

**Sanitary Survey
for the
Buffalo Harbor State Park –
Gallagher Beach
Erie County
Buffalo, New York**

Contract Number D003773

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**NEW YORK STATE OFFICE OF PARKS, RECREATION,
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625 Broadway, 2nd Floor
Albany, New York 12238

Prepared by:

ECOLOGY AND ENVIRONMENT ENGINEERING, P.C.
368 Pleasant View Drive
Lancaster, New York 14086

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List of Abbreviations and Acronyms

°F	degrees Fahrenheit
AMSL	above mean sea level
BAV	Beach Action Value
BGS	below ground surface
BHC	benzenehexachloride
BHSP	Buffalo Harbor State Park
BSA	Buffalo Sewer Authority
CDF	confined disposal facility
CFU	colony-forming unit
CSO	combined sewer overflow
ECHDC	Erie Canal Harbor Development Corporation
EEEP	Ecology and Environment Engineering, P.C.
EPA	(United States) Environmental Protection Agency
FEMA	Federal Emergency Management Agency
ft/s	feet per second
GPS	global positioning system
LTCP	Long-Term Control Plan
µg/L	micrograms per liter
mg/L	milligrams per liter
mL	milliliters
mph	miles per hour
MS/MSD	matrix spike/matrix spike duplicate
NFTA	Niagara Frontier Transportation Authority
NOAA	National Oceanic and Atmospheric Administration
NTU	nephelometric turbidity unit
NWS	National Weather Service
NYCRR	New York Codes, Rules and Regulations

List of Abbreviations and Acronyms (cont.)

NHP	(New York) Natural Heritage Program
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
ORPHP	(New York State) Office of Parks, Recreation, and Historic Preservation
PCB	polychlorinated biphenyl
PCR	Polymerase Chain Reaction
SAP	Sampling and Analysis Plan
SAV	submerged aquatic vegetation
SVOC	semivolatile organic compound
TAL	Target Analyte List
TCL	Target Compound List
TOC	total organic carbon
USDA	U.S. Department of Agriculture
USGS	U.S. Geological Survey
VOC	volatile organic compound

1

Introduction

Ecology and Environment Engineering, P.C. (EEEEPC), under contract to the New York State Office of Parks, Recreation, and Historic Preservation (OPRHP) (Contract Number D003773), performed a sanitary survey in conjunction with the OPRHP staff to evaluate the potential for Gallagher Beach at the Buffalo Harbor State Park (BHSP) to be used as a bathing beach. In order to complete the sanitary survey several types of data (i.e., bacteriological, other biological, meteorological, water flow direction/speed, and general observations), were collected from June through August 2014. The BHSP is located in Erie County, Buffalo, New York (see Figure 1-1). The BHSP consists of Gallagher Beach, the green-space (park/playground) immediately to the north, and a marina area that is north of the green space. The BHSP is included within the Buffalo Outer Harbor (see Figure 1-2). Photographs of the beach and investigation activities are provided in Appendix A.

A Sampling and Analysis Plan (SAP) was prepared for the sanitary survey to address the collection of surface water samples and show consistency with the requirements in Subpart 6-2 (Bathing Beaches) of the New York State Sanitary Code and the United States Environmental Protection Agency's (EPA's), Beaches Environmental Assessment and Coastal Health Act of 2000.

The scope of the SAP was based on discussions during the OPRHP's meeting on January 28, 2014, with the New York State Department of Health (NYSDOH), and New York State Department of Environmental Conservation (NYSDEC), and subsequent conversations with agency representatives.

Sanitary Survey Investigation Activities

Water quality samples were collected daily, weekly, and monthly from the locations shown on Figure 1-3. In addition, measurements of the water flow direction and velocity in the vicinity of the BHSP were taken at the monthly surface water sampling locations to determine flow patterns in the area.

Water samples were analyzed for bacteriological parameters *Escherichia coli* (*E. coli*) and *Enterococci*. *E. coli* was analyzed using EPA Method 1603, and *Enterococci* was analyzed using EPA Method 1600. Temperature and turbidity measurements were collected at the time of sampling at all sampling locations, in addition, pH measurements were collected during the monthly sampling. The BHSP's field sheets were used during collection of each water sample to document the

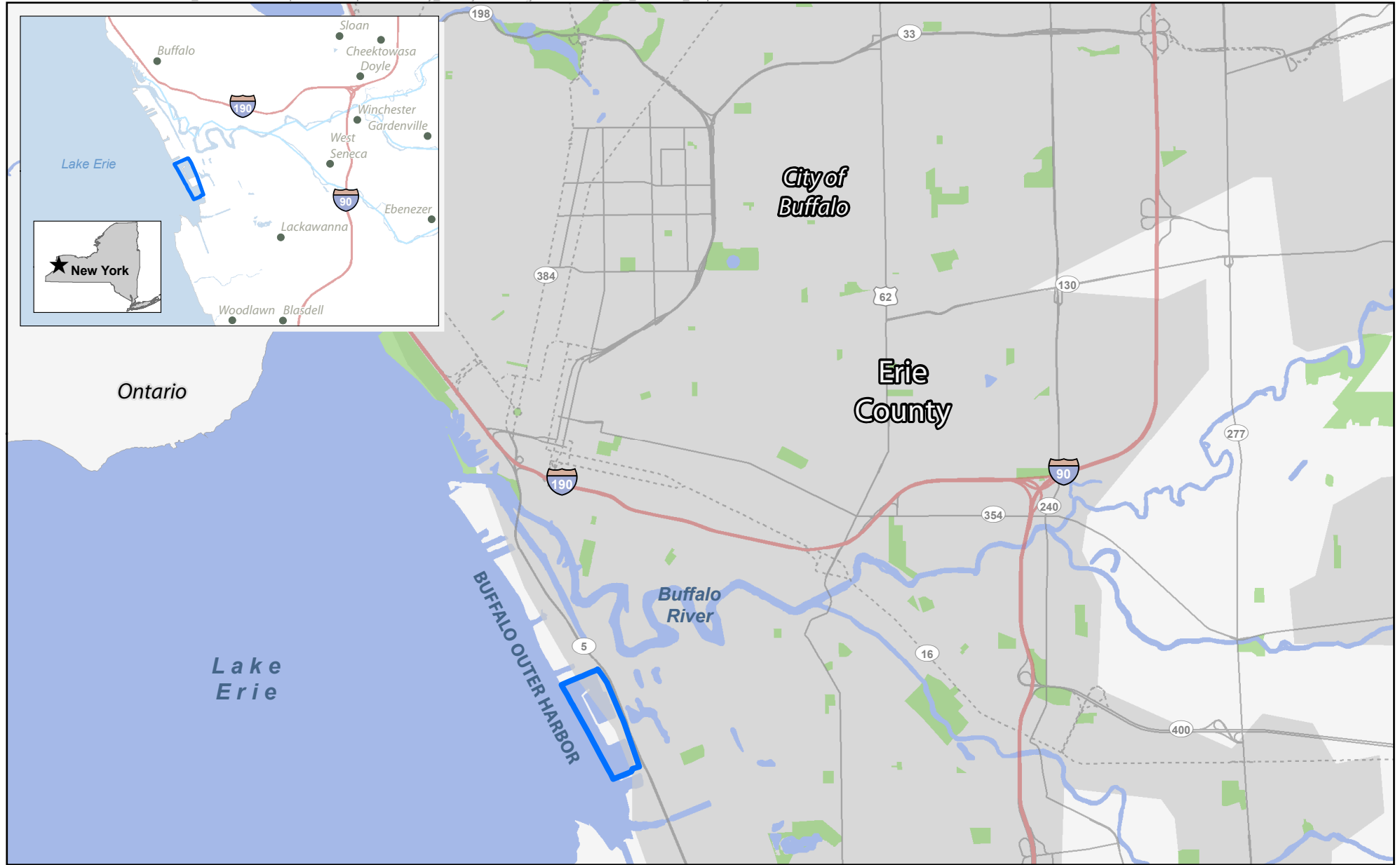
information in addition to the conditions during sampling, including weather, wave height, current direction, odor, debris, and wildlife presence (see Appendix B). Sampling was performed using existing OPRHP quality assurance/quality control procedures. All samples were analyzed by the Erie County Public Health Laboratory.

Daily Sampling. Daily water samples were collected by OPRHP staff from May 31 through August 31, 2014, at three potential swimming locations: DWS-01, DWS-02, and DWS-03. Samples were collected from the center of each potential swimming location along the beach (see Figure 1-3). These samples satisfied the sampling requirement of eight continuous weeks of sampling in New York State (NYS) Sanitary Code Subpart 6-2. The daily water sampling also satisfied the requirement for collection of water samples for five consecutive days after a heavy rain event.

Weekly Sampling. Weekly water samples were collected by the OPRHP staff between May 31 and August 31, 2014, at three locations: WWS-01 at the outfall in the BHSP small boat harbor; WWS-02 at the windsurfing area at the southern end of the beach; and WWS-03 at the stormwater outfall south of the beach, when flowing (see Figure 1-3). Additionally, the weekly sample locations were sampled again on the days following each rain event greater than 0.5 inches.

Monthly Sampling. EEEPC staff collected four rounds of monthly water samples from 10 locations, including two locations near the discharge of the Buffalo River and two adjacent to the ring-billed gull nesting colony on Confined Disposal Facility (CDF) No. 4 (see Figure 1-3). In accordance with the SAP, the team attempted to collect one set of samples on a calm day (wind speed less than 5 miles per hour [mph]), one set on a moderate day (wind speeds between 5 and 20 mph), one set on a high wind day (winds greater than 20 mph), and one set after a rain storm (rainfall greater than 0.5 inches), while still spreading out the sampling events at roughly monthly intervals. In addition, during one of the sampling events, EEEPC staff collected samples after either the high wind day or the day after a rain storm and specifically target an event where winds were from the north in order to assess the potential for combined sewer overflow (CSO)-impacted water from the mouth of the Buffalo River to flow towards the beach area. Section 2.2.1 describes the variety of weather conditions that occurred during the four rounds of monthly sampling events.

