, RECEIVED FEBRUARY 3, 2003.

Examined and Recommended:

Daniel Injerd, Chief
Lake Michigan Management Section

Approval Recommended:

Gary R. Clark, Director
Office of Water Resources

Approved:

Joel Brunsvold, Director
Department of Natural Resources

This PERMIT is subject to the terms and special conditions contained herein and in the attached NOTICE OF FINAL DETERMINATION of the Illinois Environmental Protection Agency. This PERMIT is not valid unless a NOTICE OF FINAL DETERMINATION of the Illinois Environmental Protection Agency as required by Section 39(a) of the Environmental Protection Act is attached.

PERMIT NO. LM2005003

THIS PERMIT IS SUBJECT TO THE FOLLOWING CONDITIONS:

1) This permit is granted in accordance with the Rivers, Lakes and Streams Act, "615 ILCS 5," and the Environmental Protection Act "415 ILCS 5/1."

2) This permit does not convey title to the permittee or recognize title of the permittee to any submerged or other lands, and furthermore, does not convey, lease or provide any right or rights of occupancy or use of the public or private property on which the activity or any part thereof will be located, or otherwise grant to the permittee any right or interest in or to the property, whether the property is owned or possessed by the State of Illinois or by any private or public party or parties.

3) This permit does not release the permittee from liability for damage to persons or property resulting from the work covered by this permit, and does not authorize any injury to private property or invasion of private rights.

4) This permit does not relieve the permittee of the responsibility to obtain other federal, state or local authorizations required for the construction of the permitted activity; and if the permittee is required by law to obtain approvals from any federal or other state agency to do the work, this permit is not effective until the federal and state approvals are obtained.

5) The permittee shall, at the permittee's own expense, remove all temporary piling, cofferdams, false work, and material incidental to the construction of the project from Lake Michigan. If the permittee fails to remove such structures or materials, the Department may have removal made at the expense of the permittee.

6) In public waters, if future need for public navigation or other public interest by the state or federal government necessitates changes in any part of the structure or structures, such changes shall be made by and at the expense of the permittee or the permittee's successors as required by the Department or other properly constituted agency, within sixty (60) days from receipt of written notice of the necessity from the Department or other agency, unless a longer period of time is specifically authorized.

7) The execution and details of the work authorized shall be subject to the review and approval of the Department and/or the Agency. Department and Agency personnel shall have the right of access to accomplish this purpose.

8) Starting work on the activity authorized will be considered full acceptance by the permittee of the terms and conditions of the permit.

9) The Department and Agency in issuing this permit have relied upon the statements and representations made by the permittee; if any substantive statement or representation made by the permittee is found to be false, this permit will be revoked and when revoked, all rights of the permittee under the permit are voided.

10) The permittee and the permittee's successors shall make no claim whatsoever to any interest in any accretions caused by the activity.

11) In issuing this permit, the Department and Agency do not ensure the adequacy of the design or structural strength of the structure or improvement.

12) Noncompliance with the conditions of this permit will be considered grounds for revocation.

13) If the construction activity here permitted is not completed on or before **December 31, 2015**, this permit shall cease and be null and void. When all work is constructed, the permittee shall notify the Department so that a final inspection can be completed.

THIS PERMIT IS SUBJECT TO FURTHER SPECIAL CONDITIONS AS FOLLOWS:

A. Conditions 1-8 of the Illinois Environmental Protection Agency's February 1, 2005 final determination letter.

B. Notify the City of North Chicago and Abbot Laboratories each year prior to commencement of dredging.

C. Notify the Department annually of the amount of material dredged and the disposal location.

VDS → ED-1 files

State of Illinois
ENVIRONMENTAL PROTECTION AGENCY

Mary A. Gade, Director
217/782-0610

2200 Churchill Road, Springfield, IL 62794-9276

→ ED-HE

May 30, 1996

Mr. Joseph D. Jacobazzi, P.E.
Chief, Engineering Division
Chicago District Corps of Engineers
111 North Canal Street
Chicago, IL 60606

Re: Waukegan Harbor Approach Channel and Advanced Maintenance Area: Tier 2 Evaluation
Permit # 1992-LM-0347

Dear Mr. Jacobazzi:

We have reviewed the Tier 2 evaluation for the maintenance dredging of the Waukegan Harbor approach channel and advanced maintenance area, submitted on April 22, 1996. The April 12, 1996 Tier 2 Report includes sediment dat from the advanced maintenance area. Sediments were analyzed for grain size, PCBs and elutriate concentrations for various heavy metals, nutrients and other contaminant indicators. These analyses were consistent with the required testing procedures specified in the Section 401 certification 1992-LM-0347 issued for the approach channel dredging, issued on May 4, 1992.

We concur with the findings and conclusions of the Tier 2 Report. While several metal and nutrient constituents indicate the potential for excedences, we believe the use of mechanical dredge, as proposed, and the further effects of dilution in the immediate disposal area, will mitigate these potential water quality impacts. Therefore, the Section 401 water quality certification cited above is hereby modified to include the advanced maintenance area specified in the Tier 2 Report. Subsequent dredging of this area is subject to the conditions of this certification.

If you have any questions on this matter, please contact Bruce Yurdin of my staff.

Very truly yours,

Thomas G. McSwiggin, P.E.
Manager, Permit Section
Division of Water Pollution Control

cc: DWPC, FOS, Maywood
IDNR, OWR, Chicago

State of Illinois
ENVIRONMENTAL PROTECTION AGENCY

Mary A. Gade, Director

2200 Churchill Road, Springfield, IL 62794-9276

217/782-0610

November 28, 1995

Mr. Joseph D. Jacobazzi, P.E.
Chief, Engineering Division
Chicago District Corps of Engineers
111 North Canal Street
Chicago, IL 60606

Re: Waukegan Harbor Approach Channel, Tier 1 Evaluation
Log# C-1562-95

Dear Mr. Jacobazzi:

We have reviewed the Tier 1 Sediment Evaluation for the maintenance dredging of the Waukegan Harbor approach channel, provided on November 3, 1995. The Tier 1 report concludes that the approach channel sediment should be tested for grain size and for total constituent (bulk) and elutriate concentrations for various heavy metals, nutrients, PCBs and other contaminant indicators.

We concur with the conclusions of the Tier 1 evaluation, and find it consistent with our views on the current contaminant concentration status of the Waukegan Harbor sediments.

Section 1.7 of the Tier 1 report, in documenting the various possible sources of contamination of the approach channel sediment, does not include potential contributions, past or present, from the OMC's north ditch, a drainage ditch on the northern boundary of the OMC properties. This ditch was used for an extended period to convey wastewater and stormwater runoff from the OMC site to Lake Michigan. The outfall for the north ditch is north (up drift) of the approach channel of the harbor.

Thank you for this opportunity to comment on the Corps of Engineers' evaluation of the sediment conditions at Waukegan Harbor. If you have any questions on this matter, please contact me.

Sincerely,

Bruce J. Yurdin
Manager, Watershed Unit
Permit Section
Division of Water Pollution Control

cc: DWPC, FOS, Maywood

Printed on Recycled Paper

Appendix B

Laboratory Information

SUBURBAN LABORATORIES, Inc.

4140 Litt Drive • Hillside, Illinois 60162
Tel. (708) 544-3260 • Toll Free (800) 783-LABS
Fax (708) 544-8587
www.suburbanlabs.com

Waukegan Harbor Maintenance Dredging FY10

Final Report

Revision 0
9/8/2010

Prepared By: Melissa Amador

Illinois Department of Public Health Accredited # 17585

Illinois Environmental Protection Agency Accredited #100225

4140 Litt Drive • Hillside, Illinois 60162
Tel. (708) 544-3260 • Toll Free (800) 783-LABS
Fax (708) 544-8587
www.suburbanlabs.com

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SUBURBAN LABORATORIES, Inc.

4140 Litt Drive Hillside, Illinois 60162
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Fax (708-544-8587
www.suburbanlabs.com

September 07, 2010

Workorder: 1007453

Jon Keillor
Luedtke Engineering Company
10 Fourth Street
P.O. Box 111
Frankfort, Michigan 49635

TEL: (231) 352-9631
FAX: (231) 352-7178
RE: Waukegan Harbor 2010 - Initial Samples

Dear Jon Keillor:

Suburban Laboratories, Inc. received 3 sample(s) on 07/13/10 for the analyses presented in the following report.

All data for the associated quality control (QC) met EPA, method, or internal laboratory specifications except where noted in the case narrative. If you are comparing these results to external QC specifications or compliance limits and have any questions, please contact us.

This final report of laboratory analysis consists of this cover letter, case narrative, analytical report, dates report, and any accompanying documentation on, but not limited to, chain of custody records, raw data, and letters of explanation or reliance. This report may not be reproduced, except in full, without the prior written approval of Suburban Laboratories, Inc.

If you have any questions regarding these test results, please call me at (708) 544-3260.

Sincerely,

Melissa Amador

Melissa Amador
Project Manager

Suburban Laboratories, Inc.

4140 Litt Drive, Hillside, IL 60162 (708) 544-3260

Case Narrative

Client: Luedtke Engineering Company
Project: Waukegan Harbor 2010 - Initial Samples
WorkOrder: **1007453**
Temperature of samples upon receipt at SLI: **4 C**

Date: September 07, 2010
PO #: 981-1
QC Level:
Chain of Custody #: Electronic

General Comments:
- All results reported in wet weight unless otherwise indicated. (dry = Dry Weight)
- Sample results relate only to the analytes of interest tested and to sample as received by the laboratory.
- Environmental compliance sample results meet the requirements of 35 IAC Part 186 unless otherwise indicated.
- Waste water analysis follows the rules set forth in 40 CFR part 136 except where otherwise noted.
- Accreditation by the State of Illinois is not an endorsement or a guarantee of the validity of data generated.
- For more information about the laboratories' scope of accreditation, please contact us at (708) 544-3260 or the Agency at (217) 782-6455.

Abbreviations:
- Reporting Limit: The concentration at which an analyte can be routinely detected on a day to day basis, and which also meets regulatory and client needs.
- Quantitation Limit: The lowest concentration at which results can be accurately quantitated.
- J: The analyte was positively identified above our Method Detection Limit and is considered detectable and usable; however, the associated numerical value is the approximate concentration of the analyte in the sample.
- ATC: Automatic Temperature Correction. - TNTC: Too Numerous To Count
- In Laboratory: EPA recommends this analyte be analyzed "immediately" (e.g., tests that should be performed in the field within 15 minutes of collection). Analytes with "immediate" hold times are analyzed as soon as possible upon receipt by the laboratory.
- TIC: Tentatively Identified Compound (GCMS library search identification, concentration estimated to nearest internal standard).

Method References:
For a complete list of method references please contact us.
- E: USEPA Reference methods
- SW: USEPA, Test Methods for Evaluating Solid Waste (SW-846)
- M: Standard Methods for the Examination of Water and Wastewater
- USP: Latest version of United States Pharmacopeia

Workorder Specific Comments:

Suburban Laboratories, Inc.
4140 Litt Drive, Hillside, IL 60162 (708) 544-3260

Laboratory Results

Client ID: Luedtke Engineering Company
Project Name: Waukegan Harbor 2010 - Initial Samples
Report Date: September 07, 2010
Lab Order: **1007453**

Client Sample ID: **Initial Sample Area 1 - Surface**
Lab ID: 1007453-001 **Date Received:** 07/13/2010 12:40 PM
Matrix: SURFACE WATER
Collection Date: 07/13/2010 10:35 AM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
CHLORIDE		Method: APHA-M4500-Cl⁻ E-Rev 18th, 1992				Analyst: lb	
Chloride	10.2	0.500		mg/L	1	07/14/2010 4:14 PM	R3737
FIELD PARAMETERS		Method: E150.1-FIELD				Analyst:	
pH, Field	8.36			pH		07/13/2010 10:35 AM	
Temperature	24.1			C		07/13/2010 10:35 AM	
HARDNESS, TOTAL		Method: SM-2340B-Rev 18Ed, 1992				Analyst: mn	
Hardness, Ca/Mg (As CaCO3)	132	0.050	c	mg/L	1	07/20/2010 12:00 AM	1240
AMMONIA, BY SELECTIVE ELECTRODE		Method: SM-M4500NH3 F-Rev 18Ed, 1992				Analyst: lb	
Nitrogen, Ammonia (As N)	0.0160	0.0100	J	mg/L	1	07/20/2010 10:39 AM	R3840
PHOSPHORUS, TOTAL		Method: SM-M4500P BE-Rev 18Ed, 1992				Analyst: sb	
Phosphorus (As P)	0.0121	0.00500		mg/L	1	07/15/2010 4:41 PM	1305
TOTAL SUSPENDED SOLIDS		Method: SM-M2540D-Rev 18Ed, 1992				Analyst: jos	
Residue, Non-Filterable	1.00	0.500	J	mg/L	1	07/19/2010 12:00 AM	R3821

Client Sample ID: **Initial Sample Area 1 - Mid-Depth**
Lab ID: 1007453-002 **Date Received:** 07/13/2010 12:40 PM
Matrix: SURFACE WATER
Collection Date: 07/13/2010 10:43 AM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
CHLORIDE		Method: APHA-M4500-Cl⁻ E-Rev 18th, 1992				Analyst: lb	
Chloride	10.9	0.500		mg/L	1	07/14/2010 4:14 PM	R3737
FIELD PARAMETERS		Method: E150.1-FIELD				Analyst:	
pH, Field	8.34			pH		07/13/2010 10:43 AM	
Temperature	22.6			C		07/13/2010 10:43 AM	
HARDNESS, TOTAL		Method: SM-2340B-Rev 18Ed, 1992				Analyst: mn	
Hardness, Ca/Mg (As CaCO3)	127	0.050	c	mg/L	1	07/20/2010 12:00 AM	1240
AMMONIA, BY SELECTIVE ELECTRODE		Method: SM-M4500NH3 F-Rev 18Ed, 1992				Analyst: lb	
Nitrogen, Ammonia (As N)	0.0160	0.0100	J	mg/L	1	07/20/2010 10:39 AM	R3840
PHOSPHORUS, TOTAL		Method: SM-M4500P BE-Rev 18Ed, 1992				Analyst: sb	
Phosphorus (As P)	ND	0.00500		mg/L	1	07/15/2010 4:41 PM	1305
TOTAL SUSPENDED SOLIDS		Method: SM-M2540D-Rev 18Ed, 1992				Analyst: jos	
Residue, Non-Filterable	1.00	0.500	J	mg/L	1	07/19/2010 12:00 AM	R3821

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
c	Analyte not in SLI scope of accreditation	E	Estimated, detected above quantitation range
G	Refer to case narrative page for specific comments	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limit (QL)	N	Tentatively identified compounds
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits

Suburban Laboratories, Inc.

4140 Litt Drive, Hillside, IL 60162 (708) 544-3260

Laboratory Results

Client ID: Luedtke Engineering Company
Project Name: Waukegan Harbor 2010 - Initial Samples

Report Date: September 07, 2010
Lab Order: **1007453**

Client Sample ID: **Blind Duplicate**
Lab ID: 1007453-003 **Date Received:** 07/13/2010 12:40 PM

Matrix: SURFACE WATER
Collection Date: 07/13/2010 10:48 AM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
CHLORIDE		Method: APHA-M4500-Cl⁻ E-Rev 18th, 1992				Analyst: lb	
Chloride	10.0	0.500		mg/L	1	07/14/2010 4:14 PM	R3737
FIELD PARAMETERS		Method: E150.1-FIELD				Analyst:	
pH, Field	8.32			pH		07/13/2010 10:48 AM	
Temperature	22.5			C		07/13/2010 10:48 AM	
HARDNESS, TOTAL		Method: SM-2340B-Rev 18Ed, 1992				Analyst: mn	
Hardness, Ca/Mg (As CaCO3)	133	0.050	c	mg/L	1	07/20/2010 12:00 AM	1240
AMMONIA, BY SELECTIVE ELECTRODE		Method: SM-M4500NH3 F-Rev 18Ed, 1992				Analyst: lb	
Nitrogen, Ammonia (As N)	0.0143	0.0100	J	mg/L	1	07/20/2010 10:39 AM	R3840
PHOSPHORUS, TOTAL		Method: SM-M4500P BE-Rev 18Ed, 1992				Analyst: sb	
Phosphorus (As P)	ND	0.00500		mg/L	1	07/15/2010 4:41 PM	1305
TOTAL SUSPENDED SOLIDS		Method: SM-M2540D-Rev 18Ed, 1992				Analyst: jos	
Residue, Non-Filterable	0.500	0.500	J	mg/L	1	07/19/2010 12:00 AM	R3821

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
c	Analyte not in SLI scope of accreditation	E	Estimated, detected above quantitation range
G	Refer to case narrative page for specific comments	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limit (QL)	N	Tentatively identified compounds
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits

Suburban Laboratories, Inc.

4140 Litt Drive, Hillside, IL 60162 (708) 544-3260

PREP DATES REPOR

Client: Luedtke Engineering Company

Project: Waukegan Harbor 2010 - Initial Sa

Report Date: September 07, 2010

Lab Order: **1007453**

Sample ID	Collection Date	Batch ID	Prep Method	Prep Test Name	TCLP Date	Prep Date
1007453-001B	07/13/10 10:35:00 A	1305	P_WW_LOWPR	PHOSPHORUS, TOTAL		07/15/10
1007453-001C		1240	200.2_ICPWW_	AQUEOUS PREP T/R METALS: ICP		07/14/10
1007453-002B	07/13/10 10:43:00 A	1305	P_WW_LOWPR	PHOSPHORUS, TOTAL		07/15/10
1007453-002C		1240	200.2_ICPWW_	AQUEOUS PREP T/R METALS: ICP		07/14/10
1007453-003B	07/13/10 10:48:00 A	1305	P_WW_LOWPR	PHOSPHORUS, TOTAL		07/15/10
1007453-003C		1240	200.2_ICPWW_	AQUEOUS PREP T/R METALS: ICP		07/14/10

3
Hillside, IL 60162
TEL: 708-544-3260
FAX: 708-544-8587
Website: www.SuburbanLabs.com

QC SUMMARY REPORT

WO#: **1007453**
07-Sep-10

Client: Luedtke Engineering Company
Project: Waukegan Harbor 2010 - Initial Samples
TestCode: **CL_WW1**

Sample ID: **MB-R3737** SampType: **MBLK** TestCode: **CL_WW1** Units: **mg/L** Prep Date: RunNo: **3737**
Client ID: **PBW** Batch ID: **R3737** TestNo: **A4500-Cl- E** Analysis Date: **07/14/10** SeqNo: **72748**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	ND	5.00									

Sample ID: **LCS-R3737** SampType: **LCS** TestCode: **CL_WW1** Units: **mg/L** Prep Date: RunNo: **3737**
Client ID: **LCSW** Batch ID: **R3737** TestNo: **A4500-Cl- E** Analysis Date: **07/14/10** SeqNo: **72749**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	102	5.00	100.0	0	102	85	115				

Sample ID: **1007242-001AMS** SampType: **MS** TestCode: **CL_WW1** Units: **mg/L** Prep Date: RunNo: **3737**
Client ID: **ZZZZZZ** Batch ID: **R3737** TestNo: **A4500-Cl- E** Analysis Date: **07/14/10** SeqNo: **72758**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	113	5.00	100.0	16.58	96.0	80	120				

Sample ID: **1007242-001AMSD** SampType: **MSD** TestCode: **CL_WW1** Units: **mg/L** Prep Date: RunNo: **3737**
Client ID: **ZZZZZZ** Batch ID: **R3737** TestNo: **A4500-Cl- E** Analysis Date: **07/14/10** SeqNo: **72759**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	114	5.00	100.0	16.58	97.0	80	120	112.6	0.849	20	

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level	E	Estimated, detected above quantitation range	H	Holding times for preparation or analysis exceede
M	Manual Integration used to determine area response	ND	Not Detected at the Reporting Limit	P	Second column confirmation exceeds
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

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Hillside, IL 60162
TEL: 708-544-3260
FAX: 708-544-8587
Website: www.SuburbanLabs.com

QC SUMMARY REPORT

WO#: **1007453**

07-Sep-10

Client: Luedtke Engineering Company
Project: Waukegan Harbor 2010 - Initial Samples

TestCode: **NH3_WW_LOW**

Sample ID: **MB-R3840** SampType: **MBLK** TestCode: **NH3_WW_LO** Units: **mg/L** Prep Date: RunNo: **3840**
Client ID: **PBW** Batch ID: **R3840** TestNo: **A4500-NH3 D** Analysis Date: **07/20/10** SeqNo: **75006**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrogen, Ammonia (As N)	ND	0.0200									

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level	E	Estimated, detected above quantitation range	H	Holding times for preparation or analysis exceede
M	Manual Integration used to determine area response	ND	Not Detected at the Reporting Limit	P	Second column confirmation exceeds
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

3
Hillside, IL 60162
TEL: 708-544-3260
FAX: 708-544-8587
Website: www.SuburbanLabs.com

QC SUMMARY REPORT

WO#: **1007453**
07-Sep-10

Client: Luedtke Engineering Company
Project: Waukegan Harbor 2010 - Initial Samples **TestCode:** **P_WW_LOW**

Sample ID: **MB-1305** SampType: **MBLK** TestCode: **P_WW_LOW** Units: **mg/L** Prep Date: **07/15/10** RunNo: **3772**
Client ID: **PBW** Batch ID: **1305** TestNo: **A4500-P BE** **A4500-P BE** Analysis Date: **07/15/10** SeqNo: **73611**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Phosphorus (As P)	ND	0.00300									

Sample ID: **LCS-1305** SampType: **LCS** TestCode: **P_WW_LOW** Units: **mg/L** Prep Date: **07/15/10** RunNo: **3772**
Client ID: **LCSW** Batch ID: **1305** TestNo: **A4500-P BE** **A4500-P BE** Analysis Date: **07/15/10** SeqNo: **73612**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Phosphorus (As P)	0.0464	0.00300	0.05000	0	92.9	85	115				

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level	E	Estimated, detected above quantitation range	H	Holding times for preparation or analysis exceede
M	Manual Integration used to determine area response	ND	Not Detected at the Reporting Limit	P	Second column confirmation exceeds
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

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QC SUMMARY REPORT

WO#: **1007453**
07-Sep-10

Client: Luedtke Engineering Company
Project: Waukegan Harbor 2010 - Initial Samples **TestCode:** **TSS**

Sample ID: **MB-R3821** SampType: **MBLK** TestCode: **TSS** Units: **mg/L** Prep Date: RunNo: **3821**
Client ID: **PBW** Batch ID: **R3821** TestNo: **A2540D** Analysis Date: **07/19/10** SeqNo: **75024**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Residue, Non-Filterable	ND	1.00									

Sample ID: **1007427-002ADUP** SampType: **DUP** TestCode: **TSS** Units: **mg/L** Prep Date: RunNo: **3821**
Client ID: **ZZZZZZ** Batch ID: **R3821** TestNo: **A2540D** Analysis Date: **07/19/10** SeqNo: **75040**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Residue, Non-Filterable	86.0	10.0						92.00	6.74	10	

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level	E	Estimated, detected above quantitation range	H	Holding times for preparation or analysis exceede
M	Manual Integration used to determine area response	ND	Not Detected at the Reporting Limit	P	Second column confirmation exceeds
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

SUBURBAN LABORATORIES, Inc.

4140 Litt Drive Hillside, IL 60162 Tel. 708.544.3260 Fax: 708.544.8587 Toll Free: 800.783.LABS www.suburbanlabs.com

CHAIN OF CUSTODY RECORD

Electronic Version

Company Name: Luedtke Engineering Company
Company Address:
City: Frankfort State: MI Zip: 49635
Phone: Fax: ☐ Fax Report
Email Address: ☑ Email Report
Project ID / Location: Waukegan Harbor Dredging 2010
Project Manager (Report to): Jon Keillor
Sample Collector(s): Tomas Rodriguez

TURNAROUND TIME REQUESTED
☑ Normal ☐ RUSH* *Additional Rush Charges Approved.
*Date & Time Needed:
Normal TAT is 5-7 work days for most work. Rush work must be pre-approved and additional charges apply.

Specify Regulatory Program: (Required) ☐ None/Info only
☐ LUST ☐ SRP ☐ SDWA
☐ 503 Sludge ☐ NPDES ☐ MWRDGC
☐ Disposal ☑ Other *Please specify in comment section below.

ANALYSIS & METHOD REQUESTED
Enter an "X" in box below for request

Page 1 of 1
PO No.
Shipping Method: SLI
QC Reporting Level ☐ 1 ☑ 2 ☐ 3

LAB USE ONLY
SLI Order No. 1007453
Sample containers supplied by customer? ☐ Yes
Temperature of Received Samples 4 °C
Samples received within 24 hours of collection? ☐ Yes

	SAMPLE IDENTIFICATION (Please use 1 line per container type)	COLLECTION DATE	COLLECTION TIME	MATRIX	GRAB/ COMP.	CONTAINERS Qty	CONTAINERS SIZE & TYPE	PRESERVATIVE	TSS	Chloride	Ammonia	Phosphorus	Hardness	R	Condition	Split	LAB #
1	Initial Sample Area 1 - Surface TMA 7/13/10	7/13/10	10:35	SW	G	1	1LP	none	X	X							-001A
2	↓	↓	↓	↓	↓	1	1LP	H2SO4			X	X					-001B TMA 7/13/10
3	↓	↓	↓	↓	↓	1	500p	HNO3					X				-001C
4																	
5	Initial Sample Area 2 - Mid-depth TMA 7/13/10	7/13/10	10:43	SW	G	1	1LP	none	X	X							-002A
6	↓	↓	↓	↓	↓	1	1LP	H2SO4			X	X					-002B
7	↓	↓	↓	↓	↓	1	500p	HNO3					X				-002C
8																	
9	Blind Duplicate	7/13/10	10:48	SW	G	1	1LP	none	X	X							-003A
10	↓	↓	↓	↓	↓	1	1LP	H2SO4			X	X					-003B
11	↓	↓	↓	↓	↓	1	500p	HNO3					X				-003C
12																	

MATRIX: Drinking Water (DW), Soil (S), Waste Water (WW), Surface Water (SW), Ground Water (GW), Solid Waste (WA), Sludge (U), Wipe (P) **CONTAINER:** 2oz, 4oz, 8oz, 40ml Vial, 500ml, Liter (L), Tube, Glass (G), Plastic (P) **PRESERVATIVE:** H_2SO_4, HCl, HNO_3, Methanol (MeOH), NaOH, Sodium Bisulfate ($NaHSO_4$), Nethio

COMMENTS & SPECIAL INSTRUCTIONS:

* Chicago District USACE - Waukegan Harbor Approach Channel Dredging project 2010

CONDITION CODES
1. Improper/damaged container/cap
2. Improper preservation
3. Insufficient sample volume
4. Headspace/air bubbles for VOCs
5. Received past holding time
6. Received frozen
7. Label conflicts with COC

1. Relinquished By	Date	2. Relinquished By	Date	3. Relinquished By	Date	4. Relinquished By	Date
Tomas Rodriguez	7/13/10	PGR	7/13/10				
Received By ☐ Ice	Time 11:10	Received By ☑ Ice	Time 13:40	Received By ☐ Ice	Time	Received By ☐ Ice	Time

Submission of samples subject to Terms and Conditions on back. Rev. 2/01/05 Please fill out this form completely, print, sign & submit with samples. Keep a copy for your records.

FIELD LOG

Suburban Laboratories, Inc.
4140 Litt Drive
Hillside, IL 60162-1183
P: (708) 544-3260 F: (708) 544-8567
www.SuburbanLabs.com

Luedtke Engineering Company

FY10 Dredging of Waukegan Harbor Approach Channel
Initial water sampling

Suburban Labs Field Sampling Technician(s) - PRINT: Patrick Rodriguez

Luedtke Engineering Rep. - PRINT: Jim

Weather and water conditions: Clear & Calm

Placement area (circle): (1) 2

Eutech Inst. Oakton Field pH Meter, pHTestr 30 Serial No.: 1576094

	Initial Surface	Initial Mid-depth	Blind Duplicate	Additional Comments:
Sampling Technique:	grab	Kemmerer - grab	grab	
GPS coordinate (Lat./Long.) of sample collection:[1]	N 42° 20' 38.47	E 87° 49 07.7		
GPS coordinate (state plane) of sample collection:[1]				
Water column depth to the nearest foot:[1]	17.5			
Sampling depth to the nearest foot: (enter zero for surface water samples)	0	9	9	
Date & Time of collection:	7/13/10 10:35	7/13/10 10:43	7/13/10 10:48	
Sample appearance: (clear, tinted, dark, etc..)	Clear	Clear	Clear	
pH & Time of reading:	8.36 10:35	8.34 10:43	8.32 10:48	
Temperature (degrees C):	24.1°C	22.6°C	22.5°C	
Blind Duplicate sample ID:				
Comments:				

See also chain of custody form for bottles and preservatives

Version 0 06/16/2010

SIGNATURES:

SLI Field Tech 1: Patrick Rodriguez

SLI Field Tech 2: _____

Initial Samples—Placement Area 1
7/13/10

REVISED 8/31/10

SUBURBAN LABORATORIES, Inc.

4140 Litt Drive Hillside, Illinois 60162
Tel. (708) 544-3260 Toll Free (800) 783-LABS
Fax (708-544-8587
www.suburbanlabs.com

September 07, 2010

Workorder: 1007697

Jon Keillor
Luedtke Engineering Company
10 Fourth Street
P.O. Box 111
Frankfort, Michigan 49635

TEL: (231) 352-9631
FAX: (231) 352-7178
RE: Waukegan Harbor 2010 - Week 1,
Event 1 of 2

Dear Jon Keillor:

Suburban Laboratories, Inc. received 7 sample(s) on 07/16/10 for the analyses presented in the following report.

All data for the associated quality control (QC) met EPA, method, or internal laboratory specifications except where noted in the case narrative. If you are comparing these results to external QC specifications or compliance limits and have any questions, please contact us.

This final report of laboratory analysis consists of this cover letter, case narrative, analytical report, dates report, and any accompanying documentation on, but not limited to, chain of custody records, raw data, and letters of explanation or reliance. This report may not be reproduced, except in full, without the prior written approval of Suburban Laboratories, Inc.

If you have any questions regarding these test results, please call me at (708) 544-3260.

Sincerely,

Melissa Amador

Melissa Amador
Project Manager

Suburban Laboratories, Inc.

4140 Litt Drive, Hillside, IL 60162 (708) 544-3260

Case Narrative

Client: Luedtke Engineering Company
Project: Waukegan Harbor 2010 - Week 1, Event 1 of 2
WorkOrder: 1007697
Temperature of samples upon receipt at SLI: 6 C

Date: September 07, 2010
PO #: 981-1
QC Level:
Chain of Custody #: Electronic

General Comments:
- All results reported in wet weight unless otherwise indicated. (dry = Dry Weight)
- Sample results relate only to the analytes of interest tested and to sample as received by the laboratory.
- Environmental compliance sample results meet the requirements of 35 IAC Part 186 unless otherwise indicated.
- Waste water analysis follows the rules set forth in 40 CFR part 136 except where otherwise noted.
- Accreditation by the State of Illinois is not an endorsement or a guarantee of the validity of data generated.
- For more information about the laboratories' scope of accreditation, please contact us at (708) 544-3260 or the Agency at (217) 782-6455.

Abbreviations:
- Reporting Limit: The concentration at which an analyte can be routinely detected on a day to day basis, and which also meets regulatory and client needs.
- Quantitation Limit: The lowest concentration at which results can be accurately quantitated.
- J: The analyte was positively identified above our Method Detection Limit and is considered detectable and usable; however, the associated numerical value is the approximate concentration of the analyte in the sample.
- ATC: Automatic Temperature Correction. - TNTC: Too Numerous To Count
- In Laboratory: EPA recommends this analyte be analyzed "immediately" (e.g., tests that should be performed in the field within 15 minutes of collection). Analytes with "immediate" hold times are analyzed as soon as possible upon receipt by the laboratory.
- TIC: Tentatively Identified Compound (GCMS library search identification, concentration estimated to nearest internal standard).

Method References:
For a complete list of method references please contact us.
- E: USEPA Reference methods
- SW: USEPA, Test Methods for Evaluating Solid Waste (SW-846)
- M: Standard Methods for the Examination of Water and Wastewater
- USP: Latest version of United States Pharmacopeia

Workorder Specific Comments:

Suburban Laboratories, Inc.
4140 Litt Drive, Hillside, IL 60162 (708) 544-3260

Laboratory Results

Client ID: Luedtke Engineering Company
Project Name: Waukegan Harbor 2010 - Week 1, Event 1 of 2
Report Date: September 07, 2010
Lab Order: **1007697**

Client Sample ID: 1hr-500' Downstream Surface
Lab ID: 1007697-001 **Date Received:** 07/16/2010 5:40 PM
Matrix: SURFACE WATER
Collection Date: 07/16/2010 1:13 PM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
CHLORIDE		Method: APHA-M4500-Cl⁻ E-Rev 18th, 1992				Analyst: lb	
Chloride	3.81	0.500	J	mg/L	1	07/22/2010 8:14 AM	R3906
FIELD PARAMETERS		Method: E150.1-FIELD				Analyst:	
pH, Field	8.38			pH		07/16/2010 1:13 PM	
Temperature	26.9			C		07/16/2010 1:13 PM	
HARDNESS, TOTAL		Method: SM-2340B-Rev 18Ed, 1992				Analyst: mn	
Hardness, Ca/Mg (As CaCO3)	136	0.050	c	mg/L	1	07/20/2010 12:00 AM	1264
AMMONIA, BY SELECTIVE ELECTRODE		Method: SM-M4500NH3 F-Rev 18Ed, 1992				Analyst: lb	
Nitrogen, Ammonia (As N)	0.0129	0.0100	J	mg/L	1	07/20/2010 10:39 AM	R3840
PHOSPHORUS, TOTAL		Method: SM-M4500P BE-Rev 18Ed, 1992				Analyst: sb	
Phosphorus (As P)	ND	0.00500		mg/L	1	07/23/2010 4:00 PM	1360
TOTAL SUSPENDED SOLIDS		Method: SM-M2540D-Rev 18Ed, 1992				Analyst: jos	
Residue, Non-Filterable	0.800	0.400	J	mg/L	1	07/22/2010 12:00 AM	R3928

Client Sample ID: 1hr-500' Downstream Mid-Depth
Lab ID: 1007697-002 **Date Received:** 07/16/2010 5:40 PM
Matrix: SURFACE WATER
Collection Date: 07/16/2010 1:18 PM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
CHLORIDE		Method: APHA-M4500-Cl⁻ E-Rev 18th, 1992				Analyst: lb	
Chloride	3.45	0.500	J	mg/L	1	07/22/2010 8:14 AM	R3906
FIELD PARAMETERS		Method: E150.1-FIELD				Analyst:	
pH, Field	8.35			pH		07/16/2010 1:18 PM	
Temperature	24.5			C		07/16/2010 1:18 PM	
HARDNESS, TOTAL		Method: SM-2340B-Rev 18Ed, 1992				Analyst: mn	
Hardness, Ca/Mg (As CaCO3)	130	0.050	c	mg/L	1	07/20/2010 12:00 AM	1293
AMMONIA, BY SELECTIVE ELECTRODE		Method: SM-M4500NH3 F-Rev 18Ed, 1992				Analyst: lb	
Nitrogen, Ammonia (As N)	0.0142	0.0100	J	mg/L	1	07/20/2010 10:39 AM	R3840
PHOSPHORUS, TOTAL		Method: SM-M4500P BE-Rev 18Ed, 1992				Analyst: sb	
Phosphorus (As P)	0.0108	0.00500	J	mg/L	1	07/23/2010 4:00 PM	1360
TOTAL SUSPENDED SOLIDS		Method: SM-M2540D-Rev 18Ed, 1992				Analyst: jos	
Residue, Non-Filterable	1.50	0.500	J	mg/L	1	07/22/2010 12:00 AM	R3928

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
c	Analyte not in SLI scope of accreditation	E	Estimated, detected above quantitation range
G	Refer to case narrative page for specific comments	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limit (QL)	N	Tentatively identified compounds
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits

Suburban Laboratories, Inc.
4140 Litt Drive, Hillside, IL 60162 (708) 544-3260

Laboratory Results

Client ID: Luedtke Engineering Company
Project Name: Waukegan Harbor 2010 - Week 1, Event 1 of 2
Report Date: September 07, 2010
Lab Order: **1007697**

Client Sample ID: 4hr-500' Downstream Surface
Lab ID: 1007697-003 **Date Received:** 07/16/2010 5:40 PM
Matrix: SURFACE WATER
Collection Date: 07/16/2010 3:50 PM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
CHLORIDE		Method: APHA-M4500-Cl⁻ E-Rev 18th, 1992				Analyst: lb	
Chloride	ND	0.500		mg/L	1	07/22/2010 8:14 AM	R3906
FIELD PARAMETERS		Method: E150.1-FIELD				Analyst:	
pH, Field	8.32			pH		07/16/2010 3:50 PM	
Temperature	26.9			C		07/16/2010 3:50 PM	
HARDNESS, TOTAL		Method: SM-2340B-Rev 18Ed, 1992				Analyst: mn	
Hardness, Ca/Mg (As CaCO3)	139	0.050	c	mg/L	1	07/20/2010 12:00 AM	1293
AMMONIA, BY SELECTIVE ELECTRODE		Method: SM-M4500NH3 F-Rev 18Ed, 1992				Analyst: lb	
Nitrogen, Ammonia (As N)	ND	0.0100		mg/L	1	07/20/2010 10:39 AM	R3840
PHOSPHORUS, TOTAL		Method: SM-M4500P BE-Rev 18Ed, 1992				Analyst: sb	
Phosphorus (As P)	ND	0.00500		mg/L	1	07/23/2010 4:00 PM	1360
TOTAL SUSPENDED SOLIDS		Method: SM-M2540D-Rev 18Ed, 1992				Analyst: jos	
Residue, Non-Filterable	0.500	0.500	J	mg/L	1	07/22/2010 12:00 AM	R3928

Client Sample ID: 4hr-500' Downstream Mid-Depth
Lab ID: 1007697-004 **Date Received:** 07/16/2010 5:40 PM
Matrix: SURFACE WATER
Collection Date: 07/16/2010 3:57 PM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
CHLORIDE		Method: APHA-M4500-Cl⁻ E-Rev 18th, 1992				Analyst: lb	
Chloride	2.36	0.500	J	mg/L	1	07/22/2010 8:14 AM	R3906
FIELD PARAMETERS		Method: E150.1-FIELD				Analyst:	
pH, Field	8.30			pH		07/16/2010 3:57 PM	
Temperature	25.9			C		07/16/2010 3:57 PM	
HARDNESS, TOTAL		Method: SM-2340B-Rev 18Ed, 1992				Analyst: mn	
Hardness, Ca/Mg (As CaCO3)	134	0.050	c	mg/L	1	07/20/2010 12:00 AM	1293
AMMONIA, BY SELECTIVE ELECTRODE		Method: SM-M4500NH3 F-Rev 18Ed, 1992				Analyst: lb	
Nitrogen, Ammonia (As N)	ND	0.0100		mg/L	1	07/20/2010 10:39 AM	R3840
PHOSPHORUS, TOTAL		Method: SM-M4500P BE-Rev 18Ed, 1992				Analyst: sb	
Phosphorus (As P)	ND	0.00500		mg/L	1	07/23/2010 4:00 PM	1360
TOTAL SUSPENDED SOLIDS		Method: SM-M2540D-Rev 18Ed, 1992				Analyst: jos	
Residue, Non-Filterable	2.00	0.500	J	mg/L	1	07/22/2010 12:00 AM	R3928

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
c	Analyte not in SLI scope of accreditation	E	Estimated, detected above quantitation range
G	Refer to case narrative page for specific comments	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limit (QL)	N	Tentatively identified compounds
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits

Suburban Laboratories, Inc.
4140 Litt Drive, Hillside, IL 60162 (708) 544-3260

Laboratory Results

Client ID: Luedtke Engineering Company
Project Name: Waukegan Harbor 2010 - Week 1, Event 1 of 2
Report Date: September 07, 2010
Lab Order: **1007697**

Client Sample ID: **1000' Upstream Surface**
Lab ID: 1007697-005 **Date Received:** 07/16/2010 5:40 PM
Matrix: SURFACE WATER
Collection Date: 07/16/2010 1:31 PM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
CHLORIDE		Method: APHA-M4500-Cl⁻ E-Rev 18th, 1992				Analyst: lb	
Chloride	2.42	0.500	J	mg/L	1	07/22/2010 8:14 AM	R3906
FIELD PARAMETERS		Method: E150.1-FIELD				Analyst:	
pH, Field	8.33			pH		07/16/2010 1:31 PM	
Temperature	25.4			C		07/16/2010 1:31 PM	
HARDNESS, TOTAL		Method: SM-2340B-Rev 18Ed, 1992				Analyst: mn	
Hardness, Ca/Mg (As CaCO3)	134	0.050	c	mg/L	1	07/20/2010 12:00 AM	1293
AMMONIA, BY SELECTIVE ELECTRODE		Method: SM-M4500NH3 F-Rev 18Ed, 1992				Analyst: lb	
Nitrogen, Ammonia (As N)	ND	0.0100		mg/L	1	07/20/2010 10:39 AM	R3840
PHOSPHORUS, TOTAL		Method: SM-M4500P BE-Rev 18Ed, 1992				Analyst: sb	
Phosphorus (As P)	ND	0.00500		mg/L	1	07/23/2010 4:00 PM	1360
TOTAL SUSPENDED SOLIDS		Method: SM-M2540D-Rev 18Ed, 1992				Analyst: jos	
Residue, Non-Filterable	0.500	0.500	J	mg/L	1	07/22/2010 12:00 AM	R3928

Client Sample ID: **1000' Upstream Mid-Depth**
Lab ID: 1007697-006 **Date Received:** 07/16/2010 5:40 PM
Matrix: SURFACE WATER
Collection Date: 07/16/2010 1:36 PM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
CHLORIDE		Method: APHA-M4500-Cl⁻ E-Rev 18th, 1992				Analyst: lb	
Chloride	3.21	0.500	J	mg/L	1	07/22/2010 8:14 AM	R3906
FIELD PARAMETERS		Method: E150.1-FIELD				Analyst:	
pH, Field	8.32			pH		07/16/2010 1:36 PM	
Temperature	24.9			C		07/16/2010 1:36 PM	
HARDNESS, TOTAL		Method: SM-2340B-Rev 18Ed, 1992				Analyst: mn	
Hardness, Ca/Mg (As CaCO3)	137	0.050	c	mg/L	1	07/20/2010 12:00 AM	1293
AMMONIA, BY SELECTIVE ELECTRODE		Method: SM-M4500NH3 F-Rev 18Ed, 1992				Analyst: lb	
Nitrogen, Ammonia (As N)	0.0143	0.0100	J	mg/L	1	07/20/2010 10:39 AM	R3840
PHOSPHORUS, TOTAL		Method: SM-M4500P BE-Rev 18Ed, 1992				Analyst: sb	
Phosphorus (As P)	ND	0.00500		mg/L	1	07/23/2010 4:00 PM	1360
TOTAL SUSPENDED SOLIDS		Method: SM-M2540D-Rev 18Ed, 1992				Analyst: jos	
Residue, Non-Filterable	0.500	0.500	J	mg/L	1	07/22/2010 12:00 AM	R3928

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
c	Analyte not in SLI scope of accreditation	E	Estimated, detected above quantitation range
G	Refer to case narrative page for specific comments	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limit (QL)	N	Tentatively identified compounds
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits

Suburban Laboratories, Inc.