Beach Sand and Sediment Sampling. On June 6, 2014, sediment samples (0 to 2-inch) were collected from each daily water sampling location and on June 4, 2014, surface sand samples (0 to 2-inch) were collected from the beach at the wave line adjacent to the three daily water sampling locations (DWS-01, DWS-02, and DWS-03). Sand and sediment samples were analyzed for *E. coli* and *Enterococci* using EPA Methods 1603 and 1600, respectively. The surface sand samples were planned for collection twice during the bathing season; once during high lake water level conditions and once during low lake water level conditions.



0 0.5 1 2 Miles

SOURCE: ESRI 2010; ESRI 2012;
Ecology and Environment Engineering, PC, 2015
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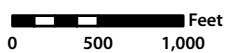
Legend

- | | | |
|---------------------|----------------|-----------------|
| Buffalo Harbor | Freeway | City of Buffalo |
| State Park Boundary | Major Road | Park |
| | Secondary Road | Water |

Figure 1-1
Buffalo Harbor State Park - Gallagher Beach
Location Map
Buffalo, New York



SCALE



Legend

- Major Road
- Buffalo Harbor State Park Boundary

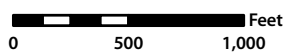
Figure 1-2
Site Features
Buffalo Harbor State Park
Buffalo, New York

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

SOURCE: ESRI 2010;
Ecology and Environment Engineering, P.C., 2015.
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SCALE



Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

SOURCE: ESRI 2010;
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Legend

- Proposed Sample Points
 - Daily Sample Location
 - Monthly Sample Location
 - Weekly Sample Location
 - Major Road
 - Potential Swimming Areas (50-square yards)

Figure 1-3
2014 Sanitary Survey
Sample Locations
Buffalo Harbor State Park
Buffalo, New York

Inset Note: Monthly sample locations at mouth of Buffalo River - approximately three miles North of Gallagher Beach.

Other Notes: Monthly sample locations MWS-01A and MWS-02A sampled on June 6, 2014. Monthly sample locations MWS-01B and MWS-02B sampled after June 6, 2014.

However, lake water levels did not fluctuate significantly during the bathing season to merit collection of the second round of surface sand samples.

Water Velocity and Flow Direction Tracking

During the monthly water sampling, water velocity and flow direction measurements were taken at each of the 10 sampling locations. Velocity and flow direction were measured from near the water surface, middle of the water column, and near the bottom of the water column.

Water flow direction (current) tracking was also performed in the vicinity of the beach. Flow direction was observed twice during the summer at two locations: one adjacent to the ring-billed gull nesting colony (MWS-10), and the second adjacent to the stormwater outfall south of Gallagher Beach (WWS-03). Additional smaller tracking runs were also conducted to help evaluate the water movement in the Gallagher Beach embayment and off shore from the WWS-03 sample location (see Section 2.3.3). Water flow direction tracking was conducted once on July 30, 2014, a dry, calm day with no rain; and once after a 0.77-inch rainfall event on June 4, 2014. The path of the flow/current was monitored by dropping a floating object (device designed for tracking water flow) in the water and following it, while tracking and recording its location with a global positioning system (GPS) unit (see Appendix A, Photos 13 through 16).

2

Description of Beach and Swimming Areas

The BHSP, including Gallagher Beach at the southern end of the park, is located on Fuhrman Boulevard (west of Tift Nature Preserve) in Erie County, Buffalo, New York (see Figure 1-1). The BHSP is approximately 180 acres and includes the BHSP small boat harbor, greenspace (park/playground), Gallagher Beach, and associated waters of Lake Erie. Gallagher Beach is approximately 1,400 feet long, and ranges from 50 to 250 feet wide (see Figure 1-2).

The BHSP property is bordered to the north by a former industrial property currently owned by the Erie Canal Harbor Development Corporation (ECHDC). East of the BHSP is the Greenway Nature Trail, Fuhrman Boulevard, Buffalo Skyway (NY-5) and Tift Nature Preserve, respectively. South of the property are abandoned grain silos and industrial property (former Bethlehem Steel plant), currently the site of a wind farm. West of the property is Lake Erie, which is separated from the Buffalo Outer Harbor and the BHSP by a breakwater.

The ECHDC acquired the BHSP property from the Niagara Frontier Transportation Authority (NFTA) in 2014 to create the park, which is operated by the OPRHP.

Gallagher Beach is currently a non-bathing beach used for sun bathing, dog walking, wind surfing, jet skiing activities, and a fishing pier. Wind surfing activities occur primarily at the south end of the beach and jet skiing activities at the north end. A pavilion and picnic areas are located immediately to the east and separated from the beach by a wooden boardwalk and large rocks (riprap revetment). Access to the beach from the boardwalk is via either one of two sets of stairs or directly at the north and south ends of the beach.

The final locations of swimming areas have not been selected; however, when selected swimming areas would be placed to allow the wind surfing, jet skiing, and fishing activities to continue.

Surface Conditions

The current surface materials on the beach consist primarily of natural well-rounded gravel and sand, with some slag mixed in. The pea gravel surface material was placed on the pre-existing underlying sediments as part of the boardwalk

2 Description of Beach and Swimming Areas

and pier development in 2001. The current beach slopes uniformly at 6 to 7% grade from the upslope riprap revetment approximately 70 feet to the water's edge. Lakeward beneath the water lies a zone with exposed bricks and stone, which is followed by a soft layer of fine sand at a slope of approximately 2.5% (URS Corporation 2012).

Sanitary Facilities

Sanitary facilities were installed by the OPRHP in 2014 on the greenspace (park/playground) located approximately 250 feet north of the beach.

Beach Use

Estimates of the number of people using Gallagher Beach are not available. However, the beach is used significantly by jet skiers at the north end, wind surfers at the south end, sunbathers along both sides of the central fishing pier, and hikers/dog walkers are often seen everywhere on the property. On hot summer days the beach is usually filled with people enjoying the Buffalo waterfront. This is a very popular park during the warmer months and attendance is anticipated to increase significantly as the greenspace is converted into a destination playground, with additional pavilions, walking paths, seating, and a stage for outdoor concerts and other activities.

Beach Cleaning

Beach cleanup generally begins in mid to late April. Fall and winter seiches often deposit debris (e.g., wood logs, trash, and vegetation) along full width of the beach and along its entire length. In addition, due to the prevailing wave action/wind from the southwest, sand and gravel is moved about during the winter months. This material is reclaimed and spread on the entire beach as needed.

Beach maintenance occurs on a routine basis from June through August. Park staff picks up litter and natural debris by hand as needed during the day. The beach is groomed approximately three times per week with a Barber surf rake pulled by a tractor, and on the off days a york rake is used to groom the beach.

Small amounts of debris and trash are found regularly at this beach including plastic, bottles, cans, and other man-made debris, along with natural debris, such as aquatic vegetation, leaves, sticks, dead fish, and bird feathers. There are litterbins placed strategically throughout the beach and greenspace areas. These are emptied as often as needed, at least once a day when it is busy. Park staff removes any additional trash left by patrons by hand.

2.1 Area Meteorological Characteristics – Buffalo, New York

2.1.1 Climate

The BHSP - Gallagher Beach is located along the eastern shore of Lake Erie in Buffalo, New York. This area experiences a fairly humid, continental-type climate, but is greatly influenced by the Great Lakes. Winters are generally cold with snow and last from mid-November to mid-March. The area has some of the

2 Description of Beach and Swimming Areas

sunniest and driest summers in the Northeast. Lake Erie affects summer temperatures with cooling winds, inhibits thunderstorms, and enhances sunshine in the Buffalo area. The highest recorded temperature in Buffalo was 99 degrees Fahrenheit (°F) in August 1948, and the lowest recorded temperature was -20°F in February 1934. Average precipitation is around 40 inches per year, and the average snowfall is around 96 inches per year. Average temperature for a year ranges from 18°F to 80°F (NOAA 2013a).

2.1.2 Rainfall

Historical precipitation data for the Buffalo area was obtained from the National Oceanic and Atmospheric Administration (NOAA), National Weather Service (NWS) Forecast Office in Buffalo, New York. Between 2000 and 2013, the average monthly precipitation during June through August was approximately 3.32 inches. Between 2000 and 2014, the maximum monthly rainfall observed during the bathing season was 8.13 inches in June 2010, and the minimum monthly rainfall observed was 0.73 inches in July 2001.

Rainfall was also monitored daily during the bathing season using a rain gauge at the Tifft Nature Preserve.

2.1.3 Prevailing Winds

Average wind speeds in the Buffalo area typically range from 3 mph to 20 mph. Gusts can reach up to 30 mph on average. Wind direction is most often out of the southwest (NOAA 2013a).

2.2 Monitored Meteorological Characteristics – Gallagher Beach

2.2.1 Data Collection

There is currently no weather station located at Gallagher Beach. Weather parameters related to sampling (i.e., temperature, wind speed/direction, wave height, rainfall, and general weather conditions) were recorded daily during each sampling event throughout the bathing season using hand-held thermometers/temperature meters, wind meters, wave sticks, and a rain gauge at the Tifft Nature Preserve, approximately 1,300 feet northwest of the beach, as part of the sampling program (see Table 2-1).

Table 2-1 Buffalo Harbor State Park - Gallagher Beach Weather Condition Parameters

Parameter	Measured (M) or Estimated (E)	Equipment/Method Used
Air Temperature	M	Kestrel Model 2500 weather and environmental meter or hand-held thermometer
Wind Speed and Direction	M	Kestrel Model 2500 weather and environmental meter
Rainfall	M	Rain gauge
Weather Conditions	E	Visual assessment of cloud cover and conditions

In addition, data was collected the day after significant rainfall events (0.5 inches or more), and from monthly sampling locations (sampling days selected to obtain data during various weather conditions over the course of the bathing season).

2.2.2 Findings

The weather at BHSP - Gallagher Beach is typical for an NYS park beach on the Great Lakes. There can be significant fluctuations of temperatures throughout the operating season. Data collected during the daily sampling at the beach in 2014 found that average early morning temperatures were 64°F with a range from 42.1 to 75°F.

Gallagher Beach was affected by a number of rain events during the 2014 bathing season. There were 24 rain events of less than 0.5 inches, seven between 0.5 and 1 inch, and two with greater than 1 inch of rainfall. There were slightly more rain events than a “normal” year. July was wetter than normal, while June and August were near normal according to the NWS Buffalo Weather Forecast Office (NOAA 2014). Table 2-2 provides a listing of the daily rainfall throughout the bathing season and Appendix B contains tables summarizing the field observations recorded on the field sheets used during sample collection.

Early morning wind speed and direction measured during the daily sampling at the beach varied throughout the 2014 season. Mean wind speed was 3.3 mph in the early morning. The maximum wind speed recorded in the early morning was 12.4 mph, while the minimum was 0.5 mph. Wind most commonly came from the southwest.

Wind speed and direction were also monitored during the monthly water sampling at locations just off shore in the vicinity of the beach (see Section 3.3.3). Wind speed and direction was monitored from mid-morning through early afternoon, and varied throughout the 2014 season. Mean wind speed recorded was 7.8 mph, maximum speed was 24 mph, and minimum speed was 0 mph. Once again, wind direction was most commonly from the southwest.

2.3 Topography and Hydrographic Conditions

2.3.1 Topography

The BHSP lies within the Erie-Ontario Lowlands, in particular, the Lake Erie Plain. This area encompasses the relatively low, flat areas immediately south and east of Lake Erie. Elevations range from approximately 570 feet above mean sea level (AMSL) at the lake surface to approximately 1,500 feet AMSL within landward areas of the plain (U.S. Department of Agriculture [USDA] 1986). The topography is a fairly level, gently rolling terrain (U.S. Geological Survey [USGS] 2013).

Table 2-2 Buffalo Harbor State Park - Gallagher Beach, 2014 Rain Data

Date	Inches
5/31/2014	0
6/1/2014	0
6/2/2014	0
6/3/2014	0.77
6/4/2014	0.17
6/5/2014	0
6/6/2014	0
6/7/2014	0
6/8/2014	0
6/9/2014	0.68
6/10/2014	0
6/11/2014	0.02
6/12/2014	0.12
6/13/2014	0.93
6/14/2014	0.03
6/15/2014	0
6/16/2014	0
6/17/2014	0
6/18/2014	0.02
6/19/2014	0.1
6/20/2014	0
6/21/2014	0
6/22/2014	0
6/23/2014	0
6/24/2014	0.1
6/25/2014	0.3
6/26/2014	0.16
6/27/2014	0
6/28/2014	0
6/29/2014	0
6/30/2014	0.13
7/1/2014	0
7/2/2014	0.05
7/3/2014	0.02
7/4/2014	0.13
7/5/2014	0
7/6/2014	0
7/7/2014	0.61
7/8/2014	0.47
7/9/2014	0.67
7/10/2014	0

Date	Inches
7/11/2014	0
7/12/2014	0
7/13/2014	0
7/14/2014	1.13
7/15/2014	0.05
7/16/2014	0
7/17/2014	0
7/18/2014	0
7/19/2014	0
7/20/2014	0.48
7/21/2014	0
7/22/2014	0
7/23/2014	0
7/24/2014	0
7/25/2014	0
7/26/2014	0
7/27/2014	0.075
7/28/2014	1.06
7/29/2014	0.1
7/30/2014	0
7/31/2014	0.58
8/1/2014	0.06
8/2/2014	0
8/3/2014	0.27
8/4/2014	0
8/5/2014	0.02
8/6/2014	0.1
8/7/2014	0
8/8/2014	0
8/9/2014	0
8/10/2014	0
8/11/2014	0
8/12/2014	0.17
8/13/2014	0.48
8/14/2014	0
8/15/2014	0
8/16/2014	0
8/17/2014	0.2
8/18/2014	0
8/19/2014	0
8/20/2014	0

Date	Inches
8/21/2014	0
8/22/2014	0
8/23/2014	0
8/24/2014	0
8/25/2014	0
8/26/2014	0
8/27/2014	NC
8/28/2014	0
8/29/2014	0
8/30/2014	0
8/31/2014	0.57

Note: Rain data collected from Tifft Nature Preserve.

Key:

NC = not collected
02:10C2654.0010.05-B4254

Table 2-2 2014 BHSP_gallagher Beach Rain Datat.xlsx-4/20/2015

2.3.2 Floodplains

Portions of the BHSP are within floodplains, including areas directly along the shoreline of Lake Erie. According to the Federal Emergency Management Agency (FEMA), the BHSP is within three flood zones. These zones are classified as Zone AE or Zone X. The area classified as Zone AE is in an area that is subject to inundation by a 100-year flood and a base flood elevation of 581 feet has been determined for this area. There are two flood zones located in Zone X. The first Zone X classification includes those areas outside the 500-year floodplain, while the second classification includes areas of the 500-year floodplain, areas of in the 100-year floodplain with average depths of less than 1 foot or with drainage areas of less than 1 square mile, and areas that are protected by levees from the 100-year flood (FEMA 1999).

Mapping obtained from Erie County indicates most of the same areas described above, excluding those outside the 500-year floodplain lie within a zone that has a 1% annual chance of flood hazard (Erie County 2013).

2.3.3 Lake Currents

Previous studies (Beletsky et al. 1999) have shown that the annual current circulation pattern in the Great Lakes closely resembles winter circulation due to the strength of winter winds and currents. In Lake Erie, winter circulation tends to be cyclonic (counterclockwise), while summer circulation is predominantly anticyclonic (clockwise). NOAA's Great Lakes Environmental Research Laboratory has developed a "Great Lakes Forecasting System" that provides surface current forecasts for Lake Erie for up to 48 hours.

Lake Erie currents in the area of Gallagher Beach are affected by the breakwater located west of the site in the Outer Harbor and its proximity to the Buffalo and Niagara rivers. EEEPC made flow direction measurements to evaluate flow inside of the breakwater as follows:

- The general flow direction in the area inside of the entire breakwater.
- At the south end of the breakwater in the opening adjacent to CDF No. 4. A ring-billed gull nesting colony exists on CDF No. 4 and flow from this area to Gallagher Beach could potentially result in bacteriological impact.
- The nearshore flow direction in the embayment adjacent to Gallagher Beach.
- The nearshore flow direction in the embayment that is south of Gallagher Beach.

EEEPC performed flow tracking on two occasions during the summer of 2014: once after a 0.77-inch rainfall event on June 4 and 6, 2014; and once on July 30, 2014, a dry, calm day with no rain (see Figure 2-1). Three locations were tracked on June 4. These three locations were tracked again on July 30 along with two additional locations. Three locations were tracked near the shore at the additional flow direction measurement locations (OP-01, OP-02, and OP-03) during the sample event on June 6. The flow tracking was done by recording the location of



Figure 2-1
Sanitary Survey
Water Flow Direction Tracking
Buffalo Harbor State Park
Buffalo, New York

Legend

Sanitary Survey Sample Locations

- Daily Sample Location
- Monthly Sample Location
- Weekly Sample Location
- ▲ Additional Flow Direction Measurement

General Flow Direction

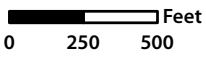
- ▶ Based on June 04, 2014 Tracking Events
- ▶ Based on July 30, 2014 Tracking Events
- ▶ Based on June 06, 2014 Tracking Events
- ▶ Summary of 2014 Flow Observation

Sanitary Survey Flow Direction Tracking Events

- Tracking Event Point (June 04, 2014)
- Tracking Event Point (July 30, 2014)



SCALE



1 inch = 650 feet

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

SOURCE: ESRI 2010; Ecology and Environment Engineering, P.C. 2015
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2 Description of Beach and Swimming Areas

a floating device designed to respond to the water current using a GPS unit. A photograph of this device is provided in Appendix A (see photo 13).

The flow monitoring indicates that the general flow direction within the breakwater is from the south to the north. Significant movement was observed. The flow monitoring at the location adjacent to CDF No. 4 and the ring-billed gull nesting colony indicated that water flow was toward the Gallagher Beach embayment and the outside of the embayment to the south.

The flow monitoring at locations OP-01 to OP-03 started within approximately 500 feet of the beach. The general movement in this area is from west to east-southeast (i.e., towards the beach). The tracking at OP-02 indicates water in this vicinity would reach the shoreline. The monitoring at locations in the embayment to the south indicated similar flow patterns. The tracking event that occurred in this area near MWS-08 showed this portion of the harbor is relatively stagnant, but the tracking that took place at WWS-03 indicated that flow was moving toward the shore.

In addition, during the monthly water sampling, water velocity, and flow direction measurements were taken at each of the 10 sampling locations (see Table 2-3). Water velocity and flow direction measurements were not collected from monthly water sample locations MWS-01A and MWS-02A during the June 4 and 6 sampling event due to rough water conditions. Velocity and flow direction were measured from approximately 1 foot below the water surface, middle of the water column (varied depending on depth of water at each location and meter used to collect the velocity data), and generally from 1 to 4 feet above the bottom of the water column. During the first round of monthly sampling in June 2014, the meter used to measure the flow velocities could only extend to a depth of 15 feet below the water surface; in subsequent rounds a meter capable of 30 feet below the water surface was used.

Water flow velocities measured ranged from zero (no detectable current) to a maximum of 0.8 feet per second (ft/s). The water currents measured during the monthly water sampling generally confirmed the flow patterns obtained during the flow tracking events described above and illustrated on Figure 2-1. No consistent pattern of variations between the surface, middle, and bottom measurements was detected, although the surface water was often the fastest moving water, likely due to the influence of the wind.

2.3.4 Surface Water

The BHSP - Gallagher Beach lies along Lake Erie and within the Buffalo River watershed. The Buffalo River watershed is fed by three major tributaries; Cayuga Creek, Buffalo Creek, and Cazenovia Creek (Buffalo Niagara Riverkeeper 2013). Ultimately, the Buffalo River drains to Lake Erie north of the beach. Drinking water for the Erie County Water Authority is supplied by surface water from Lake Erie (EA Science and Technology 1988).

2 Description of Beach and Swimming Areas

There are no surface waters that drain directly to Gallagher Beach (see Figure 2-2). There is a small lake (Lake Kirsty) and several ponds located in Tiff Nature Preserve, just east of the BHSP. Lake Kirsty, in particular, is connected via an underground culvert which connects to, and normally drains, overflow into the BHSP small boat marina. However, the flow through the culvert was observed to reverse on one occasion in the fall of 2013 when the lake water level was high.