4140 Litt Drive, Hillside, IL 60162 (708) 544-3260

Laboratory Results

Client ID: Luedtke Engineering Company
Project Name: Waukegan Harbor 2010 - Week 1, Event 1 of 2

Report Date: September 07, 2010
Lab Order: **1007697**

Client Sample ID: **Blind Duplicate**
Lab ID: 1007697-007 **Date Received:** 07/16/2010 5:40 PM

Matrix: SURFACE WATER
Collection Date: 07/16/2010 1:41 PM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
CHLORIDE		Method: APHA-M4500-Cl⁻ E-Rev 18th, 1992				Analyst: lb	
Chloride	2.26	0.500	J	mg/L	1	07/22/2010 8:14 AM	R3906
FIELD PARAMETERS		Method: E150.1-FIELD				Analyst:	
pH, Field	8.29			pH		07/16/2010 1:41 PM	
Temperature	24.7			C		07/16/2010 1:41 PM	
HARDNESS, TOTAL		Method: SM-2340B-Rev 18Ed, 1992				Analyst: mn	
Hardness, Ca/Mg (As CaCO3)	137	0.050	c	mg/L	1	07/20/2010 12:00 AM	1293
AMMONIA, BY SELECTIVE ELECTRODE		Method: SM-M4500NH3 F-Rev 18Ed, 1992				Analyst: lb	
Nitrogen, Ammonia (As N)	ND	0.0100		mg/L	1	07/20/2010 10:39 AM	R3840
PHOSPHORUS, TOTAL		Method: SM-M4500P BE-Rev 18Ed, 1992				Analyst: sb	
Phosphorus (As P)	ND	0.00500		mg/L	1	07/23/2010 4:00 PM	1360
TOTAL SUSPENDED SOLIDS		Method: SM-M2540D-Rev 18Ed, 1992				Analyst: jos	
Residue, Non-Filterable	1.00	0.500	J	mg/L	1	07/22/2010 12:00 AM	R3928

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
c	Analyte not in SLI scope of accreditation	E	Estimated, detected above quantitation range
G	Refer to case narrative page for specific comments	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limit (QL)	N	Tentatively identified compounds
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits

Suburban Laboratories, Inc.

4140 Litt Drive, Hillside, IL 60162 (708) 544-3260

PREP DATES REPOR

Client: Luedtke Engineering Company
Project: Waukegan Harbor 2010 - Week 1,

Report Date: September 07, 2010
Lab Order: **1007697**

Sample ID	Collection Date	Batch ID	Prep Method	Prep Test Name	TCLP Date	Prep Date
1007697-001B	07/16/10 1:13:00 PM	1360	P_WW_LOWPR	PHOSPHORUS, TOTAL		07/23/10
1007697-001C		1264	200.2_ICPWW_	AQUEOUS PREP T/R METALS: ICP		07/16/10
		1293	200.2_ICPWW_	AQUEOUS PREP T/R METALS: ICP		07/19/10
1007697-002B	07/16/10 1:18:00 PM	1360	P_WW_LOWPR	PHOSPHORUS, TOTAL		07/23/10
1007697-002C		1293	200.2_ICPWW_	AQUEOUS PREP T/R METALS: ICP		07/19/10
1007697-003B	07/16/10 3:50:00 PM	1360	P_WW_LOWPR	PHOSPHORUS, TOTAL		07/23/10
1007697-003C		1293	200.2_ICPWW_	AQUEOUS PREP T/R METALS: ICP		07/19/10
1007697-004B	07/16/10 3:57:00 PM	1360	P_WW_LOWPR	PHOSPHORUS, TOTAL		07/23/10
1007697-004C		1293	200.2_ICPWW_	AQUEOUS PREP T/R METALS: ICP		07/19/10
1007697-005B	07/16/10 1:31:00 PM	1360	P_WW_LOWPR	PHOSPHORUS, TOTAL		07/23/10
1007697-005C		1293	200.2_ICPWW_	AQUEOUS PREP T/R METALS: ICP		07/19/10
1007697-006B	07/16/10 1:36:00 PM	1360	P_WW_LOWPR	PHOSPHORUS, TOTAL		07/23/10
1007697-006C		1293	200.2_ICPWW_	AQUEOUS PREP T/R METALS: ICP		07/19/10
1007697-007B	07/16/10 1:41:00 PM	1360	P_WW_LOWPR	PHOSPHORUS, TOTAL		07/23/10
1007697-007C		1293	200.2_ICPWW_	AQUEOUS PREP T/R METALS: ICP		07/19/10

3
Hillside, IL 60162
TEL: 708-544-3260
FAX: 708-544-8587
Website: www.SuburbanLabs.com

QC SUMMARY REPORT

WO#: **1007697**
07-Sep-10

Client: Luedtke Engineering Company
Project: Waukegan Harbor 2010 - Week 1, Event 1 of 2 **TestCode:** **CL_WW1**

Sample ID: **MB-R3906** SampType: **MBLK** TestCode: **CL_WW1** Units: **mg/L** Prep Date: RunNo: **3906**
Client ID: **PBW** Batch ID: **R3906** TestNo: **A4500-Cl- E** Analysis Date: **07/22/10** SeqNo: **76784**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	ND	5.00									

Sample ID: **LCS-R3906** SampType: **LCS** TestCode: **CL_WW1** Units: **mg/L** Prep Date: RunNo: **3906**
Client ID: **LCSW** Batch ID: **R3906** TestNo: **A4500-Cl- E** Analysis Date: **07/22/10** SeqNo: **76785**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	106	5.00	100.0	0	106	85	115				

Sample ID: **1007662-003AMS** SampType: **MS** TestCode: **CL_WW1** Units: **mg/L** Prep Date: RunNo: **3906**
Client ID: **ZZZZZZ** Batch ID: **R3906** TestNo: **A4500-Cl- E** Analysis Date: **07/22/10** SeqNo: **76841**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	110	5.00	100.0	12.84	97.5	80	120				

Sample ID: **1007662-003AMSD** SampType: **MSD** TestCode: **CL_WW1** Units: **mg/L** Prep Date: RunNo: **3906**
Client ID: **ZZZZZZ** Batch ID: **R3906** TestNo: **A4500-Cl- E** Analysis Date: **07/22/10** SeqNo: **76842**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	110	5.00	100.0	12.84	96.7	80	120	110.3	0.764	20	

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level	E	Estimated, detected above quantitation range	H	Holding times for preparation or analysis exceede
M	Manual Integration used to determine area response	ND	Not Detected at the Reporting Limit	P	Second column confirmation exceeds
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

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QC SUMMARY REPORT

WO#: **1007697**

07-Sep-10

Client: Luedtke Engineering Company
Project: Waukegan Harbor 2010 - Week 1, Event 1 of 2 **TestCode:** **NH3_WW_LOW**

Sample ID: **MB-R3840** SampType: **MBLK** TestCode: **NH3_WW_LO** Units: **mg/L** Prep Date: RunNo: **3840**
Client ID: **PBW** Batch ID: **R3840** TestNo: **A4500-NH3 D** Analysis Date: **07/20/10** SeqNo: **75006**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrogen, Ammonia (As N)	ND	0.0200									

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level	E	Estimated, detected above quantitation range	H	Holding times for preparation or analysis exceede
M	Manual Integration used to determine area response	ND	Not Detected at the Reporting Limit	P	Second column confirmation exceeds
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

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QC SUMMARY REPORT

WO#: **1007697**
07-Sep-10

Client: Luedtke Engineering Company
Project: Waukegan Harbor 2010 - Week 1, Event 1 of 2 **TestCode:** **P_WW_LOW**

Sample ID: **LCS-1360** SampType: **LCS** TestCode: **P_WW_LOW** Units: **mg/L** Prep Date: **07/23/10** RunNo: **3992**
Client ID: **LCSW** Batch ID: **1360** TestNo: **A4500-P BE** **A4500-P BE** Analysis Date: **07/23/10** SeqNo: **78786**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Phosphorus (As P)	0.0529	0.0120	0.05000	0	106	85	115				

Sample ID: **MB-1360** SampType: **MBLK** TestCode: **P_WW_LOW** Units: **mg/L** Prep Date: **07/23/10** RunNo: **3992**
Client ID: **PBW** Batch ID: **1360** TestNo: **A4500-P BE** **A4500-P BE** Analysis Date: **07/23/10** SeqNo: **78787**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Phosphorus (As P)	ND	0.0120									

Sample ID: **1007697-007BMS** SampType: **MS** TestCode: **P_WW_LOW** Units: **mg/L** Prep Date: **07/23/10** RunNo: **3992**
Client ID: **Blind Duplicate** Batch ID: **1360** TestNo: **A4500-P BE** **A4500-P BE** Analysis Date: **07/23/10** SeqNo: **78795**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Phosphorus (As P)	0.0529	0.0120	0.05000	0	106	80	120				

Sample ID: **1007697-007BMSD** SampType: **MSD** TestCode: **P_WW_LOW** Units: **mg/L** Prep Date: **07/23/10** RunNo: **3992**
Client ID: **Blind Duplicate** Batch ID: **1360** TestNo: **A4500-P BE** **A4500-P BE** Analysis Date: **07/23/10** SeqNo: **78796**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Phosphorus (As P)	0.0529	0.0120	0.05000	0	106	80	120	0.05292	0	13.7	

Sample ID: **MB-1360** SampType: **MBLK** TestCode: **P_WW_low** Units: **mg/L** Prep Date: **07/23/10** RunNo: **4036**
Client ID: **PBW** Batch ID: **1360** TestNo: **A4500-P BE** **A4500-P BE** Analysis Date: **07/26/10** SeqNo: **79798**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Phosphorus (As P)	ND	0.0120									

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level	E	Estimated, detected above quantitation range	H	Holding times for preparation or analysis exceede
M	Manual Integration used to determine area response	ND	Not Detected at the Reporting Limit	P	Second column confirmation exceeds
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

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QC SUMMARY REPORT

WO#: **1007697**

07-Sep-10

Client: Luedtke Engineering Company

Project: Waukegan Harbor 2010 - Week 1, Event 1 of 2

TestCode: **P_WW_LOW**

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level	E	Estimated, detected above quantitation range	H	Holding times for preparation or analysis exceede
M	Manual Integration used to determine area response	ND	Not Detected at the Reporting Limit	P	Second column confirmation exceeds
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

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QC SUMMARY REPORT

WO#: **1007697**
07-Sep-10

Client: Luedtke Engineering Company
Project: Waukegan Harbor 2010 - Week 1, Event 1 of 2 **TestCode:** **TSS**

Sample ID: **MB-R3928** SampType: **MBLK** TestCode: **TSS** Units: **mg/L** Prep Date: RunNo: **3928**
Client ID: **PBW** Batch ID: **R3928** TestNo: **A2540D** Analysis Date: **07/22/10** SeqNo: **77889**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Residue, Non-Filterable	ND	1.00									

Sample ID: **1007667-001ADUP** SampType: **DUP** TestCode: **TSS** Units: **mg/L** Prep Date: RunNo: **3928**
Client ID: **ZZZZZZ** Batch ID: **R3928** TestNo: **A2540D** Analysis Date: **07/22/10** SeqNo: **77901**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Residue, Non-Filterable	5.00	5.00						5.000	0	10	

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level	E	Estimated, detected above quantitation range	H	Holding times for preparation or analysis exceede
M	Manual Integration used to determine area response	ND	Not Detected at the Reporting Limit	P	Second column confirmation exceeds
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

SUBURBAN LABORATORIES, Inc.

4140 Litt Drive Hillside, IL 60162 Tel. 708.544.3260 Fax: 708.544.8587 Toll Free: 800.783.LABS www.suburbanlabs.com

CHAIN OF CUSTODY RECORD

Electronic Version

Company Name: Luedtke Engineering Company

Company Address:

City: Frankfort State: MI Zip: 49635

Phone: Fax: ☐ Fax Report

Email Address: ☑ Email Report

Project ID / Location: Waukegan Harbor Dredging 2010

Project Manager (Report to): Jon Keillor

Sample Collector(s): Patrick Rodriguez

TURNAROUND TIME REQUESTED: ☑ Normal ☐ RUSH* *Additional Rush Charges Approved.

*Date & Time Needed:

Normal TAT is 5-7 work days for most work. Rush work must be pre-approved and additional charges apply.

Specify Regulatory Program: (Required) ☐ None/Info only

☐ LUST ☐ SRP ☐ SDWA

☐ 503 Sludge ☐ NPDES ☐ MWRDGC

☐ Disposal ☑ Other *Please specify in comment section below.

ANALYSIS & METHOD REQUESTED: Enter an "X" in box below for request

Page 1 of 2

PO No.

Shipping Method: SLI

QC Reporting Level ☐ 1 ☑ 2 ☐ 3

LAB USE ONLY

SLI Order No. 1007697

Sample containers supplied by customer? ☐ Yes

Temperature of Received Samples 16 °C

Samples received within 24 hours of collection? ☐ Yes

	SAMPLE IDENTIFICATION (Please use 1 line per container type)	COLLECTION DATE	COLLECTION TIME	MATRIX	GRAB/ COMP.	CONTAINERS Qty	CONTAINERS SIZE & TYPE	PRESERVATIVE	TSS	Chloride	Ammonia	Phosphorus	Hardness	R	Condition	Split	LAB #
1	1hr-500' downstream, surface	7/16/10	13:13	SW	G	1	1LP	none	X	X							1A
2						1	1LP	H2SO4			X	X					1B
3						1	500p	HNO3					X				1C
4	1hr-500' downstream, mid-depth	7/16/10	13:18	SW	G	1	1LP	none	X	X							2A
5						1	1LP	H2SO4			X	X					2B
6						1	500p	HNO3					X				2C
7	4hr-500' downstream, surface	7/16/10	15:50	SW	G	1	1LP	none	X	X							3A
8						1	1LP	H2SO4			X	X					3B
9																	3C
10	4hr-500' downstream, mid-depth	7/16/10	15:57	SW	G	1	1LP	none	X	X							4A
11						1	1LP	H2SO4			X	X					4B
12						1	500p	HNO3					X				4C

MATRIX: Drinking Water (DW), Soil (S), Waste Water (WW), Surface Water(SW), Ground Water (GW), Solid Waste (WA), Sludge (U), Wipe (P) **CONTAINER:** 2oz, 4oz, 8oz, 40ml Vial, 500ml, Liter (L), Tube, Glass (G), Plastic (P) **PRESERVATIVE:** H_2SO_4, HCl, HNO_3, Methanol (MeOH) NaOH, Sodium Bisulfate (NaB), NaThio

COMMENTS & SPECIAL INSTRUCTIONS:

* Chicago District USACE - Waukegan Harbor Approach Channel Dredging project 2010

CONDITION CODES

1. Improper/damaged container/cap
2. Improper preservation
3. Insufficient sample volume
4. Headspace/air bubbles for VOCs
5. Received past holding time
6. Received frozen
7. Label conflicts with COC

1. Relinquished By	Date	2. Relinquished By	Date	3. Relinquished By	Date	4. Relinquished By	Date
	7/16/10	PGR	7/16/10				
Received By ☐ Ice	Time 14:00	Received By PGR ☐ Ice	Time 17:40	Received By ☐ Ice	Time	Received By ☐ Ice	Time

Submission of samples subject to Terms and Conditions on back. Rev. 2/01/05 Please fill out this form completely, print, sign & submit with samples. Keep a copy for your records.

SUBURBAN LABORATORIES, Inc.

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CHAIN OF CUSTODY RECORD

Electronic Version

Company Name: Luedtke Engineering Company

Company Address:

City: Frankfort State: MI Zip: 49635

Phone: Fax: ☐ Fax Report

Email Address: ☑ Email Report

Project ID / Location: Waukegan Harbor Dredging 2010

Project Manager (Report to): Jon Keillor

Sample Collector(s): Patrick Rodriguez

TURNAROUND TIME REQUESTED: ☑ Normal ☐ RUSH* (*Additional Rush Charges Approved)

*Date & Time Needed:

Normal TAT is 5-7 work days for most work. Rush work must be pre-approved and additional charges apply.

Specify Regulatory Program: (Required) ☐ None/Info only

☐ LUST ☐ SRP ☐ SDWA

☐ 503 Sludge ☐ NPDES ☐ MWRDGC

☐ Disposal ☑ Other *Please specify in comment section below.

ANALYSIS & METHOD REQUESTED: Enter an "X" in box below for request

Page 2 of 2

PO No.:

Shipping Method: SLI

QC Reporting Level: ☐ 1 ☑ 2 ☐ 3

LAB USE ONLY

SLI Order No.: 100-7697

Sample containers supplied by customer? ☐ Yes

Temperature of Received Samples: 6 °C

Samples received within 24 hours of collection? ☐ Yes

	SAMPLE IDENTIFICATION (Please use 1 line per container type)	COLLECTION DATE	COLLECTION TIME	MATRIX	GRAB/ COMP.	CONTAINERS Qty	CONTAINERS SIZE & TYPE	PRESERVATIVE	TSS	Chloride	Ammonia	Phosphorus	Hardness						R	Condition	Split	LAB #
1	1000' upstream, surface	7/16/10	13:31	SW	G	1	1LP	none	X	X												5A
2						1	1LP	H2SO4			X	X										5B
3						1	500p	HNO3					X									5C
4	1000' upstream, mid-depth	7/16/10	13:36	SW	G	1	1LP	none	X	X												6A
5						1	1LP	H2SO4			X	X										6B
6						1	500p	HNO3					X									6C
[redacted]																						
10	Blind duplicate	7/16/10	13:41	SW	G	1	1LP	none	X	X												7A
11						1	1LP	H2SO4			X	X										7B
12						1	500p	HNO3					X									7C

MATRIX: Drinking Water (DW), Soil (S), Waste Water (WW), Surface Water (SW), Ground Water (GW), Solid Waste (WA), Sludge (U), Wipe (P) CONTAINER: 2oz, 4oz, 8oz, 40ml Vial, 500ml, Liter (L), Tube, Glass (G), Plastic (P) PRESERVATIVE: H_2SO_4, HC, HNO_3, Methanol (MeOH), NaOH, Sodium Bisulfate (NaBi), NaThio

COMMENTS & SPECIAL INSTRUCTIONS:

* Chicago District USACE - Waukegan Harbor Approach Channel Dredging project 2010

CONDITION CODES
1. Improper/damaged container/cap
2. Improper preservation
3. Insufficient sample volume
4. Headspace/air bubbles for VOCs
5. Received past holding time
6. Received frozen
7. Label conflicts with COC

1. Relinquished By	Date	2. Relinquished By	Date	3. Relinquished By	Date	4. Relinquished By	Date
	7/16/10	PGR	7/16/10				
Received By: [signature] ☐ Ice	Time 14:00	Received By: PGR ☑ Ice	Time 14:40	Received By ☐ Ice	Time	Received By ☐ Ice	Time

Submission of samples subject to Terms and Conditions on back. Rev. 2/01/05 Please fill out this form completely, print, sign & submit with samples. Keep a copy for your records.

FIELD LOG

Suburban Laboratories, Inc.
4140 Litt Drive
Hillside, IL 60162-1183
P: (708) 544-3260 F: (708) 544-8587
www.SuburbanLabs.com

Luedtke Engineering Company

FY10 Dredging of Waukegan Harbor Approach Channel
Weekly water sampling

Suburban Labs Field Sampling Technician(s) - PRINT: Patrick Rodriguez		Placement area (circle): 1 2	Eutech Inst. Oakton Field pH Meter, pHTestr 30 Serial No.: 1576094
Luedtke Engineering Rep. - PRINT: Tim Kibby		GPS coordinates of discharge point:[1] E087° 49' 16.3835" N42° 20' 54.2730"	Scow name and quantity of discharge:[1] SCOW 17 - 900 yd
Weather and water conditions: Clear, hot, windy		Date of Discharge: 7/16/10	Time of Discharge:[1] 12:00

	1hr-500' downstream Surface	1hr-500' downstream Mid-depth	4hr-500' downstream Surface	4hr-500' downstream Mid-depth
Sampling Technique:	grab	Kemmerer - grab	grab	Kemmerer - grab
GPS coordinate (Lat./Long.) of sample collection:[1]	E087° 49' 12.9984" N42° 20'		30.0399"	
GPS coordinate (state plane) of sample collection:[1]				
Water column depth to the nearest foot:[1]	18		18	
Sampling depth to the nearest foot: (enter zero for surface water samples)	0	9	0	9
Date & Time of collection:	7/16/10 13:13	7/16/10 13:18	7/16/10 15:50	7/16/10 15:57
Sample appearance: (clear, tinted, dark, etc..)	clear	clear	clear	clear
pH & Time of reading:	8:38	8.35	8.32	8.30
Temperature (degrees C):	26.9	24.5	26.9	25.9
Comments:				

Additional Comments:

See also chain of custody form for bottles and preservatives

Version 0 06/16/2010

FIELD LOG

Suburban Laboratories, Inc.
4140 Litt Drive
Hillside, IL 60162-1183
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www.SuburbanLabs.com

Luedtke Engineering Company

FY10 Dredging of Waukegan Harbor Approach Channel
Weekly water sampling

Date of Discharge: 7/16/10

	1000' upstream Surface	1000' upstream Mid-depth	Blind Duplicate	Additional Comments:
Sampling Technique:	grab	Kemmerer - grab		
GPS coordinate (Lat./Long.) of sample collection:[1]	N 42° 20' 44.04	E 087° 49' 15.0		
GPS coordinate (state plane) of sample collection:[1]				
Water column depth to the nearest foot:[1]	13		13	
Sampling depth to the nearest foot: (enter zero for surface water samples)	0	7	7	
Date & Time of collection:	7/16/10 13:31	7/16/10 13:36	7/16/10 13:41	
Sample appearance: (clear, tinted, dark, etc..)	Clear	Clear	Clear	
pH & Time of reading:	8.33	8.32	8.29	
Temperature (degrees C):	25.4	24.9	24.7	
Blind Duplicate sample ID:				
Comments:				

See also chain of custody form for bottles and preservatives

Version 0 06/16/2010

SIGNATURES:

SLI Field Tech 1: [signature]

SLI Field Tech 2: _____

Week 1, Event 1
7/16/10

REVISED 9/1/10

SUBURBAN LABORATORIES, Inc.

4140 Litt Drive Hillside, Illinois 60162
Tel. (708) 544-3260 Toll Free (800) 783-LABS
Fax (708-544-8587
www.suburbanlabs.com

September 07, 2010

Workorder: 1007811

Jon Keillor
Luedtke Engineering Company
10 Fourth Street
P.O. Box 111
Frankfort, Michigan 49635

TEL: (231) 352-9631
FAX: (231) 352-7178
RE: Waukegan Harbor 2010 - Week 1,
Event 2 of 2

Dear Jon Keillor:

Suburban Laboratories, Inc. received 7 sample(s) on 07/19/10 for the analyses presented in the following report.

All data for the associated quality control (QC) met EPA, method, or internal laboratory specifications except where noted in the case narrative. If you are comparing these results to external QC specifications or compliance limits and have any questions, please contact us.

This final report of laboratory analysis consists of this cover letter, case narrative, analytical report, dates report, and any accompanying documentation on, but not limited to, chain of custody records, raw data, and letters of explanation or reliance. This report may not be reproduced, except in full, without the prior written approval of Suburban Laboratories, Inc.

If you have any questions regarding these test results, please call me at (708) 544-3260.

Sincerely,

Melissa Amador

Melissa Amador
Project Manager

Suburban Laboratories, Inc.

4140 Litt Drive, Hillside, IL 60162 (708) 544-3260

Case Narrative

Client: Luedtke Engineering Company
Project: Waukegan Harbor 2010 - Week 1, Event 2 of 2
WorkOrder: 1007811
Temperature of samples upon receipt at SLI: 8 C

Date: September 07, 2010
PO #: 981-1
QC Level:
Chain of Custody #: Electronic

General Comments:
- All results reported in wet weight unless otherwise indicated. (dry = Dry Weight)
- Sample results relate only to the analytes of interest tested and to sample as received by the laboratory.
- Environmental compliance sample results meet the requirements of 35 IAC Part 186 unless otherwise indicated.
- Waste water analysis follows the rules set forth in 40 CFR part 136 except where otherwise noted.
- Accreditation by the State of Illinois is not an endorsement or a guarantee of the validity of data generated.
- For more information about the laboratories' scope of accreditation, please contact us at (708) 544-3260 or the Agency at (217) 782-6455.

Abbreviations:
- Reporting Limit: The concentration at which an analyte can be routinely detected on a day to day basis, and which also meets regulatory and client needs.
- Quantitation Limit: The lowest concentration at which results can be accurately quantitated.
- J: The analyte was positively identified above our Method Detection Limit and is considered detectable and usable; however, the associated numerical value is the approximate concentration of the analyte in the sample.
- ATC: Automatic Temperature Correction. - TNTC: Too Numerous To Count
- In Laboratory: EPA recommends this analyte be analyzed "immediately" (e.g., tests that should be performed in the field within 15 minutes of collection). Analytes with "immediate" hold times are analyzed as soon as possible upon receipt by the laboratory.
- TIC: Tentatively Identified Compound (GCMS library search identification, concentration estimated to nearest internal standard).

Method References:
For a complete list of method references please contact us.
- E: USEPA Reference methods
- SW: USEPA, Test Methods for Evaluating Solid Waste (SW-846)
- M: Standard Methods for the Examination of Water and Wastewater
- USP: Latest version of United States Pharmacopeia

Workorder Specific Comments:

Suburban Laboratories, Inc.
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Laboratory Results

Client ID: Luedtke Engineering Company
Project Name: Waukegan Harbor 2010 - Week 1, Event 2 of 2
Report Date: September 07, 2010
Lab Order: **1007811**

Client Sample ID: 1hr-500' Downstream Surface
Lab ID: 1007811-001 **Date Received:** 07/19/2010 2:20 PM
Matrix: SURFACE WATER
Collection Date: 07/19/2010 10:20 AM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
CHLORIDE		Method: APHA-M4500-Cl⁻ E-Rev 18th, 1992				Analyst: lb	
Chloride	2.96	0.500	J	mg/L	1	07/22/2010 8:14 AM	R3906
FIELD PARAMETERS		Method: E150.1-FIELD				Analyst:	
pH, Field	8.61			pH		07/19/2010 10:20 AM	
Temperature	24.1			C		07/19/2010 10:20 AM	
HARDNESS, TOTAL		Method: SM-2340B-Rev 18Ed, 1992				Analyst: mn	
Hardness, Ca/Mg (As CaCO3)	126	0.050	c	mg/L	1	07/24/2010 12:00 AM	1357
AMMONIA, BY SELECTIVE ELECTRODE		Method: SM-M4500NH3 F-Rev 18Ed, 1992				Analyst: lb	
Nitrogen, Ammonia (As N)	0.0168	0.0100	J	mg/L	1	07/20/2010 10:39 AM	R3840
PHOSPHORUS, TOTAL		Method: SM-M4500P BE-Rev 18Ed, 1992				Analyst: sb	
Phosphorus (As P)	0.0128	0.00500		mg/L	1	07/26/2010 3:14 PM	1379
TOTAL SUSPENDED SOLIDS		Method: SM-M2540D-Rev 18Ed, 1992				Analyst: jos	
Residue, Non-Filterable	3.50	0.500		mg/L	1	07/23/2010 12:00 AM	R3984

Client Sample ID: 1hr-500' Downstream Mid-Depth
Lab ID: 1007811-002 **Date Received:** 07/19/2010 2:20 PM
Matrix: SURFACE WATER
Collection Date: 07/19/2010 10:45 AM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
CHLORIDE		Method: APHA-M4500-Cl⁻ E-Rev 18th, 1992				Analyst: lb	
Chloride	1.45	0.500	J	mg/L	1	07/22/2010 8:14 AM	R3906
FIELD PARAMETERS		Method: E150.1-FIELD				Analyst:	
pH, Field	8.44			pH		07/19/2010 10:45 AM	
Temperature	23.0			C		07/19/2010 10:45 AM	
HARDNESS, TOTAL		Method: SM-2340B-Rev 18Ed, 1992				Analyst: mn	
Hardness, Ca/Mg (As CaCO3)	130	0.050	c	mg/L	1	07/24/2010 12:00 AM	1357
AMMONIA, BY SELECTIVE ELECTRODE		Method: SM-M4500NH3 F-Rev 18Ed, 1992				Analyst: lb	
Nitrogen, Ammonia (As N)	0.0158	0.0100	J	mg/L	1	07/20/2010 10:39 AM	R3840
PHOSPHORUS, TOTAL		Method: SM-M4500P BE-Rev 18Ed, 1992				Analyst: sb	
Phosphorus (As P)	0.0147	0.00500		mg/L	1	07/26/2010 3:14 PM	1379
TOTAL SUSPENDED SOLIDS		Method: SM-M2540D-Rev 18Ed, 1992				Analyst: jos	
Residue, Non-Filterable	5.50	0.500		mg/L	1	07/23/2010 12:00 AM	R3984

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
c	Analyte not in SLI scope of accreditation	E	Estimated, detected above quantitation range
G	Refer to case narrative page for specific comments	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limit (QL)	N	Tentatively identified compounds
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits

Suburban Laboratories, Inc.
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Laboratory Results

Client ID: Luedtke Engineering Company
Project Name: Waukegan Harbor 2010 - Week 1, Event 2 of 2
Report Date: September 07, 2010
Lab Order: **1007811**

Client Sample ID: 4hr-500' Downstream Surface
Lab ID: 1007811-003 **Date Received:** 07/19/2010 2:20 PM
Matrix: SURFACE WATER
Collection Date: 07/19/2010 1:00 PM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
CHLORIDE		Method: APHA-M4500-Cl⁻ E-Rev 18th, 1992				Analyst: lb	
Chloride	2.69	0.500	J	mg/L	1	07/22/2010 8:14 AM	R3906
FIELD PARAMETERS		Method: E150.1-FIELD				Analyst:	
pH, Field	8.31			pH		07/19/2010 1:00 PM	
Temperature	26.0			C		07/19/2010 1:00 PM	
HARDNESS, TOTAL		Method: SM-2340B-Rev 18Ed, 1992				Analyst: mn	
Hardness, Ca/Mg (As CaCO3)	127	0.050	c	mg/L	1	07/24/2010 12:00 AM	1357
AMMONIA, BY SELECTIVE ELECTRODE		Method: SM-M4500NH3 F-Rev 18Ed, 1992				Analyst: lb	
Nitrogen, Ammonia (As N)	0.0104	0.0100	J	mg/L	1	07/20/2010 10:39 AM	R3840
PHOSPHORUS, TOTAL		Method: SM-M4500P BE-Rev 18Ed, 1992				Analyst: sb	
Phosphorus (As P)	0.00562	0.00500	J	mg/L	1	07/26/2010 3:14 PM	1379
TOTAL SUSPENDED SOLIDS		Method: SM-M2540D-Rev 18Ed, 1992				Analyst: jos	
Residue, Non-Filterable	1.00	0.500	J	mg/L	1	07/23/2010 12:00 AM	R3984

Client Sample ID: 4hr-500' Downstream Mid-Depth
Lab ID: 1007811-004 **Date Received:** 07/19/2010 2:20 PM
Matrix: SURFACE WATER
Collection Date: 07/19/2010 1:06 PM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
CHLORIDE		Method: APHA-M4500-Cl⁻ E-Rev 18th, 1992				Analyst: lb	
Chloride	0.840	0.500	J	mg/L	1	07/22/2010 8:14 AM	R3906
FIELD PARAMETERS		Method: E150.1-FIELD				Analyst:	
pH, Field	8.36			pH		07/19/2010 1:06 PM	
Temperature	25.1			C		07/19/2010 1:06 PM	
HARDNESS, TOTAL		Method: SM-2340B-Rev 18Ed, 1992				Analyst: mn	
Hardness, Ca/Mg (As CaCO3)	126	0.050	c	mg/L	1	07/24/2010 12:00 AM	1357
AMMONIA, BY SELECTIVE ELECTRODE		Method: SM-M4500NH3 F-Rev 18Ed, 1992				Analyst: lb	
Nitrogen, Ammonia (As N)	0.0139	0.0100	J	mg/L	1	07/20/2010 10:39 AM	R3840
PHOSPHORUS, TOTAL		Method: SM-M4500P BE-Rev 18Ed, 1992				Analyst: sb	
Phosphorus (As P)	ND	0.00500		mg/L	1	07/26/2010 3:14 PM	1379
TOTAL SUSPENDED SOLIDS		Method: SM-M2540D-Rev 18Ed, 1992				Analyst: jos	
Residue, Non-Filterable	1.00	0.500	J	mg/L	1	07/23/2010 12:00 AM	R3984

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
c	Analyte not in SLI scope of accreditation	E	Estimated, detected above quantitation range
G	Refer to case narrative page for specific comments	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limit (QL)	N	Tentatively identified compounds
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits

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Laboratory Results

Client ID: Luedtke Engineering Company
Project Name: Waukegan Harbor 2010 - Week 1, Event 2 of 2
Report Date: September 07, 2010
Lab Order: **1007811**

Client Sample ID: **1000' Upstream Surface**
Lab ID: 1007811-005 **Date Received:** 07/19/2010 2:20 PM
Matrix: SURFACE WATER
Collection Date: 07/19/2010 10:40 AM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
CHLORIDE		Method: APHA-M4500-Cl⁻ E-Rev 18th, 1992				Analyst: lb	
Chloride	1.30	0.500	J	mg/L	1	07/22/2010 8:14 AM	R3906
FIELD PARAMETERS		Method: E150.1-FIELD				Analyst:	
pH, Field	8.37			pH		07/19/2010 10:40 AM	
Temperature	23.5			C		07/19/2010 10:40 AM	
HARDNESS, TOTAL		Method: SM-2340B-Rev 18Ed, 1992				Analyst: mn	
Hardness, Ca/Mg (As CaCO3)	129	0.050	c	mg/L	1	07/24/2010 12:00 AM	1357
AMMONIA, BY SELECTIVE ELECTRODE		Method: SM-M4500NH3 F-Rev 18Ed, 1992				Analyst: lb	
Nitrogen, Ammonia (As N)	0.0151	0.0100	J	mg/L	1	07/20/2010 10:39 AM	R3840
PHOSPHORUS, TOTAL		Method: SM-M4500P BE-Rev 18Ed, 1992				Analyst: sb	
Phosphorus (As P)	ND	0.00500		mg/L	1	07/26/2010 3:14 PM	1379
TOTAL SUSPENDED SOLIDS		Method: SM-M2540D-Rev 18Ed, 1992				Analyst: jos	
Residue, Non-Filterable	1.00	0.500	J	mg/L	1	07/23/2010 12:00 AM	R3984

Client Sample ID: **1000' Upstream Mid-Depth**
Lab ID: 1007811-006 **Date Received:** 07/19/2010 2:20 PM
Matrix: SURFACE WATER
Collection Date: 07/19/2010 10:45 AM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
CHLORIDE		Method: APHA-M4500-Cl⁻ E-Rev 18th, 1992				Analyst: lb	
Chloride	0.720	0.500	J	mg/L	1	07/22/2010 8:14 AM	R3906
FIELD PARAMETERS		Method: E150.1-FIELD				Analyst:	
pH, Field	8.39			pH		07/19/2010 10:45 AM	
Temperature	22.7			C		07/19/2010 10:45 AM	
HARDNESS, TOTAL		Method: SM-2340B-Rev 18Ed, 1992				Analyst: mn	
Hardness, Ca/Mg (As CaCO3)	129	0.050	c	mg/L	1	07/24/2010 12:00 AM	1357
AMMONIA, BY SELECTIVE ELECTRODE		Method: SM-M4500NH3 F-Rev 18Ed, 1992				Analyst: lb	
Nitrogen, Ammonia (As N)	0.0159	0.0100	J	mg/L	1	07/20/2010 10:39 AM	R3840
PHOSPHORUS, TOTAL		Method: SM-M4500P BE-Rev 18Ed, 1992				Analyst: sb	
Phosphorus (As P)	ND	0.00500		mg/L	1	07/26/2010 3:14 PM	1379
TOTAL SUSPENDED SOLIDS		Method: SM-M2540D-Rev 18Ed, 1992				Analyst: jos	
Residue, Non-Filterable	0.500	0.500	J	mg/L	1	07/23/2010 12:00 AM	R3984

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
c	Analyte not in SLI scope of accreditation	E	Estimated, detected above quantitation range
G	Refer to case narrative page for specific comments	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limit (QL)	N	Tentatively identified compounds
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits

Suburban Laboratories, Inc.

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Laboratory Results

Client ID: Luedtke Engineering Company
Project Name: Waukegan Harbor 2010 - Week 1, Event 2 of 2

Report Date: September 07, 2010
Lab Order: **1007811**

Client Sample ID: **Blind Duplicate**
Lab ID: 1007811-007 **Date Received:** 07/19/2010 2:20 PM

Matrix: SURFACE WATER
Collection Date: 07/19/2010 10:30 AM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
CHLORIDE		Method: APHA-M4500-Cl⁻ E-Rev 18th, 1992				Analyst: lb	
Chloride	1.66	0.500	J	mg/L	1	07/22/2010 8:14 AM	R3906
FIELD PARAMETERS		Method: E150.1-FIELD				Analyst:	
pH, Field	8.43			pH		07/19/2010 10:30 AM	
Temperature	23.1			C		07/19/2010 10:30 AM	
HARDNESS, TOTAL		Method: SM-2340B-Rev 18Ed, 1992				Analyst: mn	
Hardness, Ca/Mg (As CaCO3)	131	0.050	c	mg/L	1	07/24/2010 12:00 AM	1357
AMMONIA, BY SELECTIVE ELECTRODE		Method: SM-M4500NH3 F-Rev 18Ed, 1992				Analyst: lb	
Nitrogen, Ammonia (As N)	0.0106	0.0100	J	mg/L	1	07/20/2010 10:39 AM	R3840
PHOSPHORUS, TOTAL		Method: SM-M4500P BE-Rev 18Ed, 1992				Analyst: sb	
Phosphorus (As P)	0.00692	0.00500	J	mg/L	1	07/26/2010 3:14 PM	1379
TOTAL SUSPENDED SOLIDS		Method: SM-M2540D-Rev 18Ed, 1992				Analyst: jos	
Residue, Non-Filterable	5.50	0.500		mg/L	1	07/23/2010 12:00 AM	R3984

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
c	Analyte not in SLI scope of accreditation	E	Estimated, detected above quantitation range
G	Refer to case narrative page for specific comments	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limit (QL)	N	Tentatively identified compounds
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits

Suburban Laboratories, Inc.

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PREP DATES REPOR

Client: Luedtke Engineering Company

Project: Waukegan Harbor 2010 - Week 1,

Report Date: September 07, 2010

Lab Order: **1007811**

Sample ID	Collection Date	Batch ID	Prep Method	Prep Test Name	TCLP Date	Prep Date
1007811-001B	07/19/10 10:20:00 A	1379	P_WW_LOWPR	PHOSPHORUS, TOTAL		07/26/10
1007811-001C		1357	200.2_ICPWW_	AQUEOUS PREP T/R METALS: ICP		07/23/10
1007811-002B	07/19/10 10:45:00 A	1379	P_WW_LOWPR	PHOSPHORUS, TOTAL		07/26/10
1007811-002C		1357	200.2_ICPWW_	AQUEOUS PREP T/R METALS: ICP		07/23/10
1007811-003B	07/19/10 1:00:00 PM	1379	P_WW_LOWPR	PHOSPHORUS, TOTAL		07/26/10
1007811-003C		1357	200.2_ICPWW_	AQUEOUS PREP T/R METALS: ICP		07/23/10
1007811-004B	07/19/10 1:06:00 PM	1379	P_WW_LOWPR	PHOSPHORUS, TOTAL		07/26/10
1007811-004C		1357	200.2_ICPWW_	AQUEOUS PREP T/R METALS: ICP		07/23/10
1007811-005B	07/19/10 10:40:00 A	1379	P_WW_LOWPR	PHOSPHORUS, TOTAL		07/26/10
1007811-005C		1357	200.2_ICPWW_	AQUEOUS PREP T/R METALS: ICP		07/23/10
1007811-006B	07/19/10 10:45:00 A	1379	P_WW_LOWPR	PHOSPHORUS, TOTAL		07/26/10
1007811-006C		1357	200.2_ICPWW_	AQUEOUS PREP T/R METALS: ICP		07/23/10
1007811-007B	07/19/10 10:30:00 A	1379	P_WW_LOWPR	PHOSPHORUS, TOTAL		07/26/10
1007811-007C		1357	200.2_ICPWW_	AQUEOUS PREP T/R METALS: ICP		07/23/10

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Hillside, IL 60162
TEL: 708-544-3260
FAX: 708-544-8587
Website: www.SuburbanLabs.com

QC SUMMARY REPORT

WO#: **1007811**
07-Sep-10

Client: Luedtke Engineering Company
Project: Waukegan Harbor 2010 - Week 1, Event 2 of 2 **TestCode:** **CL_WW1**

Sample ID: **MB-R3906** SampType: **MBLK** TestCode: **CL_WW1** Units: **mg/L** Prep Date: RunNo: **3906**
Client ID: **PBW** Batch ID: **R3906** TestNo: **A4500-Cl- E** Analysis Date: **07/22/10** SeqNo: **76784**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	ND	5.00									

Sample ID: **LCS-R3906** SampType: **LCS** TestCode: **CL_WW1** Units: **mg/L** Prep Date: RunNo: **3906**
Client ID: **LCSW** Batch ID: **R3906** TestNo: **A4500-Cl- E** Analysis Date: **07/22/10** SeqNo: **76785**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	106	5.00	100.0	0	106	85	115				

Sample ID: **1007662-003AMS** SampType: **MS** TestCode: **CL_WW1** Units: **mg/L** Prep Date: RunNo: **3906**
Client ID: **ZZZZZZ** Batch ID: **R3906** TestNo: **A4500-Cl- E** Analysis Date: **07/22/10** SeqNo: **76841**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	110	5.00	100.0	12.84	97.5	80	120				

Sample ID: **1007662-003AMSD** SampType: **MSD** TestCode: **CL_WW1** Units: **mg/L** Prep Date: RunNo: **3906**
Client ID: **ZZZZZZ** Batch ID: **R3906** TestNo: **A4500-Cl- E** Analysis Date: **07/22/10** SeqNo: **76842**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	110	5.00	100.0	12.84	96.7	80	120	110.3	0.764	20	

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level	E	Estimated, detected above quantitation range	H	Holding times for preparation or analysis exceede
M	Manual Integration used to determine area response	ND	Not Detected at the Reporting Limit	P	Second column confirmation exceeds
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

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Website: www.SuburbanLabs.com

QC SUMMARY REPORT

WO#: **1007811**

07-Sep-10

Client: Luedtke Engineering Company
Project: Waukegan Harbor 2010 - Week 1, Event 2 of 2 **TestCode:** **NH3_WW_LOW**

Sample ID: **MB-R3840** SampType: **MBLK** TestCode: **NH3_WW_LO** Units: **mg/L** Prep Date: RunNo: **3840**
Client ID: **PBW** Batch ID: **R3840** TestNo: **A4500-NH3 D** Analysis Date: **07/20/10** SeqNo: **75006**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrogen, Ammonia (As N)	ND	0.0200									

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level	E	Estimated, detected above quantitation range	H	Holding times for preparation or analysis exceede
M	Manual Integration used to determine area response	ND	Not Detected at the Reporting Limit	P	Second column confirmation exceeds
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

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QC SUMMARY REPORT

WO#: **1007811**

07-Sep-10

Client: Luedtke Engineering Company
Project: Waukegan Harbor 2010 - Week 1, Event 2 of 2 **TestCode:** **P_WW_LOW**

Sample ID:	**LCS-1379**	SampType:	**LCS**	TestCode:	**P_WW_low**	Units:	**mg/L**	Prep Date:	**07/26/10**	RunNo:	**4036**		
Client ID:	**LCSW**	Batch ID:	**1379**	TestNo:	**A4500-P BE**		**A4500-P BE**	Analysis Date:	**07/26/10**	SeqNo:	**79797**		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Phosphorus (As P)	0.0536	0.0120	0.05000	0	107	85	115				

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level	E	Estimated, detected above quantitation range	H	Holding times for preparation or analysis exceede
M	Manual Integration used to determine area response	ND	Not Detected at the Reporting Limit	P	Second column confirmation exceeds
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

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Website: www.SuburbanLabs.com

QC SUMMARY REPORT

WO#: **1007811**
07-Sep-10

Client: Luedtke Engineering Company
Project: Waukegan Harbor 2010 - Week 1, Event 2 of 2 **TestCode:** **TSS**

Sample ID: **MB-R3984** SampType: **MBLK** TestCode: **TSS** Units: **mg/L** Prep Date: RunNo: **3984**
Client ID: **PBW** Batch ID: **R3984** TestNo: **A2540D** Analysis Date: **07/23/10** SeqNo: **79417**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Residue, Non-Filterable	ND	1.00									

Sample ID: **1007770-012ADUP** SampType: **DUP** TestCode: **TSS** Units: **mg/L** Prep Date: RunNo: **3984**
Client ID: **ZZZZZZ** Batch ID: **R3984** TestNo: **A2540D** Analysis Date: **07/23/10** SeqNo: **79419**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Residue, Non-Filterable	2.00	2.50						2.000	0	10	J

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level	E	Estimated, detected above quantitation range	H	Holding times for preparation or analysis exceede
M	Manual Integration used to determine area response	ND	Not Detected at the Reporting Limit	P	Second column confirmation exceeds
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

SUBURBAN LABORATORIES, Inc.

4140 Litt Drive Hillside, IL 60162 Tel. 708.544.3260 Fax 708.544.8587 Toll Free: 800.783.LABS www.suburbanlabs.com

CHAIN OF CUSTODY RECORD

Electronic Version

Company Name: Luedtke Engineering Company
Company Address:
City: Frankfort State: MI Zip: 49635
Phone: Fax: ☐ Fax Report
Email Address: ☑ Email Report
Project ID / Location: Waukegan Harbor Dredging 2010
Project Manager (Report to): Jon Keillor
Sample Collectors: Patrick Rodriguez

TURNAROUND TIME REQUESTED
☑ Normal ☐ RUSH* *Additional Rush Charges Approved.
*Date & Time Needed:
Normal TAT is 5-7 work days for most work. Rush work must be pre-approved and additional charges apply.
Specify Regulatory Program: (Required) ☐ None/Info only
☐ LUST ☐ SRP ☐ SDWA
☐ 503 Sludge ☐ NPDES ☐ MWRDGC
☐ Disposal ☑ Other *Please specify in comment section below.

ANALYSIS & METHOD REQUESTED
Enter an "X" in box below for request

Page 1 of 2
PO No.
Shipping Method: SLI
CC Reporting Level ☐ 1 ☑ 2 ☐ 3
LAB USE ONLY
SL Order No. 1007788113 7/20/10
Sample containers supplied by customer? ☐ Yes
Temperature of Received Samples 8 °C
Samples received within 24 hours of collection? ☐ Yes

	SAMPLE IDENTIFICATION (Please use 1 line per container type)	COLLECTION DATE	COLLECTION TIME	MATRIX	GRAB/ COMP.	CONTAINERS Qty	CONTAINERS SIZE & TYPE	PRESERVATIVE	TSS	Chloride	Ammonia	Phosphorus	Hardness	R	Condition	Split	LAB #
1	1hr-500' downstream, surface	7/19/10	10:20	SW	G	1	1LP	none	X	X							001A
2	↓	↓	↓	↓	↓	1	1LP	H2SO4			X	X					001B
3	↓	↓	↓	↓	↓	1	500p	HNO3					X				001C
4	1hr-500' downstream, mid-depth	7/19/10	10:25	SW	G	1	1LP	none	X	X							002A
5	↓	↓	↓	↓	↓	1	1LP	H2SO4			X	X					002B
6	↓	↓	↓	↓	↓	1	500p	HNO3					X				002C
7	4hr-500' downstream, surface	7/19/10	13:00	SW	G	1	1LP	none	X	X							003A
8	↓	↓	↓	↓	↓	1	1LP	H2SO4			X	X					003B
9	↓	↓	↓	↓	↓												003C
10	4hr-500' downstream, mid-depth	7/19/10	13:06	SW	G	1	1LP	none	X	X							004A
11	↓	↓	↓	↓	↓	1	1LP	H2SO4			X	X					004B
12	↓	↓	↓	↓	↓	1	500p	HNO3					X				004C

MATRIX: Drinking Water (DW), Soil (S), Waste Water (WW), Surface Water(SW), Ground Water (GW), Solid Waste (WA), Sludge (U), Wipe (P) **CONTAINER:** 2oz, 4oz, 8oz, 40ml Vial, 500ml, Liter (L), Tube, Glass (G), Plastic (P) **PRESERVATIVE:** H_2SO_4, HCl, HNO_3, Methanol (MeOH) NaOH, Sodium Bisulfate (NaB), NaThio

COMMENTS & SPECIAL INSTRUCTIONS:

* Chicago District USACE - Waukegan Harbor Approach Channel Dredging project 2010

CONDITION CODES
1. Improper/damaged container/cap
2. Improper preservation
3. Insufficient sample volume
4. Headspace/air bubbles for VOCs
5. Received past holding time
6. Received frozen
7. Label conflicts with COC

1. Relinquished By	Date	2. Relinquished By	Date	3. Relinquished By	Date	4. Relinquished By	Date
	7/19/10	PGR	7/19/10				
Received By ☐ Ice	Time 13:20	Received By PGR ☒ Ice	Time 14:20	Received By ☐ Ice	Time	Received By ☐ Ice	Time

Submission of samples subject to Terms and Conditions on back. Rev. 2/01/05 Please fill out this form completely, print, sign & submit with samples. Keep a copy for your records.

SUBURBAN LABORATORIES, Inc.

4140 Litt Drive Hillside, IL 60162 Tel. 708.544.3260 Fax. 708.544.8587 Toll Free: 800.783.LABS www.suburbanlabs.com

CHAIN OF CUSTODY RECORD

Electronic Version

Company Name: Luedtke Engineering Company
Company Address:
City: Frankfort State: MI Zip: 49635
Phone: Fax: ☐ Fax Report
Email Address: ☑ Email Report
Project ID / Location: Waukegan Harbor Dredging 2010
Project Manager (Report to): Jon Keillor
Sample Collector(s): Patrick Rodriguez

TURNAROUND TIME REQUESTED
☑ Normal ☐ RUSH* *Additional Rush Charges Approved
*Date & Time Needed:
Normal TAT is 5-7 work days for most work. Rush work must be pre-approved and additional charges apply
Specify Regulatory Program: (Required) ☐ None/Info only
☐ LUST ☐ SRP ☐ SDWA
☐ 503 Sludge ☐ NPDES ☐ MWRDGC
☐ Disposal ☑ Other *Please specify in comment section below

ANALYSIS & METHOD REQUESTED
Enter an "X" in box below for request

Page 2 of 2
PO No.
Shipping Method: SLI
QC Reporting Level ☐ 1 ☑ 2 ☐ 3
LAB USE ONLY
SU Order No. 1007788
Sample containers supplied by customer? ☐ Yes
Temperature of Received Samples 8 °C
Samples received within 24 hours of collection? ☐ Yes

	SAMPLE IDENTIFICATION (Please use 1 line per container type)	COLLECTION DATE	COLLECTION TIME	MATRIX	GRAB/ COMP.	CONTAINERS Qty	CONTAINERS SIZE & TYPE	PRESERVATIVE	TSS	Chloride	Ammonia	Phosphorus	Hardness	R	Condition	Split	LAB #
1	1000' upstream, surface	7/19/10	10:40	SW	G	1	1LP	none	X	X							005A
2						1	1LP	H2SO4			X	X					005B
3						1	500p	HNO3					X				005C
4	1000' upstream, mid-depth	7/19/10	10:45	SW	G	1	1LP	none	X	X							006A
5						1	1LP	H2SO4			X	X					006B
6						1	500p	HNO3					X				006C
7	~~1000' upstream, mid-depth~~	7/			G		1LP										
8						1	1LP	H2SO4									
9						1	500p	HNO3					X				
10	Blind duplicate	7/19/10	10:30	SW	G	1	1LP	none	X	X							007A
11						1	1LP	H2SO4			X	X					007B
12						1	500p	HNO3					X				007C

MATRIX: Drinking Water (DW), Soil (S), Waste Water (WW), Surface Water(SW), Ground Water (GW), Solid Waste (WA), Sludge (U), Wipe (P) CONTAINER: 2oz, 4oz, 8oz, 40ml Vial, 500ml, Liter (L), Tube, Glass (G), Plastic (P) PRESERVATIVE: H_2SO_4, HCl HNO_3, Methanol (MeOH) NaOH, Sodium Bisulfate (NaB), NaThio

COMMENTS & SPECIAL INSTRUCTIONS:

* Chicago District USACE - Waukegan Harbor Approach Channel Dredging project 2010

CONDITION CODES
1. Improper/damaged container/cap
2. Improper preservation
3. Insufficient sample volume
4. Headspace/air bubbles for VOCs
5. Received past holding time
6. Received frozen
7. Label conflicts with COC

1. Relinquished By	Date	2. Relinquished By	Date	3. Relinquished By	Date	4. Relinquished By	Date
Received By ☐ Ice	Time 13:20	Received By PGR ☑ Ice	Time 14:20	Received By ☐ Ice	Time	Received By ☐ Ice	Time

Submission of samples subject to Terms and Conditions on back. Rev. 2/01/06 Please fill out this form completely, print, sign & submit with samples. Keep a copy for your records.

FIELD LOG

Suburban Laboratories, Inc.
4140 Litt Drive
Hillside, IL 60162-1183
P: (708) 544-3260 F: (708) 544-8587
www.SuburbanLabs.com

Luedtke Engineering Company

FY10 Dredging of Waukegan Harbor Approach Channel
Weekly water sampling

Suburban Labs Field Sampling Technician(s) - PRINT: Patrick Rodriguez			Placement area (circle): 1 2		Eutech Inst. Oakton Field pH Meter, pHTestr 30 Serial No.: 1576094
Luedtke Engineering Rep. - PRINT: Tim Kilby			GPS coordinates of discharge point:[1] N42° 20' 46.4338" E087° 49' 13.7018"		Scow name and quantity of discharge:[1] 17 900 yds
Weather and water conditions: Clear + Calm			Date of Discharge: 7/19/10		Time of Discharge:[1] 9:01
	1hr-500' downstream Surface	1hr-500' downstream Mid-depth	4hr-500' downstream Surface	4hr-500' downstream Mid-depth	Additional Comments:
Sampling Technique:	grab	Kemmerer - grab	grab	Kemmerer - grab	
GPS coordinate (Lat./Long.) of sample collection:[1]	E087° 49' 12.9855" N42° 20' 41.5438"				
GPS coordinate (state plane) of sample collection:[1]					
Water column depth to the nearest foot:[1]	14		14		
Sampling depth to the nearest foot: (enter zero for surface water samples)	0	7	0	7	
Date & Time of collection	7/19/10 10:20	7/19/10 10:25	7/19/10 13:00	7/19/10 13:06	
Sample appearance: (clear, tinted, dark, etc..)	Clear	Clear	Clear	Clear	
pH & Time of reading:	8.61	8.44	8.31	8.26	
Temperature (degrees C):	24.1	23.0	26.0	25.1	
Comments:					

See also chain of custody form for bottles and preservatives

Version 0 06/16/2010

FIELD LOG

Suburban Laboratories, Inc.
4140 Litt Drive
Hillside, IL 60162-1183
P: (708) 544-3260 F: (708) 544-6587
www.SuburbanLabs.com

Luedtke Engineering Company

FY10 Dredging of Waukegan Harbor Approach Channel
Weekly water sampling

Date of Discharge: 7/19/10

	1000' upstream Surface	1000' upstream Mid-depth	Blind Duplicate	Additional Comments:
Sampling Technique:	grab	Kemmerer - grab		
GPS coordinate (Lat./Long.) of sample collection:[1]	~~E087° 49' 13.7018" N42° 20' 46.9350"~~		E87° 49' 13.9855" N42° 20' 41.5438"	
GPS coordinate (~~state plane~~) of sample collection:[1] Lat/Long.	E087° 49' 12.2119" N42° 20' 55.9644" 7/19/10			
Water column depth to the nearest foot:[1]	11		14	
Sampling depth to the nearest foot: (enter zero for surface water samples)	0	5	7	
Date & Time of collection:	7/19/10 10:40	7/19/10 10:45	7/19/10 10:35	
Sample appearance: (clear, tinted, dark, etc..)	Clear	Clear	Clear	
pH & Time of reading:	8.37	8.39	8.43	
Temperature (degrees C):	23.5	22.7	23.1	
Blind Duplicate sample ID:				
Comments:				

See also chain of custody form for bottles and preservatives

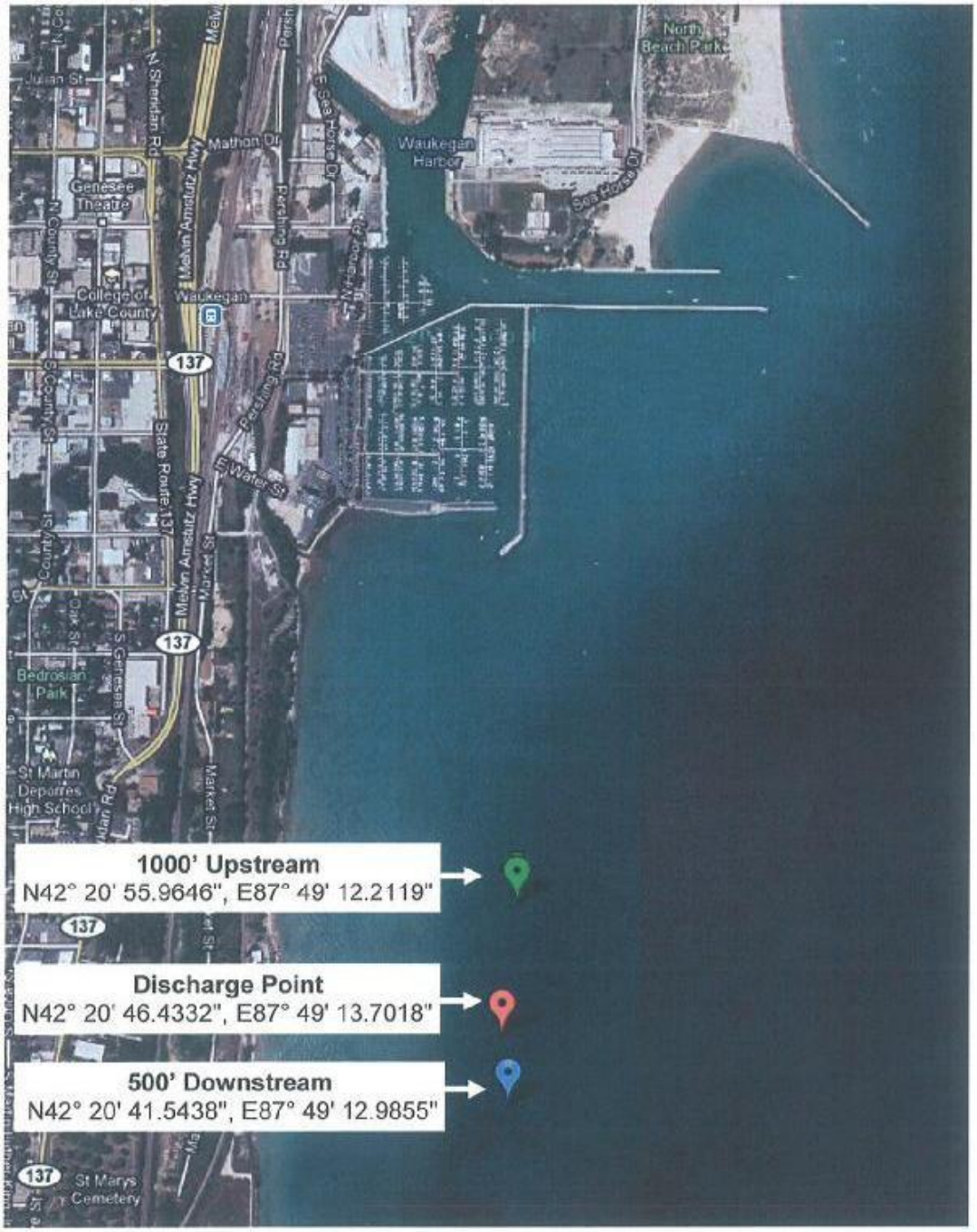
Version 3 08/16/2010

SIGNATURES:

SLI Field Tech 1: [signature]

SLI Field Tech 2: _____

Week 1, Event 2
7/19/10



REVISED 9/1/10

SUBURBAN LABORATORIES, Inc.

4140 Litt Drive Hillside, Illinois 60162
Tel. (708) 544-3260 Toll Free (800) 783-LABS
Fax (708-544-8587
www.suburbanlabs.com

September 07, 2010

Workorder: 1007980

Jon Keillor
Luedtke Engineering Company
10 Fourth Street
P.O. Box 111
Frankfort, Michigan 49635

TEL: (231) 352-9631
FAX: (231) 352-7178
RE: Waukegan Harbor 2010 - Week 2,
Event 1 of 1

Dear Jon Keillor:

Suburban Laboratories, Inc. received 7 sample(s) on 07/21/10 for the analyses presented in the following report.

All data for the associated quality control (QC) met EPA, method, or internal laboratory specifications except where noted in the case narrative. If you are comparing these results to external QC specifications or compliance limits and have any questions, please contact us.

This final report of laboratory analysis consists of this cover letter, case narrative, analytical report, dates report, and any accompanying documentation on, but not limited to, chain of custody records, raw data, and letters of explanation or reliance. This report may not be reproduced, except in full, without the prior written approval of Suburban Laboratories, Inc.

If you have any questions regarding these test results, please call me at (708) 544-3260.

Sincerely,

Melissa Amador

Melissa Amador
Project Manager

Suburban Laboratories, Inc.

4140 Litt Drive, Hillside, IL 60162 (708) 544-3260

Case Narrative

Client: Luedtke Engineering Company
Project: Waukegan Harbor 2010 - Week 2, Event 1 of 1
WorkOrder: 1007980
Temperature of samples upon receipt at SLI: 6 C

Date: September 07, 2010
PO #: 981-1
QC Level:
Chain of Custody #: Electronic

General Comments:
- All results reported in wet weight unless otherwise indicated. (dry = Dry Weight)
- Sample results relate only to the analytes of interest tested and to sample as received by the laboratory.
- Environmental compliance sample results meet the requirements of 35 IAC Part 186 unless otherwise indicated.
- Waste water analysis follows the rules set forth in 40 CFR part 136 except where otherwise noted.
- Accreditation by the State of Illinois is not an endorsement or a guarantee of the validity of data generated.
- For more information about the laboratories' scope of accreditation, please contact us at (708) 544-3260 or the Agency at (217) 782-6455.

Abbreviations:
- Reporting Limit: The concentration at which an analyte can be routinely detected on a day to day basis, and which also meets regulatory and client needs.
- Quantitation Limit: The lowest concentration at which results can be accurately quantitated.
- J: The analyte was positively identified above our Method Detection Limit and is considered detectable and usable; however, the associated numerical value is the approximate concentration of the analyte in the sample.
- ATC: Automatic Temperature Correction. - TNTC: Too Numerous To Count
- In Laboratory: EPA recommends this analyte be analyzed "immediately" (e.g., tests that should be performed in the field within 15 minutes of collection). Analytes with "immediate" hold times are analyzed as soon as possible upon receipt by the laboratory.
- TIC: Tentatively Identified Compound (GCMS library search identification, concentration estimated to nearest internal standard).

Method References:
For a complete list of method references please contact us.
- E: USEPA Reference methods
- SW: USEPA, Test Methods for Evaluating Solid Waste (SW-846)
- M: Standard Methods for the Examination of Water and Wastewater
- USP: Latest version of United States Pharmacopeia

Workorder Specific Comments:

This report supersedes the report dated 7/28/10.

Suburban Laboratories, Inc.
4140 Litt Drive, Hillside, IL 60162 (708) 544-3260

Laboratory Results

Client ID: Luedtke Engineering Company
Project Name: Waukegan Harbor 2010 - Week 2, Event 1 of 1
Report Date: September 07, 2010
Lab Order: **1007980**

Client Sample ID: 1hr-500' Downstream Surface
Lab ID: 1007980-001 **Date Received:** 07/21/2010 5:10 PM
Matrix: SURFACE WATER
Collection Date: 07/21/2010 12:20 PM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
CHLORIDE		Method: APHA-M4500-Cl⁻ E-Rev 18th, 1992				Analyst: ts	
Chloride	12.6	0.500		mg/L	1	07/27/2010 4:15 PM	R4082
FIELD PARAMETERS		Method: E150.1-FIELD				Analyst:	
pH, Field	8.45			pH		07/21/2010 12:20 PM	
Temperature	24.7			C		07/21/2010 12:20 PM	
HARDNESS, TOTAL		Method: SM-2340B-Rev 18Ed, 1992				Analyst: mn	
Hardness, Ca/Mg (As CaCO3)	132	0.050	c	mg/L	1	07/27/2010 12:00 AM	1377
AMMONIA, BY SELECTIVE ELECTRODE		Method: SM-M4500NH3 F-Rev 18Ed, 1992				Analyst: lb	
Nitrogen, Ammonia (As N)	0.0215	0.0100		mg/L	1	07/28/2010 7:20 AM	R4091
PHOSPHORUS, TOTAL		Method: SM-M4500P BE-Rev 18Ed, 1992				Analyst: sb	
Phosphorus (As P)	ND	0.00500		mg/L	1	07/26/2010 3:14 PM	1379
TOTAL SUSPENDED SOLIDS		Method: SM-M2540D-Rev 18Ed, 1992				Analyst: jos	
Residue, Non-Filterable	0.800	0.400	J	mg/L	1	07/28/2010 4:47 PM	R4060

Client Sample ID: 1hr-500' Downstream Mid-Depth
Lab ID: 1007980-002 **Date Received:** 07/21/2010 5:10 PM
Matrix: SURFACE WATER
Collection Date: 07/21/2010 12:25 PM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
CHLORIDE		Method: APHA-M4500-Cl⁻ E-Rev 18th, 1992				Analyst: ts	
Chloride	11.1	0.500		mg/L	1	07/27/2010 4:00 PM	R4081
FIELD PARAMETERS		Method: E150.1-FIELD				Analyst:	
pH, Field	8.41			pH		07/21/2010 12:25 PM	
Temperature	23.5			C		07/21/2010 12:25 PM	
HARDNESS, TOTAL		Method: SM-2340B-Rev 18Ed, 1992				Analyst: mn	
Hardness, Ca/Mg (As CaCO3)	133	0.050	c	mg/L	1	07/27/2010 12:00 AM	1377
AMMONIA, BY SELECTIVE ELECTRODE		Method: SM-M4500NH3 F-Rev 18Ed, 1992				Analyst: lb	
Nitrogen, Ammonia (As N)	0.0214	0.0100		mg/L	1	07/28/2010 7:20 AM	R4091
PHOSPHORUS, TOTAL		Method: SM-M4500P BE-Rev 18Ed, 1992				Analyst: sb	
Phosphorus (As P)	0.0128	0.00500		mg/L	1	07/26/2010 3:14 PM	1379
TOTAL SUSPENDED SOLIDS		Method: SM-M2540D-Rev 18Ed, 1992				Analyst: jos	
Residue, Non-Filterable	0.800	0.400	J	mg/L	1	07/28/2010 4:47 PM	R4060

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
c	Analyte not in SLI scope of accreditation	E	Estimated, detected above quantitation range
G	Refer to case narrative page for specific comments	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limit (QL)	N	Tentatively identified compounds
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits

Suburban Laboratories, Inc.
4140 Litt Drive, Hillside, IL 60162 (708) 544-3260

Laboratory Results

Client ID: Luedtke Engineering Company
Project Name: Waukegan Harbor 2010 - Week 2, Event 1 of 1
Report Date: September 07, 2010
Lab Order: **1007980**

Client Sample ID: 4hr-500' Downstream Surface
Lab ID: 1007980-003 **Date Received:** 07/21/2010 5:10 PM
Matrix: SURFACE WATER
Collection Date: 07/21/2010 3:20 PM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
CHLORIDE		Method: APHA-M4500-Cl⁻ E-Rev 18th, 1992				Analyst: ts	
Chloride	11.7	0.500		mg/L	1	07/27/2010 4:00 PM	R4081
FIELD PARAMETERS		Method: E150.1-FIELD				Analyst:	
pH, Field	8.38			pH		07/21/2010 3:20 PM	
Temperature	25.9			C		07/21/2010 3:20 PM	
HARDNESS, TOTAL		Method: SM-2340B-Rev 18Ed, 1992				Analyst: mn	
Hardness, Ca/Mg (As CaCO3)	137	0.050	c	mg/L	1	07/27/2010 12:00 AM	1377
AMMONIA, BY SELECTIVE ELECTRODE		Method: SM-M4500NH3 F-Rev 18Ed, 1992				Analyst: lb	
Nitrogen, Ammonia (As N)	0.0185	0.0100	J	mg/L	1	07/28/2010 7:20 AM	R4091
PHOSPHORUS, TOTAL		Method: SM-M4500P BE-Rev 18Ed, 1992				Analyst: sb	
Phosphorus (As P)	ND	0.00500		mg/L	1	07/26/2010 3:14 PM	1379
TOTAL SUSPENDED SOLIDS		Method: SM-M2540D-Rev 18Ed, 1992				Analyst: jos	
Residue, Non-Filterable	ND	0.400		mg/L	1	07/28/2010 4:47 PM	R4060

Client Sample ID: 4hr-500' Downstream Mid-Depth
Lab ID: 1007980-004 **Date Received:** 07/21/2010 5:10 PM
Matrix: SURFACE WATER
Collection Date: 07/21/2010 3:26 PM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
CHLORIDE		Method: APHA-M4500-Cl⁻ E-Rev 18th, 1992				Analyst: ts	
Chloride	10.5	0.500		mg/L	1	07/27/2010 4:00 PM	R4081
FIELD PARAMETERS		Method: E150.1-FIELD				Analyst:	
pH, Field	8.36			pH		07/21/2010 3:26 PM	
Temperature	24.9			C		07/21/2010 3:26 PM	
HARDNESS, TOTAL		Method: SM-2340B-Rev 18Ed, 1992				Analyst: mn	
Hardness, Ca/Mg (As CaCO3)	133	0.050	c	mg/L	1	07/27/2010 12:00 AM	1377
AMMONIA, BY SELECTIVE ELECTRODE		Method: SM-M4500NH3 F-Rev 18Ed, 1992				Analyst: lb	
Nitrogen, Ammonia (As N)	0.0183	0.0100	J	mg/L	1	07/28/2010 7:20 AM	R4091
PHOSPHORUS, TOTAL		Method: SM-M4500P BE-Rev 18Ed, 1992				Analyst: sb	
Phosphorus (As P)	ND	0.00500		mg/L	1	07/26/2010 3:14 PM	1379
TOTAL SUSPENDED SOLIDS		Method: SM-M2540D-Rev 18Ed, 1992				Analyst: jos	
Residue, Non-Filterable	0.400	0.400	J	mg/L	1	07/28/2010 4:47 PM	R4060

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
c	Analyte not in SLI scope of accreditation	E	Estimated, detected above quantitation range
G	Refer to case narrative page for specific comments	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limit (QL)	N	Tentatively identified compounds
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits

Suburban Laboratories, Inc.
4140 Litt Drive, Hillside, IL 60162 (708) 544-3260

Laboratory Results

Client ID: Luedtke Engineering Company
Project Name: Waukegan Harbor 2010 - Week 2, Event 1 of 1
Report Date: September 07, 2010
Lab Order: **1007980**

Client Sample ID: **1000' Upstream Surface**
Lab ID: 1007980-005 **Date Received:** 07/21/2010 5:10 PM
Matrix: SURFACE WATER
Collection Date: 07/21/2010 12:31 PM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
CHLORIDE		Method: APHA-M4500-Cl⁻ E-Rev 18th, 1992				Analyst: ts	
Chloride	11.3	0.500		mg/L	1	07/27/2010 4:00 PM	R4081
FIELD PARAMETERS		Method: E150.1-FIELD				Analyst:	
pH, Field	8.39			pH		07/21/2010 12:31 PM	
Temperature	24.1			C		07/21/2010 12:31 PM	
HARDNESS, TOTAL		Method: SM-2340B-Rev 18Ed, 1992				Analyst: mn	
Hardness, Ca/Mg (As CaCO3)	133	0.050	c	mg/L	1	07/27/2010 12:00 AM	1377
AMMONIA, BY SELECTIVE ELECTRODE		Method: SM-M4500NH3 F-Rev 18Ed, 1992				Analyst: lb	
Nitrogen, Ammonia (As N)	0.0219	0.0100		mg/L	1	07/28/2010 7:20 AM	R4091
PHOSPHORUS, TOTAL		Method: SM-M4500P BE-Rev 18Ed, 1992				Analyst: sb	
Phosphorus (As P)	ND	0.00500		mg/L	1	07/27/2010 6:09 PM	1393
TOTAL SUSPENDED SOLIDS		Method: SM-M2540D-Rev 18Ed, 1992				Analyst: jos	
Residue, Non-Filterable	0.800	0.400	J	mg/L	1	07/28/2010 4:47 PM	R4060

Client Sample ID: **1000' Upstream Mid-Depth**
Lab ID: 1007980-006 **Date Received:** 07/21/2010 5:10 PM
Matrix: SURFACE WATER
Collection Date: 07/21/2010 12:41 PM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
CHLORIDE		Method: APHA-M4500-Cl⁻ E-Rev 18th, 1992				Analyst: ts	
Chloride	9.93	0.500		mg/L	1	07/27/2010 4:00 PM	R4081
FIELD PARAMETERS		Method: E150.1-FIELD				Analyst:	
pH, Field	8.36			pH		07/21/2010 12:41 PM	
Temperature	23.1			C		07/21/2010 12:41 PM	
HARDNESS, TOTAL		Method: SM-2340B-Rev 18Ed, 1992				Analyst: mn	
Hardness, Ca/Mg (As CaCO3)	137	0.050	c	mg/L	1	07/27/2010 12:00 AM	1377
AMMONIA, BY SELECTIVE ELECTRODE		Method: SM-M4500NH3 F-Rev 18Ed, 1992				Analyst: lb	
Nitrogen, Ammonia (As N)	0.0173	0.0100	J	mg/L	1	07/28/2010 7:20 AM	R4091
PHOSPHORUS, TOTAL		Method: SM-M4500P BE-Rev 18Ed, 1992				Analyst: sb	
Phosphorus (As P)	ND	0.00500		mg/L	1	07/27/2010 6:09 PM	1393
TOTAL SUSPENDED SOLIDS		Method: SM-M2540D-Rev 18Ed, 1992				Analyst: jos	
Residue, Non-Filterable	1.20	0.400	J	mg/L	1	07/28/2010 4:47 PM	R4060

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
c	Analyte not in SLI scope of accreditation	E	Estimated, detected above quantitation range
G	Refer to case narrative page for specific comments	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limit (QL)	N	Tentatively identified compounds
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits

Suburban Laboratories, Inc.
4140 Litt Drive, Hillside, IL 60162 (708) 544-3260

Laboratory Results

Client ID: Luedtke Engineering Company
Project Name: Waukegan Harbor 2010 - Week 2, Event 1 of 1
Report Date: September 07, 2010
Lab Order: **1007980**

Client Sample ID: **Blind Duplicate**
Lab ID: 1007980-007 **Date Received:** 07/21/2010 5:10 PM
Matrix: SURFACE WATER
Collection Date: 07/21/2010 12:36 PM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
CHLORIDE		Method: APHA-M4500-Cl⁻ E-Rev 18th, 1992				Analyst: ts	
Chloride	10.5	0.500		mg/L	1	07/27/2010 4:00 PM	R4081
FIELD PARAMETERS		Method: E150.1-FIELD				Analyst:	
pH, Field	8.38			pH		07/21/2010 12:36 PM	
Temperature	23.9			C		07/21/2010 12:36 PM	
HARDNESS, TOTAL		Method: SM-2340B-Rev 18Ed, 1992				Analyst: mn	
Hardness, Ca/Mg (As CaCO3)	132	0.050	c	mg/L	1	07/27/2010 12:00 AM	1377
AMMONIA, BY SELECTIVE ELECTRODE		Method: SM-M4500NH3 F-Rev 18Ed, 1992				Analyst: lb	
Nitrogen, Ammonia (As N)	0.0176	0.0100	J	mg/L	1	07/28/2010 7:20 AM	R4091
PHOSPHORUS, TOTAL		Method: SM-M4500P BE-Rev 18Ed, 1992				Analyst: sb	
Phosphorus (As P)	ND	0.00500		mg/L	1	07/27/2010 6:09 PM	1393
TOTAL SUSPENDED SOLIDS		Method: SM-M2540D-Rev 18Ed, 1992				Analyst: jos	
Residue, Non-Filterable	0.800	0.400	J	mg/L	1	07/28/2010 4:47 PM	R4060

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
c	Analyte not in SLI scope of accreditation	E	Estimated, detected above quantitation range
G	Refer to case narrative page for specific comments	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limit (QL)	N	Tentatively identified compounds
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits

Suburban Laboratories, Inc.

4140 Litt Drive, Hillside, IL 60162 (708) 544-3260

PREP DATES REPOR

Client: Luedtke Engineering Company

Project: Waukegan Harbor 2010 - Week 2,

Report Date: September 07, 2010

Lab Order: **1007980**

Sample ID	Collection Date	Batch ID	Prep Method	Prep Test Name	TCLP Date	Prep Date
1007980-001B	07/21/10 12:20:00 P	1379	P_WW_LOWPR	PHOSPHORUS, TOTAL		07/26/10
1007980-001C		1377	200.2_ICPWW_	AQUEOUS PREP T/R METALS: ICP		07/26/10
1007980-002B	07/21/10 12:25:00 P	1379	P_WW_LOWPR	PHOSPHORUS, TOTAL		07/26/10
1007980-002C		1377	200.2_ICPWW_	AQUEOUS PREP T/R METALS: ICP		07/26/10
1007980-003B	07/21/10 3:20:00 PM	1379	P_WW_LOWPR	PHOSPHORUS, TOTAL		07/26/10
1007980-003C		1377	200.2_ICPWW_	AQUEOUS PREP T/R METALS: ICP		07/26/10
1007980-004B	07/21/10 3:26:00 PM	1379	P_WW_LOWPR	PHOSPHORUS, TOTAL		07/26/10
1007980-004C		1377	200.2_ICPWW_	AQUEOUS PREP T/R METALS: ICP		07/26/10
1007980-005B	07/21/10 12:31:00 P	1393	P_WW_LOWPR	PHOSPHORUS, TOTAL		07/27/10
1007980-005C		1377	200.2_ICPWW_	AQUEOUS PREP T/R METALS: ICP		07/26/10
1007980-006B	07/21/10 12:41:00 P	1393	P_WW_LOWPR	PHOSPHORUS, TOTAL		07/27/10
1007980-006C		1377	200.2_ICPWW_	AQUEOUS PREP T/R METALS: ICP		07/26/10
1007980-007B	07/21/10 12:36:00 P	1393	P_WW_LOWPR	PHOSPHORUS, TOTAL		07/27/10
1007980-007C		1377	200.2_ICPWW_	AQUEOUS PREP T/R METALS: ICP		07/26/10

3
Hillside, IL 60162
TEL: 708-544-3260
FAX: 708-544-8587
Website: www.SuburbanLabs.com

QC SUMMARY REPORT

WO#: **1007980**

07-Sep-10

Client: Luedtke Engineering Company
Project: Waukegan Harbor 2010 - Week 2, Event 1 of 1 **TestCode:** **CL_WW1**

Sample ID: **MB-R4081** SampType: **MBLK** TestCode: **CL_WW1** Units: **mg/L** Prep Date: RunNo: **4081**
Client ID: **PBW** Batch ID: **R4081** TestNo: **A4500-Cl- E** Analysis Date: **07/27/10** SeqNo: **80595**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	ND	5.00									

Sample ID: **LCS-R4081** SampType: **LCS** TestCode: **CL_WW1** Units: **mg/L** Prep Date: RunNo: **4081**
Client ID: **LCSW** Batch ID: **R4081** TestNo: **A4500-Cl- E** Analysis Date: **07/27/10** SeqNo: **80596**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	101	5.00	100.0	0	101	85	115				

Sample ID: **MB-R4082** SampType: **MBLK** TestCode: **CL_WW1** Units: **mg/L** Prep Date: RunNo: **4082**
Client ID: **PBW** Batch ID: **R4082** TestNo: **A4500-Cl- E** Analysis Date: **07/27/10** SeqNo: **80603**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	ND	5.00									

Sample ID: **LCS-R4082** SampType: **LCS** TestCode: **CL_WW1** Units: **mg/L** Prep Date: RunNo: **4082**
Client ID: **LCSW** Batch ID: **R4082** TestNo: **A4500-Cl- E** Analysis Date: **07/27/10** SeqNo: **80604**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	98.6	5.00	100.0	0	98.6	85	115				

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level	E	Estimated, detected above quantitation range	H	Holding times for preparation or analysis exceede
M	Manual Integration used to determine area response	ND	Not Detected at the Reporting Limit	P	Second column confirmation exceeds
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

3
Hillside, IL 60162
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FAX: 708-544-8587
Website: www.SuburbanLabs.com

QC SUMMARY REPORT

WO#: **1007980**
07-Sep-10

Client: Luedtke Engineering Company
Project: Waukegan Harbor 2010 - Week 2, Event 1 of 1 **TestCode:** **P_WW_LOW**

Sample ID: **LCS-1379** SampType: **LCS** TestCode: **P_WW_low** Units: **mg/L** Prep Date: **07/26/10** RunNo: **4036**
Client ID: **LCSW** Batch ID: **1379** TestNo: **A4500-P BE** **A4500-P BE** Analysis Date: **07/26/10** SeqNo: **79797**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Phosphorus (As P)	0.0536	0.0120	0.05000	0	107	85	115				

Sample ID: **LCS-1393** SampType: **LCS** TestCode: **P_WW_LOW** Units: **mg/L** Prep Date: **07/27/10** RunNo: **4085**
Client ID: **LCSW** Batch ID: **1393** TestNo: **A4500-P BE** **A4500-P BE** Analysis Date: **07/27/10** SeqNo: **80621**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Phosphorus (As P)	0.0478	0.0120	0.05000	0	95.5	85	115				

Sample ID: **MB-1393** SampType: **MBLK** TestCode: **P_WW_LOW** Units: **mg/L** Prep Date: **07/27/10** RunNo: **4085**
Client ID: **PBW** Batch ID: **1393** TestNo: **A4500-P BE** **A4500-P BE** Analysis Date: **07/27/10** SeqNo: **80622**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Phosphorus (As P)	ND	0.0120									

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level	E	Estimated, detected above quantitation range	H	Holding times for preparation or analysis exceede
M	Manual Integration used to determine area response	ND	Not Detected at the Reporting Limit	P	Second column confirmation exceeds
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

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Hillside, IL 60162
TEL: 708-544-3260
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QC SUMMARY REPORT

WO#: **1007980**
07-Sep-10

Client: Luedtke Engineering Company
Project: Waukegan Harbor 2010 - Week 2, Event 1 of 1 **TestCode:** **TSS**

Sample ID: **MB-R4060** SampType: **MBLK** TestCode: **TSS** Units: **mg/L** Prep Date: RunNo: **4060**
Client ID: **PBW** Batch ID: **R4060** TestNo: **A2540D** Analysis Date: **07/28/10** SeqNo: **80834**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Residue, Non-Filterable	ND	1.00									

Sample ID: **1007A12-005ADUP** SampType: **DUP** TestCode: **TSS** Units: **mg/L** Prep Date: RunNo: **4060**
Client ID: **ZZZZZZ** Batch ID: **R4060** TestNo: **A2540D** Analysis Date: **07/28/10** SeqNo: **80844**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Residue, Non-Filterable	4.00	2.50						4.000	0	10	

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level	E	Estimated, detected above quantitation range	H	Holding times for preparation or analysis exceede
M	Manual Integration used to determine area response	ND	Not Detected at the Reporting Limit	P	Second column confirmation exceeds
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

SUBURBAN LABORATORIES, Inc.