Water Levels

A NOAA water level station is located approximately 2.8 miles northwest of BHSP - Gallagher Beach. The station reads water levels as feet using the International Great Lakes Datum 1985 system. The average water level at the station is approximately 571 feet and seasonal water levels vary between 570 and 573 feet (NOAA 2013b). Water levels are higher during the summer months and drop off during winter months. During the 2013 and 2014 bathing seasons (June through August), average monthly water levels varied from 571 to 572 feet. Over the past five years, average water levels during bathing season have consistently remained between 571 and 572 feet, with one peak level of approximately 573 feet in June 2011 (NOAA 2013b).

During field activities performed from October 22 to 30, 2013, EEEPC measured water levels at the western end of the Gallagher Beach pier using a pressure transducer. During this time period, average water level at the transducer was 570.6 feet.

Water levels were not measured with the pressure transducer in 2014, although general observations of the water level made during the sanitary survey sampling program confirm that the water level at the beach remained consistent and no significantly high or low water level events were noted.

2.3.5 Bathymetry Survey

Bathymetry is the measurement of the depths of waterbodies from the water surface. Bathymetric surveys are generally conducted with a transducer, which both transmits a sound pulse from the water surface (attached to a boat) and records that same signal when it bounces from the bottom of the waterbody. An echo sounder attached to the transducer filters and records the travel time of the pulse. At the same time that the pulse occurs, a GPS unit can record the location of the reading. After many of these readings are taken, corrections are made based on fluctuations in the water surface elevation that may have occurred during the survey. The individual points are then mapped.

A bathymetric survey of the Gallagher Beach embayment (submerged portion of the property) was completed on October 23, 2013. The bathymetric survey was completed with a vertical resolution of 0.1 foot to identify any pertinent lake-bottom features. Due to dense vegetation coverage on large portions the bottom, the bathymetric survey was conducted using a lead-weighted line. Water depths were recorded to the nearest tenth along transect lines spaced approximately 100

Table 2-3 Buffalo Harbor State Park, Lake Current Measurements

Monthly Sample Location	Date	Depth of Measurement (feet)	Depth Range	Total Depth (feet)	Velocity (feet/second)	Water Flow Direction	Notes
MWS-01A	6/6/15	*	*	20	*	*	Turbidity measurements and flow data were not collected due to wave conditions and safety issues.
MWS-02A	6/6/15	5	*	28.5	0	*	Only one flow measurement taken due to wave height and safety concerns.
MWS-03	6/6/15	15	Bottom	16.5	0.2	NE	
		10	Mid		0.4	NE	
		5	Surface		0.4	NE	
MWS-04	6/4/15	9	Bottom	10.2	0.6	E	
		5	Mid		0.2	E	
		1	Surface		0.4	E	
MWS-05	6/4/15	9	Bottom	9.5	0.2	NE	
		5	Mid		0.2	NE	
		1	Surface		0.2	NE	
MWS-06	6/4/15	15	Bottom	17.5	0	NA	
		10	Mid		0	NA	
		1	Surface		0.2	E	
MWS-07	6/4/15	15	Bottom	25.5	0.6	NNE	
		10	Mid		0.4	NNE	
		1	Surface		0.6	NNE	
MWS-08	6/4/15	15	Bottom	21	0.2	ENE	
		10	Mid		0.2	ENE	
		1	Surface		0.4	ENE	
MWS-09	6/4/15	15	Bottom	26.5	0.4	NE	
		10	Mid		0.4	NE	
		1	Surface		0.4	NE	
MWS-10	6/4/15	15	Bottom	28	0	NA	
		10	Mid		0.8	SE	
		1	Bottom		0	NA	
MWS-01B	7/1/15	*	*	*	*	*	Flow to NW, Sample taken at shoreline. Unable to collect velocity measurement.
MWS-02B	7/2/15	25	Bottom	28	0	NA	
		15	Mid		0.3	NE	
		1	Surface		0.3	NE	
MWS-03	7/2/15	15	Bottom	17	0	NA	
		10	Mid		0	NA	
		1	Surface		0.1	S	
MWS-04	7/1/15	8	Bottom	9	0.2	NE	
		5	Mid		0.1	NE	
		1	Surface		0.8	NE	
MWS-05	7/1/15	5	Mid	9.5	0.5	NE	Did not collect bottom measurement due to weather conditions and safety hazards.
		1	Surface		0.4	NE	

Table 2-3 Buffalo Harbor State Park, Lake Current Measurements

Monthly Sample Location	Date	Depth of Measurement (feet)	Depth Range	Total Depth (feet)	Velocity (feet/second)	Water Flow Direction	Notes
MWS-06	7/2/15	17	Bottom	18.3	0	E	
		10	Mid		0.1	E	
		1	Surface		0.1	E	
MWS-07	7/2/15	27	Bottom	29.5	0.3	N	
		15	Mid		0.3	N	
		1	Surface		0.3	N	
MWS-08	7/2/15	19	Bottom	21.5	0	NA	
		10	Mid		0	NA	
		1	Surface		0	NA	
MWS-09	7/2/15	25	Bottom	27	0.2	SE	
		10	Mid		0.5	SE	
		1	Surface		0.2	SE	
MWS-10	7/2/15	30	Bottom	33	0.5	ESE	
		15	Mid		0.4	ESE	
		1	Surface		0.2	ESE	
MWS-01B	7/30/15	*	*	*	*	*	Taken at Shoreline (Water approximately 2 ft deep), unable to collect velocity measurement.
MWS-02B	7/29/15	25	Bottom	25.5	0.2	NE	
		15	Mid		0.1	NE	
		1	Surface		0.1	NE	
MWS-03	7/29/15	10	Bottom	13.8	0	NA	
		5	Mid		0	NA	
		1	Surface		0	NA	
MWS-04	7/29/15	7	Bottom	10.7	0	NA	
		5	Mid		0	NA	
		1	Surface		0.1	SE	
MWS-05	7/30/15	7	Bottom	9	0.2	ENE	Heavy plant growth. Suspect Reading.
		5	Mid		0	NA	
		1	Surface		0	NA	
MWS-06	7/29/15	10	Bottom	13.6	0	NA	
		5	Mid		0	NA	
		1	Surface		0.1	NNE	
MWS-07	7/30/15	23	Bottom	26.5	0.2	N	
		12	Mid		0.4	N	
		1	Surface		0.6	N	

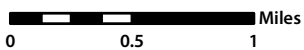
Table 2-3 Buffalo Harbor State Park, Lake Current Measurements

Monthly Sample Location	Date	Depth of Measurement (feet)	Depth Range	Total Depth (feet)	Velocity (feet/second)	Water Flow Direction	Notes
MWS-08	7/30/15	20	Bottom	22.1	0	NA	
		10	Mid		0	NA	
		1	Surface		0	NA	
MWS-09	7/29/15	23	Bottom	26.6	0	NA	
		13	Mid		0	NA	
		1	Surface		0.1	NE	
MWS-10	7/29/15	25	Bottom	29.1	0.4	E	
		15	Mid		0.4	E	
		1	Surface		0.3	E	
MWS-01B	8/28/15	*	*	*	*	*	Water/waves coming on-shore at this location (Water approximately 2 ft deep), unable to collect velocity measurement.
MWS-02B	8/28/15	25	Bottom	31	0.2	SSE	
		15	Mid		0.2	SSE	Direction estimated, probe not visible.
		1	Surface		0.4	SSE	
MWS-03	8/28/15	15	Bottom	20	0	NA	No reading due to SAV.
		10	Mid		0.1	SE	
		1	Surface		0.2	SE	
MWS-04	8/28/15	15	Bottom	16.5	0	NA	No reading due to SAV.
		8	Mid		0	NA	
		1	Surface		0.2	SSE	
MWS-05	8/28/15	12	Bottom	15	0	NA	No reading due to SAV.
		8	Mid		0.2	ESE	
		1	Surface		0.1	ESE	
MWS-06	8/28/15	20	Bottom	23	0	NA	
		12	Mid		0.1	SW	
		1	Surface		0.3	SW	
MWS-07	8/28/15	28	Bottom	30	0	NW	
		15	Mid		0.4	NW	Direction estimated, probe not visible.
		1	Surface		0.7	NW	
MWS-08	8/28/15	26	Bottom	28	0	NA	
		14	Mid		0	NA	
		1	Surface		0.2	SW	
MWS-09	8/28/15	30	Bottom	32.5	0	NA	
		18	Mid		0	NA	
		1	Surface		0.3	SE	
MWS-10	8/28/15	33	Bottom	37	0.3	E	Direction estimated, probe not visible.
		17	Mid		0.5	E	Direction estimated, probe not visible.
		1	Surface		0.7	E	

Key:
MWS = Monthly Water Sample
NA = Not Applicable
SAV = Submerged Aquatic Vegetation



SCALE



Legend

- Freeway
- Major Road
- Secondary Road
- Park Area
- Buffalo Harbor State Park Boundary
- Approximate 10,000-foot radius from Gallagher Beach
- NYSDEC Superfund Site
- Buffalo Sewer Authority CSO
- Stormwater Outfalls
- Buffalo Sewer Authority
- City of Buffalo
- Erie County Sewer District 6
- Private
- Surface Water Flow Centerline
- Surface Water Flow
- USGS HUC-12 Watershed Boundary
- Water Area

Figure 2-2
Surface Water Flow
Buffalo Harbor State Park
Buffalo, New York

Note: Water flows under Route 5 between Lake Kirsty and the BHSP Marina via a culvert. Water was observed flowing in both direction at different times.

2 Description of Beach and Swimming Areas

to 150 feet apart, perpendicular to the shoreline. Spacing between depth measurement points along each transect was approximately 50 feet. Additional points were added when necessary to define bottom anomalies. Navigation of the planned survey transects was conducted with a Trimble 6000 Series GeoXT GPS system. Figure 2-3 shows the bathymetric elevation within the Gallagher Beach area.

The bottom of the Gallagher Beach embayment generally slopes gently to the west from an elevation of approximately 571 feet at the beach to 562 feet approximately 150 feet from the beach, and then remains at 562 for the majority of the embayment surface. Five small depressions 1 foot deep and six small mounds 1 to 2 feet high were also detected within the embayment. In addition, as the embayment bottom approaches the southernmost extent of the bay, the elevations again slopes downward approximately 6 feet over a distance of approximately 40 feet.