4140 Litt Drive Hillside, IL 60162 Tel. 708.544.3260 Fax: 708.544.8587 Toll Free: 800.783.LABS www.suburbanlabs.com

CHAIN OF CUSTODY RECORD

Electronic Version

Company Name: Luedtke Engineering Company
Company Address:
City: Frankfort State: MI Zip: 49635
Phone: Fax: ☐ Fax Report
Email Address: ☑ Email Report
Project ID / Location: Waukegan Harbor Dredging 2010 - Week 2, Event 1
Project Manager (Report to): Jon Keillor
Sample Collector(s): Patrick Rodriguez

TURNAROUND TIME REQUESTED
☑ Normal ☐ RUSH* *Additional Rush Charges Approved
*Date & Time Needed:
Normal TAT is 5-7 work days for most work. Rush work must be pre-approved and additional charges apply.
Specify Regulatory Program: (Required) ☐ None/Info only
☐ LUST ☐ SRP ☐ SDWA
☐ 503 Sludge ☐ NPDES ☐ MWRDGC
☐ Disposal ☑ Other *Please specify in comment section below.

ANALYSIS & METHOD REQUESTED
Enter an "X" in box below for request

Page 1 of 2
PO No.
Shipping Method: SLI
QC Reporting Level ☐ 1 ☑ 2 ☐ 3
LAB USE ONLY
SLI Order No: 1007-980
Sample containers supplied by customer? ☐ Yes
Temperature of Received Samples: 6 °C
Samples received within 24 hours of collection? ☐ Yes

	SAMPLE IDENTIFICATION (Please use 1 line per container type)	COLLECTION DATE	COLLECTION TIME	MATRIX	GRAB/ COMP.	CONTAINERS Qty	CONTAINERS SIZE & TYPE	PRESERVATIVE	TSS	Chloride	Ammonia	Phosphorus	Hardness	R	Condition	Split	LAB #
1	1hr-500' downstream, surface	7/2/10	12:00	SW	G	1	1LP	none	X	X							1A
2	↓	↓	↓	↓	↓	1	1LP	H2SO4			X	X					1B
3	↓	↓	↓	↓	↓	1	500p	HNO3					X				1C
4	1hr-500' downstream, mid-depth	7/2/10	12:05	SW	G	1	1LP	none	X	X							2A
5	↓	↓	↓	↓	↓	1	1LP	H2SO4			X	X					2B
6	↓	↓	↓	↓	↓	1	500p	HNO3					X				2C
7	4hr-500' downstream, surface	7/2/10	15:20	SW	G	1	1LP	none	X	X							3A
8	↓	↓	↓	↓	↓	1	1LP	H2SO4			X	X					3B
9	↓	↓	↓	↓	↓												3C
10	4hr-500' downstream, mid-depth	7/2/10	15:26	SW	G	1	1LP	none	X	X							4A
11	↓	↓	↓	↓	↓	1	1LP	H2SO4			X	X					4B
12	↓	↓	↓	↓	↓	1	500p	HNO3					X				4C

MATRIX: Drinking Water (DW), Soil (S), Waste Water (WW), Surface Water(SW), Ground Water (GW), Solid Waste (WA), Sludge (U), Wipe (P) **CONTAINER:** 2oz, 4oz, 8oz, 40ml Vial, 500ml, Liter (L), Tube, Glass (G), Plastic (P) **PRESERVATIVE:** H_2SO_4, HCl, HNO_3, Methanol (MeOH) NaOH, Sodium Bisulfate (NaB), NaThio

COMMENTS & SPECIAL INSTRUCTIONS:

* Chicago District USACE - Waukegan Harbor Approach Channel Dredging project 2010

CONDITION CODES
1. Improper/damaged container/cap
2. Improper preservation
3. Insufficient sample volume
4. Headspace/air bubbles for VOCs
5. Received past holding time
6. Received frozen
7. Label conflicts with COC

1. Relinquished By	Date	2. Relinquished By	Date	3. Relinquished By	Date	4. Relinquished By	Date
[signature]	7/2/10						
Received By ☐ Ice	Time 12:10	Received By ☐ Ice	Time	Received By ☐ Ice	Time	Received By ☐ Ice	Time

Submission of samples subject to Terms and Conditions on back. Rev. 2/01/05 Please fill out this form completely, print, sign & submit with samples. Keep a copy for your records.

SUBURBAN LABORATORIES, Inc.

4140 Litt Drive Hillside, IL 60162 Tel. 708.544.3260 Fax: 708.544.8587 Toll Free: 800.783.LABS www.suburbanlabs.com

CHAIN OF CUSTODY RECORD

Electronic Version

Company Name: Luedtke Engineering Company
Company Address:
City: Frankfort State: MI Zip: 49635
Phone: Fax: ☐ Fax Report
Email Address: ☑ Email Report
Project ID / Location: Waukegan Harbor Dredging 2010 - Week 2, Event 1
Project Manager (Report to): Jon Keillor
Sample Collector(s): Patrick Rodriguez

TURNAROUND TIME REQUESTED
☑ Normal ☐ RUSH* *Additional Rush Charges Approved.
*Date & Time Needed:
Normal TAT is 5-7 work days for most work. Rush work must be pre-approved and additional charges apply.
Specify Regulatory Program: (Required) ☐ None/Info only
☐ LUST ☐ SRP ☐ SDWA
☐ 503 Sludge ☐ NPDES ☐ MWRDGC
☐ Disposal ☑ Other *Please specify in comment section below

ANALYSIS & METHOD REQUESTED
Enter an "X" in box below for request

Page 2 of 2
PO No
Shipping Method: SLI
QC Reporting Level ☐ 1 ☑ 2 ☐ 3

LAB USE ONLY
SLI Order No: 1607-980
Sample containers supplied by customer? ☐ Yes
Temperature of Received Samples: 6 °C
Samples received within 24 hours of collection? ☐ Yes

	SAMPLE IDENTIFICATION (Please use 1 line per container type)	COLLECTION DATE	COLLECTION TIME	MATRIX	GRAB/ COMP.	CONTAINERS Qty	CONTAINERS SIZE & TYPE	PRESERVATIVE	TSS	Chloride	Ammonia	Phosphorus	Hardness	R	Condition	Split	LAB #
1	1000' upstream, surface	7/21/10	12:31	SW	G	1	1LP	none	X	X							5A
2						1	1LP	H2SO4			X	X					5B
3						1	500p	HNO3					X				5C
4	1000' upstream, mid-depth	7/21/10	12:45	SW	G	1	1LP	none	X	X							6A
5						1	1LP	H2SO4			X	X					6B
6						1	500p	HNO3					X				6C
7	Blind duplicate	7/21/10	12:36	SW	G	1	1LP	none	X	X							7A
8						1	1LP	H2SO4			X	X					7B
9						1	500p	HNO3					X				7C
10																	
11																	
12																	

MATRIX: Drinking Water (DW), Soil (S), Waste Water (WW), Surface Water(SW), Ground Water (GW), Solid Waste (WA), Sludge (U), Wipe (P) CONTAINER: 2oz, 4oz, 8oz, 40ml Vial, 500ml, Liter (L), Tube, Glass (G), Plastic (P) PRESERVATIVE: H_2SO_4, HCl, HNO_3, Methanol (MeOH) NaOH, Sodium Bisulfate (NaB), NaThio

COMMENTS & SPECIAL INSTRUCTIONS:

* Chicago District USACE - Waukegan Harbor Approach Channel Dredging project 2010

CONDITION CODES
1. Improper/damaged container/cap
2. Improper preservation
3. Insufficient sample volume
4. Headspace/air bubbles for VOCs
5. Received past holding time
6. Received frozen
7. Label conflicts with COC

1. Relinquished By	Date	2. Relinquished By	Date	3. Relinquished By	Date	4. Relinquished By	Date
[signature]	7/21/10						
Received By ☑ Ice	Time 11:10	Received By ☐ Ice	Time	Received By ☐ Ice	Time	Received By ☐ Ice	Time

Submission of samples subject to Terms and Conditions on back. Rev. 2/01/05 Please fill out this form completely, print, sign & submit with samples. Keep a copy for your records.

FIELD LOG

Suburban Laboratories, Inc.
4140 Litt Drive
Hillside, IL 60162-1183
P: (708) 544-3260 F: (708) 544-8587
www.SuburbanLabs.com

Luedtke Engineering Company

FY10 Dredging of Waukegan Harbor Approach Channel
Weekly water sampling

Suburban Labs Field Sampling Technician(s) - PRINT: Patrick Rodriguez			Placement area (circle): (1) 2		Eutech Inst. Oakton Field pH Meter, pHTestr 30 Serial No.: 15776094
Luedtke Engineering Rep. - PRINT: Tim Kibby			GPS coordinates of discharge point:[1] N42° 20' 46.1784" E087° 49' 7.3161"		Scow name and quantity of discharge:[1] 17 900 yds
Weather and water conditions: Clear Calm			Date of Discharge: 7/21/10		Time of Discharge:[1] 11:20
	1hr-500' downstream Surface	1hr-500' downstream Mid-depth	4hr-500' downstream Surface	4hr-500' downstream Mid-depth	Additional Comments:
Sampling Technique:	grab	Kemmerer - grab	grab	Kemmerer - grab	
GPS coordinate (Lat./Long.) of sample collection:[1]	N42° 20' 41.4680" E087° 49' 7.5123"				
GPS coordinate (state plane) of sample collection:[1]					
Water column depth to the nearest foot:[1]	14		14		
Sampling depth to the nearest foot: (enter zero for surface water samples)	0	7	0	7	
Date & Time of collection:	7/21/10 12:20	7/21/10 12:25	7/21/10 15:20	7/21/10 15:26	
Sample appearance: (clear, tinted, dark, etc..)	Clear	Clear	Clear	Clear	
pH & Time of reading:	8.45	8.41	8.38	8.36	
Temperature (degrees C):	24.7	23.5	25.9	24.9	
Comments:					

See also chain of custody form for bottles and preservatives

Version 0 06/16/2010

FIELD LOG

Suburban Laboratories, Inc.
4140 Litt Drive
Hillside, IL 60162-1183
P: (708) 544-3260 F: (708) 544-8587
www.SuburbanLabs.com

Luedtke Engineering Company

FY10 Dredging of Waukegan Harbor Approach Channel
Weekly water sampling

Date of Discharge: 7/21/10

	1000' upstream Surface	1000' upstream Mid-depth	Blind Duplicate	Additional Comments:
Sampling Technique:	grab	Kemmerer - grab		
GPS coordinate (Lat./Long.) of sample collection:[1]	N42° 20' 56.0985"	E087° 49' 6.7476"		
GPS coordinate (state plane) of sample collection:[1]				
Water column depth to the nearest foot:[1]	13		13	
Sampling depth to the nearest foot: (enter zero for surface water samples)	0	7	0	
Date & Time of collection:	7/21/10 12:41	7/21/10 12:41	7/21/10 12:36	
Sample appearance: (clear, tinted, dark, etc..)	Clear	Clear	Clear	
pH & Time of reading:	8.39	8.36	8.38	
Temperature (degrees C):	24.1	23.1	23.9	
Blind Duplicate sample ID:				
Comments:				

See also chain of custody form for bottles and preservatives

Version 0 08/16/2010

SIGNATURES:

SLI Field Tech 1: [signature]

SLI Field Tech 2: _____

Week 2, Event 1
7/21/10

SUBURBAN LABORATORIES, Inc.

4140 Litt Drive Hillside, Illinois 60162
Tel. (708) 544-3260 Toll Free (800) 783-LABS
Fax (708-544-8587
www.suburbanlabs.com

September 07, 2010

Workorder: 1007D11

Jon Keillor
Luedtke Engineering Company
10 Fourth Street
P.O. Box 111
Frankfort, Michigan 49635

TEL: (231) 352-9631
FAX: (231) 352-7178
RE: Waukegan Harbor 2010 - Initial Samples Area 2

Dear Jon Keillor:

Suburban Laboratories, Inc. received 3 sample(s) on 07/29/10 for the analyses presented in the following report.

All data for the associated quality control (QC) met EPA, method, or internal laboratory specifications except where noted in the case narrative. If you are comparing these results to external QC specifications or compliance limits and have any questions, please contact us.

This final report of laboratory analysis consists of this cover letter, case narrative, analytical report, dates report, and any accompanying documentation on, but not limited to, chain of custody records, raw data, and letters of explanation or reliance. This report may not be reproduced, except in full, without the prior written approval of Suburban Laboratories, Inc.

If you have any questions regarding these test results, please call me at (708) 544-3260.

Sincerely,

Melissa Amador

Melissa Amador
Project Manager

Suburban Laboratories, Inc.

4140 Litt Drive, Hillside, IL 60162 (708) 544-3260

Case Narrative

Client: Luedtke Engineering Company
Project: Waukegan Harbor 2010 - Initial Samples Area 2
WorkOrder: 1007D11
Temperature of samples upon receipt at SLI: 6 C

Date: September 07, 2010
PO #: 981-1
QC Level:
Chain of Custody #: Electronic

General Comments:
- All results reported in wet weight unless otherwise indicated. (dry = Dry Weight)
- Sample results relate only to the analytes of interest tested and to sample as received by the laboratory.
- Environmental compliance sample results meet the requirements of 35 IAC Part 186 unless otherwise indicated.
- Waste water analysis follows the rules set forth in 40 CFR part 136 except where otherwise noted.
- Accreditation by the State of Illinois is not an endorsement or a guarantee of the validity of data generated.
- For more information about the laboratories' scope of accreditation, please contact us at (708) 544-3260 or the Agency at (217) 782-6455.

Abbreviations:
- Reporting Limit: The concentration at which an analyte can be routinely detected on a day to day basis, and which also meets regulatory and client needs.
- Quantitation Limit: The lowest concentration at which results can be accurately quantitated.
- J: The analyte was positively identified above our Method Detection Limit and is considered detectable and usable; however, the associated numerical value is the approximate concentration of the analyte in the sample.
- ATC: Automatic Temperature Correction. - TNTC: Too Numerous To Count
- In Laboratory: EPA recommends this analyte be analyzed "immediately" (e.g., tests that should be performed in the field within 15 minutes of collection). Analytes with "immediate" hold times are analyzed as soon as possible upon receipt by the laboratory.
- TIC: Tentatively Identified Compound (GCMS library search identification, concentration estimated to nearest internal standard).

Method References:
For a complete list of method references please contact us.
- E: USEPA Reference methods
- SW: USEPA, Test Methods for Evaluating Solid Waste (SW-846)
- M: Standard Methods for the Examination of Water and Wastewater
- USP: Latest version of United States Pharmacopeia

Workorder Specific Comments:

Suburban Laboratories, Inc.
4140 Litt Drive, Hillside, IL 60162 (708) 544-3260

Laboratory Results

Client ID: Luedtke Engineering Company
Project Name: Waukegan Harbor 2010 - Initial Samples Area 2
Report Date: September 07, 2010
Lab Order: **1007D11**

Client Sample ID: **Initial Sample Area 2 - Surface**
Lab ID: 1007D11-001 **Date Received:** 07/29/2010 4:35 PM
Matrix: SURFACE WATER
Collection Date: 07/29/2010 1:38 PM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
CHLORIDE		Method: APHA-M4500-Cl⁻ E-Rev 18th, 1992				Analyst: lb	
Chloride	10.4	0.500		mg/L	1	08/04/2010 2:21 PM	R4332
FIELD PARAMETERS		Method: E150.1-FIELD				Analyst:	
pH, Field	8.42			pH		07/29/2010 1:38 PM	
Temperature	26.6			C		07/29/2010 1:38 PM	
HARDNESS, TOTAL		Method: SM-2340B-Rev 18Ed, 1992				Analyst: mn	
Hardness, Ca/Mg (As CaCO3)	133	0.050	c	mg/L	1	08/03/2010 12:00 AM	1444
AMMONIA, BY SELECTIVE ELECTRODE		Method: SM-M4500NH3 F-Rev 18Ed, 1992				Analyst: lb	
Nitrogen, Ammonia (As N)	ND	0.0100		mg/L	1	08/04/2010 3:44 PM	R4336
PHOSPHORUS, TOTAL		Method: SM-M4500P BE-Rev 18Ed, 1992				Analyst: sb	
Phosphorus (As P)	ND	0.00500		mg/L	1	08/03/2010 4:43 PM	1464
TOTAL SUSPENDED SOLIDS		Method: SM-M2540D-Rev 18Ed, 1992				Analyst: jos	
Residue, Non-Filterable	0.500	0.500	J	mg/L	1	08/03/2010 4:30 PM	R4296

Client Sample ID: **Initial Sample Area 2 - Mid-Depth**
Lab ID: 1007D11-002 **Date Received:** 07/29/2010 4:35 PM
Matrix: SURFACE WATER
Collection Date: 07/29/2010 1:49 PM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
CHLORIDE		Method: APHA-M4500-Cl⁻ E-Rev 18th, 1992				Analyst: lb	
Chloride	11.2	0.500		mg/L	1	08/04/2010 2:21 PM	R4332
FIELD PARAMETERS		Method: E150.1-FIELD				Analyst:	
pH, Field	8.39			pH		07/29/2010 1:49 PM	
Temperature	25.1			C		07/29/2010 1:49 PM	
HARDNESS, TOTAL		Method: SM-2340B-Rev 18Ed, 1992				Analyst: mn	
Hardness, Ca/Mg (As CaCO3)	134	0.050	c	mg/L	1	08/03/2010 12:00 AM	1444
AMMONIA, BY SELECTIVE ELECTRODE		Method: SM-M4500NH3 F-Rev 18Ed, 1992				Analyst: lb	
Nitrogen, Ammonia (As N)	ND	0.0100		mg/L	1	08/04/2010 3:44 PM	R4336
PHOSPHORUS, TOTAL		Method: SM-M4500P BE-Rev 18Ed, 1992				Analyst: sb	
Phosphorus (As P)	ND	0.00500		mg/L	1	08/03/2010 4:43 PM	1464
TOTAL SUSPENDED SOLIDS		Method: SM-M2540D-Rev 18Ed, 1992				Analyst: jos	
Residue, Non-Filterable	0.500	0.500	J	mg/L	1	08/03/2010 4:30 PM	R4296

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
c	Analyte not in SLI scope of accreditation	E	Estimated, detected above quantitation range
G	Refer to case narrative page for specific comments	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limit (QL)	N	Tentatively identified compounds
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits

Suburban Laboratories, Inc.

4140 Litt Drive, Hillside, IL 60162 (708) 544-3260

Laboratory Results

Client ID: Luedtke Engineering Company
Project Name: Waukegan Harbor 2010 - Initial Samples Area 2

Report Date: September 07, 2010
Lab Order: **1007D11**

Client Sample ID: **Blind Duplicate**
Lab ID: 1007D11-003 **Date Received:** 07/29/2010 4:35 PM

Matrix: SURFACE WATER
Collection Date: 07/29/2010 1:43 PM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
CHLORIDE		Method: APHA-M4500-Cl⁻ E-Rev 18th, 1992				Analyst: lb	
Chloride	10.2	0.500		mg/L	1	08/04/2010 2:21 PM	R4332
FIELD PARAMETERS		Method: E150.1-FIELD				Analyst:	
pH, Field	8.40			pH		07/29/2010 1:43 PM	
Temperature	26.4			C		07/29/2010 1:43 PM	
HARDNESS, TOTAL		Method: SM-2340B-Rev 18Ed, 1992				Analyst: mn	
Hardness, Ca/Mg (As CaCO3)	131	0.050	c	mg/L	1	08/03/2010 12:00 AM	1444
AMMONIA, BY SELECTIVE ELECTRODE		Method: SM-M4500NH3 F-Rev 18Ed, 1992				Analyst: lb	
Nitrogen, Ammonia (As N)	ND	0.0100		mg/L	1	08/04/2010 3:44 PM	R4336
PHOSPHORUS, TOTAL		Method: SM-M4500P BE-Rev 18Ed, 1992				Analyst: sb	
Phosphorus (As P)	ND	0.00500		mg/L	1	08/03/2010 4:43 PM	1464
TOTAL SUSPENDED SOLIDS		Method: SM-M2540D-Rev 18Ed, 1992				Analyst: jos	
Residue, Non-Filterable	ND	0.500		mg/L	1	08/03/2010 4:30 PM	R4296

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
c	Analyte not in SLI scope of accreditation	E	Estimated, detected above quantitation range
G	Refer to case narrative page for specific comments	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limit (QL)	N	Tentatively identified compounds
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits

Suburban Laboratories, Inc.

4140 Litt Drive, Hillside, IL 60162 (708) 544-3260

PREP DATES REPOR

Client: Luedtke Engineering Company

Project: Waukegan Harbor 2010 - Initial Sa

Report Date: September 07, 2010

Lab Order: **1007D11**

Sample ID	Collection Date	Batch ID	Prep Method	Prep Test Name	TCLP Date	Prep Date
1007D11-001B	07/29/10 1:38:00 PM	1464	P_WW_LOWPR	PHOSPHORUS, TOTAL		08/03/10
1007D11-001C		1444	200.2_ICPWW_	AQUEOUS PREP T/R METALS: ICP		08/02/10
1007D11-002B	07/29/10 1:49:00 PM	1464	P_WW_LOWPR	PHOSPHORUS, TOTAL		08/03/10
1007D11-002C		1444	200.2_ICPWW_	AQUEOUS PREP T/R METALS: ICP		08/02/10
1007D11-003B	07/29/10 1:43:00 PM	1464	P_WW_LOWPR	PHOSPHORUS, TOTAL		08/03/10
1007D11-003C		1444	200.2_ICPWW_	AQUEOUS PREP T/R METALS: ICP		08/02/10

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Hillside, IL 60162
TEL: 708-544-3260
FAX: 708-544-8587
Website: www.SuburbanLabs.com

QC SUMMARY REPORT

WO#: **1007D11**
07-Sep-10

Client: Luedtke Engineering Company
Project: Waukegan Harbor 2010 - Initial Samples Area 2 **TestCode:** **CL_WW1**

Sample ID: **MB-R4332** SampType: **MBLK** TestCode: **CL_WW1** Units: **mg/L** Prep Date: RunNo: **4332**
Client ID: **PBW** Batch ID: **R4332** TestNo: **A4500-Cl- E** Analysis Date: **08/04/10** SeqNo: **86405**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	1.63	5.00									J

Sample ID: **LCS-R4332** SampType: **LCS** TestCode: **CL_WW1** Units: **mg/L** Prep Date: RunNo: **4332**
Client ID: **LCSW** Batch ID: **R4332** TestNo: **A4500-Cl- E** Analysis Date: **08/04/10** SeqNo: **86406**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	104	5.00	100.0	0	104	85	115				

Sample ID: **1007C12-001AMS** SampType: **MS** TestCode: **CL_WW1** Units: **mg/L** Prep Date: RunNo: **4332**
Client ID: **ZZZZZZ** Batch ID: **R4332** TestNo: **A4500-Cl- E** Analysis Date: **08/04/10** SeqNo: **86408**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	137	5.00	100.0	42.60	94.7	80	120				

Sample ID: **1007C12-001AMSD** SampType: **MSD** TestCode: **CL_WW1** Units: **mg/L** Prep Date: RunNo: **4332**
Client ID: **ZZZZZZ** Batch ID: **R4332** TestNo: **A4500-Cl- E** Analysis Date: **08/04/10** SeqNo: **86409**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	138	5.00	100.0	42.60	95.6	80	120	137.3	0.646	20	

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level	E	Estimated, detected above quantitation range	H	Holding times for preparation or analysis exceede
M	Manual Integration used to determine area response	ND	Not Detected at the Reporting Limit	P	Second column confirmation exceeds
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

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QC SUMMARY REPORT

WO#: **1007D11**
07-Sep-10

Client: Luedtke Engineering Company
Project: Waukegan Harbor 2010 - Initial Samples Area 2 **TestCode:** **P_WW_LOW**

Sample ID: **LCS-1464** SampType: **LCS** TestCode: **P_WW_LOW** Units: **mg/L** Prep Date: **08/03/10** RunNo: **4312**
Client ID: **LCSW** Batch ID: **1464** TestNo: **A4500-P BE** **A4500-P BE** Analysis Date: **08/03/10** SeqNo: **85965**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Phosphorus (As P)	0.0497	0.0120	0.05000	0	99.4	85	115				

Sample ID: **MB-1464** SampType: **MBLK** TestCode: **P_WW_LOW** Units: **mg/L** Prep Date: **08/03/10** RunNo: **4312**
Client ID: **PBW** Batch ID: **1464** TestNo: **A4500-P BE** **A4500-P BE** Analysis Date: **08/03/10** SeqNo: **85966**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Phosphorus (As P)	ND	0.0120									

Sample ID: **1007D11-001BMS** SampType: **MS** TestCode: **P_WW_LOW** Units: **mg/L** Prep Date: **08/03/10** RunNo: **4312**
Client ID: **Initial Sample Area** Batch ID: **1464** TestNo: **A4500-P BE** **A4500-P BE** Analysis Date: **08/03/10** SeqNo: **85968**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Phosphorus (As P)	0.0503	0.0120	0.05000	0	101	80	120				

Sample ID: **1007D11-001BMSD** SampType: **MSD** TestCode: **P_WW_LOW** Units: **mg/L** Prep Date: **08/03/10** RunNo: **4312**
Client ID: **Initial Sample Area** Batch ID: **1464** TestNo: **A4500-P BE** **A4500-P BE** Analysis Date: **08/03/10** SeqNo: **85969**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Phosphorus (As P)	0.0542	0.0120	0.05000	0	108	80	120	0.05032	7.46	13.7	

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level	E	Estimated, detected above quantitation range	H	Holding times for preparation or analysis exceede
M	Manual Integration used to determine area response	ND	Not Detected at the Reporting Limit	P	Second column confirmation exceeds
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

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FAX: 708-544-8587
Website: www.SuburbanLabs.com

QC SUMMARY REPORT

WO#: **1007D11**
07-Sep-10

Client: Luedtke Engineering Company
Project: Waukegan Harbor 2010 - Initial Samples Area 2 **TestCode:** **TSS**

Sample ID: **MB-R4296** SampType: **MBLK** TestCode: **TSS** Units: **mg/L** Prep Date: RunNo: **4296**
Client ID: **PBW** Batch ID: **R4296** TestNo: **A2540D** Analysis Date: **08/03/10** SeqNo: **85883**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Residue, Non-Filterable	ND	1.00									

Sample ID: **1007D07-005ADUP** SampType: **DUP** TestCode: **TSS** Units: **mg/L** Prep Date: RunNo: **4296**
Client ID: **ZZZZZZ** Batch ID: **R4296** TestNo: **A2540D** Analysis Date: **08/03/10** SeqNo: **85885**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Residue, Non-Filterable	0.500	2.50						0.5000	0	10	J

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level	E	Estimated, detected above quantitation range	H	Holding times for preparation or analysis exceede
M	Manual Integration used to determine area response	ND	Not Detected at the Reporting Limit	P	Second column confirmation exceeds
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

SUBURBAN LABORATORIES, Inc.

4140 Litt Drive Hillside, IL 60162 Tel. 708.544.3260 Fax: 708.544.8587 Toll Free: 800.783.LABS www.suburbanlabs.com

CHAIN OF CUSTODY RECORD

Electronic Version

Company Name: Luedtke Engineering Company
Company Address:
City: Frankfort State: MI Zip: 49635
Phone: Fax: ☐ Fax Report
Email Address: ☑ Email Report
Project ID / Location: Waukegan Harbor Dredging 2010
Project Manager (Report to): Jon Keillor
Sample Collector(s): Patrick Rodriguez

TURNAROUND TIME REQUESTED
☑ Normal ☐ RUSH* *Additional Rush Charges Approved
*Date & Time Needed:
Normal TAT is 5-7 work days for most work. Rush work must be pre-approved and additional charges apply.
Specify Regulatory Program: (Required) ☐ None/Info only
☐ LUST ☐ SRP ☐ SDWA
☐ 503 Sludge ☐ NPDES ☐ MWRDGC
☐ Disposal ☑ Other *Please specify in comment section below.

ANALYSIS & METHOD REQUESTED
Enter an "X" in box below for request

Page 1 of 1
PO No.
Shipping Method: SLI
QC Reporting Level ☐ 1 ☑ 2 ☐ 3
LAB USE ONLY
SLI Order No. 1007 D11
Sample containers supplied by customer? ☐ Yes
Temperature of Received Samples 6 °C
Samples received within 24 hours of collection? ☐ Yes

	SAMPLE IDENTIFICATION (Please use 1 line per container type)	COLLECTION DATE	COLLECTION TIME	MATRIX	GRAB/ COMP.	CONTAINERS Qty	CONTAINERS SIZE & TYPE	PRESERVATIVE	TSS	Chloride	Ammonia	Phosphorus	Hardness	R	Condition	Split	LAB #
1	Initial Sample Area 2 - Surface	7/29/10	13:35	SW	G	1	1LP	none	X	X							1A
2	↓	↓	↓	↓	↓	1	1LP	H2SO4			X	X					1B
3	↓	↓	↓	↓	↓	1	500p	HNO3					X				1C
4																	~~3A~~
5	Initial Sample Area 2 - Mid-depth	7/29/10	13:39	SW	G	1	1LP	none	X	X							~~3B~~ 2A
6	↓	↓	↓	↓	↓	1	1LP	H2SO4			X	X					~~2C~~ 2B
7	↓	↓	↓	↓	↓	1	500p	HNO3					X				~~3A~~ 2C
8																	~~3B~~ 2
9	Blind Duplicate	7/29/10	13:43	SW	G	1	1LP	none	X	X							~~2C~~ 3A
10	↓	↓	↓	↓	↓	1	1LP	H2SO4			X	X					3B TMA 7/30/10
11	↓	↓	↓	↓	↓	1	500p	HNO3					X				3C
12																	

MATRIX: Drinking Water (DW), Soil (S), Waste Water (WW), Surface Water(SW), Ground Water (GW), Solid Waste (WA), Sludge (U), Wipe (P) CONTAINER: 2oz, 4oz, 8oz, 40ml Vial, 500ml, Liter (L), Tube, Glass (G), Plastic (P) PRESERVATIVE: H_2SO_4, HCl, HNO_3, Methanol (MeOH) NaOH, Sodium Bisulfate (NaB), NaThio

COMMENTS & SPECIAL INSTRUCTIONS:

* Chicago District USACE - Waukegan Harbor Approach Channel Dredging project 2010

CONDITION CODES
1. Improper/damaged container/cap
2. Improper preservation
3. Insufficient sample volume
4. Headspace/air bubbles for VOCs
5. Received past holding time
6. Received frozen
7. Label conflicts with COC

1. Relinquished By	Date	2. Relinquished By	Date	3. Relinquished By	Date	4. Relinquished By	Date
	7/29/10	Patrick Rodriguez	7/29/10				
Received By: Debra Rodriguez ☐ Ice	Time: 915:10	Received By: Debra Rodriguez ☒ Ice	Time: ~~1435~~ 1635	Received By: ☐ Ice	Time	Received By: ☐ Ice	Time

Submission of samples subject to Terms and Conditions on back. Rev. 2/01/05 Please fill out this form completely, print, sign & submit with samples. Keep a copy for your records.

FIELD LOG

Suburban Laboratories, Inc.
4140 Litt Drive
Hillside, IL 60162-1183
P: (708) 544-3260 F: (708) 544-8587
www.SuburbanLabs.com

Luedtke Engineering Company

FY10 Dredging of Waukegan Harbor Approach Channel
Initial water sampling

Suburban Labs Field Sampling Technician(s) - PRINT: Patrick Rodriguez

Luedtke Engineering Rep. - PRINT: Tim Kibby

Weather and water conditions: Clear - Swells

Placement area (circle): 1 (2)

Eutech Inst. Oakton Field pH Meter, pHTestr 30 Serial No.: 1576094

	Initial Surface	Initial Mid-depth	Blind Duplicate	Additional Comments:
Sampling Technique:	grab	Kemmerer - grab	grab	
GPS coordinate (Lat./Long.) of sample collection:[1]	E087° 47' 51.0103" N42° 28' 42.2722"			
GPS coordinate (state plane) of sample collection:[1]				
Water column depth to the nearest foot:[1]	12			
Sampling depth to the nearest foot: (enter zero for surface water samples)	0	6	0	
Date & Time of collection:	7/29/10 13:38	7/29/10 13:49	7/29/10 13:43	
Sample appearance: (clear, tinted, dark, etc..)	Clear	Clear	Clear	
pH & Time of reading:	8.42	8.39	8.40	
Temperature (degrees C):	26.6°	25.1°	26.4°	
Blind Duplicate sample ID:				
Comments:				

See also chain of custody form for bottles and preservatives

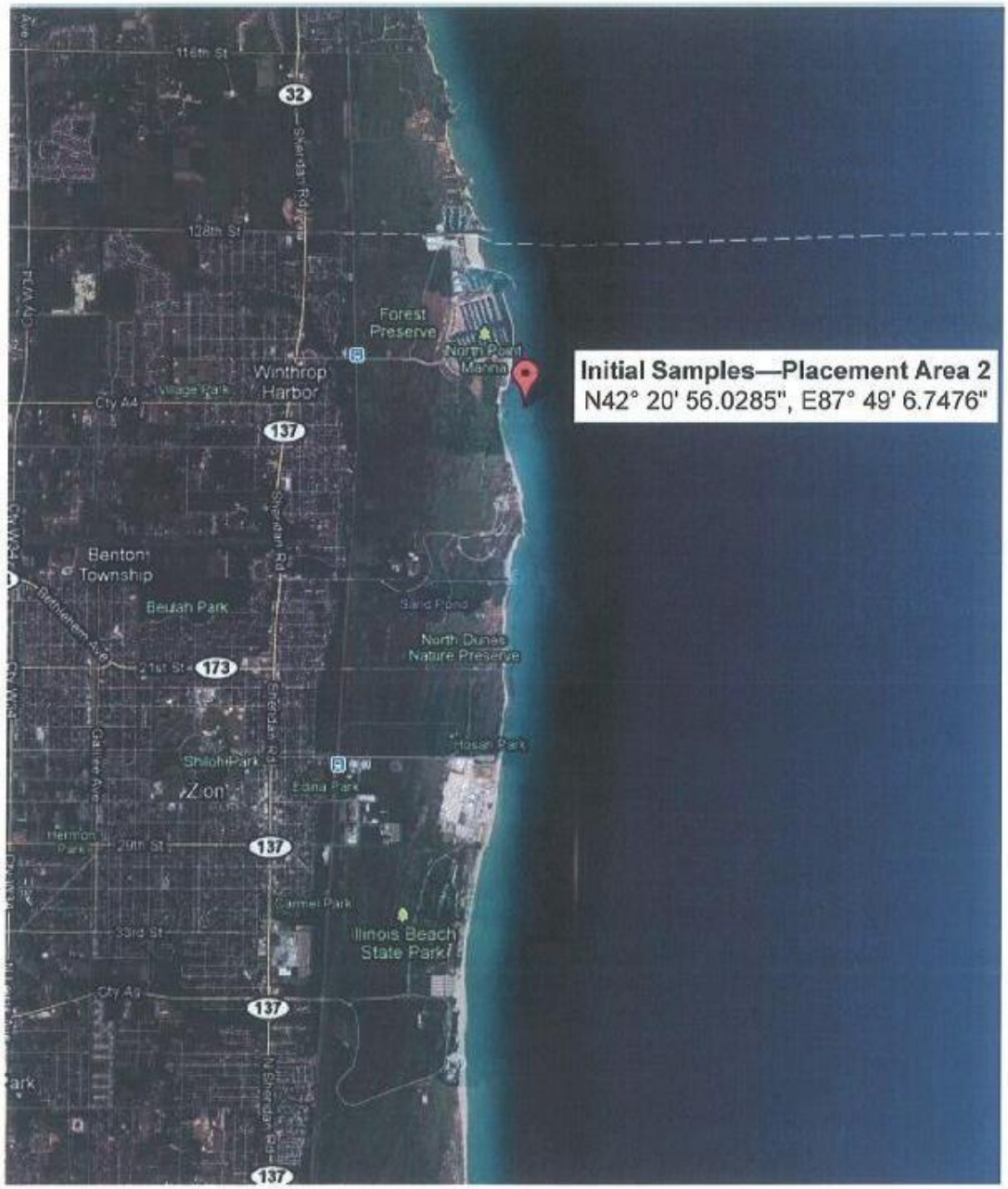
Version 0 09/16/2010

SIGNATURES:

SLI Field Tech 1: Patrick Rodriguez

SLI Field Tech 2:

Initial Samples—Placement Area 2
7/29/10



SUBURBAN LABORATORIES, Inc.

4140 Litt Drive Hillside, Illinois 60162
Tel. (708) 544-3260 Toll Free (800) 783-LABS
Fax (708-544-8587
www.suburbanlabs.com

September 07, 2010

Workorder: 1007D12

Jon Keillor
Luedtke Engineering Company
10 Fourth Street
P.O. Box 111
Frankfort, Michigan 49635

TEL: (231) 352-9631
FAX: (231) 352-7178
RE: Waukegan Harbor 2010 - Week 3,
Event 1 of 1

Dear Jon Keillor:

Suburban Laboratories, Inc. received 7 sample(s) on 07/29/10 for the analyses presented in the following report.

All data for the associated quality control (QC) met EPA, method, or internal laboratory specifications except where noted in the case narrative. If you are comparing these results to external QC specifications or compliance limits and have any questions, please contact us.

This final report of laboratory analysis consists of this cover letter, case narrative, analytical report, dates report, and any accompanying documentation on, but not limited to, chain of custody records, raw data, and letters of explanation or reliance. This report may not be reproduced, except in full, without the prior written approval of Suburban Laboratories, Inc.

If you have any questions regarding these test results, please call me at (708) 544-3260.

Sincerely,

Melissa Amador

Melissa Amador
Project Manager

Illinois Department of Public Health Accredited # 17585 Illinois Environmental Protection Agency Accredited #100225

Suburban Laboratories, Inc.

4140 Litt Drive, Hillside, IL 60162 (708) 544-3260

Case Narrative

Client: Luedtke Engineering Company
Project: Waukegan Harbor 2010 - Week 3, Event 1 of 1
WorkOrder: 1007D12
Temperature of samples upon receipt at SLI: 6 C

Date: September 07, 2010
PO #: 981-1
QC Level:
Chain of Custody #: Electronic

General Comments:
- All results reported in wet weight unless otherwise indicated. (dry = Dry Weight)
- Sample results relate only to the analytes of interest tested and to sample as received by the laboratory.
- Environmental compliance sample results meet the requirements of 35 IAC Part 186 unless otherwise indicated.
- Waste water analysis follows the rules set forth in 40 CFR part 136 except where otherwise noted.
- Accreditation by the State of Illinois is not an endorsement or a guarantee of the validity of data generated.
- For more information about the laboratories' scope of accreditation, please contact us at (708) 544-3260 or the Agency at (217) 782-6455.