2.4 Other Investigation Activities

2.4.1 Threatened and Endangered Species

The NYSDEC Natural Heritage Program (NHP) was consulted to determine the potential occurrence of federally and state-listed endangered and threatened species and significant natural communities and habitats within the survey area (Chaloux 2013). In addition, to threatened and/or endangered species, the NYNHP reports on significant natural communities that could serve as habitat for endangered or threatened animals, and/or other rare animals and rare plants found at such habitats. A copy of the NHP response letter is included as Appendix C.

The NHP correspondence indicates that there are no federally listed species within a 0.5-mile radius of the BHSP – Gallagher Beach. A total of four state-listed species were identified as occurring within a 0.5-mile radius of the BHSP, including the state-endangered peregrine falcon (*Falco peregrinus*) and state-threatened least bittern (*Ixobrychus exilis*), pied-billed grebe (*Podilymbus podiceps*), and lake sturgeon (*Acipenser fulvescens*). It is important to note that the NHP specifically identified the lake sturgeon as occurring within the BHSP survey area. In addition to the aforementioned state-listed species, the NHP identified the presence of a ring-billed gull nesting colony at Stony Point (this is at active U.S. Army Corps of Engineers CDF No. 4), which is a dredge spoil disposal site utilized by nesting gull species and the presence of devil crawfish (*Cambarus diogenes*), which are known to occur within the marshes of Tifft Nature Preserve (east of the BHSP); the devil crawfish is unlisted within New York, but is recognized as imperiled within the state by the NHP.

2.4.2 Submerged Aquatic Vegetation

On October 25, 2013, EEEPC conducted a submerged aquatic vegetation (SAV) survey to identify the various species present and map the approximate distribution of each species present at the BHSP - Gallagher Beach. Prior to the on-site work survey, a desktop review of existing aerial photography was conducted to determine a baseline extent and potential density of the SAV coverage within the

2 Description of Beach and Swimming Areas

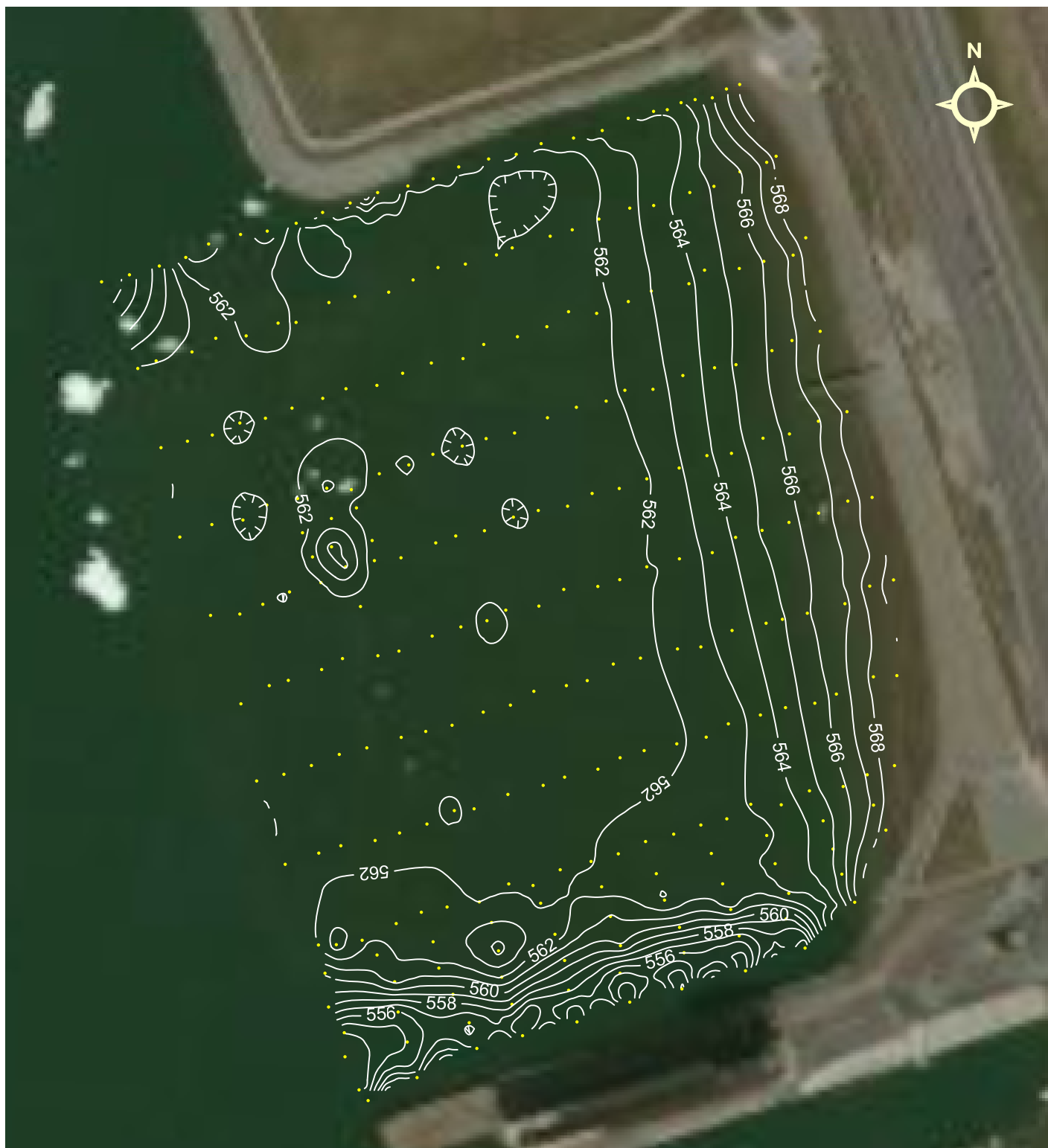
embayment. Utilizing aerial photographs from different years, as well as different times of year, allowed for an accurate map of the extent of the SAV to be developed.

A survey of the Gallagher Beach embayment was conducted to directly compare the actual on-site observations to the aerial photography signatures observed during the desktop review. Using the map created during the desktop review, the on-site biologist was able to accurately compare actual observed site conditions to aerial imagery. The survey of the SAV within the Gallagher Beach embayment was conducted from a boat using an Aqua Scope VI™ Viewing Scope and a weighted line. A weighted line was used where the water was too deep to use the Aqua Scope VI™ (viewing scope) or if the water was not clear enough. The weighted line was slowly dragged across the bottom to retrieve samples for identification to determine specific species present and it determined the level of resistance which correlated to the SAV density. See Table 2-4 for a species list of the SAV encountered during this survey. EEEPC used the information obtained from their survey of SAV and existing aerial imagery to create Figure 2-4, which shows the approximate distribution and density of the SAV within the embayment, as well as the species distribution.

Table 2-4 Submerged Aquatic Vegetation Species List

Common Name	Scientific Name	Relative Abundance
Coontail	<i>Ceratophyllum demersum</i>	Rare
American waterweed	<i>Elodea canadensis</i>	Common
Grassleaf mudplantain	<i>Heteranthera dubia</i>	Common
Eurasian watermilfoil	<i>Myriophyllum spicatum</i>	Common
Richardson's pondweed	<i>Potamogeton richardsonii</i>	Common
Wild celery	<i>Vallisneria americana</i>	Dominant

Overall, the dominant species found within the Gallagher Beach embayment during this survey was wild celery (*Vallisneria americana*). It was found in every area that SAV was present with the exception of a small area in the southwest portion of the embayment, which has become a dense monoculture of Eurasian watermilfoil (*Myriophyllum spicatum*). The Eurasian watermilfoil was common in the deeper portion of the embayment, as well as along the riprap on the north edge, but it was only co-dominant with other SAV species in those areas, and did not form a monoculture. The other species found to often be co-dominant with the wild celery were American waterweed (*Elodea canadensis*), grassleaf mudplantain (*Heteranthera dubia*), and Richardson's pondweed (*Potamogeton richardsonii*). Lastly, coontail (*Ceratophyllum demersum*) was also observed, but only a limited number of individuals.



Service Layer Credits: Image Courtesy of USGS State of Michigan
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0 50 100 150 Feet

Key:

- Water Depth Measurement Locations
- Top of Sediment Elevation (feet)

Note:
Elevation datum is North American Vertical Datum 1988, feet.

Figure 2-3
Bathymetric Elevations
Buffalo Harbor State Park - Gallagher Beach
Buffalo, New York



SCALE

0 200 400 Feet

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

SOURCE: ESRI 2010;
Ecology and Environment Engineering, P.C., 2015.

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Legend

- Major Road
- Submerged Aquatic Vegetation Sections

Figure 2-4
Locations and Densities of
Submerged Aquatic
Vegetation Species
Gallagher Beach
Buffalo, New York

2 Description of Beach and Swimming Areas

Water celery was present in low densities near the beach shoreline in fairly shallow water of only a few feet deep. In those areas it was typically the only species present and consisted of small, broadly spaced individuals a few inches high. In these areas, most of the bottom was visible. Once the water depths reach approximately 3 to 4 feet and deeper, the wild celery density typically was such that it completely covered the bottom to a point that there was little to no substrate visible. The individual plants in this area were also much more robust and were at least a foot or more in length. Richardson's pondweed appeared to be in shallow areas 3 to 8 feet deep and ranged in densities from only being a minor component among the wild celery to being nearly co-dominate with the wild celery. It was not observed in the deeper portions of the harbor. American waterweed and grassleaf mudplantain appeared to be present in the deeper sections of the harbor, and were also nearly co-dominant with the wild celery. In the deeper water, many of these plants were rather large and were often 2 or 3 feet long when retrieved. Eurasian milfoil was found primarily in the deepest portions of the harbor that had SAV present. It often grew to 1 or 2 feet below the surface, so there were individuals that may have exceeded 6 to 8 feet in height. It was also sporadically present throughout much of deeper portions of the embayment as well.

3

Water Quality Sampling

3.1 Indicators and Agency Standards

The NYS Sanitary Code requires monitoring of NYS beaches for total coliform, fecal coliform, *E. coli*, or *Enterococci*. Federal rule, 40 Code of Federal Regulations Part 131, requires the use of *E. coli* or *Enterococcus* as bacteriological indicators for water quality at coastal bathing beaches. Based on these standards, NYS requires the use of *E. coli* as an indicator of water quality at NYS park freshwater beaches.

NYSDOH standards and EPA criteria are based on threshold values for single samples and logarithmic means of bacteriological indicator levels. Single sample results provide an instantaneous measure of the beach's water quality and represent water quality conditions at the time of sampling. These results are important for determining beach closures. The NYS and EPA standard for an *E. coli* single sample is 235 colony-forming unit (CFU)/100 milliliters (mL). The NYS standard for *Enterococci* single sample is 61 CFU/100 mL. Logarithmic means provide a measure of the beach's water quality over a 30-day period. Log means are approximations of overall, long-term beach water quality. The New York State standard and EPA criterion for *E. coli* log mean results are 126 CFU/100 mL. The New York State standard for *Enterococci* log mean results is 33 CFU/100 mL. A summary of 6 New York Codes, Rules and Regulations (NYCRR) Subpart 2.15, Water Quality Monitoring for Bathing Beaches, bacteriological limits is listed in Table 3-1.

**Table 3-1 Summary of Water Quality Monitoring for Bathing Beaches
Bacteriological Limits**

Indicator	Single Sample (CFU/100 mL)	Log Mean (CFU//100 mL)
Fecal coliform	1,000	200
<i>E. coli</i>	235	126
<i>Enterococci</i>	61	33

Key:

CFU = colony-forming units

mL = milliliter

Table 3-2 reflects the Beach Action Values (BAVs) contained in the National Beach Guidance and Required Performance Criteria for Grants, 2014 Edition (EPA-823-B-14-001).

Table 3-2 Beach Action Values

Indicator	Estimated Illness Rate (NEEAR GI): 36 NGI per 1,000 recreators (CFU/100 mL)	Estimated Illness Rate (NEEAR GI): 32 NGI per 1,000 recreators (CFU/100 mL)
<i>E. coli</i>	235	190
<i>Enterococci</i>	70	60

Key:

CFU = colony forming units
GI = gastrointestinal illness
mL = milliliter

NEEAR = National Epidemiological Assessment of Recreational (water studies)

NGI = NEEAR GI Illness

3.2 2013 Site Investigation Sampling

An environmental investigation was performed on the BHSP property between October 21 and 31, 2013, to determine if contaminants of concern were present in the water, sediment, soils, and groundwater. For the purpose of this sanitary survey, only the water and sediment samples associated with the beach are discussed here. Exceedances of the selected screening criteria are presented on the figures referred to below, and a complete listing of all the analytical data collected is provided in the *Buffalo Harbor State Park Data Summary* dated May 7, 2013 (see Appendix E).

Integrated water column surface water samples and sediment samples were collected from a total of 13 sample locations (SD-01 through SD-13) from Lake Erie near Gallagher Beach between October 21 and 31, 2013 (see Figures 3-1 and 3-3). In addition, two stormwater outfalls (WST-01 and WST-02) and three nearshore surface water samples (SW-01, SW-02, and SW-03) were collected following a rain event (see Figure 3-2). Samples were collected in accordance with the approved SAP (EEEPC 2013a).

Water samples were analyzed for Target Compound List (TCL) volatile organic compounds (VOCs), TCL semivolatile organic compounds (SVOCs), TCL organochlorine pesticides, TCL polychlorinated biphenyls (PCBs), Target Analyte List (TAL) inorganics (metals), mercury, cyanide, oil and grease, phosphorus, nitrite/nitrate, total Kjeldahl nitrogen, biological oxygen demand, chemical oxygen demand, sulfate, hardness, total dissolved solids, and bacteriological testing was performed for *Enterococci* using Enterolert, and fecal coliform and *E. coli* using EPA Method SM 9222B.

The waters of Lake Erie at the BHSP are classified as Class “B” (6 NYCRR 837.4). The best uses of Class “B” water are, “... primary and secondary contact

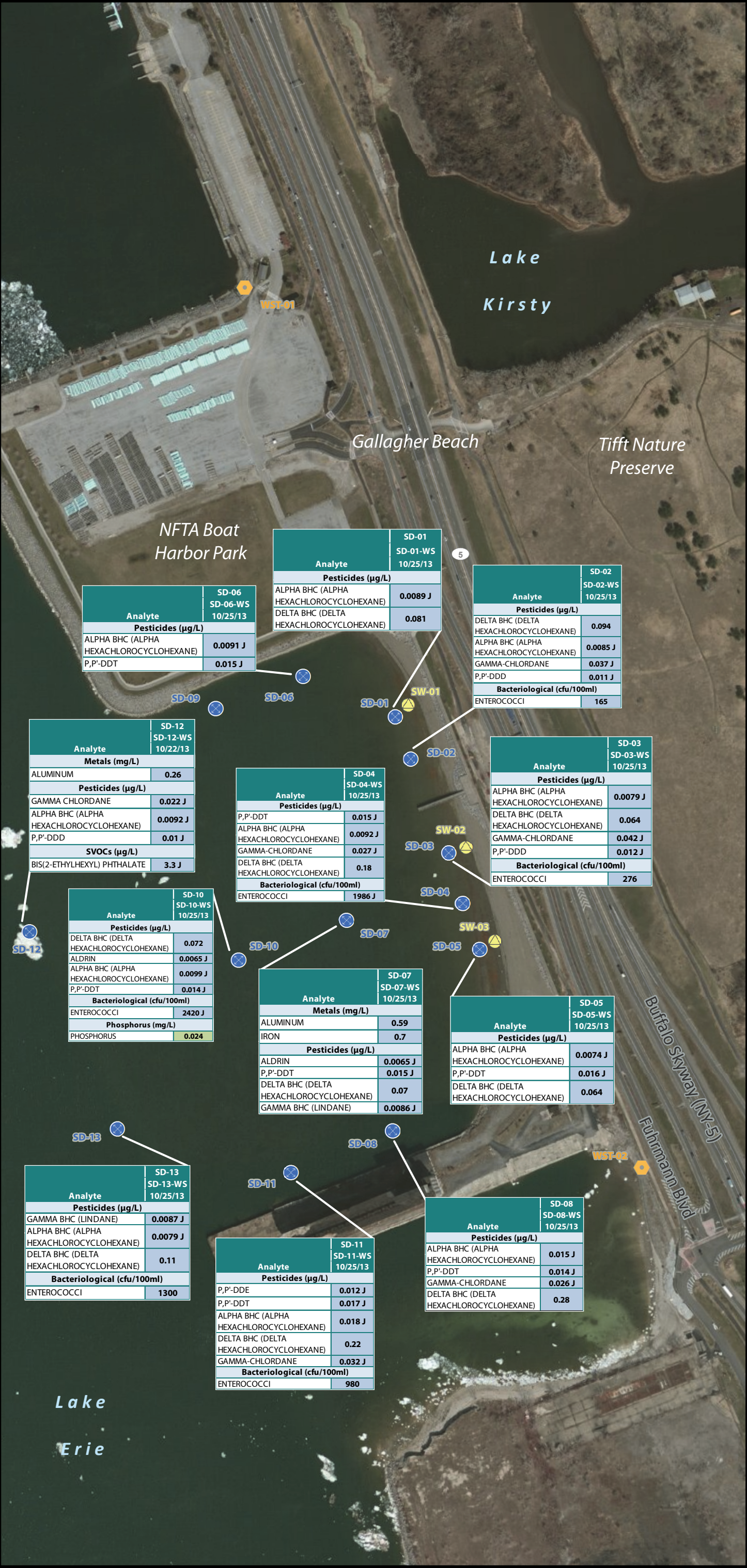
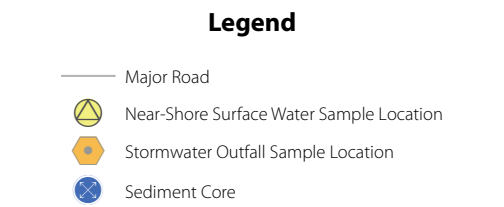


Figure 3-1
2013 Environmental Investigation
Summary of Surface Water Exceedances
Buffalo Harbor State Park
Buffalo, New York

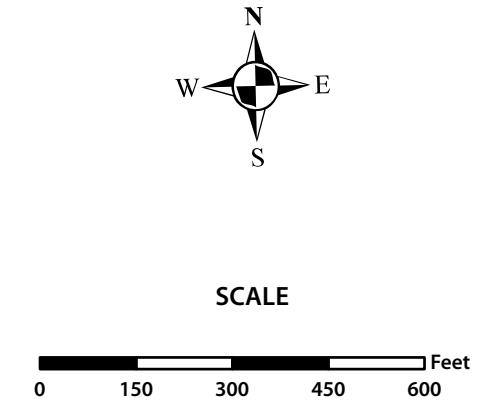
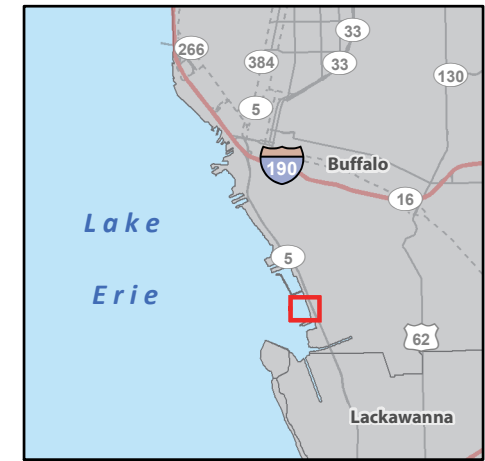


Key:
Qualifiers
J = Estimated value

Notes
µg/L = Micrograms per liter
mg/L = Milligrams per liter
cfu/100ml = colony forming unit per 100 milliliters

No surface water exceedances for SD-09.