Abbreviations:
- Reporting Limit: The concentration at which an analyte can be routinely detected on a day to day basis, and which also meets regulatory and client needs.
- Quantitation Limit: The lowest concentration at which results can be accurately quantitated.
- J: The analyte was positively identified above our Method Detection Limit and is considered detectable and usable; however, the associated numerical value is the approximate concentration of the analyte in the sample.
- ATC: Automatic Temperature Correction. - TNTC: Too Numerous To Count
- In Laboratory: EPA recommends this analyte be analyzed "immediately" (e.g., tests that should be performed in the field within 15 minutes of collection). Analytes with "immediate" hold times are analyzed as soon as possible upon receipt by the laboratory.
- TIC: Tentatively Identified Compound (GCMS library search identification, concentration estimated to nearest internal standard).

Method References:
For a complete list of method references please contact us.
- E: USEPA Reference methods
- SW: USEPA, Test Methods for Evaluating Solid Waste (SW-846)
- M: Standard Methods for the Examination of Water and Wastewater
- USP: Latest version of United States Pharmacopeia

Workorder Specific Comments:

This report supersedes the report dated 8/5/10.

Suburban Laboratories, Inc.
4140 Litt Drive, Hillside, IL 60162 (708) 544-3260

Laboratory Results

Client ID: Luedtke Engineering Company
Project Name: Waukegan Harbor 2010 - Week 3, Event 1 of 1
Report Date: September 07, 2010
Lab Order: **1007D12**

Client Sample ID: 1hr-500' Downstream Surface
Lab ID: 1007D12-001 **Date Received:** 07/29/2010 4:35 PM
Matrix: SURFACE WATER
Collection Date: 07/29/2010 12:05 PM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
CHLORIDE		Method: APHA-M4500-Cl⁻ E-Rev 18th, 1992				Analyst: lb	
Chloride	10.8	0.500		mg/L	1	08/04/2010 2:21 PM	R4332
FIELD PARAMETERS		Method: E150.1-FIELD				Analyst:	
pH, Field	8.52			pH		07/29/2010 12:05 PM	
Temperature	26.7			C		07/29/2010 12:05 PM	
HARDNESS, TOTAL		Method: SM-2340B-Rev 18Ed, 1992				Analyst: mn	
Hardness, Ca/Mg (As CaCO3)	131	0.050	c	mg/L	1	08/03/2010 12:00 AM	1444
AMMONIA, BY SELECTIVE ELECTRODE		Method: SM-M4500NH3 F-Rev 18Ed, 1992				Analyst: lb	
Nitrogen, Ammonia (As N)	ND	0.0100		mg/L	1	08/04/2010 3:44 PM	R4336
PHOSPHORUS, TOTAL		Method: SM-M4500P BE-Rev 18Ed, 1992				Analyst: sb	
Phosphorus (As P)	0.0134	0.00500		mg/L	1	08/03/2010 4:43 PM	1464
TOTAL SUSPENDED SOLIDS		Method: SM-M2540D-Rev 18Ed, 1992				Analyst: jos	
Residue, Non-Filterable	ND	0.500		mg/L	1	08/03/2010 4:30 PM	R4296

Client Sample ID: 1hr-500' Downstream Mid-Depth
Lab ID: 1007D12-002 **Date Received:** 07/29/2010 4:35 PM
Matrix: SURFACE WATER
Collection Date: 07/29/2010 12:10 PM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
CHLORIDE		Method: APHA-M4500-Cl⁻ E-Rev 18th, 1992				Analyst: lb	
Chloride	9.98	0.500		mg/L	1	08/04/2010 2:21 PM	R4332
FIELD PARAMETERS		Method: E150.1-FIELD				Analyst:	
pH, Field	8.46			pH		07/29/2010 12:10 PM	
Temperature	26.0			C		07/29/2010 12:10 PM	
HARDNESS, TOTAL		Method: SM-2340B-Rev 18Ed, 1992				Analyst: mn	
Hardness, Ca/Mg (As CaCO3)	133	0.050	c	mg/L	1	08/03/2010 12:00 AM	1444
AMMONIA, BY SELECTIVE ELECTRODE		Method: SM-M4500NH3 F-Rev 18Ed, 1992				Analyst: lb	
Nitrogen, Ammonia (As N)	ND	0.0100		mg/L	1	08/04/2010 3:44 PM	R4336
PHOSPHORUS, TOTAL		Method: SM-M4500P BE-Rev 18Ed, 1992				Analyst: sb	
Phosphorus (As P)	0.00562	0.00500	J	mg/L	1	08/03/2010 4:43 PM	1464
TOTAL SUSPENDED SOLIDS		Method: SM-M2540D-Rev 18Ed, 1992				Analyst: jos	
Residue, Non-Filterable	ND	0.500		mg/L	1	08/03/2010 4:30 PM	R4296

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
c	Analyte not in SLI scope of accreditation	E	Estimated, detected above quantitation range
G	Refer to case narrative page for specific comments	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limit (QL)	N	Tentatively identified compounds
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits

Suburban Laboratories, Inc.
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Laboratory Results

Client ID: Luedtke Engineering Company
Project Name: Waukegan Harbor 2010 - Week 3, Event 1 of 1
Report Date: September 07, 2010
Lab Order: **1007D12**

Client Sample ID: 4hr-500' Downstream Surface
Lab ID: 1007D12-003 **Date Received:** 07/29/2010 4:35 PM
Matrix: SURFACE WATER
Collection Date: 07/29/2010 2:50 PM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
CHLORIDE		Method: APHA-M4500-Cl⁻ E-Rev 18th, 1992				Analyst: lb	
Chloride	10.4	0.500		mg/L	1	08/04/2010 2:21 PM	R4332
FIELD PARAMETERS		Method: E150.1-FIELD				Analyst:	
pH, Field	8.46			pH		07/29/2010 2:50 PM	
Temperature	26.8			C		07/29/2010 2:50 PM	
HARDNESS, TOTAL		Method: SM-2340B-Rev 18Ed, 1992				Analyst: mn	
Hardness, Ca/Mg (As CaCO3)	130	0.050	c	mg/L	1	08/03/2010 12:00 AM	1444
AMMONIA, BY SELECTIVE ELECTRODE		Method: SM-M4500NH3 F-Rev 18Ed, 1992				Analyst: lb	
Nitrogen, Ammonia (As N)	ND	0.0100		mg/L	1	08/04/2010 3:44 PM	R4336
PHOSPHORUS, TOTAL		Method: SM-M4500P BE-Rev 18Ed, 1992				Analyst: sb	
Phosphorus (As P)	0.0212	0.00500		mg/L	1	08/03/2010 4:43 PM	1464
TOTAL SUSPENDED SOLIDS		Method: SM-M2540D-Rev 18Ed, 1992				Analyst: jos	
Residue, Non-Filterable	ND	0.500		mg/L	1	08/03/2010 4:30 PM	R4296

Client Sample ID: 4hr-500' Downstream Mid-Depth
Lab ID: 1007D12-004 **Date Received:** 07/29/2010 4:35 PM
Matrix: SURFACE WATER
Collection Date: 07/29/2010 2:55 PM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
CHLORIDE		Method: APHA-M4500-Cl⁻ E-Rev 18th, 1992				Analyst: lb	
Chloride	9.67	0.500		mg/L	1	08/04/2010 2:21 PM	R4332
FIELD PARAMETERS		Method: E150.1-FIELD				Analyst:	
pH, Field	8.39			pH		07/29/2010 2:55 PM	
Temperature	25.7			C		07/29/2010 2:55 PM	
HARDNESS, TOTAL		Method: SM-2340B-Rev 18Ed, 1992				Analyst: mn	
Hardness, Ca/Mg (As CaCO3)	140	0.050	c	mg/L	1	08/03/2010 12:00 AM	1444
AMMONIA, BY SELECTIVE ELECTRODE		Method: SM-M4500NH3 F-Rev 18Ed, 1992				Analyst: lb	
Nitrogen, Ammonia (As N)	ND	0.0100		mg/L	1	08/04/2010 3:44 PM	R4336
PHOSPHORUS, TOTAL		Method: SM-M4500P BE-Rev 18Ed, 1992				Analyst: sb	
Phosphorus (As P)	ND	0.00500		mg/L	1	08/03/2010 4:43 PM	1464
TOTAL SUSPENDED SOLIDS		Method: SM-M2540D-Rev 18Ed, 1992				Analyst: jos	
Residue, Non-Filterable	ND	0.500		mg/L	1	08/03/2010 4:30 PM	R4296

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
c	Analyte not in SLI scope of accreditation	E	Estimated, detected above quantitation range
G	Refer to case narrative page for specific comments	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limit (QL)	N	Tentatively identified compounds
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits

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Laboratory Results

Client ID: Luedtke Engineering Company
Project Name: Waukegan Harbor 2010 - Week 3, Event 1 of 1
Report Date: September 07, 2010
Lab Order: **1007D12**

Client Sample ID: **1000' Upstream Surface**
Lab ID: 1007D12-005 **Date Received:** 07/29/2010 4:35 PM
Matrix: SURFACE WATER
Collection Date: 07/29/2010 12:20 PM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
CHLORIDE		Method: APHA-M4500-Cl⁻ E-Rev 18th, 1992				Analyst: lb	
Chloride	10.5	0.500		mg/L	1	08/05/2010 2:26 PM	R4382
FIELD PARAMETERS		Method: E150.1-FIELD				Analyst:	
pH, Field	8.44			pH		07/29/2010 12:20 PM	
Temperature	26.0			C		07/29/2010 12:20 PM	
HARDNESS, TOTAL		Method: SM-2340B-Rev 18Ed, 1992				Analyst: mn	
Hardness, Ca/Mg (As CaCO3)	130	0.050	c	mg/L	1	08/03/2010 12:00 AM	1444
AMMONIA, BY SELECTIVE ELECTRODE		Method: SM-M4500NH3 F-Rev 18Ed, 1992				Analyst: lb	
Nitrogen, Ammonia (As N)	ND	0.0100		mg/L	1	08/04/2010 3:44 PM	R4336
PHOSPHORUS, TOTAL		Method: SM-M4500P BE-Rev 18Ed, 1992				Analyst: sb	
Phosphorus (As P)	ND	0.00500		mg/L	1	08/03/2010 4:43 PM	1464
TOTAL SUSPENDED SOLIDS		Method: SM-M2540D-Rev 18Ed, 1992				Analyst: jos	
Residue, Non-Filterable	1.50	0.500	J	mg/L	1	08/03/2010 4:30 PM	R4296

Client Sample ID: **1000' Upstream Mid-Depth**
Lab ID: 1007D12-006 **Date Received:** 07/29/2010 4:35 PM
Matrix: SURFACE WATER
Collection Date: 07/29/2010 12:25 PM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
CHLORIDE		Method: APHA-M4500-Cl⁻ E-Rev 18th, 1992				Analyst: lb	
Chloride	9.44	0.500		mg/L	1	08/04/2010 2:21 PM	R4332
FIELD PARAMETERS		Method: E150.1-FIELD				Analyst:	
pH, Field	8.44			pH		07/29/2010 12:25 PM	
Temperature	25.7			C		07/29/2010 12:25 PM	
HARDNESS, TOTAL		Method: SM-2340B-Rev 18Ed, 1992				Analyst: mn	
Hardness, Ca/Mg (As CaCO3)	135	0.050	c	mg/L	1	08/03/2010 12:00 AM	1444
AMMONIA, BY SELECTIVE ELECTRODE		Method: SM-M4500NH3 F-Rev 18Ed, 1992				Analyst: lb	
Nitrogen, Ammonia (As N)	ND	0.0100		mg/L	1	08/04/2010 3:44 PM	R4336
PHOSPHORUS, TOTAL		Method: SM-M4500P BE-Rev 18Ed, 1992				Analyst: sb	
Phosphorus (As P)	0.0134	0.00500		mg/L	1	08/03/2010 4:43 PM	1464
TOTAL SUSPENDED SOLIDS		Method: SM-M2540D-Rev 18Ed, 1992				Analyst: jos	
Residue, Non-Filterable	0.500	0.500	J	mg/L	1	08/03/2010 4:30 PM	R4296

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
c	Analyte not in SLI scope of accreditation	E	Estimated, detected above quantitation range
G	Refer to case narrative page for specific comments	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limit (QL)	N	Tentatively identified compounds
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits

Suburban Laboratories, Inc.

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Laboratory Results

Client ID: Luedtke Engineering Company
Project Name: Waukegan Harbor 2010 - Week 3, Event 1 of 1

Report Date: September 07, 2010
Lab Order: **1007D12**

Client Sample ID: **Blind Duplicate**
Lab ID: 1007D12-007 **Date Received:** 07/29/2010 4:35 PM

Matrix: SURFACE WATER
Collection Date: 07/29/2010 3:00 PM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
CHLORIDE		Method: APHA-M4500-Cl⁻ E-Rev 18th, 1992				Analyst: lb	
Chloride	9.88	0.500		mg/L	1	08/04/2010 2:21 PM	R4332
FIELD PARAMETERS		Method: E150.1-FIELD				Analyst:	
pH, Field	8.38			pH		07/29/2010 3:00 PM	
Temperature	25.8			C		07/29/2010 3:00 PM	
HARDNESS, TOTAL		Method: SM-2340B-Rev 18Ed, 1992				Analyst: mn	
Hardness, Ca/Mg (As CaCO3)	135	0.050	c	mg/L	1	08/03/2010 12:00 AM	1444
AMMONIA, BY SELECTIVE ELECTRODE		Method: SM-M4500NH3 F-Rev 18Ed, 1992				Analyst: lb	
Nitrogen, Ammonia (As N)	ND	0.0100		mg/L	1	08/04/2010 3:44 PM	R4336
PHOSPHORUS, TOTAL		Method: SM-M4500P BE-Rev 18Ed, 1992				Analyst: sb	
Phosphorus (As P)	ND	0.00500		mg/L	1	08/03/2010 4:43 PM	1464
TOTAL SUSPENDED SOLIDS		Method: SM-M2540D-Rev 18Ed, 1992				Analyst: jos	
Residue, Non-Filterable	ND	0.500		mg/L	1	08/03/2010 4:30 PM	R4296

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
c	Analyte not in SLI scope of accreditation	E	Estimated, detected above quantitation range
G	Refer to case narrative page for specific comments	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limit (QL)	N	Tentatively identified compounds
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits

Suburban Laboratories, Inc.

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PREP DATES REPOR

Client: Luedtke Engineering Company

Project: Waukegan Harbor 2010 - Week 3,

Report Date: September 07, 2010

Lab Order: **1007D12**

Sample ID	Collection Date	Batch ID	Prep Method	Prep Test Name	TCLP Date	Prep Date
1007D12-001B	07/29/10 12:05:00 P	1464	P_WW_LOWPR	PHOSPHORUS, TOTAL		08/03/10
1007D12-001C		1444	200.2_ICPWW_	AQUEOUS PREP T/R METALS: ICP		08/02/10
1007D12-002B	07/29/10 12:10:00 P	1464	P_WW_LOWPR	PHOSPHORUS, TOTAL		08/03/10
1007D12-002C		1444	200.2_ICPWW_	AQUEOUS PREP T/R METALS: ICP		08/02/10
1007D12-003B	07/29/10 2:50:00 PM	1464	P_WW_LOWPR	PHOSPHORUS, TOTAL		08/03/10
1007D12-003C		1444	200.2_ICPWW_	AQUEOUS PREP T/R METALS: ICP		08/02/10
1007D12-004B	07/29/10 2:55:00 PM	1464	P_WW_LOWPR	PHOSPHORUS, TOTAL		08/03/10
1007D12-004C		1444	200.2_ICPWW_	AQUEOUS PREP T/R METALS: ICP		08/02/10
1007D12-005B	07/29/10 12:20:00 P	1464	P_WW_LOWPR	PHOSPHORUS, TOTAL		08/03/10
1007D12-005C		1444	200.2_ICPWW_	AQUEOUS PREP T/R METALS: ICP		08/02/10
1007D12-006B	07/29/10 12:25:00 P	1464	P_WW_LOWPR	PHOSPHORUS, TOTAL		08/03/10
1007D12-006C		1444	200.2_ICPWW_	AQUEOUS PREP T/R METALS: ICP		08/02/10
1007D12-007B	07/29/10 3:00:00 PM	1464	P_WW_LOWPR	PHOSPHORUS, TOTAL		08/03/10
1007D12-007C		1444	200.2_ICPWW_	AQUEOUS PREP T/R METALS: ICP		08/02/10

3
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Website: www.SuburbanLabs.com

QC SUMMARY REPORT

WO#: **1007D12**
07-Sep-10

Client: Luedtke Engineering Company
Project: Waukegan Harbor 2010 - Week 3, Event 1 of 1 **TestCode:** **CL_WW1**

Sample ID: **MB-R4332** SampType: **MBLK** TestCode: **CL_WW1** Units: **mg/L** Prep Date: RunNo: **4332**
Client ID: **PBW** Batch ID: **R4332** TestNo: **A4500-Cl- E** Analysis Date: **08/04/10** SeqNo: **86405**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	1.63	5.00									J

Sample ID: **LCS-R4332** SampType: **LCS** TestCode: **CL_WW1** Units: **mg/L** Prep Date: RunNo: **4332**
Client ID: **LCSW** Batch ID: **R4332** TestNo: **A4500-Cl- E** Analysis Date: **08/04/10** SeqNo: **86406**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	104	5.00	100.0	0	104	85	115				

Sample ID: **1007C12-001AMS** SampType: **MS** TestCode: **CL_WW1** Units: **mg/L** Prep Date: RunNo: **4332**
Client ID: **ZZZZZZ** Batch ID: **R4332** TestNo: **A4500-Cl- E** Analysis Date: **08/04/10** SeqNo: **86408**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	137	5.00	100.0	42.60	94.7	80	120				

Sample ID: **1007C12-001AMSD** SampType: **MSD** TestCode: **CL_WW1** Units: **mg/L** Prep Date: RunNo: **4332**
Client ID: **ZZZZZZ** Batch ID: **R4332** TestNo: **A4500-Cl- E** Analysis Date: **08/04/10** SeqNo: **86409**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	138	5.00	100.0	42.60	95.6	80	120	137.3	0.646	20	

Sample ID: **MB-R4382** SampType: **MBLK** TestCode: **CL_WW1** Units: **mg/L** Prep Date: RunNo: **4382**
Client ID: **PBW** Batch ID: **R4382** TestNo: **A4500-Cl- E** Analysis Date: **08/05/10** SeqNo: **87798**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	ND	5.00									

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level	E	Estimated, detected above quantitation range	H	Holding times for preparation or analysis exceede
M	Manual Integration used to determine area response	ND	Not Detected at the Reporting Limit	P	Second column confirmation exceeds
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

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Website: www.SuburbanLabs.com

QC SUMMARY REPORT

WO#: **1007D12**

07-Sep-10

Client: Luedtke Engineering Company

Project: Waukegan Harbor 2010 - Week 3, Event 1 of 1

TestCode: **CL_WW1**

Sample ID: **LCS-R4382** SampType: **LCS** TestCode: **CL_WW1** Units: **mg/L** Prep Date: RunNo: **4382**

Client ID: **LCSW** Batch ID: **R4382** TestNo: **A4500-Cl- E** Analysis Date: **08/05/10** SeqNo: **87799**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	100	5.00	100.0	0	100	85	115				

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level	E	Estimated, detected above quantitation range	H	Holding times for preparation or analysis exceede
M	Manual Integration used to determine area response	ND	Not Detected at the Reporting Limit	P	Second column confirmation exceeds
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

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QC SUMMARY REPORT

WO#: **1007D12**
07-Sep-10

Client: Luedtke Engineering Company
Project: Waukegan Harbor 2010 - Week 3, Event 1 of 1 **TestCode:** **P_WW_LOW**

Sample ID: **LCS-1464** SampType: **LCS** TestCode: **P_WW_LOW** Units: **mg/L** Prep Date: **08/03/10** RunNo: **4312**
Client ID: **LCSW** Batch ID: **1464** TestNo: **A4500-P BE** **A4500-P BE** Analysis Date: **08/03/10** SeqNo: **85965**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Phosphorus (As P)	0.0497	0.0120	0.05000	0	99.4	85	115				

Sample ID: **MB-1464** SampType: **MBLK** TestCode: **P_WW_LOW** Units: **mg/L** Prep Date: **08/03/10** RunNo: **4312**
Client ID: **PBW** Batch ID: **1464** TestNo: **A4500-P BE** **A4500-P BE** Analysis Date: **08/03/10** SeqNo: **85966**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Phosphorus (As P)	ND	0.0120									

Sample ID: **1007D11-001BMS** SampType: **MS** TestCode: **P_WW_LOW** Units: **mg/L** Prep Date: **08/03/10** RunNo: **4312**
Client ID: **ZZZZZZ** Batch ID: **1464** TestNo: **A4500-P BE** **A4500-P BE** Analysis Date: **08/03/10** SeqNo: **85968**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Phosphorus (As P)	0.0503	0.0120	0.05000	0	101	80	120				

Sample ID: **1007D11-001BMSD** SampType: **MSD** TestCode: **P_WW_LOW** Units: **mg/L** Prep Date: **08/03/10** RunNo: **4312**
Client ID: **ZZZZZZ** Batch ID: **1464** TestNo: **A4500-P BE** **A4500-P BE** Analysis Date: **08/03/10** SeqNo: **85969**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Phosphorus (As P)	0.0542	0.0120	0.05000	0	108	80	120	0.05032	7.46	13.7	

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level	E	Estimated, detected above quantitation range	H	Holding times for preparation or analysis exceede
M	Manual Integration used to determine area response	ND	Not Detected at the Reporting Limit	P	Second column confirmation exceeds
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

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QC SUMMARY REPORT

WO#: **1007D12**
07-Sep-10

Client: Luedtke Engineering Company
Project: Waukegan Harbor 2010 - Week 3, Event 1 of 1 **TestCode:** **TSS**

Sample ID: **MB-R4296** SampType: **MBLK** TestCode: **TSS** Units: **mg/L** Prep Date: RunNo: **4296**
Client ID: **PBW** Batch ID: **R4296** TestNo: **A2540D** Analysis Date: **08/03/10** SeqNo: **85883**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Residue, Non-Filterable	ND	1.00									

Sample ID: **1007D07-005ADUP** SampType: **DUP** TestCode: **TSS** Units: **mg/L** Prep Date: RunNo: **4296**
Client ID: **ZZZZZZ** Batch ID: **R4296** TestNo: **A2540D** Analysis Date: **08/03/10** SeqNo: **85885**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Residue, Non-Filterable	0.500	2.50						0.5000	0	10	J

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level	E	Estimated, detected above quantitation range	H	Holding times for preparation or analysis exceede
M	Manual Integration used to determine area response	ND	Not Detected at the Reporting Limit	P	Second column confirmation exceeds
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

SUBURBAN LABORATORIES, Inc.

4140 Litt Drive Hillside, IL 60162 Tel 708.544.3260 Fax: 708.544.8587 Toll Free: 800.783.LABS www.suburbanlabs.com

CHAIN OF CUSTODY RECORD

Electronic Version

Company Name: Luedtke Engineering Company

Company Address:

City: Frankfort State: MI Zip: 49635

Phone: Fax: ☐ Fax Report

Email Address: ☑ Email Report

Project ID / Location: Waukegan Harbor Dredging 2010 - Week 3, Event 1

Project Manager (Report to): Jon Keillor

Sample Collector(s): Patrick Rodriguez

TURNAROUND TIME REQUESTED: ☑ Normal ☐ RUSH* *Additional Rush Charges Approved.

*Date & Time Needed:

Normal TAT is 5-7 work days for most work. Rush work must be pre-approved and additional charges apply.

Specify Regulatory Program: (Required) ☐ None/Info only

☐ LUST ☐ SRP ☐ SDWA

☐ 503 Sludge ☐ NPDES ☐ MWRDGC

☐ Disposal ☑ Other *Please specify in comment section below.

ANALYSIS & METHOD REQUESTED

Enter an "X" in box below for request

Page 1 of 2

PO No.:

Shipping Method: SLI

QC Reporting Level: ☐ 1 ☑ 2 ☐ 3

LAB USE ONLY

SLI Order No.: 1007 012

Sample containers supplied by customer? ☐ Yes

Temperature of Received Samples: 6 °C

Samples received within 24 hours of collection? ☐ Yes

	SAMPLE IDENTIFICATION (Please use 1 line per container type)	COLLECTION DATE	COLLECTION TIME	MATRIX	GRAB/ COMP.	CONTAINERS Qty	CONTAINERS SIZE & TYPE	PRESERVATIVE	TSS	Chloride	Ammonia	Phosphorus	Hardness						R	Condition	Spill	LAB #
1	1hr-500' downstream, surface	7/29/10	12:05	SW	G	1	1LP	none	X	X												1A
2						1	1LP	H2SO4			X	X										1B
3						1	500p	HNO3					X									1C
4	1hr-500' downstream, mid-depth	7/29/10	12:10	SW	G	1	1LP	none	X	X												2A
5						1	1LP	H2SO4			X	X										2B
6						1	500p	HNO3					X									2C
7	4hr-500' downstream, surface	7/29/10	14:50	SW	G	1	1LP	none	X	X												3A
8						1	1LP	H2SO4			X	X										3B
9																						3C
10	4hr-500' downstream, mid-depth	7/29/10	14:55	SW	G	1	1LP	none	X	X												4A
11						1	1LP	H2SO4			X	X										4B
12						1	500p	HNO3					X									4C

MATRIX: Drinking Water (DW), Soil (S), Waste Water (WW), Surface Water(SW), Ground Water (GW), Solid Waste (WA), Sludge (U), Wipe (P) **CONTAINER:** 2oz 4oz, 8oz, 40ml Vial, 500ml, Liter (L), Tube, Glass (G), Plastic (P) **PRESERVATIVE:** H_2SO_4, HCl, HNO_3, Methanol (MeOH) NaOH, Sodium Bisulfate (NaB), NaThio

COMMENTS & SPECIAL INSTRUCTIONS:

* Chicago District USACE - Waukegan Harbor Approach Channel Dredging project 2010

CONDITION CODES

1. Improper/damaged container/cap
2. Improper preservation
3. Insufficient sample volume
4. Headspace/air bubbles for VOCs
5. Received past holding time
6. Received frozen
7. Label conflicts with COC

1. Relinquished By	Date	2. Relinquished By	Date	3. Relinquished By	Date	4. Relinquished By	Date
	7/29/10	Patrick Rodriguez	7/29/10				
Received By: Patrick Rodriguez ☐ Ice	Time: 15:10	Received By: Patrick Rodriguez ☒ Ice	Time: ~~14:55~~ 16:35	Received By: ☐ Ice	Time	Received By: ☐ Ice	Time

Submission of samples subject to Terms and Conditions on back. Rev. 2/01/05 Please fill out this form completely, print, sign & submit with samples. Keep a copy for your records.

SUBURBAN LABORATORIES, Inc.

4140 Litt Drive Hillside, IL 60162 Tel. 708.544.3260 Fax: 708.544.8587 Toll Free: 800.783.LABS www.suburbanlabs.com

CHAIN OF CUSTODY RECORD

Electronic Version

Company Name: Luedtke Engineering Company

Company Address:

City: Frankfort State: MI Zip: 49635

Phone: Fax: ☐ Fax Report

Email Address: ☑ Email Report

Project ID / Location: Waukegan Harbor Dredging 2010 - Week 3, Event 1

Project Manager (Report to): Jon Keillor

Sample Collector(s): Patrick Rodriguez

TURNAROUND TIME REQUESTED: ☑ Normal ☐ RUSH* *Additional Rush Charges Approved.

*Date & Time Needed:

Normal TAT is 5-7 work days for most work. Rush work must be pre-approved and additional charges apply

Specify Regulatory Program: (Required) ☐ None/Info only

☐ LUST ☐ SRP ☐ SDWA

☐ 503 Sludge ☐ NPDES ☐ MWRDGC

☐ Disposal ☑ Other *Please specify in comment section below.

ANALYSIS & METHOD REQUESTED: Enter an "X" in box below for request

Page 2 of 2

PO No.:

Shipping Method: SLI

QC Reporting Level: ☐ 1 ☑ 2 ☐ 3

LAB USE ONLY

SLI Order No.: 1007D12

Sample containers supplied by customer? ☐ Yes

Temperature of Received Samples: 6 °C

Samples received within 24 hours of collection? ☐ Yes

	SAMPLE IDENTIFICATION (Please use 1 line per container type)	COLLECTION DATE	COLLECTION TIME	MATRIX	GRAB/ COMP.	CONTAINERS Qty	CONTAINERS SIZE & TYPE	PRESERVATIVE	TSS	Chloride	Ammonia	Phosphorus	Hardness	R	Condition	Split	LAB #
1	1000' upstream, surface	7/29/10	12:20	SW	G	1	1LP	none	X	X							5A
2	↓	↓	↓	↓	↓	1	1LP	H2SO4			X	X					5B
3	↓	↓	↓	↓	↓	1	500p	HNO3					X				5C
4	1000' upstream, mid-depth	7/29/10	12:25	SW	G	1	1LP	none	X	X							6A
5	↓	↓	↓	↓	↓	1	1LP	H2SO4			X	X					6B
6	↓	↓	↓	↓	↓	1	500p	HNO3					X				6C
7	Blind duplicate	7/29/10	15:00	SW	G	1	1LP	none	X	X							7A
8	↓	↓	↓	↓	↓	1	1LP	H2SO4			X	X					7B
9	↓	↓	↓	↓	↓	1	500p	HNO3					X				7C
10																	
11																	
12																	

MATRIX: Drinking Water (DW), Soil (S), Waste Water (WW), Surface Water(SW), Ground Water (GW), Solid Waste (WA), Sludge (L), Wipe (P) CONTAINER: 2oz, 4oz, 8oz, 40ml Vial, 500ml, Liter (L), Tube, Glass (G), Plastic (P) PRESERVATIVE: H_2SO_4, HCl, HNO_3, Methanol (MeOH) NaOH, Sodium Bisulfate (NaB), NaThio

COMMENTS & SPECIAL INSTRUCTIONS:

* Chicago District USACE - Waukegan Harbor Approach Channel Dredging project 2010

CONDITION CODES
1. Improper/damaged container/cap
2. Improper preservation
3. Insufficient sample volume
4. Headspace/air bubbles for VOCs
5. Received past holding time
6. Received frozen
7. Label conflicts with COC

1. Relinquished By	Date	2. Relinquished By	Date	3. Relinquished By	Date	4. Relinquished By	Date
Received By ☐ Ice	Time 15:10	Received By ☑ Ice	Time 14:35	Received By ☐ Ice	Time	Received By ☐ Ice	Time

Submission of samples subject to Terms and Conditions on back. Rev. 2/01/06 Please fill out this form completely, print, sign & submit with samples. Keep a copy for your records.

FIELD LOG

Suburban Laboratories, Inc.
4140 Litt Drive
Hillside, IL 60162-1183
P: (708) 544-3260 F: (708) 544-8587
www.SuburbanLabs.com

Luedtke Engineering Company

FY10 Dredging of Waukegan Harbor Approach Channel
Weekly water sampling

Suburban Labs Field Sampling Technician(s) - PRINT: Patrick Rodriguez	Placement area (circle): 1 2		Eutech Inst. Oakton Field pH Meter, pHTestr 30 Serial No.: 15760094
Luedtke Engineering Rep. - PRINT: Tim Kibby	GPS coordinates of discharge point:[1] E087°49'20.185" N42° 20' 29.4144'		Scow name and quantity of discharge:[1] 17 900 yds
Weather and water conditions: Clear - Swells	Date of Discharge: 7/29/10		Time of Discharge:[1] 10:53

	1hr-500' downstream Surface	1hr-500' downstream Mid-depth	4hr-500' downstream Surface	4hr-500' downstream Mid-depth
Sampling Technique:	grab	Kemmerer - grab	grab	Kemmerer - grab
GPS coordinate (Lat./Long.) of sample collection:[1]	E087° 49' 19.7903'	N42° 20' 24.4727'		
GPS coordinate (state plane) of sample collection:[1]				
Water column depth to the nearest foot:[1]	17		17	
Sampling depth to the nearest foot: (enter zero for surface water samples)	0	8	0	8
Date & Time of collection:	7/29/10 12:05	7/29/10 12:10	7/29/10 14:50	7/29/10 14:55
Sample appearance: (clear, tinted, dark, etc.)	Clear	Clear	Clear	Clear
pH & Time of reading:	8.52	8.46	8.46	8.39
Temperature (degrees C):	26.7°	26.0°	26.8°	25.7
Comments:				

Additional Comments:

See also chain of custody form for bottles and preservatives

Version 0 06/16/2010

FIELD LOG

Suburban Laboratories, Inc.
4140 Litt Drive
Hillside, IL 60162-1183
P: (708) 544-3260 F: (708) 544-8537
www.SuburbanLabs.com

Luedtke Engineering Company

FY10 Dredging of Waukegan Harbor Approach Channel
Weekly water sampling

Date of Discharge: 7/29/10

	1000' upstream Surface	1000' upstream Mid-depth	Blind Duplicate	Additional Comments:
Sampling Technique:	grab	Kemmerer - grab		
GPS coordinate (Lat./Long.) of sample collection:[1]	E087° 49' 19.5417" N42° 20' 39.2939"			
GPS coordinate (state plane) of sample collection:[1]				
Water column depth to the nearest foot:[1]	16		17	
Sampling depth to the nearest foot: (enter zero for surface water samples)	0	8	9	
Date & Time of collection:	7/29/10 12:20	7/29/10 12:25	7/29/10 15:05	
Sample appearance: (clear, tinted, dark, etc..)	Clear	Clear	Clear	
pH & Time of reading:	8.44	8.44	8.38	
Temperature (degrees C):	26.0	25.7	25.8	
Blind Duplicate sample ID:				
Comments:				

See also chain of custody form for bottles and preservatives

Version 0 06/16/2010

SIGNATURES:

SLI Field Tech 1: Tatiana Rodriguez

SLI Field Tech 2: _____

Week 3, Event 1
7/29/10

SUBURBAN LABORATORIES, Inc.

4140 Litt Drive Hillside, Illinois 60162
Tel. (708) 544-3260 Toll Free (800) 783-LABS
Fax (708-544-8587
www.suburbanlabs.com

September 07, 2010

Workorder: 1008319

Jon Keillor
Luedtke Engineering Company
10 Fourth Street
P.O. Box 111
Frankfort, Michigan 49635

TEL: (231) 352-9631
FAX: (231) 352-7178
RE: Waukegan Harbor 2010 - Week 4,
Event 1 of 1

Dear Jon Keillor:

Suburban Laboratories, Inc. received 7 sample(s) on 08/06/10 for the analyses presented in the following report.

All data for the associated quality control (QC) met EPA, method, or internal laboratory specifications except where noted in the case narrative. If you are comparing these results to external QC specifications or compliance limits and have any questions, please contact us.

This final report of laboratory analysis consists of this cover letter, case narrative, analytical report, dates report, and any accompanying documentation on, but not limited to, chain of custody records, raw data, and letters of explanation or reliance. This report may not be reproduced, except in full, without the prior written approval of Suburban Laboratories, Inc.

If you have any questions regarding these test results, please call me at (708) 544-3260.

Sincerely,

Melissa Amador

Melissa Amador
Project Manager

Suburban Laboratories, Inc.

4140 Litt Drive, Hillside, IL 60162 (708) 544-3260

Case Narrative

Client: Luedtke Engineering Company
Project: Waukegan Harbor 2010 - Week 4, Event 1 of 1
WorkOrder: 1008319
Temperature of samples upon receipt at SLI: 6 C

Date: September 07, 2010
PO #: 981-1
QC Level:
Chain of Custody #: Electronic

General Comments:
- All results reported in wet weight unless otherwise indicated. (dry = Dry Weight)
- Sample results relate only to the analytes of interest tested and to sample as received by the laboratory.
- Environmental compliance sample results meet the requirements of 35 IAC Part 186 unless otherwise indicated.
- Waste water analysis follows the rules set forth in 40 CFR part 136 except where otherwise noted.
- Accreditation by the State of Illinois is not an endorsement or a guarantee of the validity of data generated.
- For more information about the laboratories' scope of accreditation, please contact us at (708) 544-3260 or the Agency at (217) 782-6455.

Abbreviations:
- Reporting Limit: The concentration at which an analyte can be routinely detected on a day to day basis, and which also meets regulatory and client needs.
- Quantitation Limit: The lowest concentration at which results can be accurately quantitated.
- J: The analyte was positively identified above our Method Detection Limit and is considered detectable and usable; however, the associated numerical value is the approximate concentration of the analyte in the sample.
- ATC: Automatic Temperature Correction. - TNTC: Too Numerous To Count
- In Laboratory: EPA recommends this analyte be analyzed "immediately" (e.g., tests that should be performed in the field within 15 minutes of collection). Analytes with "immediate" hold times are analyzed as soon as possible upon receipt by the laboratory.
- TIC: Tentatively Identified Compound (GCMS library search identification, concentration estimated to nearest internal standard).

Method References:
For a complete list of method references please contact us.
- E: USEPA Reference methods
- SW: USEPA, Test Methods for Evaluating Solid Waste (SW-846)
- M: Standard Methods for the Examination of Water and Wastewater
- USP: Latest version of United States Pharmacopeia

Workorder Specific Comments:

Suburban Laboratories, Inc.
4140 Litt Drive, Hillside, IL 60162 (708) 544-3260

Laboratory Results

Client ID: Luedtke Engineering Company
Project Name: Waukegan Harbor 2010 - Week 4, Event 1 of 1
Report Date: September 07, 2010
Lab Order: **1008319**

Client Sample ID: 1hr-500' Downstream Surface
Lab ID: 1008319-001 **Date Received:** 08/06/2010 3:50 PM
Matrix: SURFACE WATER
Collection Date: 08/06/2010 10:40 AM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
CHLORIDE		Method: APHA-M4500-Cl⁻ E-Rev 18th, 1992				Analyst: lb	
Chloride	12.0	0.500		mg/L	1	08/11/2010 11:15 AM	R4505
FIELD PARAMETERS		Method: E150.1-FIELD				Analyst:	
pH, Field	8.53			pH		08/06/2010 10:40 AM	
Temperature	24.2			C		08/06/2010 10:40 AM	
HARDNESS, TOTAL		Method: SM-2340B-Rev 18Ed, 1992				Analyst: mn	
Hardness, Ca/Mg (As CaCO3)	127	0.050	c	mg/L	1	08/10/2010 12:00 AM	1503
AMMONIA, BY SELECTIVE ELECTRODE		Method: SM-M4500NH3 F-Rev 18Ed, 1992				Analyst: lb	
Nitrogen, Ammonia (As N)	0.0310	0.0100		mg/L	1	08/13/2010 12:27 PM	R4592
PHOSPHORUS, TOTAL		Method: SM-M4500P BE-Rev 18Ed, 1992				Analyst: sb	
Phosphorus (As P)	ND	0.00500		mg/L	1	08/11/2010 7:06 PM	1541
TOTAL SUSPENDED SOLIDS		Method: SM-M2540D-Rev 18Ed, 1992				Analyst: jos	
Residue, Non-Filterable	0.500	0.500	J	mg/L	1	08/09/2010 12:00 AM	R4458

Client Sample ID: 1hr-500' Downstream Mid-Depth
Lab ID: 1008319-002 **Date Received:** 08/06/2010 3:50 PM
Matrix: SURFACE WATER
Collection Date: 08/06/2010 10:44 AM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
CHLORIDE		Method: APHA-M4500-Cl⁻ E-Rev 18th, 1992				Analyst: lb	
Chloride	10.7	0.500		mg/L	1	08/11/2010 11:15 AM	R4505
FIELD PARAMETERS		Method: E150.1-FIELD				Analyst:	
pH, Field	8.5			pH		08/06/2010 10:44 AM	
Temperature	23.7			C		08/06/2010 10:44 AM	
HARDNESS, TOTAL		Method: SM-2340B-Rev 18Ed, 1992				Analyst: mn	
Hardness, Ca/Mg (As CaCO3)	138	0.050	c	mg/L	1	08/10/2010 12:00 AM	1503
AMMONIA, BY SELECTIVE ELECTRODE		Method: SM-M4500NH3 F-Rev 18Ed, 1992				Analyst: lb	
Nitrogen, Ammonia (As N)	0.0328	0.0100		mg/L	1	08/13/2010 12:27 PM	R4592
PHOSPHORUS, TOTAL		Method: SM-M4500P BE-Rev 18Ed, 1992				Analyst: sb	
Phosphorus (As P)	0.0140	0.00500		mg/L	1	08/11/2010 7:06 PM	1541
TOTAL SUSPENDED SOLIDS		Method: SM-M2540D-Rev 18Ed, 1992				Analyst: jos	
Residue, Non-Filterable	6.50	0.500		mg/L	1	08/09/2010 12:00 AM	R4458

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
c	Analyte not in SLI scope of accreditation	E	Estimated, detected above quantitation range
G	Refer to case narrative page for specific comments	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limit (QL)	N	Tentatively identified compounds
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits

Suburban Laboratories, Inc.
4140 Litt Drive, Hillside, IL 60162 (708) 544-3260

Laboratory Results

Client ID: Luedtke Engineering Company
Project Name: Waukegan Harbor 2010 - Week 4, Event 1 of 1
Report Date: September 07, 2010
Lab Order: **1008319**

Client Sample ID: 4hr-500' Downstream Surface
Lab ID: 1008319-003 **Date Received:** 08/06/2010 3:50 PM
Matrix: SURFACE WATER
Collection Date: 08/06/2010 2:15 PM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
CHLORIDE		Method: APHA-M4500-Cl⁻ E-Rev 18th, 1992				Analyst: lb	
Chloride	11.9	0.500		mg/L	1	08/11/2010 11:15 AM	R4505
FIELD PARAMETERS		Method: E150.1-FIELD				Analyst:	
pH, Field	8.46			pH		08/06/2010 2:15 PM	
Temperature	25.1			C		08/06/2010 2:15 PM	
HARDNESS, TOTAL		Method: SM-2340B-Rev 18Ed, 1992				Analyst: mn	
Hardness, Ca/Mg (As CaCO3)	127	0.050	c	mg/L	1	08/10/2010 12:00 AM	1503
AMMONIA, BY SELECTIVE ELECTRODE		Method: SM-M4500NH3 F-Rev 18Ed, 1992				Analyst: lb	
Nitrogen, Ammonia (As N)	0.0205	0.0100		mg/L	1	08/13/2010 12:27 PM	R4592
PHOSPHORUS, TOTAL		Method: SM-M4500P BE-Rev 18Ed, 1992				Analyst: sb	
Phosphorus (As P)	0.00628	0.00500	J	mg/L	1	08/11/2010 7:06 PM	1541
TOTAL SUSPENDED SOLIDS		Method: SM-M2540D-Rev 18Ed, 1992				Analyst: jos	
Residue, Non-Filterable	ND	0.500		mg/L	1	08/09/2010 12:00 AM	R4458

Client Sample ID: 4hr-500' Downstream Mid-Depth
Lab ID: 1008319-004 **Date Received:** 08/06/2010 3:50 PM
Matrix: SURFACE WATER
Collection Date: 08/06/2010 2:20 PM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
CHLORIDE		Method: APHA-M4500-Cl⁻ E-Rev 18th, 1992				Analyst: lb	
Chloride	11.3	0.500		mg/L	1	08/11/2010 11:15 AM	R4505
FIELD PARAMETERS		Method: E150.1-FIELD				Analyst:	
pH, Field	8.41			pH		08/06/2010 2:20 PM	
Temperature	24.6			C		08/06/2010 2:20 PM	
HARDNESS, TOTAL		Method: SM-2340B-Rev 18Ed, 1992				Analyst: mn	
Hardness, Ca/Mg (As CaCO3)	130	0.050	c	mg/L	1	08/10/2010 12:00 AM	1503
AMMONIA, BY SELECTIVE ELECTRODE		Method: SM-M4500NH3 F-Rev 18Ed, 1992				Analyst: lb	
Nitrogen, Ammonia (As N)	0.0201	0.0100		mg/L	1	08/13/2010 12:27 PM	R4592
PHOSPHORUS, TOTAL		Method: SM-M4500P BE-Rev 18Ed, 1992				Analyst: sb	
Phosphorus (As P)	0.0114	0.00500	J	mg/L	1	08/11/2010 7:06 PM	1541
TOTAL SUSPENDED SOLIDS		Method: SM-M2540D-Rev 18Ed, 1992				Analyst: jos	
Residue, Non-Filterable	ND	0.500		mg/L	1	08/09/2010 12:00 AM	R4458

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
c	Analyte not in SLI scope of accreditation	E	Estimated, detected above quantitation range
G	Refer to case narrative page for specific comments	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limit (QL)	N	Tentatively identified compounds
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits

Suburban Laboratories, Inc.
4140 Litt Drive, Hillside, IL 60162 (708) 544-3260

Laboratory Results

Client ID: Luedtke Engineering Company
Project Name: Waukegan Harbor 2010 - Week 4, Event 1 of 1
Report Date: September 07, 2010
Lab Order: **1008319**

Client Sample ID: **1000' Upstream Surface**
Lab ID: 1008319-005 **Date Received:** 08/06/2010 3:50 PM
Matrix: SURFACE WATER
Collection Date: 08/06/2010 10:57 AM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
CHLORIDE		Method: APHA-M4500-Cl⁻ E-Rev 18th, 1992				Analyst: lb	
Chloride	10.8	0.500		mg/L	1	08/11/2010 11:15 AM	R4505
FIELD PARAMETERS		Method: E150.1-FIELD				Analyst:	
pH, Field	8.4			pH		08/06/2010 10:57 AM	
Temperature	24.1			C		08/06/2010 10:57 AM	
HARDNESS, TOTAL		Method: SM-2340B-Rev 18Ed, 1992				Analyst: mn	
Hardness, Ca/Mg (As CaCO3)	134	0.050	c	mg/L	1	08/10/2010 12:00 AM	1503
AMMONIA, BY SELECTIVE ELECTRODE		Method: SM-M4500NH3 F-Rev 18Ed, 1992				Analyst: lb	
Nitrogen, Ammonia (As N)	0.0148	0.0100	J	mg/L	1	08/13/2010 12:27 PM	R4592
PHOSPHORUS, TOTAL		Method: SM-M4500P BE-Rev 18Ed, 1992				Analyst: sb	
Phosphorus (As P)	ND	0.00500		mg/L	1	08/11/2010 7:06 PM	1541
TOTAL SUSPENDED SOLIDS		Method: SM-M2540D-Rev 18Ed, 1992				Analyst: jos	
Residue, Non-Filterable	0.500	0.500	J	mg/L	1	08/09/2010 12:00 AM	R4458

Client Sample ID: **1000' Upstream Mid-Depth**
Lab ID: 1008319-006 **Date Received:** 08/06/2010 3:50 PM
Matrix: SURFACE WATER
Collection Date: 08/06/2010 11:04 AM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
CHLORIDE		Method: APHA-M4500-Cl⁻ E-Rev 18th, 1992				Analyst: lb	
Chloride	10.4	0.500		mg/L	1	08/11/2010 11:15 AM	R4505
FIELD PARAMETERS		Method: E150.1-FIELD				Analyst:	
pH, Field	8.36			pH		08/06/2010 11:04 AM	
Temperature	23.7			C		08/06/2010 11:04 AM	
HARDNESS, TOTAL		Method: SM-2340B-Rev 18Ed, 1992				Analyst: mn	
Hardness, Ca/Mg (As CaCO3)	128	0.050	c	mg/L	1	08/10/2010 12:00 AM	1503
AMMONIA, BY SELECTIVE ELECTRODE		Method: SM-M4500NH3 F-Rev 18Ed, 1992				Analyst: lb	
Nitrogen, Ammonia (As N)	0.0156	0.0100	J	mg/L	1	08/13/2010 12:27 PM	R4592
PHOSPHORUS, TOTAL		Method: SM-M4500P BE-Rev 18Ed, 1992				Analyst: sb	
Phosphorus (As P)	ND	0.00500		mg/L	1	08/11/2010 7:06 PM	1541
TOTAL SUSPENDED SOLIDS		Method: SM-M2540D-Rev 18Ed, 1992				Analyst: jos	
Residue, Non-Filterable	0.500	0.500	J	mg/L	1	08/09/2010 12:00 AM	R4458

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
c	Analyte not in SLI scope of accreditation	E	Estimated, detected above quantitation range
G	Refer to case narrative page for specific comments	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limit (QL)	N	Tentatively identified compounds
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits

Suburban Laboratories, Inc.
4140 Litt Drive, Hillside, IL 60162 (708) 544-3260

Laboratory Results

Client ID: Luedtke Engineering Company
Project Name: Waukegan Harbor 2010 - Week 4, Event 1 of 1
Report Date: September 07, 2010
Lab Order: **1008319**

Client Sample ID: **Blind Duplicate**
Lab ID: 1008319-007 **Date Received:** 08/06/2010 3:50 PM
Matrix: SURFACE WATER
Collection Date: 08/06/2010 10:49 AM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
CHLORIDE		Method: APHA-M4500-Cl⁻ E-Rev 18th, 1992				Analyst: lb	
Chloride	10.9	0.500		mg/L	1	08/11/2010 11:15 AM	R4505
FIELD PARAMETERS		Method: E150.1-FIELD				Analyst:	
pH, Field	8.45			pH		08/06/2010 10:49 AM	
Temperature	23.5			C		08/06/2010 10:49 AM	
HARDNESS, TOTAL		Method: SM-2340B-Rev 18Ed, 1992				Analyst: mn	
Hardness, Ca/Mg (As CaCO3)	128	0.050	c	mg/L	1	08/10/2010 12:00 AM	1503
AMMONIA, BY SELECTIVE ELECTRODE		Method: SM-M4500NH3 F-Rev 18Ed, 1992				Analyst: lb	
Nitrogen, Ammonia (As N)	0.0155	0.0100	J	mg/L	1	08/13/2010 12:27 PM	R4592
PHOSPHORUS, TOTAL		Method: SM-M4500P BE-Rev 18Ed, 1992				Analyst: sb	
Phosphorus (As P)	0.00758	0.00500	J	mg/L	1	08/11/2010 7:06 PM	1541
TOTAL SUSPENDED SOLIDS		Method: SM-M2540D-Rev 18Ed, 1992				Analyst: jos	
Residue, Non-Filterable	6.50	0.500		mg/L	1	08/09/2010 12:00 AM	R4458

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
c	Analyte not in SLI scope of accreditation	E	Estimated, detected above quantitation range
G	Refer to case narrative page for specific comments	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limit (QL)	N	Tentatively identified compounds
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits

Suburban Laboratories, Inc.

4140 Litt Drive, Hillside, IL 60162 (708) 544-3260

PREP DATES REPOR

Client: Luedtke Engineering Company
Project: Waukegan Harbor 2010 - Week 4,

Report Date: September 07, 2010
Lab Order: **1008319**

Sample ID	Collection Date	Batch ID	Prep Method	Prep Test Name	TCLP Date	Prep Date
1008319-001B	08/06/10 10:40:00 A	1541	P_WW_LOWPR	PHOSPHORUS, TOTAL		08/11/10
1008319-001C		1503	200.2_ICPWW_	AQUEOUS PREP T/R METALS: ICP		08/06/10
1008319-002B	08/06/10 10:44:00 A	1541	P_WW_LOWPR	PHOSPHORUS, TOTAL		08/11/10
1008319-002C		1503	200.2_ICPWW_	AQUEOUS PREP T/R METALS: ICP		08/06/10
1008319-003B	08/06/10 2:15:00 PM	1541	P_WW_LOWPR	PHOSPHORUS, TOTAL		08/11/10
1008319-003C		1503	200.2_ICPWW_	AQUEOUS PREP T/R METALS: ICP		08/06/10
1008319-004B	08/06/10 2:20:00 PM	1541	P_WW_LOWPR	PHOSPHORUS, TOTAL		08/11/10
1008319-004C		1503	200.2_ICPWW_	AQUEOUS PREP T/R METALS: ICP		08/06/10
1008319-005B	08/06/10 10:57:00 A	1541	P_WW_LOWPR	PHOSPHORUS, TOTAL		08/11/10
1008319-005C		1503	200.2_ICPWW_	AQUEOUS PREP T/R METALS: ICP		08/06/10
1008319-006B	08/06/10 11:04:00 A	1541	P_WW_LOWPR	PHOSPHORUS, TOTAL		08/11/10
1008319-006C		1503	200.2_ICPWW_	AQUEOUS PREP T/R METALS: ICP		08/06/10
1008319-007B	08/06/10 10:49:00 A	1541	P_WW_LOWPR	PHOSPHORUS, TOTAL		08/11/10
1008319-007C		1503	200.2_ICPWW_	AQUEOUS PREP T/R METALS: ICP		08/06/10

3
Hillside, IL 60162
TEL: 708-544-3260
FAX: 708-544-8587
Website: www.SuburbanLabs.com

QC SUMMARY REPORT

WO#: **1008319**
07-Sep-10

Client: Luedtke Engineering Company
Project: Waukegan Harbor 2010 - Week 4, Event 1 of 1 **TestCode:** **CL_WW1**

Sample ID: **MB-R4505** SampType: **MBLK** TestCode: **CL_WW1** Units: **mg/L** Prep Date: RunNo: **4505**
Client ID: **PBW** Batch ID: **R4505** TestNo: **A4500-Cl- E** Analysis Date: **08/11/10** SeqNo: **90577**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	1.33	5.00									J

Sample ID: **LCS-R4505** SampType: **LCS** TestCode: **CL_WW1** Units: **mg/L** Prep Date: RunNo: **4505**
Client ID: **LCSW** Batch ID: **R4505** TestNo: **A4500-Cl- E** Analysis Date: **08/11/10** SeqNo: **90578**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	102	5.00	100.0	0	102	85	115				

Sample ID: **1008193-003AMS** SampType: **MS** TestCode: **CL_WW1** Units: **mg/L** Prep Date: RunNo: **4505**
Client ID: **ZZZZZZ** Batch ID: **R4505** TestNo: **A4500-Cl- E** Analysis Date: **08/11/10** SeqNo: **90581**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	62.3	5.00	50.00	13.36	97.9	80	120				

Sample ID: **1008193-003AMSD** SampType: **MSD** TestCode: **CL_WW1** Units: **mg/L** Prep Date: RunNo: **4505**
Client ID: **ZZZZZZ** Batch ID: **R4505** TestNo: **A4500-Cl- E** Analysis Date: **08/11/10** SeqNo: **90582**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	62.7	5.00	50.00	13.36	98.7	80	120	62.32	0.640	20	

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level	E	Estimated, detected above quantitation range	H	Holding times for preparation or analysis exceede
M	Manual Integration used to determine area response	ND	Not Detected at the Reporting Limit	P	Second column confirmation exceeds
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

3
Hillside, IL 60162
TEL: 708-544-3260
FAX: 708-544-8587
Website: www.SuburbanLabs.com

QC SUMMARY REPORT

WO#: **1008319**
07-Sep-10

Client: Luedtke Engineering Company
Project: Waukegan Harbor 2010 - Week 4, Event 1 of 1 **TestCode:** **P_WW_LOW**

Sample ID: **LCS-1541** SampType: **LCS** TestCode: **P_WW_LOW** Units: **mg/L** Prep Date: **08/11/10** RunNo: **4523**
Client ID: **LCSW** Batch ID: **1541** TestNo: **A4500-P BE** **A4500-P BE** Analysis Date: **08/11/10** SeqNo: **91092**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Phosphorus (As P)	0.0549	0.0120	0.05000	0	110	85	115				

Sample ID: **MB-1541** SampType: **MBLK** TestCode: **P_WW_LOW** Units: **mg/L** Prep Date: **08/11/10** RunNo: **4523**
Client ID: **PBW** Batch ID: **1541** TestNo: **A4500-P BE** **A4500-P BE** Analysis Date: **08/11/10** SeqNo: **91093**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Phosphorus (As P)	ND	0.0120									

Sample ID: **1008319-005BMS** SampType: **MS** TestCode: **P_WW_LOW** Units: **mg/L** Prep Date: **08/11/10** RunNo: **4523**
Client ID: **1000' Upstream Surf** Batch ID: **1541** TestNo: **A4500-P BE** **A4500-P BE** Analysis Date: **08/11/10** SeqNo: **91099**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Phosphorus (As P)	0.0574	0.0120	0.05000	0	115	80	120				

Sample ID: **1008319-005BMSD** SampType: **MSD** TestCode: **P_WW_LOW** Units: **mg/L** Prep Date: **08/11/10** RunNo: **4523**
Client ID: **1000' Upstream Surf** Batch ID: **1541** TestNo: **A4500-P BE** **A4500-P BE** Analysis Date: **08/11/10** SeqNo: **91100**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Phosphorus (As P)	0.0568	0.0120	0.05000	0	114	80	120	0.05745	1.14	13.7	

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level	E	Estimated, detected above quantitation range	H	Holding times for preparation or analysis exceede
M	Manual Integration used to determine area response	ND	Not Detected at the Reporting Limit	P	Second column confirmation exceeds
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

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Website: www.SuburbanLabs.com

QC SUMMARY REPORT

WO#: **1008319**
07-Sep-10

Client: Luedtke Engineering Company
Project: Waukegan Harbor 2010 - Week 4, Event 1 of 1 **TestCode:** **TSS**

Sample ID: **MB-R4458** SampType: **MBLK** TestCode: **TSS** Units: **mg/L** Prep Date: RunNo: **4458**
Client ID: **PBW** Batch ID: **R4458** TestNo: **A2540D** Analysis Date: **08/09/10** SeqNo: **89952**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Residue, Non-Filterable	ND	1.00									

Sample ID: **1008155-005ADUP** SampType: **DUP** TestCode: **TSS** Units: **mg/L** Prep Date: RunNo: **4458**
Client ID: **ZZZZZZ** Batch ID: **R4458** TestNo: **A2540D** Analysis Date: **08/09/10** SeqNo: **89956**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Residue, Non-Filterable	2.50	2.50						2.500	0	10	

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level	E	Estimated, detected above quantitation range	H	Holding times for preparation or analysis exceede
M	Manual Integration used to determine area response	ND	Not Detected at the Reporting Limit	P	Second column confirmation exceeds
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

SUBURBAN LABORATORIES, Inc.

4140 Litt Drive Hillside, IL 60162 Tel. 708.544.3260 Fax: 708.544.8587 Toll Free: 800.783.LABS www.suburbanlabs.com

CHAIN OF CUSTODY RECORD

Electronic Version

Company Name: Luedtke Engineering Company

Company Address:

City: Frankfort State: MI Zip: 49635

Phone: Fax: ☐ Fax Report

Email Address: ☑ Email Report

Project ID / Location: Waukegan Harbor Dredging 2010

Project Manager (Report to): Jon Keillor

Sample Collector(s): 8/6/10 Patrick Rodriguez

TURNAROUND TIME REQUESTED: ☑ Normal ☐ RUSH* *Additional Rush Charges Approved.

*Date & Time Needed:

Normal TAT is 5-7 work days for most work. Rush work must be pre-approved and additional charges apply.

Specify Regulatory Program: (Required) ☐ None/Info only

☐ LUST ☐ SRP ☐ SDWA

☐ 503 Sludge ☐ NPDES ☐ MWRDGC

☐ Disposal ☑ Other *Please specify in comment section below.

ANALYSIS & METHOD REQUESTED: Enter an "X" in box below for request

Page 1 of 2

PO No.:

Shipping Method: SLI

GC Reporting Level: ☐ 1 ☑ 2 ☐ 3

LAB USE ONLY

SLI Order No.: 1008319

Sample containers supplied by customer? ☐ Yes

Temperature of Received Samples: 6 °C

Samples received within 24 hours of collection? ☐ Yes

	SAMPLE IDENTIFICATION (Please use 1 line per container type)	COLLECTION DATE	COLLECTION TIME	MATRIX	GRAB/ COMP.	CONTAINERS Qty	CONTAINERS SIZE & TYPE	PRESERVATIVE	TSS	Chloride	Ammonia	Phosphorus	Hardness	R	Condition	Split	LAB #
1	1hr-500' downstream, surface	8/6/10	10:40	SW	G	1	1LP	none	X	X							1A
2						1	1LP	H2SO4			X	X					1B
3						1	500p	HNO3					X				1C
4	1hr-500' downstream, mid-depth	8/6/10	10:44	SW	G	1	1LP	none	X	X							2A
5						1	1LP	H2SO4			X	X					2B
6						1	500p	HNO3					X				2C
7	4hr-500' downstream, surface	8/6/10	14:15	SW	G	1	1LP	none	X	X							3A
8						1	1LP	H2SO4			X	X					3B
9																	3C
10	4hr-500' downstream, mid-depth	8/6/10	14:20	SW	G	1	1LP	none	X	X							4A
11						1	1LP	H2SO4			X	X					4B
12						1	500p	HNO3					X				4C

MATRIX: Drinking Water (DW), Soil (S), Waste Water (WW), Surface Water(SW), Ground Water (GW), Solid Waste (WA), Sludge (U), Wipe (F) **CONTAINER:** 2oz, 4oz, 8oz, 40ml Vial, 500ml, Liter (L), Tube, Glass (G), Plastic (P) **PRESERVATIVE:** H_2SO_4, HCl, HNO_3, Methanol (MeOH), NaOH, Sodium Bisulfate (NaBi, NaThio

COMMENTS & SPECIAL INSTRUCTIONS:

* Chicago District USACE - Waukegan Harbor Approach Channel Dredging project 2010

CONDITION CODES
1. Improper/damaged container/cap
2. Improper preservation
3. Insufficient sample volume
4. Headspace/air bubbles for VOCs
5. Received past holding time
6. Received frozen
7. Label conflicts with COC

1. Relinquished By	Date	2. Relinquished By	Date	3. Relinquished By	Date	4. Relinquished By	Date
	8/6/10		8/6/10				
Received By	Time	Received By	Time	Received By	Time	Received By	Time
☐ Ice	14:30	☐ Ice	15:50	☐ Ice		☐ Ice	

Submission of samples subject to Terms and Conditions on back. Rev. 2/01/06 Please fill out this form completely, print, sign & submit with samples. Keep a copy for your records.

SUBURBAN LABORATORIES, Inc.

4140 Litt Drive Hillside, IL 60162 Tel. 708.544.3260 Fax: 708.544.8587 Toll Free: 800.783.LABS www.suburbanlabs.com

CHAIN OF CUSTODY RECORD

Electronic Version

Company Name: Luedtke Engineering Company

Company Address:

City: Frankfort State: MI Zip: 49635

Phone: Fax: ☐ Fax Report

Email Address: ☑ Email Report

Project ID / Location: Waukegan Harbor Dredging 2010

Project Manager (Report to): Jon Keillor

Sample Collector(s): Patrick Rodriguez

TURNAROUND TIME REQUESTED: ☑ Normal ☐ RUSH* *Additional Rush Charges Approved.

*Date & Time Needed:

Normal TAT is 5-7 work days for most work. Rush work must be pre-approved and additional charges apply.

Specify Regulatory Program: (Required) ☐ None/Info only

☐ LUST ☐ SRP ☐ SDWA

☐ 503 Sludge ☐ NPDES ☐ MWRDGC

☐ Disposal ☑ Other *Please specify in comment section below

ANALYSIS & METHOD REQUESTED: Enter an "X" in box below for request

Page 2 of 2

PO No.

Shipping Method: SLI

CC Reporting Level: ☐ 1 ☑ 2 ☐ 3

LAB USE ONLY

SLI Order No.

Sample containers supplied by customer? ☐ Yes

Temperature of Received Samples: 6 °C

Samples received within 24 hours of collection? ☐ Yes

	SAMPLE IDENTIFICATION (Please use 1 line per container type)	COLLECTION DATE	COLLECTION TIME	MATRIX	GRAB/ COMP.	CONTAINERS Qty	CONTAINERS SIZE & TYPE	PRESERVATIVE	TSS	Chloride	Ammonia	Phosphorus	Hardness						R	Condition	Split	LAB #
1	1000' upstream, surface	8/6/10	10:57	SW	G	1	1LP	none	X	X												5A
2	↓	↓	↓	↓	↓	1	1LP	H2SO4			X	X										5B
3	↓	↓	↓	↓	↓	1	500p	HNO3					X									5C
4	1000' upstream, mid-depth	8/6/10	11:04	SW	G	1	1LP	none	X	X												6A
5	↓	↓	↓	↓	↓	1	1LP	H2SO4			X	X										6B
6	↓	↓	↓	↓	↓	1	500p	HNO3					X									6C
7	Blind duplicate	8/6/10	10:49	SW	G	1	1LP	none	X	X												7A
8	↓	↓	↓	↓	↓	1	1LP	H2SO4			X	X										7B
9	↓	↓	↓	↓	↓	1	500p	HNO3					X									7C
10																						
11																						
12																						

MATRIX: Drinking Water (DW), Soil (S), Waste Water (WW), Surface Water(SW), Ground Water (GW), Solid Waste (WA), Sludge (U), Wipe (P) **CONTAINER:** 2oz, 4oz, 8oz, 40ml Vial, 500ml, Liter (L), Tube, Glass (G), Plastic (P) **PRESERVATIVE:** H_2SO_4, HCl, HNO_3, Methanol (MeOH) NaOH, Sodium Bisulfate (NaB), NaThio

COMMENTS & SPECIAL INSTRUCTIONS:

* Chicago District USACE - Waukegan Harbor Approach Channel Dredging project 2010

CONDITION CODES

1. Improper/damaged container/cap
2. Improper preservation
3. Insufficient sample volume
4. Headspace/air bubbles for VOCs
5. Received past holding time
6. Received frozen
7. Label conflicts with COC

1. Relinquished By	Date	2. Relinquished By	Date	3. Relinquished By	Date	4. Relinquished By	Date
	8/6/10		8/6/10				
Received By ☐ Ice	Time 14:30	Received By ☐ Ice	Time 15:50	Received By ☐ Ice	Time	Received By ☐ Ice	Time

Submission of samples subject to Terms and Conditions on back. Rev. 2/01/06 Please fill out this form completely, print, sign & submit with samples. Keep a copy for your records.

FIELD LOG

Suburban Laboratories, Inc.
4140 Litt Drive
Hillside, IL 60162-1183
P: (708) 544-3260 F: (708) 544-8587
www.SuburbanLabs.com

Luedtke Engineering Company

FY10 Dredging of Waukegan Harbor Approach Channel
Weekly water sampling

Suburban Labs Field Sampling Technician(s) - PRINT: Patrick Rodriguez	Placement area (circle): (1) 2	Eutech Inst. Oakton Field pH Meter, pHTestr 30 Serial No.: 1576094	
Luedtke Engineering Rep. - PRINT: Tim Kibby	GPS coordinates of discharge point:[1] E087°49'13.0475" N42°20'31.4395"	Scow name and quantity of discharge:[1] 17 900 yds	
Weather and water conditions: Clear + Calm	Date of Discharge: 8/6/10	Time of Discharge:[1] 9:33	

	1hr-500' downstream Surface	1hr-500' downstream Mid-depth	4hr-500' downstream Surface	4hr-500' downstream Mid-depth	Additional Comments:
Sampling Technique:	grab	Kemmerer - grab	grab	Kemmerer - grab	
GPS coordinate (Lat./Long.) of sample collection:[1]	E087° 49' 12.8494" N42° 20' 26.5198"		E087°49'12.8494", N42°20'26.5198"		
GPS coordinate (state plane) of sample collection:[1]					
Water column depth to the nearest foot:[1]	20		20		
Sampling depth to the nearest foot: (enter zero for surface water samples)	0	10	0	10	
Date & Time of collection:	8/6/10 10:40	8/6/10 10:44	8/6/10 14:15	8/6/10 14:20	
Sample appearance: (clear, tinted, dark, etc..)	Clear	Clear	Clear	Clear	
pH & Time of reading:	8.53	8.50	8.46	8.41	
Temperature (degrees C):	24.2°C	23.7°C	25.1°C	24.6°C	
Comments:					

[1] See also chain of custody form for bottles and preservatives

Version 0 06/16/2010

FIELD LOG

Suburban Laboratories, Inc.
4140 Litt Drive
Hillside, IL 60162-1183
P: (708) 544-3260 F: (708) 544-8587
www.SuburbanLabs.com

Luedtke Engineering Company

FY10 Dredging of Waukegan Harbor Approach Channel
Weekly water sampling

Date of Discharge: 8/6/10

	1000' upstream Surface	1000' upstream Mid-depth	Blind Duplicate	Additional Comments:
Sampling Technique:	grab	Kemmerer - grab		
GPS coordinate (Lat./Long.) of sample collection:[1]	E087°49' 12.9553"	N42° 20' 41.2859"	087° 49' 12.8474" N42° 20' 26.5198"	
GPS coordinate (state plane) of sample collection:[1]				
Water column depth to the nearest foot:[1]	13		20	
Sampling depth to the nearest foot: (enter zero for surface water samples)	0	7	10	
Date & Time of collection:	8/6/10 10:57	8/6/10 11:04	8/6/10 10:49	
Sample appearance: (clear, tinted, dark, etc..)	Clear	Clear	Clear	
pH & Time of reading:	8.40	8.36	8.45	
Temperature (degrees C):	24.1°C	23.7°C	23.5°C	
Blind Duplicate sample ID:				
Comments:				

See also chain of custody form for bottles and preservatives

Version 0 06/10/2010

SIGNATURES:

SLI Field Tech 1: Pamela Radyk

SLI Field Tech 2: _____

Week 4, Event 1
8/6/10

SUBURBAN LABORATORIES, Inc.

4140 Litt Drive Hillside, Illinois 60162
Tel. (708) 544-3260 Toll Free (800) 783-LABS
Fax (708-544-8587
www.suburbanlabs.com

September 07, 2010

Workorder: 1008443

Jon Keillor
Luedtke Engineering Company
10 Fourth Street
P.O. Box 111
Frankfort, Michigan 49635

TEL: (231) 352-9631
FAX: (231) 352-7178
RE: Waukegan Harbor FY10 -
Background Beach Sampling

Dear Jon Keillor:

Suburban Laboratories, Inc. received 4 sample(s) on 08/10/10 for the analyses presented in the following report.

All data for the associated quality control (QC) met EPA, method, or internal laboratory specifications except where noted in the case narrative. If you are comparing these results to external QC specifications or compliance limits and have any questions, please contact us.

This final report of laboratory analysis consists of this cover letter, case narrative, analytical report, dates report, and any accompanying documentation on, but not limited to, chain of custody records, raw data, and letters of explanation or reliance. This report may not be reproduced, except in full, without the prior written approval of Suburban Laboratories, Inc.

If you have any questions regarding these test results, please call me at (708) 544-3260.

Sincerely,

Melissa Amador

Melissa Amador
Project Manager

Illinois Department of Public Health Accredited # 17585 Illinois Environmental Protection Agency Accredited #100225

Suburban Laboratories, Inc.

4140 Litt Drive, Hillside, IL 60162 (708) 544-3260

Case Narrative

Client: Luedtke Engineering Company
Project: Waukegan Harbor FY10 - Background Beach Sa
WorkOrder: 1008443
Temperature of samples upon receipt at SLI: 4 C

Date: September 07, 2010
PO #: 981-1
QC Level:
Chain of Custody #: Electronic

General Comments:
- All results reported in wet weight unless otherwise indicated. (dry = Dry Weight)
- Sample results relate only to the analytes of interest tested and to sample as received by the laboratory.
- Environmental compliance sample results meet the requirements of 35 IAC Part 186 unless otherwise indicated.
- Waste water analysis follows the rules set forth in 40 CFR part 136 except where otherwise noted.
- Accreditation by the State of Illinois is not an endorsement or a guarantee of the validity of data generated.
- For more information about the laboratories' scope of accreditation, please contact us at (708) 544-3260 or the Agency at (217) 782-6455.

Abbreviations:
- Reporting Limit: The concentration at which an analyte can be routinely detected on a day to day basis, and which also meets regulatory and client needs.
- Quantitation Limit: The lowest concentration at which results can be accurately quantitated.
- J: The analyte was positively identified above our Method Detection Limit and is considered detectable and usable; however, the associated numerical value is the approximate concentration of the analyte in the sample.
- ATC: Automatic Temperature Correction. - TNTC: Too Numerous To Count
- In Laboratory: EPA recommends this analyte be analyzed "immediately" (e.g., tests that should be performed in the field within 15 minutes of collection). Analytes with "immediate" hold times are analyzed as soon as possible upon receipt by the laboratory.
- TIC: Tentatively Identified Compound (GCMS library search identification, concentration estimated to nearest internal standard).

Method References:
For a complete list of method references please contact us.
- E: USEPA Reference methods
- SW: USEPA, Test Methods for Evaluating Solid Waste (SW-846)
- M: Standard Methods for the Examination of Water and Wastewater
- USP: Latest version of United States Pharmacopeia

Workorder Specific Comments:

1008443-002B,-003B,-004B:Samples subcontracted to United Analytical Services (630-691-8271) for some of the analysis requested. Their report is attached.

Suburban Laboratories, Inc.
4140 Litt Drive, Hillside, IL 60162 (708) 544-3260

Laboratory Results

Client ID: Luedtke Engineering Company
Project Name: Waukegan Harbor FY10 - Background Beach Sa
Report Date: September 07, 2010
Lab Order: **1008443**

Client Sample ID: **Beach Water 1**
Lab ID: 1008443-001 **Date Received:** 08/10/2010 2:50 PM
Matrix: SURFACE WATER
Collection Date: 08/09/2010 12:39 PM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
METALS BY ICPMS		Method: SW846-SW6020-Rev 0, Sep-94				Analyst: dc	
Lead	ND	0.00010		mg/L	1	08/23/2010 4:09 PM	1629
Zinc	ND	0.00300		mg/L	1	08/19/2010 12:55 PM	1597
PCBS		Method: EPA-SW8082-Rev 0, Dec-96				Analyst: mn	
Aroclor 1016	ND	0.020		µg/L	1	08/17/2010 7:02 PM	1578
Aroclor 1221	ND	0.020		µg/L	1	08/17/2010 7:02 PM	1578
Aroclor 1232	ND	0.020		µg/L	1	08/17/2010 7:02 PM	1578
Aroclor 1242	ND	0.020		µg/L	1	08/17/2010 7:02 PM	1578
Aroclor 1248	ND	0.020		µg/L	1	08/17/2010 7:02 PM	1578
Aroclor 1254	ND	0.020		µg/L	1	08/17/2010 7:02 PM	1578
Aroclor 1260	ND	0.020		µg/L	1	08/17/2010 7:02 PM	1578
Surr: Tetrachloro-m-xylene	73.8	40.4-143		%REC	1	08/17/2010 7:02 PM	1578
CHLORIDE		Method: APHA-M4500-Cl^- E-Rev 18th, 1992				Analyst: lb	
Chloride	15.1	0.500		mg/L	1	08/18/2010 1:51 PM	R4729
FIELD PARAMETERS		Method: E150.1-FIELD				Analyst:	
pH, Field	8.53			pH		08/09/2010 12:39 PM	
Temperature	26.1			C		08/09/2010 12:39 PM	
HARDNESS, TOTAL		Method: SM-2340B-Rev 18Ed, 1992				Analyst: mn	
Hardness, Ca/Mg (As CaCO3)	135	0.050	c	mg/L	1	08/18/2010 12:00 AM	1598
AMMONIA, BY SELECTIVE ELECTRODE		Method: SM-M4500NH3 F-Rev 18Ed, 1992				Analyst: lb	
Nitrogen, Ammonia (As N)	0.0520	0.0100		mg/L	1	08/18/2010 4:27 PM	R4744
PHOSPHORUS, TOTAL		Method: SM-M4500P BE-Rev 18Ed, 1992				Analyst: sb	
Phosphorus (As P)	0.0361	0.00500		mg/L	1	08/16/2010 7:22 PM	1587
SULFATE		Method: ASTM-ASTM D516-Rev 2004				Analyst: lb	
Sulfate	29	1.0		mg/L	1	09/01/2010 1:11 PM	R5118
TOTAL DISSOLVED SOLIDS		Method: SM-M2540C-Rev 18Ed, 1992				Analyst: jos	
Residue, Filterable	173	1.00		mg/L	1	08/16/2010 12:00 AM	R4646
TOTAL SUSPENDED SOLIDS		Method: SM-M2540D-Rev 18Ed, 1992				Analyst: jos	
Residue, Non-Filterable	7.50	0.500		mg/L	1	08/13/2010 12:00 AM	R4593
TOTAL VOLATILE SOLIDS		Method:				Analyst: jos	
Total Volatile Solids	5.72	1.00	c	mg/L	1	08/16/2010 12:00 AM	R4647

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
c	Analyte not in SLI scope of accreditation	E	Estimated, detected above quantitation range
G	Refer to case narrative page for specific comments	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limit (QL)	N	Tentatively identified compounds
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits

Suburban Laboratories, Inc.
4140 Litt Drive, Hillside, IL 60162 (708) 544-3260

Laboratory Results

Client ID: Luedtke Engineering Company
Project Name: Waukegan Harbor FY10 - Background Beach Sa
Report Date: September 07, 2010
Lab Order: **1008443**

Client Sample ID: **Beach Sediment 1**
Lab ID: 1008443-002 **Date Received:** 08/10/2010 2:50 PM
Matrix: SEDIMENT
Collection Date: 08/09/2010 12:45 PM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
PCBS		Method: EPA-8082-Rev 0, Dec-96				Analyst: mn	
Aroclor 1016	ND	2.58		µg/Kg-dry	1	08/17/2010 7:58 PM	1576
Aroclor 1221	ND	2.58		µg/Kg-dry	1	08/17/2010 7:58 PM	1576
Aroclor 1232	ND	2.58		µg/Kg-dry	1	08/17/2010 7:58 PM	1576
Aroclor 1242	ND	2.58		µg/Kg-dry	1	08/17/2010 7:58 PM	1576
Aroclor 1248	ND	2.58		µg/Kg-dry	1	08/17/2010 7:58 PM	1576
Aroclor 1254	ND	2.58		µg/Kg-dry	1	08/17/2010 7:58 PM	1576
Aroclor 1260	ND	2.58		µg/Kg-dry	1	08/17/2010 7:58 PM	1576
Surr: Tetrachloro-m-xylene	66.3	33.7-156		%REC	1	08/17/2010 7:58 PM	1576
ASBESTOS		Method:				Analyst: maa	
Asbestos	Attached	0	c		1	08/18/2010 12:00 AM	R4868
PERCENT MOISTURE		Method: ASTM-D2216-Rev 2005				Analyst: jos	
Percent Moisture	23	1.0		wt%	1	08/12/2010 12:00 AM	R4559
SIEVE ANALYSIS FOR GRAIN SIZE		Method: ASTM-ASTM D422 Modified-Rev 1998				Analyst: ll	
Material finer than #230 (Sieve 230, 63 µm)	25	0		wt%	1	08/18/2010 2:08 PM	R4731

Client Sample ID: **Beach Sediment 2**
Lab ID: 1008443-003 **Date Received:** 08/10/2010 2:50 PM
Matrix: SEDIMENT
Collection Date: 08/09/2010 12:51 PM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
PCBS		Method: EPA-8082-Rev 0, Dec-96				Analyst: mn	
Aroclor 1016	ND	2.64		µg/Kg-dry	1	08/17/2010 8:17 PM	1576
Aroclor 1221	ND	2.64		µg/Kg-dry	1	08/17/2010 8:17 PM	1576
Aroclor 1232	13.1	2.64		µg/Kg-dry	1	08/17/2010 8:17 PM	1576
Aroclor 1242	ND	2.64		µg/Kg-dry	1	08/17/2010 8:17 PM	1576
Aroclor 1248	ND	2.64		µg/Kg-dry	1	08/17/2010 8:17 PM	1576
Aroclor 1254	ND	2.64		µg/Kg-dry	1	08/17/2010 8:17 PM	1576
Aroclor 1260	ND	2.64		µg/Kg-dry	1	08/17/2010 8:17 PM	1576
Surr: Tetrachloro-m-xylene	46.3	33.7-156		%REC	1	08/17/2010 8:17 PM	1576
ASBESTOS		Method:				Analyst: maa	
Asbestos	Attached	0	c		1	08/18/2010 12:00 AM	R4868
PERCENT MOISTURE		Method: ASTM-D2216-Rev 2005				Analyst: jos	
Percent Moisture	24	1.0		wt%	1	08/12/2010 12:00 AM	R4559
SIEVE ANALYSIS FOR GRAIN SIZE		Method: ASTM-ASTM D422 Modified-Rev 1998				Analyst: ll	
Material finer than #230 (Sieve 230, 63 µm)	24	0		wt%	1	08/18/2010 2:08 PM	R4731

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
c	Analyte not in SLI scope of accreditation	E	Estimated, detected above quantitation range
G	Refer to case narrative page for specific comments	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limit (QL)	N	Tentatively identified compounds
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits

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Laboratory Results

Client ID: Luedtke Engineering Company
Project Name: Waukegan Harbor FY10 - Background Beach Sa
Report Date: September 07, 2010
Lab Order: **1008443**

Client Sample ID: **Beach Sediment 3**
Lab ID: 1008443-004 **Date Received:** 08/10/2010 2:50 PM
Matrix: SEDIMENT
Collection Date: 08/09/2010 1:04 PM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
PCBS		Method: EPA-8082-Rev 0, Dec-96				Analyst: mn	
Aroclor 1016	ND	2.63		µg/Kg-dry	1	08/17/2010 8:35 PM	1576
Aroclor 1221	ND	2.63		µg/Kg-dry	1	08/17/2010 8:35 PM	1576
Aroclor 1232	ND	2.63		µg/Kg-dry	1	08/17/2010 8:35 PM	1576
Aroclor 1242	ND	2.63		µg/Kg-dry	1	08/17/2010 8:35 PM	1576
Aroclor 1248	ND	2.63		µg/Kg-dry	1	08/17/2010 8:35 PM	1576
Aroclor 1254	ND	2.63		µg/Kg-dry	1	08/17/2010 8:35 PM	1576
Aroclor 1260	ND	2.63		µg/Kg-dry	1	08/17/2010 8:35 PM	1576
Surr: Tetrachloro-m-xylene	47.5	33.7-156		%REC	1	08/17/2010 8:35 PM	1576
ASBESTOS		Method:				Analyst: maa	
Asbestos	Attached	0	c		1	08/18/2010 12:00 AM	R4868
PERCENT MOISTURE		Method: ASTM-D2216-Rev 2005				Analyst: jos	
Percent Moisture	24	1.0		wt%	1	08/12/2010 12:00 AM	R4559
SIEVE ANALYSIS FOR GRAIN SIZE		Method: ASTM-ASTM D422 Modified-Rev 1998				Analyst: ll	
Material finer than #230 (Sieve 230, 63 µm)	23	0		wt%	1	08/18/2010 2:08 PM	R4731

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
c	Analyte not in SLI scope of accreditation	E	Estimated, detected above quantitation range
G	Refer to case narrative page for specific comments	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limit (QL)	N	Tentatively identified compounds
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits

Suburban Laboratories, Inc.