10	Exceeds groundwater standard.
100	Exceeds groundwater guidance value.



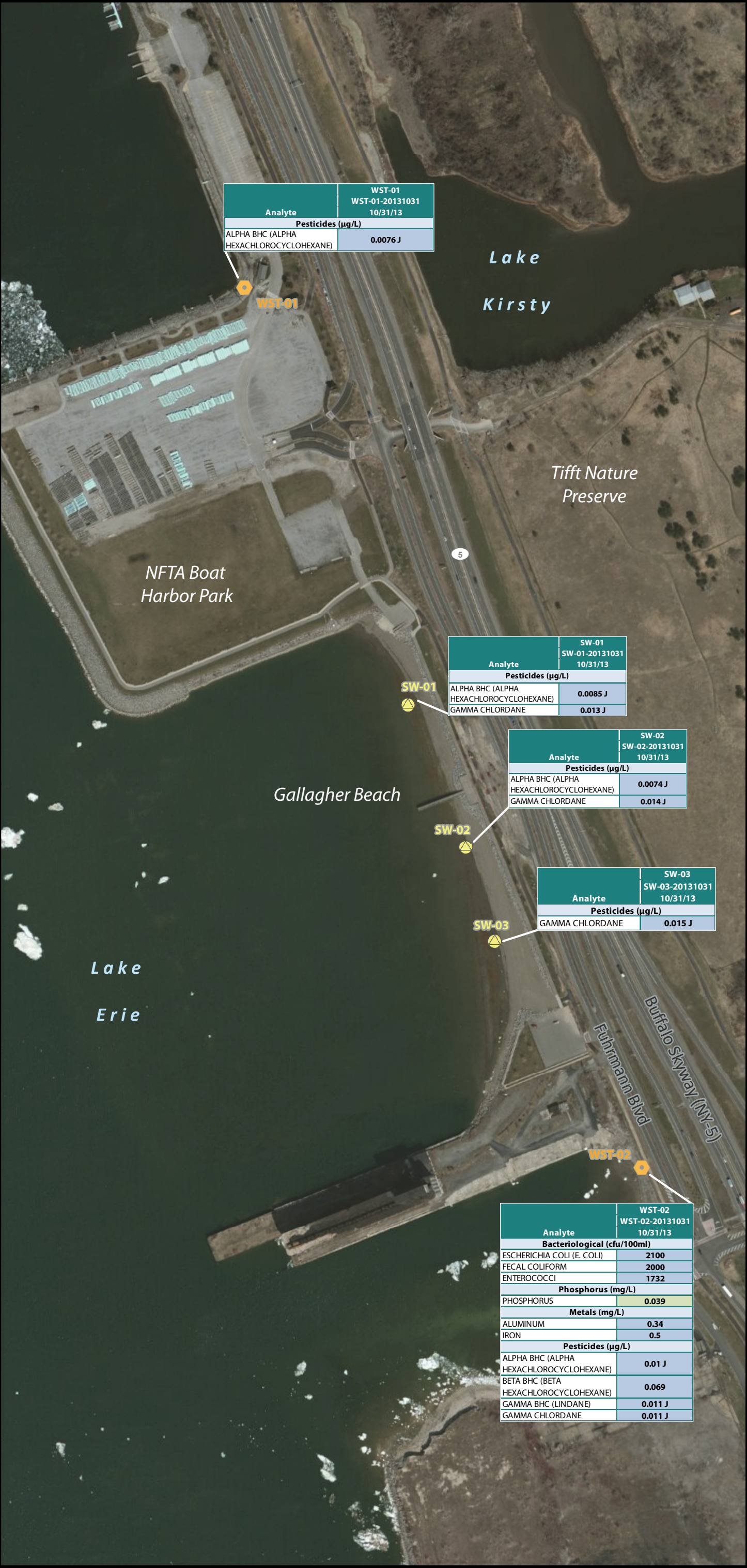


Figure 3-2
2013 Environmental Investigation
Summary of Rain Event
Water Sample Exceedances

Buffalo Harbor State Park
Buffalo, New York

Legend

- Major Road
- Near-Shore Surface Water Sample Location
- Stormwater Outfall Sample Location

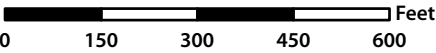
Key:
Qualifiers
J = Estimated value

Notes
µg/L = Micrograms per liter
mg/L = Milligrams per liter
cfu/100ml = colony forming unit per 100 milliliters

10	Exceeds groundwater standard.
100	Exceeds groundwater guidance value.



SCALE



Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
SOURCE: ESRI 2010; ESRI 2012; Ecology and Environment Engineering, P.C. 2015

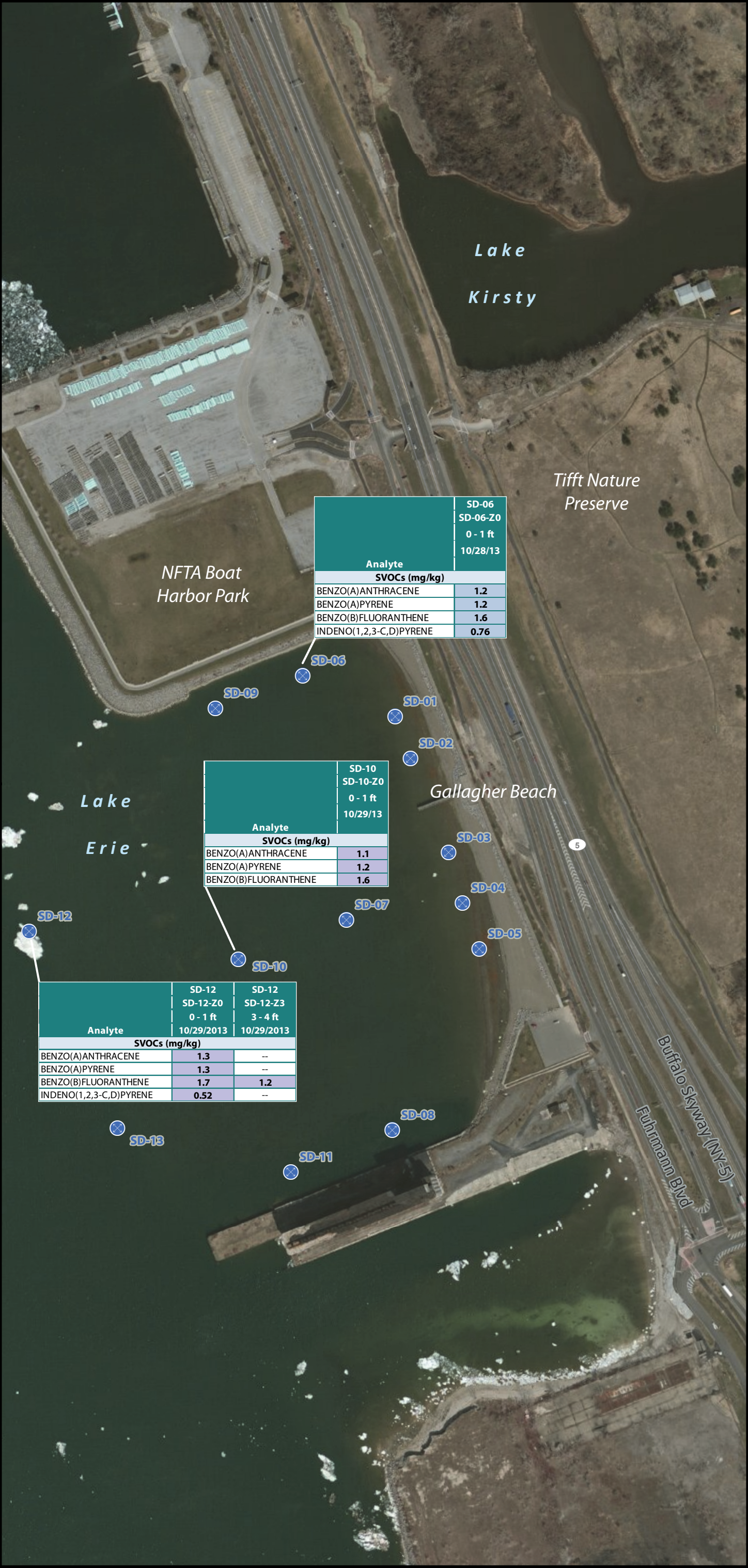


Figure 3-3
2013 Environmental Investigation
Summary of Sediment
Exceedances

Buffalo Harbor State Park
Buffalo, New York

Legend

- Major Road
- Sediment Core

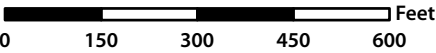
Key:
mg/kg = Milligrams per kilogram
SVOCs = Semivolatile Organic Compounds

Notes:
Analytical results for sediment samples will be compared to 6 NYCRR 375-6.8(a) Restricted-Residential Use SCOs.

No exceedances for SD-01 through SD-05, SD-07 through SD-09, SD-11, and SD-13.



SCALE



Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
SOURCE: ESRI 2010; ESRI 2012; Ecology and Environment Engineering, P.C. 2015

recreation and fishing” (6 NYCRR 701.7). Therefore, analytical results for surface water samples were compared to the Class “B” ambient water quality standards in 6 NYCRR Part 703.5 and guidance values found in NYSDEC’s Division of Water Technical and Operational Guidance Series 1.1.1, “Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations” (NYSDEC 1998). Type codes associated with human consumption of fish or aesthetics were used. An exception is bacteriological water quality. Results for fecal coliform, *E. coli*, and *Enterococci* analyses were compared to NYSDOH limits for bathing beaches (10 NYCRR Subpart 6-2.15). Analytical results that exceed the screening criteria are presented on Figures 3-1 and 3-2.

Sediment samples were analyzed for TCL VOCs, TCL SVOCs, TCL organochlorine pesticides, TCL PCBs, TAL metals, mercury, total organic carbon, cyanide, oil and grease, and bacteriological testing was performed for *Enterococci* using Enterolert, and fecal coliform and *E. coli* using EPA Method SM 9222B. Analytical results for sediment samples were compared to 6 NYCRR 375-6.8(a) Restricted-Residential Use Soil Cleanup Objectives. Analytical results that exceed the screening criteria are presented on Figure 3-3.

Chemical testing was performed by Test America Laboratories in Amherst, New York. Bacteriological analyses of samples were completed by Biotrax Testing Laboratories in Depew, New York.

3.2.1 Sample Collection

Integrated Water Column Surface Water Sampling

An integrated water column sample was collected at each sediment core location, SD-01 through SD-13, for a total of 13 surface water samples. The samples were collected from the top of the water column to just above the top of sediment. The samples represent a composite of the water column with the exception that the bacteriological portion was collected from a depth of approximately 1 foot below the water surface at each sample location using a disposable polyethylene bailer. Since the bacteriological samples had a maximum holding time of only 6 hours, those samples were collected from each location first and submitted to the laboratory for analyses.