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PREP DATES REPOR

Client: Luedtke Engineering Company

Project: Waukegan Harbor FY10 - Backgro

Report Date: September 07, 2010

Lab Order: **1008443**

Sample ID	Collection Date	Batch ID	Prep Method	Prep Test Name	TCLP Date	Prep Date
1008443-001B	08/09/10 12:39:00 P	1587	P_WW_LOWPR	PHOSPHORUS, TOTAL		08/16/10
1008443-001C		1598	200.2_ICPWW_	AQUEOUS PREP T/R METALS: ICP		08/17/10
		1629	200.2_ICPMS_W	AQUEOUS PREP TOTAL METALS: ICP		08/19/10
		1597	200.2_ICPMS_W	AQUEOUS PREP TOTAL METALS: ICP		08/17/10
1008443-001D		1578	3510_PCB	AQUEOUS PREP SEP FUNNEL: PCB		08/16/10
1008443-002A	08/09/10 12:45:00 P	1576	3550_PCB	SOLID PREP SONICATION: PCB		08/16/10
1008443-003A	08/09/10 12:51:00 P	1576	3550_PCB	SOLID PREP SONICATION: PCB		08/16/10
1008443-004A	08/09/10 1:04:00 PM	1576	3550_PCB	SOLID PREP SONICATION: PCB		08/16/10

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Website: www.SuburbanLabs.com

QC SUMMARY REPORT

WO#: **1008443**
07-Sep-10

Client: Luedtke Engineering Company
Project: Waukegan Harbor FY10 - Background Beach S **TestCode:** **6020_W**

Sample ID: **MB-1597** SampType: **MBLK** TestCode: **6020_W** Units: **mg/L** Prep Date: **08/17/10** RunNo: **4784**
Client ID: **PBW** Batch ID: **1597** TestNo: **SW6020** **E200.2** Analysis Date: **08/19/10** SeqNo: **97164**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	0.00017	0.00020									J
Zinc	ND	0.00300									

Sample ID: **LCS-1597** SampType: **LCS** TestCode: **6020_W** Units: **mg/L** Prep Date: **08/17/10** RunNo: **4784**
Client ID: **LCSW** Batch ID: **1597** TestNo: **SW6020** **E200.2** Analysis Date: **08/19/10** SeqNo: **97165**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	0.0450	0.00020	0.05000	0	90.0	85	115				
Zinc	0.0468	0.00300	0.05000	0	93.5	85	115				

Sample ID: **MB-1629** SampType: **MBLK** TestCode: **6020_W** Units: **mg/L** Prep Date: **08/19/10** RunNo: **4877**
Client ID: **PBW** Batch ID: **1629** TestNo: **SW6020** **E200.2** Analysis Date: **08/23/10** SeqNo: **98981**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	ND	0.00020									

Sample ID: **LCS-1629** SampType: **LCS** TestCode: **6020_W** Units: **mg/L** Prep Date: **08/19/10** RunNo: **4877**
Client ID: **LCSW** Batch ID: **1629** TestNo: **SW6020** **E200.2** Analysis Date: **08/23/10** SeqNo: **98982**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	0.0492	0.00020	0.05000	0	98.5	85	115				

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level	E	Estimated, detected above quantitation range	H	Holding times for preparation or analysis exceede
M	Manual Integration used to determine area response	ND	Not Detected at the Reporting Limit	P	Second column confirmation exceeds
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

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QC SUMMARY REPORT

WO#: **1008443**
07-Sep-10

Client: Luedtke Engineering Company
Project: Waukegan Harbor FY10 - Background Beach S **TestCode:** **6020_W**

Sample ID: **1008443-001CMS** SampType: **MS** TestCode: **6020_W** Units: **mg/L** Prep Date: **08/19/10** RunNo: **4877**
Client ID: **Beach Water 1** Batch ID: **1629** TestNo: **SW6020** **E200.2** Analysis Date: **08/23/10** SeqNo: **98984**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	0.0464	0.00020	0.05000	0	92.8	70	130				

Sample ID: **1008443-001CMSD** SampType: **MSD** TestCode: **6020_W** Units: **mg/L** Prep Date: **08/19/10** RunNo: **4877**
Client ID: **Beach Water 1** Batch ID: **1629** TestNo: **SW6020** **E200.2** Analysis Date: **08/23/10** SeqNo: **98985**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	0.0473	0.00020	0.05000	0	94.6	70	130	0.04638	1.95	20	

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level	E	Estimated, detected above quantitation range	H	Holding times for preparation or analysis exceede
M	Manual Integration used to determine area response	ND	Not Detected at the Reporting Limit	P	Second column confirmation exceeds
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

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QC SUMMARY REPORT

WO#: **1008443**
07-Sep-10

Client: Luedtke Engineering Company
Project: Waukegan Harbor FY10 - Background Beach S **TestCode:** **8082_S**

Sample ID: **lcs-1576** SampType: **lcs** TestCode: **8082_S** Units: **µg/Kg** Prep Date: **08/16/10** RunNo: **4891**
Client ID: **LCSS** Batch ID: **1576** TestNo: **SW8082** **SW3550B** Analysis Date: **08/17/10** SeqNo: **99356**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aroclor 1016	24.1	3.34	33.33	0	72.4	10	215				
Aroclor 1260	19.8	3.34	33.33	0	59.4	58.2	140				
Surr: Decachlorobiphenyl	1.30		2.666		48.8	41.4	165				
Surr: Tetrachloro-m-xylene	1.33		2.666		50.0	33.7	156				

Sample ID: **mb-1576** SampType: **mblk** TestCode: **8082_S** Units: **µg/Kg** Prep Date: **08/16/10** RunNo: **4891**
Client ID: **PBS** Batch ID: **1576** TestNo: **SW8082** **SW3550B** Analysis Date: **08/17/10** SeqNo: **99358**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aroclor 1016	ND	3.34									
Aroclor 1221	ND	3.34									
Aroclor 1232	ND	3.34									
Aroclor 1242	ND	3.34									
Aroclor 1248	ND	3.34									
Aroclor 1254	ND	3.34									
Aroclor 1260	ND	3.34									
Surr: Decachlorobiphenyl	2.07		2.666		77.5	41.4	165				
Surr: Tetrachloro-m-xylene	1.80		2.666		67.5	33.7	156				

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level	E	Estimated, detected above quantitation range	H	Holding times for preparation or analysis exceede
M	Manual Integration used to determine area response	ND	Not Detected at the Reporting Limit	P	Second column confirmation exceeds
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

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QC SUMMARY REPORT

WO#: **1008443**
07-Sep-10

Client: Luedtke Engineering Company
Project: Waukegan Harbor FY10 - Background Beach S **TestCode:** **8082_W**

Sample ID: **LCS-1578** SampType: **LCS** TestCode: **8082_W** Units: **µg/L** Prep Date: **08/16/10** RunNo: **4891**
Client ID: **LCSW** Batch ID: **1578** TestNo: **SW8082** **SW3510B** Analysis Date: **08/17/10** SeqNo: **99352**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aroclor 1016	0.838	0.020	1.000	0	83.8	10	215				
Aroclor 1260	0.730	0.020	1.000	0	73.0	63	135				
Surr: Tetrachloro-m-xylene	0.047		0.08000		58.8	40.4	143				

Sample ID: **mb-1578** SampType: **mblk** TestCode: **8082_W** Units: **µg/L** Prep Date: **08/16/10** RunNo: **4891**
Client ID: **PBW** Batch ID: **1578** TestNo: **SW8082** **SW3510B** Analysis Date: **08/17/10** SeqNo: **99354**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aroclor 1016	ND	0.020									
Aroclor 1221	ND	0.020									
Aroclor 1232	ND	0.020									
Aroclor 1242	ND	0.020									
Aroclor 1248	ND	0.020									
Aroclor 1254	ND	0.020									
Aroclor 1260	ND	0.020									
Surr: Decachlorobiphenyl	0.059		0.08000		73.8	10	200				
Surr: Tetrachloro-m-xylene	0.049		0.08000		61.3	40.4	143				

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level	E	Estimated, detected above quantitation range	H	Holding times for preparation or analysis exceede
M	Manual Integration used to determine area response	ND	Not Detected at the Reporting Limit	P	Second column confirmation exceeds
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

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QC SUMMARY REPORT

WO#: **1008443**
07-Sep-10

Client: Luedtke Engineering Company
Project: Waukegan Harbor FY10 - Background Beach S
TestCode: **CL_WW1**

Sample ID: **MB-R4729** SampType: **MBLK** TestCode: **CL_WW1** Units: **mg/L** Prep Date: RunNo: **4729**
Client ID: **PBW** Batch ID: **R4729** TestNo: **A4500-Cl- E** Analysis Date: **08/18/10** SeqNo: **95992**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	ND	5.00									

Sample ID: **LCS-R4729** SampType: **LCS** TestCode: **CL_WW1** Units: **mg/L** Prep Date: RunNo: **4729**
Client ID: **LCSW** Batch ID: **R4729** TestNo: **A4500-Cl- E** Analysis Date: **08/18/10** SeqNo: **95993**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	92.7	5.00	100.0	0	92.7	85	115				

Sample ID: **1008533-001AMS** SampType: **MS** TestCode: **CL_WW1** Units: **mg/L** Prep Date: RunNo: **4729**
Client ID: **ZZZZZZ** Batch ID: **R4729** TestNo: **A4500-Cl- E** Analysis Date: **08/18/10** SeqNo: **95995**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	165	5.00	100.0	78.47	86.4	80	120				

Sample ID: **1008533-001AMSD** SampType: **MSD** TestCode: **CL_WW1** Units: **mg/L** Prep Date: RunNo: **4729**
Client ID: **ZZZZZZ** Batch ID: **R4729** TestNo: **A4500-Cl- E** Analysis Date: **08/18/10** SeqNo: **95996**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	166	5.00	100.0	78.47	87.4	80	120	164.9	0.611	20	

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level	E	Estimated, detected above quantitation range	H	Holding times for preparation or analysis exceede
M	Manual Integration used to determine area response	ND	Not Detected at the Reporting Limit	P	Second column confirmation exceeds
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

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QC SUMMARY REPORT

WO#: **1008443**
07-Sep-10

Client: Luedtke Engineering Company
Project: Waukegan Harbor FY10 - Background Beach S **TestCode:** **P_WW_LOW**

Sample ID: **LCS-1587** SampType: **LCS** TestCode: **P_WW_LOW** Units: **mg/L** Prep Date: **08/16/10** RunNo: **4654**
Client ID: **LCSW** Batch ID: **1587** TestNo: **A4500-P BE** **A4500-P BE** Analysis Date: **08/16/10** SeqNo: **93990**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Phosphorus (As P)	0.0503	0.0120	0.05000	0	101	85	115				

Sample ID: **MB-1587** SampType: **MBLK** TestCode: **P_WW_LOW** Units: **mg/L** Prep Date: **08/16/10** RunNo: **4654**
Client ID: **PBW** Batch ID: **1587** TestNo: **A4500-P BE** **A4500-P BE** Analysis Date: **08/16/10** SeqNo: **93991**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Phosphorus (As P)	ND	0.0120									

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level	E	Estimated, detected above quantitation range	H	Holding times for preparation or analysis exceede
M	Manual Integration used to determine area response	ND	Not Detected at the Reporting Limit	P	Second column confirmation exceeds
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

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QC SUMMARY REPORT

WO#: **1008443**
07-Sep-10

Client: Luedtke Engineering Company
Project: Waukegan Harbor FY10 - Background Beach S
TestCode: **SO4_WW**

Sample ID: **MB-R4742** SampType: **MBLK** TestCode: **SO4_WW** Units: **mg/L** Prep Date: RunNo: **4742**
Client ID: **PBW** Batch ID: **R4742** TestNo: **ASTM-D516** Analysis Date: **08/18/10** SeqNo: **96175**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	ND	10									

Sample ID: **LCS-R4742** SampType: **LCS** TestCode: **SO4_WW** Units: **mg/L** Prep Date: RunNo: **4742**
Client ID: **LCSW** Batch ID: **R4742** TestNo: **ASTM-D516** Analysis Date: **08/18/10** SeqNo: **96176**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	41	10	40.00	0	103	90	110				

Sample ID: **MB-R5118** SampType: **MBLK** TestCode: **SO4_WW** Units: **mg/L** Prep Date: RunNo: **5118**
Client ID: **PBW** Batch ID: **R5118** TestNo: **ASTM-D516** Analysis Date: **09/01/10** SeqNo: **103785**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	ND	10									

Sample ID: **LCS-R5118** SampType: **LCS** TestCode: **SO4_WW** Units: **mg/L** Prep Date: RunNo: **5118**
Client ID: **LCSW** Batch ID: **R5118** TestNo: **ASTM-D516** Analysis Date: **09/01/10** SeqNo: **103786**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	39	10	40.00	0	97.3	90	110				

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level	E	Estimated, detected above quantitation range	H	Holding times for preparation or analysis exceede
M	Manual Integration used to determine area response	ND	Not Detected at the Reporting Limit	P	Second column confirmation exceeds
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

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QC SUMMARY REPORT

WO#: **1008443**
07-Sep-10

Client: Luedtke Engineering Company
Project: Waukegan Harbor FY10 - Background Beach S **TestCode:** **TDS_WW_LOW**

Sample ID: **1008443-001ADUP** SampType: **DUP** TestCode: **TDS_WW_LO** Units: **mg/L** Prep Date: RunNo: **4646**
Client ID: **Beach Water 1** Batch ID: **R4646** TestNo: **A2540C** Analysis Date: **08/16/10** SeqNo: **97143**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Residue, Filterable	172	4.00						173.2	0.928	10	

Sample ID: **MB-R4646** SampType: **MBLK** TestCode: **TDS_WW_LO** Units: **mg/L** Prep Date: RunNo: **4646**
Client ID: **PBW** Batch ID: **R4646** TestNo: **A2540C** Analysis Date: **08/16/10** SeqNo: **97146**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Residue, Filterable	2.00	4.00									J

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level	E	Estimated, detected above quantitation range	H	Holding times for preparation or analysis exceede
M	Manual Integration used to determine area response	ND	Not Detected at the Reporting Limit	P	Second column confirmation exceeds
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

3
Hillside, IL 60162
TEL: 708-544-3260
FAX: 708-544-8587
Website: www.SuburbanLabs.com

QC SUMMARY REPORT

WO#: **1008443**
07-Sep-10

Client: Luedtke Engineering Company
Project: Waukegan Harbor FY10 - Background Beach S **TestCode:** **TSS**

Sample ID: **MB-R4593** SampType: **MBLK** TestCode: **TSS** Units: **mg/L** Prep Date: RunNo: **4593**
Client ID: **PBW** Batch ID: **R4593** TestNo: **A2540D** Analysis Date: **08/13/10** SeqNo: **93303**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Residue, Non-Filterable	ND	1.00									

Sample ID: **1008484-005ADUP** SampType: **DUP** TestCode: **TSS** Units: **mg/L** Prep Date: RunNo: **4593**
Client ID: **ZZZZZZ** Batch ID: **R4593** TestNo: **A2540D** Analysis Date: **08/13/10** SeqNo: **93308**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Residue, Non-Filterable	0.500	2.50						0.5000	0	10	J

Sample ID: **1008484-007ADUP** SampType: **DUP** TestCode: **TSS** Units: **mg/L** Prep Date: RunNo: **4593**
Client ID: **ZZZZZZ** Batch ID: **R4593** TestNo: **A2540D** Analysis Date: **08/13/10** SeqNo: **93311**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Residue, Non-Filterable	15.0	5.00						16.00	6.45	10	

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level	E	Estimated, detected above quantitation range	H	Holding times for preparation or analysis exceede
M	Manual Integration used to determine area response	ND	Not Detected at the Reporting Limit	P	Second column confirmation exceeds
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

3
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Website: www.SuburbanLabs.com

QC SUMMARY REPORT

WO#: **1008443**
07-Sep-10

Client: Luedtke Engineering Company
Project: Waukegan Harbor FY10 - Background Beach S **TestCode:** **TVS_WW_LOW**

Sample ID: **1008443-001ADUP** SampType: **DUP** TestCode: **TVS_WW_LO** Units: **mg/L** Prep Date: RunNo: **4647**
Client ID: **Beach Water 1** Batch ID: **R4647** TestNo: **A2540E** Analysis Date: **08/16/10** SeqNo: **99258**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Volatile Solids	5.78	4.00						5.720	1.04	10	

Sample ID: **MB-R4647** SampType: **MBLK** TestCode: **TVS_WW_LO** Units: **mg/L** Prep Date: RunNo: **4647**
Client ID: **PBW** Batch ID: **R4647** TestNo: **A2540E** Analysis Date: **08/16/10** SeqNo: **99261**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Volatile Solids	ND	4.00									

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level	E	Estimated, detected above quantitation range	H	Holding times for preparation or analysis exceede
M	Manual Integration used to determine area response	ND	Not Detected at the Reporting Limit	P	Second column confirmation exceeds
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

SUBURBAN LABORATORIES, Inc.

4140 Litt Drive Hillside, IL 60162 Tel. 708.544.3260 Fax: 708.544.8587 Toll Free: 800.783.LABS www.suburbanlabs.com

CHAIN OF CUSTODY RECORD

Electronic Version

Company Name: Luedtke Engineering Company

Company Address:

City: Frankfort State: MI Zip: 49635

Phone: Fax: ☐ Fax Report

Email Address: ☑ Email Report

Project ID / Location: Waukegan Harbor Dredging 2010

Project Manager (Report to): Jon Keillor

Sample Collector(s): Patrick Rodriguez

TURNAROUND TIME REQUESTED: ☑ Normal ☐ RUSH* (*Additional Rush Charges Approved.)

*Date & Time Needed:

Normal TAT is 5-7 work days for most work. Rush work must be pre-approved and additional charges apply.

Specify Regulatory Program: (Required) ☐ None/Info only ☐ LUST ☐ SRP ☐ SDWA ☐ 503 Sludge ☐ NPDES ☐ MWRDGC ☐ Disposal ☑ Other (*Please specify in comment section below.)

ANALYSIS & METHOD REQUESTED: Enter an "X" in box below for request

Page 1 of 1

PO No.:

Shipping Method: SLI

QC Reporting Level: ☐ 1 ☑ 2 ☐ 3

LAB USE ONLY

SLI Order No.: 1008443

Sample containers supplied by customer? ☐ Yes

Temperature of Received Samples: 4 °C

Samples received within 24 hours of collection? ☐ Yes

	SAMPLE IDENTIFICATION (Please use 1 line per container type)	COLLECTION DATE	COLLECTION TIME	MATRIX	GRAB/ COMP.	CONTAINERS Qty	CONTAINERS SIZE & TYPE	PRESERVATIVE	TSS, TDS, TVS	Sulfate	Chloride	Ammonia	Phosphorus	Lead, Zinc, Hardness	PCBs	Asbestos (PLM & TEM)	Grain Size	Hold for use in Supernatant prep	R	Condition	Split	LAB #
1	Beach Water 1	8/10/10	12:39	SW	G	4	1LP	none	X	X	X											1A
2						1	1LP	H2SO4				X	X									1B
3						1	500p	HNO3						X								1C
4						2	1LAMG	none							X							1D
5	~~Beach Water 2~~	~~8/10/10~~	~~12:39~~	~~SW~~	~~G~~	~~20~~	~~1LG~~	~~none~~										~~X~~				~~2A-3A-D,4A-D~~ TMA 8/10/10
6	Beach Sediment #1	8/10/10	12:45	Sediment	G	2	1LG	none							X	X	X				2	~~1~~A-B
7	Beach Sediment #2	8/10/10	12:51	Sediment	G	2	1LG	none							X	X	X				3	~~1~~A-B
8	Beach Sediment #3	8/10/10	13:04	Sediment	G	2	1LG	none							X	X	X				4	~~1~~A-B
9																						
10																						
11																						
12																						

MATRIX: Drinking Water (DW), Soil (S), Waste Water (WW), Surface Water(SW), Ground Water (GW), Solid Waste (WA), Sludge (L), Wipe (P) CONTAINER: 2oz, 4oz, 8oz, 40ml Vial, 500ml, Liter (L), Tube, Glass (G), Plastic (P) PRESERVATIVE: H_2SO_4, HCl, HNO_3, Methanol (MeOH) NaOH, Sodium Bisulfate (NaB), NaThio

COMMENTS & SPECIAL INSTRUCTIONS:

* Chicago District USACE - Waukegan Harbor Approach Channel Dredging project 2010

CONDITION CODES
1. Improper/damaged container/cap
2. Improper preservation
3. Insufficient sample volume
4. Headspace/air bubbles for VOCs
5. Received past holding time
6. Received frozen
7. Label conflicts with COC

1. Relinquished By	Date	2. Relinquished By	Date	3. Relinquished By	Date	4. Relinquished By	Date
Patrick Rodriguez	8/10/10	Patrick Rodriguez	8/10/10				
Received By: Patrick Rodriguez ☐ Ice	Time: 13:10	Received By: Melissa Amato ☑ Ice	Time: 14:50	Received By ☐ Ice	Time	Received By ☐ Ice	Time

Submission of samples subject to Terms and Conditions on back. Rev. 2/01/05 Please fill out this form completely, print, sign & submit with samples. Keep a copy for your records.

FIELD LOG

Suburban Laboratories, Inc.
4140 Litt Drive
Hillside, IL 60162-1183
P: (708) 544-3260 F: (708) 544-8587
www.SuburbanLabs.com

Luedtke Engineering Company

FY10 Dredging of Waukegan Harbor Approach Channel
Background Beach sampling

Suburban Labs Field Sampling Technician(s) - PRINT: Patrick Rodriguez

Weather and water conditions: Foggy + Calm

Eutech Inst. Oakton Field pH Meter, pHTestr 30
Serial No.: 1576094

	Beach Water #1	~~Beach Water #2~~	Beach Sediment #1	Beach Sediment #2	Beach Sediment #3	Additional Comments:
Sampling Technique:	grab	8/10/10 ~~grab~~	grab	grab	grab	
GPS coordinate (Lat./Long.) of sample collection:[1]	N42° 29' 26.9"/87° 48' 8.6		N42° 29' 27.0" E087° 48' 8.7"	N42° 29' 31.2" E087° 48' 09.2"	N42° 29' 24.0" E87° 48' 7.2"	
GPS coordinate (state plane) of sample collection:[1]						
Date & Time of collection:	8/10/10 12:39	~~8/10/10 12:39~~	8/10/10 12:45	8/10/10 12:51	8/10/10 13:04	
Sample appearance: (clear, tinted, dark, etc..)	Clear	Clear	Dark	Dark	Dark	
pH & Time of reading:	8.53 12:39					
Temperature (degrees C):	26.1°C					
Comments:						

See also chain of custody form for bottles and preservatives.

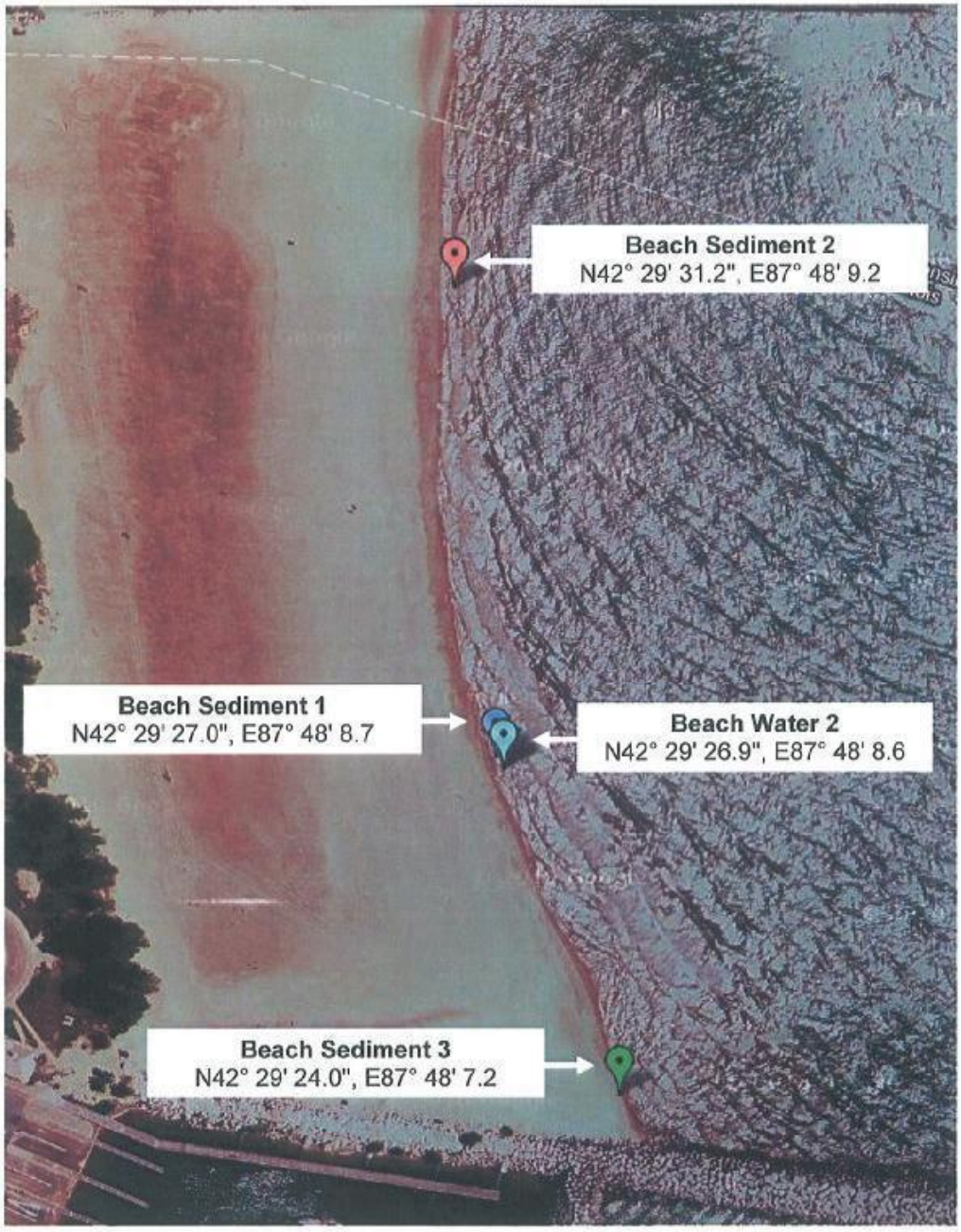
Version 0 06/16/2010

SIGNATURES:

SLI Field Tech 1: [signature]

SLI Field Tech 2: _____

Background Beach Sampling - Map 1
8/10/10



Background Beach Sampling - Map 2
8/10/10

Beach Sediment 1—Photo A

Beach Sediment 1—Photo B

Beach Sediment 2—Photo A

Beach Sediment 2—Photo B

Beach Sediment 3—Photo A

Beach Sediment 3—Photo B

UNITED ANALYTICAL SERVICES, INC.

PLM LABORATORY REPORT

METHOD:	EPA/600/R-93/116 July 1993 PLM w/ Dispersion Staining	REPORT DATE:	August 13, 2010
		DATE RECEIVED:	August 11, 2010
CLIENT:	Suburban Laboratories, Inc.	UAS SAN#:	1015146
ATTENTION:	Melissa Amador	JOB LOCATION:	1008443-002
FAX:	melissa@suburbanlabs.com		

CLIENT SAMPLE #	LAB SAMPLE #	COLOR	DESCRIPTION/ LOCATION	ASBESTOS TYPE	%	OTHER FIBERS	%	MATRIX	%
1008443-0020	1015146-01	Tan	Sediment	ND	--	ND	--	O	100
1008443-0033	1015146-02	Tan	Sediment	ND	--	ND	--	O	100
1008443-0043	1015146-03	Tan	Sediment	ND	--	ND	--	O	100

Analysis Comments:

Samples analyzed according to the EPA/600/R-93/116 July 1993 entitled Method for the Determination of Asbestos in Bulk Building Materials. Further testing by gravimetric or TEM Methods are recommended for samples that are non-friable, i.e., floor tiles, mastics, etc. Report shall not be reproduced except in full, without the written approval of the laboratory. Laboratory results pertain to those delivered for analysis. Samples will be discarded if not notified by the client within 90 days.

CODES-ASBESTOS	CODES-OTHER FIBERS	CODES-MATRIX
ND-None Detected	FBG-Fiber Glass	G-Gypsum
CHRY-Chrysotile	CELL-Cellulose	C-Calcium Carbonate
AMOS-Amosite	SYN-Synthetic	M-Mica
CROC-Crocidolite	WOLL-Wollastonite	O-Other Matrix
TREM-Tremolite	H-Hair	
ACTN-Actinolite	O-Other(Specify)	
ANTH-Anthophyllite		

ANALYZED BY- Karen Buehler / Laboratory Manager — DATE ANALYZED: August 13, 2010

REVIEWED BY- Marcia De Michael / Administrative Assistant — DATE REVIEWED: August 13, 2010

PLM & TEM

NVLAP Laboratory # 101732

AIHA Laboratory # 101212

This report must not be used by the client to claim product endorsement by AIHA, NVLAP or any agency of the United States Government.

PLM Master Report/11-10-09KB

UNITED ANALYTICAL SERVICES, INC.

TEM CHATFIELD LABORATORY REPORT - QUALITATIVE ONLY

METHOD:	Chatfield Method SOP-1988-02	REPORT DATE:	August 18, 2010
		DATE RECEIVED:	August 11, 2010
CLIENT:	Suburban Laboratories, Inc.	UAS SAM #:	1015146
ATTENTION:	Melissa Amagor	JOB LOCATION:	1008443-003
FAX:	melissa@suburbanlabs.com		

CLIENT SAMPLE #	LAB SAMPLE #	SAMPLE DESCRIPTION/LOCATION	% ORGANICS	% ACID SOLUBLE	ASBESTOS TYPE(S)	% ASBESTOS
1008443-003A	1015146-01	Sediment	-	-	-	None Detected
1008443-003B	1015146-02	Sediment	-	-	-	None Detected
1008443-003B	1015146-03	Sediment	-	-	-	None Detected

NSD=No Structures Detected

Comments:

Samples prepped according to Chatfield Method SOP-1988-02

Report shall not be reproduced in except in full, without the written approval of the laboratory.

Laboratory not responsible for the physical separation of layered materials.

Laboratory results only pertain to those items delivered.

Samples will be discarded if not notified by the client within 90 days.

ANALYZED BY- Karen Buehler / Laboratory Manager

August 18, 2010
DATE ANALYZED

PLM & TEM

NVLAP

NVLAP Laboratory # 101732

AIHA Laboratory # 101212

This report must not be used by the client to claim product endorsement by AIHA, NVLAP or any agency of the United States Government.

TEM Chatfield Master Report 11-10-02.KB

CHAIN OF CUSTODY RECORD (COC ID:)

PAGE (OF)

helic

1015146

ADDRESS
Suburban Laboratories, Inc.
Hillside, IL 60162
TEL: 708.544.3260
FAX: 708.544.8167
Website: www.SuburbanLabs.com

Please Include Email Address of Report Recipient Whenever Possible!!!

CLIENT:	United Analytical	CC: ATTN:	United Analytical Services
ADDRESS:	1429 Centre Circle Drive		
CITY, STATE, ZIP:	Downers Grove, IL 60515		
PHONE:	(630) 691-8271	FAX:	(630) 691-1819
ACCOUNT #:		EMAIL:	

SPECIAL INSTRUCTIONS/COMMENTS:
Please analyze all samples for both PLM and TEM. Email report and invoice to Melissa Amador at melissa@suburbanlabs.com

ITEM #	SAMPLE ID	BOTTLE TYPE	MATRIX	DATE COLLECTED	NUMBER OF CONTAINERS	COMMENTS (Method to Preserve Sample, Sample Location, Additional Sample Information)
1	1008443-0025 N7402	1LG_Teflon	Sediment	08/09/10 12:15:00 PM		If this sample is on hold to be used for the superfund
2	1008443-0028 N7402	1LG_Teflon	Sediment	08/09/10 12:52:00 PM		
3	1008443-0018 N7402	1LG_Teflon	Sediment	08/09/10 1:04:00 PM		

Relinquished By:	Date: 8/11/10	Time: 12:00	Received By:	Date: 8/11/10	Time: 12:00
Relinquished By:	Date:	Time:	Received By:	Date:	Time:

TAT: Standard 2DAY Next D. 3rd D. 5th D.

Note: RUSH requests will incur surcharges

REPORT TRANSMITTAL OPTIONS:
E-MAIL FAX MAIL PHONE

FOR LAB USE ONLY
Temp Blank: °C Acceptable (Y/N)
Comments:

SUBURBAN LABORATORIES, Inc.

4140 Litt Drive Hillside, Illinois 60162
Tel. (708) 544-3260 Toll Free (800) 783-LABS
Fax (708-544-8587
www.suburbanlabs.com

September 07, 2010

Workorder: 1008454

Jon Keillor
Luedtke Engineering Company
10 Fourth Street
P.O. Box 111
Frankfort, Michigan 49635

TEL: (231) 352-9631
FAX: (231) 352-7178
RE: Waukegan Harbor FY10 - After Operations Sediment

Dear Jon Keillor:

Suburban Laboratories, Inc. received 6 sample(s) on 08/10/10 for the analyses presented in the following report.

All data for the associated quality control (QC) met EPA, method, or internal laboratory specifications except where noted in the case narrative. If you are comparing these results to external QC specifications or compliance limits and have any questions, please contact us.

This final report of laboratory analysis consists of this cover letter, case narrative, analytical report, dates report, and any accompanying documentation on, but not limited to, chain of custody records, raw data, and letters of explanation or reliance. This report may not be reproduced, except in full, without the prior written approval of Suburban Laboratories, Inc.

If you have any questions regarding these test results, please call me at (708) 544-3260.

Sincerely,

Melissa Amador

Melissa Amador
Project Manager

Illinois Department of Public Health Accredited # 17585 Illinois Environmental Protection Agency Accredited #100225

Suburban Laboratories, Inc.

4140 Litt Drive, Hillside, IL 60162 (708) 544-3260

Case Narrative

Client: Luedtke Engineering Company
Project: Waukegan Harbor FY10 - After Operations Sedi
WorkOrder: 1008454
Temperature of samples upon receipt at SLI: 4 C

Date: September 07, 2010
PO #: 981-1
QC Level:
Chain of Custody #: Electronic

General Comments:
- All results reported in wet weight unless otherwise indicated. (dry = Dry Weight)
- Sample results relate only to the analytes of interest tested and to sample as received by the laboratory.
- Environmental compliance sample results meet the requirements of 35 IAC Part 186 unless otherwise indicated.
- Waste water analysis follows the rules set forth in 40 CFR part 136 except where otherwise noted.
- Accreditation by the State of Illinois is not an endorsement or a guarantee of the validity of data generated.
- For more information about the laboratories' scope of accreditation, please contact us at (708) 544-3260 or the Agency at (217) 782-6455.

Abbreviations:
- Reporting Limit: The concentration at which an analyte can be routinely detected on a day to day basis, and which also meets regulatory and client needs.
- Quantitation Limit: The lowest concentration at which results can be accurately quantitated.
- J: The analyte was positively identified above our Method Detection Limit and is considered detectable and usable; however, the associated numerical value is the approximate concentration of the analyte in the sample.
- ATC: Automatic Temperature Correction. - TNTC: Too Numerous To Count
- In Laboratory: EPA recommends this analyte be analyzed "immediately" (e.g., tests that should be performed in the field within 15 minutes of collection). Analytes with "immediate" hold times are analyzed as soon as possible upon receipt by the laboratory.
- TIC: Tentatively Identified Compound (GCMS library search identification, concentration estimated to nearest internal standard).

Method References:
For a complete list of method references please contact us.
- E: USEPA Reference methods
- SW: USEPA, Test Methods for Evaluating Solid Waste (SW-846)
- M: Standard Methods for the Examination of Water and Wastewater
- USP: Latest version of United States Pharmacopeia

Workorder Specific Comments:

Equal weights of Samples 1008454-001A, -002A, -003A were combined to form the Laboratory Composite Sample.

One and four hour Supernatant Samples were produced using the Laboratory Composite Sample.

Client:	Luedtke Engineering Company	**Date:**	September 07, 2010
Project:	Waukegan Harbor FY10 - After Operations Sedi	**PO #:**	981-1
WorkOrder:	**1008454**	**QC Level:**	
Temperature of samples upon receipt at SLI:	**4 C**	**Chain of Custody #:**	Electronic

PCBs:
Sample 1008454-002A: S= The surrogate recovery for Tetrachloro-m-xylene was outside of laboratory control limits due to sample matrix. A second surrogate, Decachlorobiphenyl was added and the percent recovery (53.76%) was within established limits (41.4-165%)

Suburban Laboratories, Inc.
4140 Litt Drive, Hillside, IL 60162 (708) 544-3260

Laboratory Results

Client ID: Luedtke Engineering Company
Project Name: Waukegan Harbor FY10 - After Operations Sedi
Report Date: September 07, 2010
Lab Order: **1008454**

Client Sample ID: **After Operations Sediment 1**
Lab ID: 1008454-001 **Date Received:** 08/10/2010 2:50 PM
Matrix: SEDIMENT
Collection Date: 08/10/2010 11:00 AM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
PCBS		Method: EPA-8082-Rev 0, Dec-96				Analyst: mn	
Aroclor 1016	ND	2.57		µg/Kg-dry	1	08/17/2010 8:54 PM	1576
Aroclor 1221	ND	2.57		µg/Kg-dry	1	08/17/2010 8:54 PM	1576
Aroclor 1232	ND	2.57		µg/Kg-dry	1	08/17/2010 8:54 PM	1576
Aroclor 1242	ND	2.57		µg/Kg-dry	1	08/17/2010 8:54 PM	1576
Aroclor 1248	ND	2.57		µg/Kg-dry	1	08/17/2010 8:54 PM	1576
Aroclor 1254	ND	2.57		µg/Kg-dry	1	08/17/2010 8:54 PM	1576
Aroclor 1260	ND	2.57		µg/Kg-dry	1	08/17/2010 8:54 PM	1576
Surr: Tetrachloro-m-xylene	40.0	33.7-156		%REC	1	08/17/2010 8:54 PM	1576
ASBESTOS		Method:				Analyst: maa	
Asbestos	Attached	0	c		1	08/18/2010 12:00 AM	R4868
PERCENT MOISTURE		Method: ASTM-D2216-Rev 2005				Analyst: jos	
Percent Moisture	22	1.0		wt%	1	08/16/2010 12:00 AM	R4637
SIEVE ANALYSIS FOR GRAIN SIZE		Method: ASTM-ASTM D422 Modified-Rev 1998				Analyst: ll	
Material finer than #230 (Sieve 230, 63 µm)	25	0		wt%	1	08/18/2010 2:08 PM	R4731

Client Sample ID: **After Operations Sediment 2**
Lab ID: 1008454-002 **Date Received:** 08/10/2010 2:50 PM
Matrix:
Collection Date: 08/10/2010 11:22 AM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
PCBS		Method: EPA-8082-Rev 0, Dec-96				Analyst: mn	
Aroclor 1016	ND	2.69		µg/Kg-dry	1	08/17/2010 9:12 PM	1576
Aroclor 1221	ND	2.69		µg/Kg-dry	1	08/17/2010 9:12 PM	1576
Aroclor 1232	ND	2.69		µg/Kg-dry	1	08/17/2010 9:12 PM	1576
Aroclor 1242	ND	2.69		µg/Kg-dry	1	08/17/2010 9:12 PM	1576
Aroclor 1248	ND	2.69		µg/Kg-dry	1	08/17/2010 9:12 PM	1576
Aroclor 1254	ND	2.69		µg/Kg-dry	1	08/17/2010 9:12 PM	1576
Aroclor 1260	ND	2.69		µg/Kg-dry	1	08/17/2010 9:12 PM	1576
Surr: Tetrachloro-m-xylene	32.5	33.7-156	S	%REC	1	08/17/2010 9:12 PM	1576
ASBESTOS		Method:				Analyst: maa	
Asbestos	Attached	0	c		1	08/18/2010 12:00 AM	R4868
PERCENT MOISTURE		Method: ASTM-D2216-Rev 2005				Analyst: jos	
Percent Moisture	26	1.0		wt%	1	08/16/2010 12:00 AM	R4637
SIEVE ANALYSIS FOR GRAIN SIZE		Method: ASTM-ASTM D422 Modified-Rev 1998				Analyst: ll	
Material finer than #230 (Sieve 230, 63 µm)	33	0		wt%	1	08/18/2010 2:08 PM	R4731

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
c	Analyte not in SLI scope of accreditation	E	Estimated, detected above quantitation range
G	Refer to case narrative page for specific comments	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limit (QL)	N	Tentatively identified compounds
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits

Suburban Laboratories, Inc.
4140 Litt Drive, Hillside, IL 60162 (708) 544-3260

Laboratory Results

Client ID: Luedtke Engineering Company
Project Name: Waukegan Harbor FY10 - After Operations Sedi
Report Date: September 07, 2010
Lab Order: **1008454**

Client Sample ID: **After Operations Sediment 3**
Lab ID: 1008454-003 **Date Received:** 08/10/2010 2:50 PM
Matrix: SEDIMENT
Collection Date: 08/10/2010 11:41 AM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
PCBS		Method: EPA-8082-Rev 0, Dec-96				Analyst: mn	
Aroclor 1016	ND	2.71		µg/Kg-dry	1	08/17/2010 9:31 PM	1576
Aroclor 1221	ND	2.71		µg/Kg-dry	1	08/17/2010 9:31 PM	1576
Aroclor 1232	ND	2.71		µg/Kg-dry	1	08/17/2010 9:31 PM	1576
Aroclor 1242	ND	2.71		µg/Kg-dry	1	08/17/2010 9:31 PM	1576
Aroclor 1248	ND	2.71		µg/Kg-dry	1	08/17/2010 9:31 PM	1576
Aroclor 1254	ND	2.71		µg/Kg-dry	1	08/17/2010 9:31 PM	1576
Aroclor 1260	ND	2.71		µg/Kg-dry	1	08/17/2010 9:31 PM	1576
Surr: Tetrachloro-m-xylene	41.3	33.7-156		%REC	1	08/17/2010 9:31 PM	1576
ASBESTOS		Method:				Analyst: maa	
Asbestos	Attached	0	c		1	08/18/2010 12:00 AM	R4868
PERCENT MOISTURE		Method: ASTM-D2216-Rev 2005				Analyst: jos	
Percent Moisture	27	1.0		wt%	1	08/16/2010 12:00 AM	R4637
SIEVE ANALYSIS FOR GRAIN SIZE		Method: ASTM-ASTM D422 Modified-Rev 1998				Analyst: ll	
Material finer than #230 (Sieve 230, 63 µm)	30	0		wt%	1	08/18/2010 2:08 PM	R4731

Client Sample ID: **Beach Water 2**
Lab ID: 1008454-004 **Date Received:** 08/10/2010 2:50 PM
Matrix: SURFACE WATER
Collection Date: 08/10/2010 12:39 PM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
LABORATORY COMPOSITING		Method:				Analyst: ll	
COMPOSITE for WET CHEM	see narrative	0			1	08/13/2010 3:07 PM	R4792
FIELD PARAMETERS		Method: E150.1-FIELD				Analyst:	
pH, Field	8.53			pH		08/10/2010 12:39 PM	
Temperature	26.1			C		08/10/2010 12:39 PM	
SUPERNATANT		Method:				Analyst: ll	
Supernatant	see narrative	0			1	08/13/2010 3:07 PM	R4792

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
c	Analyte not in SLI scope of accreditation	E	Estimated, detected above quantitation range
G	Refer to case narrative page for specific comments	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limit (QL)	N	Tentatively identified compounds
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits

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Laboratory Results

Client ID: Luedtke Engineering Company
Project Name: Waukegan Harbor FY10 - After Operations Sedi
Report Date: September 07, 2010
Lab Order: **1008454**

Client Sample ID: **Zero Hour Elutriate**
Lab ID: 1008454-005 **Date Received:** 08/10/2010 2:50 PM
Matrix: ELUTRIATE
Collection Date: 08/13/2010 12:00 AM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
METALS BY ICPMS		Method: SW846-SW6020-Rev 0, Sep-94				Analyst: dc	
Lead	0.258	0.00020		mg/L	2	08/23/2010 8:07 PM	1597
Zinc	0.716	0.0300		mg/L	10	08/24/2010 1:51 PM	1597
PCBS		Method: EPA-SW8082-Rev 0, Dec-96				Analyst: mn	
Aroclor 1016	0.023	0.020		µg/L	1	08/17/2010 5:10 PM	1578
Aroclor 1221	ND	0.020		µg/L	1	08/17/2010 5:10 PM	1578
Aroclor 1232	ND	0.020		µg/L	1	08/17/2010 5:10 PM	1578
Aroclor 1242	ND	0.020		µg/L	1	08/17/2010 5:10 PM	1578
Aroclor 1248	ND	0.020		µg/L	1	08/17/2010 5:10 PM	1578
Aroclor 1254	ND	0.020		µg/L	1	08/17/2010 5:10 PM	1578
Aroclor 1260	ND	0.020		µg/L	1	08/17/2010 5:10 PM	1578
Surr: Tetrachloro-m-xylene	51.3	40.4-143		%REC	1	08/17/2010 5:10 PM	1578
CHLORIDE		Method: APHA-M4500-Cl^- E-Rev 18th, 1992				Analyst: lb	
Chloride	17.9	0.500		mg/L	1	08/18/2010 1:51 PM	R4729
HARDNESS, TOTAL		Method: SM-2340B-Rev 18Ed, 1992				Analyst: mn	
Hardness, Ca/Mg (As CaCO3)	7,560	0.100	c	mg/L	1	08/18/2010 12:00 AM	1598
AMMONIA, BY SELECTIVE ELECTRODE		Method: SM-M4500NH3 F-Rev 18Ed, 1992				Analyst: lb	
Nitrogen, Ammonia (As N)	0.542	0.0100		mg/L	1	08/18/2010 4:27 PM	R4744
PHOSPHORUS, TOTAL		Method: SM-M4500P BE-Rev 18Ed, 1992				Analyst: sb	
Phosphorus (As P)	0.0205	0.00500		mg/L	1	08/16/2010 7:22 PM	1587
SULFATE		Method: ASTM-ASTM D516-Rev 2004				Analyst: lb	
Sulfate	36	1.0		mg/L	1	09/01/2010 1:11 PM	R5118
TOTAL DISSOLVED SOLIDS		Method: SM-M2540C-Rev 18Ed, 1992				Analyst: jos	
Residue, Filterable	194	1.00		mg/L	1	08/16/2010 12:00 AM	R4646
TOTAL SUSPENDED SOLIDS		Method: SM-M2540D-Rev 18Ed, 1992				Analyst: jos	
Residue, Non-Filterable	27,000	20.0		mg/L	1	08/16/2010 12:00 AM	R4635
TOTAL VOLATILE SOLIDS		Method:				Analyst: jos	
Total Volatile Solids	35.0	1.00	c	mg/L	1	08/16/2010 12:00 AM	R4647

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
c	Analyte not in SLI scope of accreditation	E	Estimated, detected above quantitation range
G	Refer to case narrative page for specific comments	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limit (QL)	N	Tentatively identified compounds
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits

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Laboratory Results

Client ID: Luedtke Engineering Company
Project Name: Waukegan Harbor FY10 - After Operations Sedi
Report Date: September 07, 2010
Lab Order: **1008454**

Client Sample ID: **Four Hour Elutriate**
Lab ID: 1008454-006 **Date Received:** 08/10/2010 2:50 PM
Matrix: ELUTRIATE
Collection Date: 08/13/2010 12:00 AM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
METALS BY ICPMS		Method: SW846-SW6020-Rev 0, Sep-94				Analyst: dc	
Lead	0.0291	0.00010		mg/L	1	08/19/2010 1:06 PM	1597
Zinc	0.101	0.00300		mg/L	1	08/19/2010 1:06 PM	1597
PCBS		Method: EPA-SW8082-Rev 0, Dec-96				Analyst: mn	
Aroclor 1016	0.028	0.020		µg/L	1	08/17/2010 7:39 PM	1578
Aroclor 1221	ND	0.020		µg/L	1	08/17/2010 7:39 PM	1578
Aroclor 1232	ND	0.020		µg/L	1	08/17/2010 7:39 PM	1578
Aroclor 1242	ND	0.020		µg/L	1	08/17/2010 7:39 PM	1578
Aroclor 1248	ND	0.020		µg/L	1	08/17/2010 7:39 PM	1578
Aroclor 1254	ND	0.020		µg/L	1	08/17/2010 7:39 PM	1578
Aroclor 1260	ND	0.020		µg/L	1	08/17/2010 7:39 PM	1578
Surr: Tetrachloro-m-xylene	68.8	40.4-143		%REC	1	08/17/2010 7:39 PM	1578
CHLORIDE		Method: APHA-M4500-Cl^- E-Rev 18th, 1992				Analyst: lb	
Chloride	18.6	0.500		mg/L	1	08/18/2010 1:51 PM	R4729
HARDNESS, TOTAL		Method: SM-2340B-Rev 18Ed, 1992				Analyst: mn	
Hardness, Ca/Mg (As CaCO3)	536	0.050	c	mg/L	1	08/18/2010 12:00 AM	1598
AMMONIA, BY SELECTIVE ELECTRODE		Method: SM-M4500NH3 F-Rev 18Ed, 1992				Analyst: lb	
Nitrogen, Ammonia (As N)	0.440	0.0100		mg/L	1	08/18/2010 4:27 PM	R4744
PHOSPHORUS, TOTAL		Method: SM-M4500P BE-Rev 18Ed, 1992				Analyst: sb	
Phosphorus (As P)	ND	0.00500		mg/L	1	08/17/2010 12:24 PM	1591
SULFATE		Method: ASTM-ASTM D516-Rev 2004				Analyst: lb	
Sulfate	28	1.0		mg/L	1	09/01/2010 1:11 PM	R5118
TOTAL DISSOLVED SOLIDS		Method: SM-M2540C-Rev 18Ed, 1992				Analyst: jos	
Residue, Filterable	185	1.00		mg/L	1	08/16/2010 12:00 AM	R4646
TOTAL SUSPENDED SOLIDS		Method: SM-M2540D-Rev 18Ed, 1992				Analyst: jos	
Residue, Non-Filterable	1,540	10.0		mg/L	1	08/16/2010 12:00 AM	R4635
TOTAL VOLATILE SOLIDS		Method:				Analyst: jos	
Total Volatile Solids	9.14	1.00	c	mg/L	1	08/16/2010 12:00 AM	R4647

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
c	Analyte not in SLI scope of accreditation	E	Estimated, detected above quantitation range
G	Refer to case narrative page for specific comments	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limit (QL)	N	Tentatively identified compounds
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits

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PREP DATES REPOR

Client: Luedtke Engineering Company

Project: Waukegan Harbor FY10 - After Op

Report Date: September 07, 2010

Lab Order: **1008454**

Sample ID	Collection Date	Batch ID	Prep Method	Prep Test Name	TCLP Date	Prep Date
1008454-001A	08/10/10 11:00:00 A	1576	3550_PCB	SOLID PREP SONICATION: PCB		08/16/10
1008454-002A	08/10/10 11:22:00 A	1576	3550_PCB	SOLID PREP SONICATION: PCB		08/16/10
1008454-003A	08/10/10 11:41:00 A	1576	3550_PCB	SOLID PREP SONICATION: PCB		08/16/10
1008454-005B	08/13/10	1587	P_WW_LOWPR	PHOSPHORUS, TOTAL		08/16/10
1008454-005C		1598	200.2_ICPWW_	AQUEOUS PREP T/R METALS: ICP		08/17/10
		1597	200.2_ICPMS_W	AQUEOUS PREP TOTAL METALS: ICP		08/17/10
1008454-005D		1578	3510_PCB	AQUEOUS PREP SEP FUNNEL: PCB		08/16/10
1008454-006B		1591	P_WW_LOWPR	PHOSPHORUS, TOTAL		08/17/10
1008454-006C		1598	200.2_ICPWW_	AQUEOUS PREP T/R METALS: ICP		08/17/10
		1597	200.2_ICPMS_W	AQUEOUS PREP TOTAL METALS: ICP		08/17/10
1008454-006D		1578	3510_PCB	AQUEOUS PREP SEP FUNNEL: PCB		08/16/10

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QC SUMMARY REPORT

WO#: **1008454**

07-Sep-10

Client: Luedtke Engineering Company
Project: Waukegan Harbor FY10 - After Operations Sedi

TestCode: **6020_W**

Sample ID: **MB-1597** SampType: **MBLK** TestCode: **6020_W** Units: **mg/L** Prep Date: **08/17/10** RunNo: **4784**
Client ID: **PBW** Batch ID: **1597** TestNo: **SW6020** **E200.2** Analysis Date: **08/19/10** SeqNo: **97164**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	0.00017	0.00020									J
Zinc	ND	0.00300									

Sample ID: **LCS-1597** SampType: **LCS** TestCode: **6020_W** Units: **mg/L** Prep Date: **08/17/10** RunNo: **4784**
Client ID: **LCSW** Batch ID: **1597** TestNo: **SW6020** **E200.2** Analysis Date: **08/19/10** SeqNo: **97165**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	0.0450	0.00020	0.05000	0	90.0	85	115				
Zinc	0.0468	0.00300	0.05000	0	93.5	85	115				

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level	E	Estimated, detected above quantitation range	H	Holding times for preparation or analysis exceede
M	Manual Integration used to determine area response	ND	Not Detected at the Reporting Limit	P	Second column confirmation exceeds
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

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QC SUMMARY REPORT

WO#: **1008454**
07-Sep-10

Client: Luedtke Engineering Company
Project: Waukegan Harbor FY10 - After Operations Sedi **TestCode:** **8082_S**

Sample ID: **lcs-1576** SampType: **lcs** TestCode: **8082_S** Units: **µg/Kg** Prep Date: **08/16/10** RunNo: **4891**
Client ID: **LCSS** Batch ID: **1576** TestNo: **SW8082** **SW3550B** Analysis Date: **08/17/10** SeqNo: **99356**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aroclor 1016	24.1	3.34	33.33	0	72.4	10	215				
Aroclor 1260	19.8	3.34	33.33	0	59.4	58.2	140				
Surr: Decachlorobiphenyl	1.30		2.666		48.8	41.4	165				
Surr: Tetrachloro-m-xylene	1.33		2.666		50.0	33.7	156				

Sample ID: **mb-1576** SampType: **mblk** TestCode: **8082_S** Units: **µg/Kg** Prep Date: **08/16/10** RunNo: **4891**
Client ID: **PBS** Batch ID: **1576** TestNo: **SW8082** **SW3550B** Analysis Date: **08/17/10** SeqNo: **99358**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aroclor 1016	ND	3.34									
Aroclor 1221	ND	3.34									
Aroclor 1232	ND	3.34									
Aroclor 1242	ND	3.34									
Aroclor 1248	ND	3.34									
Aroclor 1254	ND	3.34									
Aroclor 1260	ND	3.34									
Surr: Decachlorobiphenyl	2.07		2.666		77.5	41.4	165				
Surr: Tetrachloro-m-xylene	1.80		2.666		67.5	33.7	156				

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level	E	Estimated, detected above quantitation range	H	Holding times for preparation or analysis exceede
M	Manual Integration used to determine area response	ND	Not Detected at the Reporting Limit	P	Second column confirmation exceeds
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

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QC SUMMARY REPORT

WO#: **1008454**
07-Sep-10

Client: Luedtke Engineering Company
Project: Waukegan Harbor FY10 - After Operations Sedi
TestCode: **8082_W**

Sample ID: **LCS-1578** SampType: **LCS** TestCode: **8082_W** Units: **µg/L** Prep Date: **08/16/10** RunNo: **4891**
Client ID: **LCSW** Batch ID: **1578** TestNo: **SW8082** **SW3510B** Analysis Date: **08/17/10** SeqNo: **99352**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aroclor 1016	0.838	0.020	1.000	0	83.8	10	215				
Aroclor 1260	0.730	0.020	1.000	0	73.0	63	135				
Surr: Tetrachloro-m-xylene	0.047		0.08000		58.8	40.4	143				

Sample ID: **mb-1578** SampType: **mblk** TestCode: **8082_W** Units: **µg/L** Prep Date: **08/16/10** RunNo: **4891**
Client ID: **PBW** Batch ID: **1578** TestNo: **SW8082** **SW3510B** Analysis Date: **08/17/10** SeqNo: **99354**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aroclor 1016	ND	0.020									
Aroclor 1221	ND	0.020									
Aroclor 1232	ND	0.020									
Aroclor 1242	ND	0.020									
Aroclor 1248	ND	0.020									
Aroclor 1254	ND	0.020									
Aroclor 1260	ND	0.020									
Surr: Decachlorobiphenyl	0.059		0.08000		73.8	10	200				
Surr: Tetrachloro-m-xylene	0.049		0.08000		61.3	40.4	143				

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level	E	Estimated, detected above quantitation range	H	Holding times for preparation or analysis exceede
M	Manual Integration used to determine area response	ND	Not Detected at the Reporting Limit	P	Second column confirmation exceeds
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

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QC SUMMARY REPORT

WO#: **1008454**
07-Sep-10

Client: Luedtke Engineering Company
Project: Waukegan Harbor FY10 - After Operations Sedi
TestCode: **CL_WW1**

Sample ID: **MB-R4729** SampType: **MBLK** TestCode: **CL_WW1** Units: **mg/L** Prep Date: RunNo: **4729**
Client ID: **PBW** Batch ID: **R4729** TestNo: **A4500-Cl- E** Analysis Date: **08/18/10** SeqNo: **95992**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	ND	5.00									

Sample ID: **LCS-R4729** SampType: **LCS** TestCode: **CL_WW1** Units: **mg/L** Prep Date: RunNo: **4729**
Client ID: **LCSW** Batch ID: **R4729** TestNo: **A4500-Cl- E** Analysis Date: **08/18/10** SeqNo: **95993**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	92.7	5.00	100.0	0	92.7	85	115				

Sample ID: **1008533-001AMS** SampType: **MS** TestCode: **CL_WW1** Units: **mg/L** Prep Date: RunNo: **4729**
Client ID: **ZZZZZZ** Batch ID: **R4729** TestNo: **A4500-Cl- E** Analysis Date: **08/18/10** SeqNo: **95995**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	165	5.00	100.0	78.47	86.4	80	120				

Sample ID: **1008533-001AMSD** SampType: **MSD** TestCode: **CL_WW1** Units: **mg/L** Prep Date: RunNo: **4729**
Client ID: **ZZZZZZ** Batch ID: **R4729** TestNo: **A4500-Cl- E** Analysis Date: **08/18/10** SeqNo: **95996**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	166	5.00	100.0	78.47	87.4	80	120	164.9	0.611	20	

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level	E	Estimated, detected above quantitation range	H	Holding times for preparation or analysis exceede
M	Manual Integration used to determine area response	ND	Not Detected at the Reporting Limit	P	Second column confirmation exceeds
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

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QC SUMMARY REPORT

WO#: **1008454**
07-Sep-10

Client: Luedtke Engineering Company
Project: Waukegan Harbor FY10 - After Operations Sedi
TestCode: **P_WW_LOW**

Sample ID: **LCS-1587** SampType: **LCS** TestCode: **P_WW_LOW** Units: **mg/L** Prep Date: **08/16/10** RunNo: **4654**
Client ID: **LCSW** Batch ID: **1587** TestNo: **A4500-P BE** **A4500-P BE** Analysis Date: **08/16/10** SeqNo: **93990**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Phosphorus (As P)	0.0503	0.0120	0.05000	0	101	85	115				

Sample ID: **MB-1587** SampType: **MBLK** TestCode: **P_WW_LOW** Units: **mg/L** Prep Date: **08/16/10** RunNo: **4654**
Client ID: **PBW** Batch ID: **1587** TestNo: **A4500-P BE** **A4500-P BE** Analysis Date: **08/16/10** SeqNo: **93991**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Phosphorus (As P)	ND	0.0120									

Sample ID: **MB-1591** SampType: **MBLK** TestCode: **P_WW_LOW** Units: **mg/L** Prep Date: **08/17/10** RunNo: **4675**
Client ID: **PBW** Batch ID: **1591** TestNo: **A4500-P BE** **A4500-P BE** Analysis Date: **08/17/10** SeqNo: **94430**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Phosphorus (As P)	ND	0.0120									

Sample ID: **LCS-1591** SampType: **LCS** TestCode: **P_WW_LOW** Units: **mg/L** Prep Date: **08/17/10** RunNo: **4675**
Client ID: **LCSW** Batch ID: **1591** TestNo: **A4500-P BE** **A4500-P BE** Analysis Date: **08/17/10** SeqNo: **94431**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Phosphorus (As P)	0.108	0.0120	0.1000	0	108	85	115				

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level	E	Estimated, detected above quantitation range	H	Holding times for preparation or analysis exceede
M	Manual Integration used to determine area response	ND	Not Detected at the Reporting Limit	P	Second column confirmation exceeds
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

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QC SUMMARY REPORT

WO#: **1008454**

07-Sep-10

Client: Luedtke Engineering Company
Project: Waukegan Harbor FY10 - After Operations Sedi

TestCode: **PMOIST**

Sample ID: **1008575-008ADUP** SampType: **DUP** TestCode: **PMOIST** Units: **wt%** Prep Date: RunNo: **4637**
Client ID: **ZZZZZZ** Batch ID: **R4637** TestNo: **ASTM-D2216** Analysis Date: **08/16/10** SeqNo: **94572**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Percent Moisture	84	1.0						85.51	1.88	20	

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level	E	Estimated, detected above quantitation range	H	Holding times for preparation or analysis exceede
M	Manual Integration used to determine area response	ND	Not Detected at the Reporting Limit	P	Second column confirmation exceeds
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

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QC SUMMARY REPORT

WO#: **1008454**

07-Sep-10

Client: Luedtke Engineering Company
Project: Waukegan Harbor FY10 - After Operations Sedi **TestCode:** **SO4_WW**

Sample ID: **MB-R5118** SampType: **MBLK** TestCode: **SO4_WW** Units: **mg/L** Prep Date: RunNo: **5118**
Client ID: **PBW** Batch ID: **R5118** TestNo: **ASTM-D516** Analysis Date: **09/01/10** SeqNo: **103785**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	ND	10									

Sample ID: **LCS-R5118** SampType: **LCS** TestCode: **SO4_WW** Units: **mg/L** Prep Date: RunNo: **5118**
Client ID: **LCSW** Batch ID: **R5118** TestNo: **ASTM-D516** Analysis Date: **09/01/10** SeqNo: **103786**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	39	10	40.00	0	97.3	90	110				

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level	E	Estimated, detected above quantitation range	H	Holding times for preparation or analysis exceede
M	Manual Integration used to determine area response	ND	Not Detected at the Reporting Limit	P	Second column confirmation exceeds
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

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Website: www.SuburbanLabs.com

QC SUMMARY REPORT

WO#: **1008454**
07-Sep-10

Client: Luedtke Engineering Company
Project: Waukegan Harbor FY10 - After Operations Sedi
TestCode: **TDS_WW_LOW**

Sample ID: **1008443-001ADUP** SampType: **DUP** TestCode: **TDS_WW_LO** Units: **mg/L** Prep Date: RunNo: **4646**
Client ID: **ZZZZZZ** Batch ID: **R4646** TestNo: **A2540C** Analysis Date: **08/16/10** SeqNo: **97143**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Residue, Filterable	172	4.00						173.2	0.928	10	

Sample ID: **MB-R4646** SampType: **MBLK** TestCode: **TDS_WW_LO** Units: **mg/L** Prep Date: RunNo: **4646**
Client ID: **PBW** Batch ID: **R4646** TestNo: **A2540C** Analysis Date: **08/16/10** SeqNo: **97146**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Residue, Filterable	2.00	4.00									J

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level	E	Estimated, detected above quantitation range	H	Holding times for preparation or analysis exceede
M	Manual Integration used to determine area response	ND	Not Detected at the Reporting Limit	P	Second column confirmation exceeds
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

3
Hillside, IL 60162
TEL: 708-544-3260
FAX: 708-544-8587
Website: www.SuburbanLabs.com

QC SUMMARY REPORT

WO#: **1008454**
07-Sep-10

Client: Luedtke Engineering Company
Project: Waukegan Harbor FY10 - After Operations Sedi **TestCode:** **TSS**

Sample ID: **MB-R4635** SampType: **MBLK** TestCode: **TSS** Units: **mg/L** Prep Date: RunNo: **4635**
Client ID: **PBW** Batch ID: **R4635** TestNo: **A2540D** Analysis Date: **08/16/10** SeqNo: **94250**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Residue, Non-Filterable	0.200	1.00									J

Sample ID: **1008648-001BDUP** SampType: **DUP** TestCode: **TSS** Units: **mg/L** Prep Date: RunNo: **4635**
Client ID: **ZZZZZZ** Batch ID: **R4635** TestNo: **A2540D** Analysis Date: **08/16/10** SeqNo: **94267**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Residue, Non-Filterable	560	100						560.0	0	10	

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level	E	Estimated, detected above quantitation range	H	Holding times for preparation or analysis exceede
M	Manual Integration used to determine area response	ND	Not Detected at the Reporting Limit	P	Second column confirmation exceeds
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

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QC SUMMARY REPORT

WO#: **1008454**
07-Sep-10

Client: Luedtke Engineering Company
Project: Waukegan Harbor FY10 - After Operations Sedi
TestCode: **TVS_WW_LOW**

Sample ID: **1008443-001ADUP** SampType: **DUP** TestCode: **TVS_WW_LO** Units: **mg/L** Prep Date: RunNo: **4647**
Client ID: **ZZZZZZ** Batch ID: **R4647** TestNo: **A2540E** Analysis Date: **08/16/10** SeqNo: **99258**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Volatile Solids	5.78	4.00						5.720	1.04	10	

Sample ID: **MB-R4647** SampType: **MBLK** TestCode: **TVS_WW_LO** Units: **mg/L** Prep Date: RunNo: **4647**
Client ID: **PBW** Batch ID: **R4647** TestNo: **A2540E** Analysis Date: **08/16/10** SeqNo: **99261**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Volatile Solids	ND	4.00									

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level	E	Estimated, detected above quantitation range	H	Holding times for preparation or analysis exceede
M	Manual Integration used to determine area response	ND	Not Detected at the Reporting Limit	P	Second column confirmation exceeds
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

SUBURBAN LABORATORIES, Inc.

4140 Litt Drive Hillside, IL 60162 Tel. 708.544.3260 Fax: 708.544.8587 Toll Free: 800.783.LABS www.suburbanlabs.com

CHAIN OF CUSTODY RECORD

Electronic Version

Company Name: Luedtke Engineering Company

Company Address:

City: Frankfort State: MI Zip: 49635

Phone: Fax: ☐ Fax Report

Email Address: ☑ Email Report

Project ID / Location: Waukegan Harbor Dredging 2010

Project Manager (Report to): Jon Keillor

Sample Collector(s): Patrick Rodriguez

TURNAROUND TIME REQUESTED: ☑ Normal ☐ RUSH* (*Additional Rush Charges Approved.)

*Date & Time Needed:

Normal TAT is 5-7 work days for most work. Rush work must be pre-approved and additional charges apply.

Specify Regulatory Program: (Required) ☐ None/Info only

☐ LUST ☐ SRP ☐ SDWA

☐ 503 Sludge ☐ NPDES ☐ MWRDGC

☐ Disposal ☑ Other *Please specify in comment section below.

ANALYSIS & METHOD REQUESTED: Enter an "X" in box below for request

Page 1 of 1

PO No.:

Shipping Method: SLI

QC Reporting Level: ☐ 1 ☑ 2 ☐ 3

LAB USE ONLY

SLI Order No.: 1008454

Sample containers supplied by customer? ☐ Yes

Temperature of Received Samples: 4 °C

Samples received within 24 hours of collection? ☐ Yes

	SAMPLE IDENTIFICATION (Please use 1 line per container type)	COLLECTION DATE	COLLECTION TIME	MATRIX	GRAB/ COMP.	CONTAINERS Qty	CONTAINERS SIZE & TYPE	PRESERVATIVE	PCBs	Asbestos (PLM & TEM)	Grain Size	Supernatant Prep	R	Condition	Split	LAB #
1	After Operations Sediment #1	8/10/10	11:00	Sediment	G	4	ILG	none	X	X	X					1A-B
2	After Operations Sediment #2	8/10/10	11:32	Sediment	G	4	ILG	none	X	X	X					2A-B
3	After Operations Sediment #3	8/10/10	11:41	Sediment	G	4	ILG	none	X	X	X					3A-B
4	Beach Water 2	8/10/10	12:39	SW	G	22	ILG	None				X				4A
5																
6																
7																
8																
9																
10																
11																
12																

MATRIX: Drinking Water (DW), Soil (S), Waste Water (WW), Surface Water(SW), Ground Water (GW), Solid Waste (WA), Sludge (U), Wipe (P) CONTAINER: 2oz, 4oz, 8oz, 40ml Vial, 500ml, Liter (L), Tube, Glass (G), Plastic (P) PRESERVATIVE: H_2SO_4, HCl, HNO_3, Methanol (MeOH) NaOH, Sodium Bisulfate (NaB), NaThio

COMMENTS & SPECIAL INSTRUCTIONS:

* Chicago District USACE - Waukegan Harbor Approach Channel Dredging project 2010

CONDITION CODES
1. Improper/damaged container/cap
2. Improper preservation
3. Insufficient sample volume
4. Headspace/air bubbles for VOCs
5. Received past holding time
6. Received frozen
7. Label conflicts with COC

1. Relinquished By	Date	2. Relinquished By	Date	3. Relinquished By	Date	4. Relinquished By	Date
	8/10/10	Patrick Rodriguez	8/10/10				
Received By: Patrick Rodriguez ☐ Ice	Time: 13:00	Received By: Melissa Arbain ☑ Ice	Time: 14:50	Received By ☐ Ice	Time	Received By ☐ Ice	Time

Submission of samples subject to Terms and Conditions on back. Rev. 2/01/05 Please fill out this form completely, print, sign & submit with samples. Keep a copy for your records.

FIELD LOG

Suburban Laboratories, Inc.
4140 Litt Drive
Hillside, IL 60162-1183
P: (708) 544-3260 F: (708) 544-8587
www.SuburbanLabs.com

Luedtke Engineering Company

FY10 Dredging of Waukegan Harbor Approach Channel
After Operations Sediment Sampling

Suburban Labs Field Sampling Technician(s) - PRINT: Patrick Rodriguez

Weather and water conditions: Foggy + Calm

Eutech Inst. Oakton Field pH Meter, pH'estr 30 Serial No.: 1576094

	Beach Water 2	After Operations Sediment 1	After Operations Sediment 2	After Operations Sediment 3		Additional Comments:
Sampling Technique:	grab	grab	grab	grab		
GPS coordinate (Lat./Long.) of sample collection:[1]	N42° 29' 36.9" E87° 48' 8.6"	N42° 21' 46.0735" E87° 48' 27.9862"	N42° 21' 45.2800" E87° 48' 27.1572"	N42° 21' 45.7252" E87° 48' 29.7001"		
GPS coordinate (state plane) of sample collection:[1]						
Date & Time of collection:	8/10/10 12:39	8/10/10 11:00	8/10/10 11:22	8/10/10 11:41		
Sample appearance: (clear, tinted, dark, etc.)	Clear	Dark	Dark	Dark		
pH & Time of reading:	8.53 12:39					
Temperature (degrees C):	26.1°C					
Comments:						

See also chain of custody form for bottles and preservatives

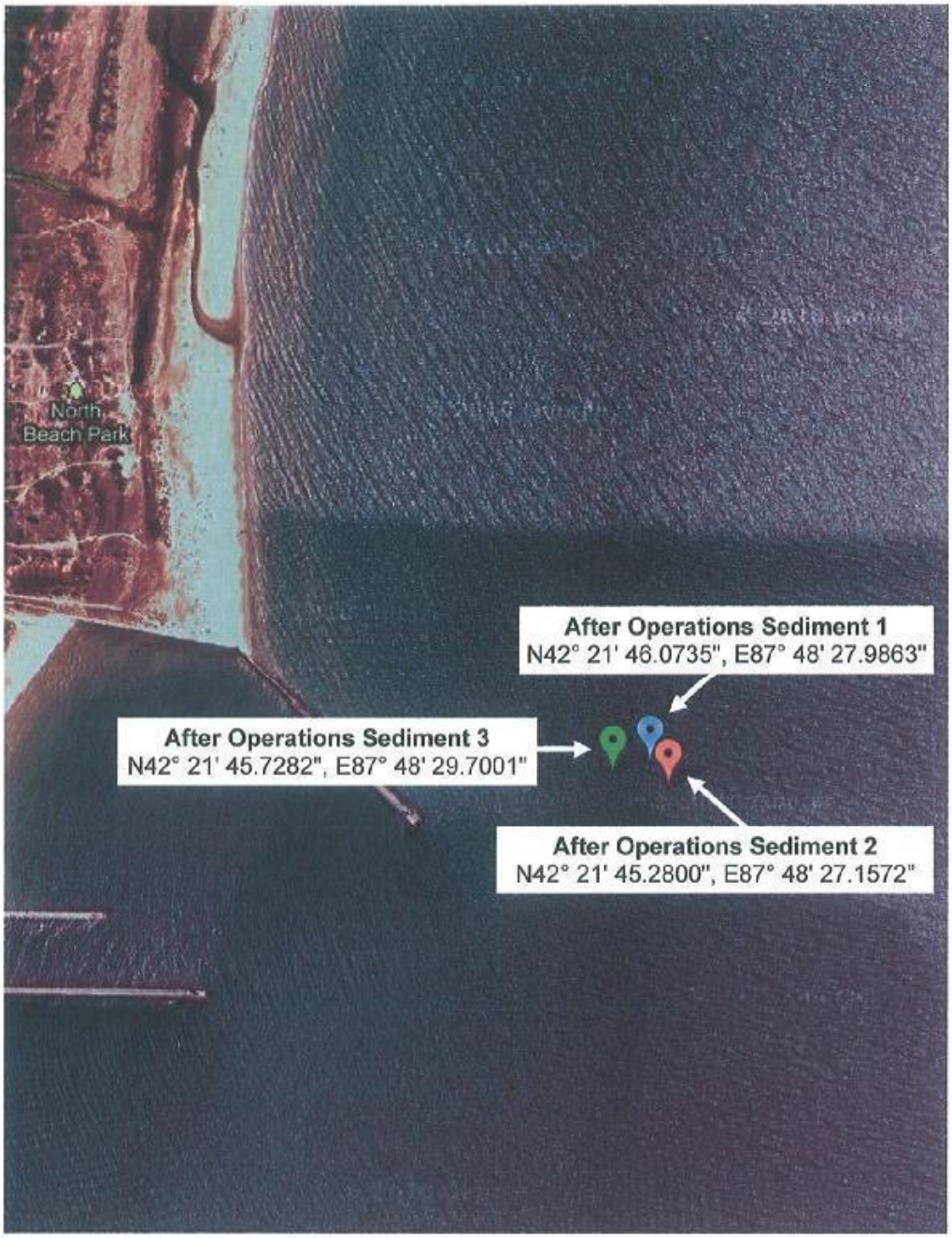
Version 0 06/10/2010

SIGNATURES:

SLI Field Tech 1: [signature]

SLI Field Tech 2: _____

After Operations Sediment - Map 1
8/10/10



After Operations Sediment - Map 2
8/10/10

After Operations Sediment 1—Photo A

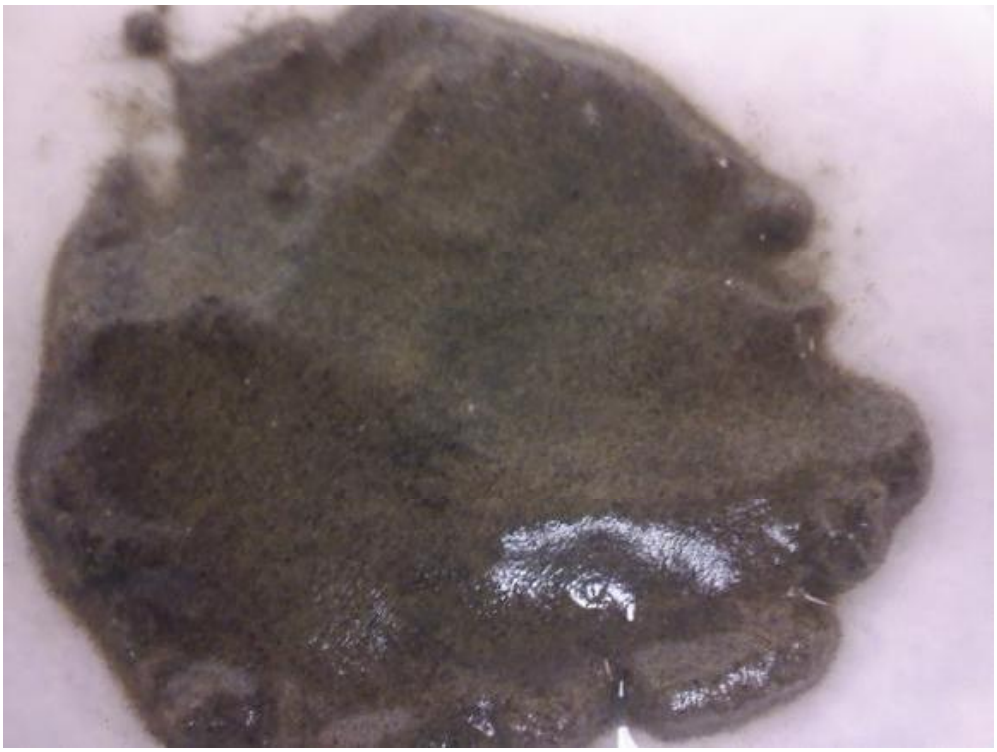
After Operations Sediment 1—Photo B

After Operations Sediment 2—Photo A

After Operations Sediment 2—Photo B

After Operations Sediment 3—Photo A

After Operations Sediment 3—Photo B



UNITED ANALYTICAL SERVICES, INC.

PLM LABORATORY REPORT

METHOD:	EPA/600/R-93/116 July 1993	REPORT DATE:	August 18, 2010
	PLM w/ Dispersion Staining	DATE RECEIVED:	August 11, 2010
CLIENT:	Suburban Laboratories, Inc	UAS SAM#:	1015147
ATTENTION:	Melissa Amador	JOB LOCATION:	1008454
FAX:	melissa@suburbanlabs.com		

CLIENT SAMPLE #	LAB SAMPLE #	COLOR	DESCRIPTION/ LOCATION	ASBESTOS TYPE	%	OTHER FIBERS	%	MATRIX	%
1008454-0001	1015147-01	Tan	Sediment	ND	-	ND		O	100
1008454-0029	1015147-02	Tan	Sediment	ND	-	ND	-	O	100
1008454-0003	1015147-03	Tan	Sediment	ND		ND		O	100

Analysis Comments:

Samples analyzed according to the EPA/600/R-93/116 July 1993 entitled Method for the Determination of Asbestos in Bulk Building Materials. Further testing by gravimetric or TEM Methods are recommended for samples that are non-friable (e.g., floor tiles, mastics, etc). Report shall not be reproduced except in full, without the written approval of the laboratory. Laboratory results pertain to those delivered for analysis. Samples will be discarded if not notified by the client within 30 days.

CODES-ASBESTOS	CODES-OTHER FIBERS	CODES-MATRIX
ND-None Detected	FBG Fiber Glass	G Gypsum
CHRY-Chrysotile	CELL-Cellulose	C-Calcium Carbonate
AMOS-Amosite	SYN-Synthetic	M-Mica
CROC-Crocidolite	WOLL-Wollastonite	O-Other Matrix
TREM-Tremolite	H-Hair	
ACTN-Actinolite	O-Other(Specify)	
ANTH-Anthophyllite		

ANALYZED BY- Karen Buehler / Laboratory Manager — August 18, 2010 DATE ANALYZED

REVIEWED BY- Marcio De Michael / Administrative Assistant — August 18, 2010 DATE REVIEWED

PLM & TEM

NVLAP Laboratory # 101752

AIHA Laboratory # 101772

This report must not be used by the client to claim product endorsement by AIHA, NVLAP or any agency of the United States Government.

PLM Master Report/11-10-09KB

UNITED ANALYTICAL SERVICES, INC.

TEM CHATFIELD LABORATORY REPORT - QUALITATIVE ONLY

METHOD:	Chatfield Method SOP-1988-02	REPORT DATE:	August 18, 2010
		DATE RECEIVED:	August 11, 2010
CLIENT:	Suburban Laboratories, Inc.	UAS SAM #:	1015147
ATTENTION:	Melissa Amador	JOB LOCATION:	1008454
FAX:	melissa@suburbanlabs.com		

CLIENT SAMPLE #	LAB SAMPLE #	SAMPLE DESCRIPTION/LOCATION	% ORGANICS	% ACID SOLUBLE	ASBESTOS TYPE(S)	% ASBESTOS
1008454-0013	1015147-01	Sediment	-	-	-	None Detected
1008454-0023	1015147-02	Sediment	-	-	-	None Detected
1008454-0033	1015147-03	Sediment	-	-	-	None Detected

NSD=No Structures Detected

Comments:

Samples prepped according to Chatfield Method SOP-1988-02

Report shall not be reproduced in except in full without the written approval of the laboratory.

Laboratory not responsible for the physical separation of layered materials.

Laboratory results only pertain to those items delivered.

Samples will be discarded if not notified by the client within 30 days.

ANALYZED BY- Karen Buehler, Laboratory Manager

August 18, 2010
DATE ANALYZED

PLM & TEM

NVLAP

NVLAP Laboratory # 101732

AIHA Laboratory # 101212

This report must not be used by the client to claim product endorsement by AIHA, NVLAP or any agency of the United States Government.

TEM Chatfield Master Report/11-10-09/KB

CHAIN OF CUSTODY RECORD

COC ID: PAGE 1 OF 1

1015147

ADDRESS
Suburban Laboratories, Inc.
Lombard, IL 60148
TEL: 708 541 3260
FAX: 708 541 5587
Website: www.suburbanlabs.com

Please Include Email Address of Report Recipient Whenever Possible!!!

SUB CONTRACTING COMPANY	United Analytical	COMPANY	United Analytical Services
ADDRESS	1429 Centre Circle Drive		
CITY, STATE, ZIP	Downers Grove, IL 60515		
PHONE	(630) 691-8271	FAX	(630) 691-1815
ATTENTION		EMAIL	

SPECIAL INSTRUCTIONS/COMMENTS:
Please analyze all samples for both PLM and TEM. Email report and invoice to Melissa Amador at melissa@suburbanlabs.com

ITEM #	SAMPLE ID	BOTTLE TYPE	MATRIX	DATE COLLECTED	NUMBER OF CONTAINERS	CONTAINERS Received Reserved Vapors HOT Sample Notation, Additional Sample Comments
1	1008464-007B N7402	1LG Teflon	Sediment	08/10/10 12:00:00 AM		
2	1008151-0020 N7402	1LG Teflon	Sediment	08/10/10 11:27:00 AM		
3	1008151-0038 N7402	1LG Teflon	Sediment	08/10/10 11:41:00 AM		

Relinquished By:	Date	Time	Received By:	Date	Time	REPORT TRANSMITTAL DESIRED	
				8/10/10	12:00	HARDCOPY (USPS Mail)	FAX / EMAIL / CONTACT
Relinquished By	Date	Time	Received By	Date	Time	LABORATORY ONLY	
						Temp of sample	°C Sample Ice
TAT:	Standard	RUSH	24-48	3rd BT	1/3BD	Comments	

Note: RUSH requests will incur surcharges!