Stormwater and Nearshore Surface Water Sampling

Two stormwater outfall samples (WST-01 and WST-02) and three nearshore surface water samples (SW-01 through SW-03) were collected concurrently on October 31, 2013, following a rain event of more than 0.5 inches. Stormwater outfall sample WST-02 was collected from the effluent before mixing with Lake Erie. Due to the location of the WST-01 outfall (beneath the water of Lake Erie), this sample was a mixture of effluent and Lake Erie water.

The nearshore surface water samples were collected from a depth of approximately 1 foot below the water surface in water with a depth not exceeding 3 feet. Samples were collected in accordance with the USGS point-sampling methods. A

NYSDEC Multi-Sector General Permit for Stormwater Discharges Associated with Industrial Activities, Quarterly Visual Monitoring Form, was completed for stormwater outfall samples WST-01 and WST-02.

Sediment

Sediment samples were collected from each of the 13 sediment core locations, SD-01 through SD-13. Sediment cores SD-01 through SD-13 were collected using a boat-mounted Vibracore equipped with a 10-foot core barrel. The sediment cores were advanced to a depth ranging from 0.8 inches to 7.3 inches below the top of soft sediment until refusal was encountered. The sediment was homogenized using dedicated stainless-steel bowls and spoons for sample collection then transferred to appropriate sample containers. The portion of the sediment sample for VOC analyses was not from the composite mixture, but was extracted directly from the sediment core in accordance with EPA procedures using a coring device (e.g., En Core™). At each core location, one sediment sample was collected from the top 1 foot of recovered material. Additional sampling intervals were selected based on visual and olfactory information, and field screening results.

3.2.2 Analytical Results

Integrated Water Column Surface Water Sampling

Surface water samples were collected on October 22 and 25, 2013, from 13 locations (SD-01 through SD-13). See Figure 3-1 for a summary of the surface water (integrated water column) screening criteria exceedances.

Bacteriological

Three bacteriological parameters were detected in six of the surface water samples. *E. coli* and fecal coliform concentrations in these samples were acceptable based on NYSDOH regulations for bathing beaches. However, *Enterococci* exceeded the screening criteria of 61 colony forming units per 100 milliliters (CFU/100 mL) in six surface water samples collected from locations SD-02, SD-03, SD-04, SD-10, SD-11, and SD-13. *Enterococci* concentrations ranged from 165 CFU/100 mL at location SD-02 to 2,420 CFU/100 mL at location SD-10. SD-10 is in the center of the surface water sample collection area in Lake Erie.

General Chemistry

Nine general chemistry tests (hardness, sulfate, total oil and grease, total nitrogen Kjeldahl, nitrogen nitrate-nitrite, chemical oxygen demand, total dissolved solids, phosphorus, and biochemical oxygen demand) were performed on the surface water samples. These tests provide general indicator parameters for the levels of contamination. None of these tests have numeric screening criteria with the exception that phosphorus has a guidance value for ponds of 0.02 milligrams per liter (mg/L). Phosphorus was detected at a concentration of 0.024 mg/L at location SD-10. SD-10 is in the center of the surface water sample collection area in Lake Erie.

Inorganics

A total of 12 metals plus cyanide were detected in at least one of the surface water samples collected from locations SD-01 through SD-13. The concentrations of two of these metals (aluminum and iron) exceeded the Class B surface water standards in at least one sample. Aluminum was detected above the screening criterion of 100 µg/L in two samples at concentrations of 260 µg/L at location SD-12 and 590 µg/L at location SD-07. Iron was detected above the screening criterion of 300 µg/L in one sample at a concentration of 700 µg/L at location SD-07. SD-12 is the westernmost water sample collected in Lake Erie. SD-07 is in the center of the surface water sample collection area in Lake Erie.

Pesticides

A total of nine pesticides were detected in at least one of the surface water samples, eight of which were present at concentrations exceeding Class B surface water standards. The pesticides that were detected include aldrin, alpha benzenehexachloride (BHC), delta BHC, gamma BHC, gamma chlordane, P,P'-DDD, P,P'-DDE, and P,P'-DDT. Each surface water sample location (SD-01 through SD-13) contained at least two pesticides at concentrations exceeding the screening criteria. The highest reported concentration was 0.28 µg/L at location SD-08 for delta BHC. SD-08 is located in the center and southern section of the surface water sample area.

PCBs

None of the surface water samples contained PCBs.

VOCs

None of the surface water samples contained VOCs.

SVOCs

Two SVOCs (benzyl butyl phthalate and bis[2-ethylhexyl]phthalate) were detected in one of the 13 surface water samples. Both analytes were detected in the sample collected from location SD-12. Benzyl butyl phthalate was detected at a concentration of 3.2 micrograms per liter (µg/L) and there is no Class B screening criterion for this compound. Bis(2-ethylhexyl) phthalate was detected at a concentration of 3.3 µg/L, which exceeded the screening criterion of 0.6 µg/L. SD-12 is the westernmost water sample collected in Lake Erie. Due to bad weather conditions, SD-12 was the only surface water sample collected on October 22, 2013. Once the weather improved, all the remaining surface water samples were collected on October 25, 2013.

Stormwater and Near-Shore Surface Water Sampling

Storm and near-shore water samples were collected on October 31, 2013, from five locations (WST-01, WST-02, SW-01, SW-02, and SW-03) (see Figure 3-2 for a summary of the screening criteria exceedances).

Bacteriological Parameters. A total of three bacteriological parameters were detected in at least one of the storm and nearshore water samples and all three of

the parameters detected in the sample from WST-02 exceeded the screening criteria for *E. coli* (235 CFU/100 mL), fecal coliform (1,000 CFU/100 mL), and *Enterococci* (61 CFU/100 mL). The bacteriological parameters were found in the sample from WST-02 at concentrations of 2,100 CFU/100 mL (*E. coli*), 2,000 CFU/100 mL (fecal coliform), and 1,732 cfm/100 mL (*Enterococci*). The WST-02 sample was collected from the stormwater outfall located off site, south of the beach. The area that drains to the WST-02 outfall was inspected during the fall of 2014 to determine the potential source of the elevated bacteriological levels detected. Decaying food waste (illegal dumping) was observed in the drainage ditch east of NY-5, which drains to Lake Erie via WST-02.

Water Quality Parameters. A total of eight water quality parameters (hardness, sulfate, total oil and grease, total Kjeldahl nitrogen, nitrogen [nitrate-nitrite], chemical oxygen demand, total dissolved solids, and biochemical oxygen demand) were detected in the storm and nearshore water samples; none of them have a screening criteria. However, one parameter (phosphorus) was found at a concentration of 0.039 mg/L at location WST-02 that exceeds the Class B Guidance Value of 0.02 mg/L. The WST-02 sample was collected from the stormwater outfall located off site, south of the beach, which drains the area east of NY-5 where decaying food waste was observed.

Inorganics. A total of 12 inorganics were detected in the storm and nearshore water samples; two of the analytes (aluminum and iron) were found at levels exceeding the screening criteria (protection for fish propagation standard) of 100 mg/L and 4 mg/L in the sample collected from the WST-02 location. Aluminum and iron were detected in the sample collected from WST-02 at concentrations of 340 µg/L and 500 µg/L, respectively. The WST-02 sample was collected from the stormwater outfall located off site, south of the beach.

Pesticides. A total of four pesticides (alpha BHC, beta BHC, gamma BHC, and gamma chlordane) were detected in the storm and nearshore water samples and all four exceeded the screening criteria in at least one sample. The pesticides were detected at sample locations SW-01, SW-02, SW-03, WST-01, and WST-02 at concentrations exceeding the screening criteria. The screening criteria used are for protection for human consumption of fish (alpha BHC at 0.002 µg/L, beta BHC at 0.007 µg/L, gamma BHC at 0.008 µg/L, and gamma chlordane at 0.00002 µg/L). Alpha BHC ranged in concentration from non-detect at location SW-01 to 0.01 µg/L at location WST-02. WST-02 contained concentrations of beta BHC at 0.069 µg/L and gamma BHC at 0.011 µg/L. Gamma chlordane ranged in concentration from 0.011 µg/L at location WST-02 to 0.015 µg/L at location SW-03. WST-02 was collected from the stormwater outfall located off site, south of the beach. The SW-02 sample was collected adjacent to the beach, south of the pier.

PCBs. None of the stormwater or near-surface water samples contained detectable concentrations for PCBs.

VOCs. One VOC (acetone) was detected in one of the stormwater sample locations (WST-02), there is no screening criteria for acetone. Acetone was detected at location WST-02 at 10 µg/L. WST-02 was collected from the stormwater outfall located off site, south of the beach.

SVOCs. None of the storm or near-surface water samples contained detectable concentrations for TCL SVOCs.

Sediment

Sediment Sampling Results. A total of 23 samples (one to three samples per location) were collected from a total of 13 sediment sample locations (SD-01 through SD-013) on October 28 and 29, 2013 (see Figure 3-3 for a summary of the screening criteria exceedances).

Bacteriological. Sediment samples were not analyzed for bacteriological parameters.

Oil and Grease and Total Organic Carbon. Oil and grease was detected in 15 sediment samples and TOC was detected in all 23 sediment samples. There are no screening criteria established for oil and grease or total organic carbon (TOC). The oil and grease concentrations ranged from 190 milligrams per kilogram (mg/kg) in SD-03-Z0-FD (0 to 1 foot BGS) to 481 mg/kg in SD-02-Z0 (0 to 1 foot BGS). TOC concentrations ranged from 2,220 mg/kg in SD-04-Z0 (0 to 1 foot BGS) to 67,500 mg/kg in SD-07-Z0 (0 to 1 foot BGS). SD-02 is located in the eastern section (near the beach), and SD-07 is located in the center of the sediment samples collected in beach embayment.

Inorganics. A total of 22 inorganics were detected in at least one of the sediment samples, none of them exceeded the screening criteria. Nine of the 22 inorganics (aluminum, antimony, calcium, cobalt, iron, magnesium, potassium, sodium, and vanadium) do not have screening criteria. The 22 inorganics (aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, total chromium, cobalt, copper, iron, lead, magnesium, manganese, nickel, potassium, selenium, sodium, vanadium, zinc, mercury, and cyanide) were detected in one or more of the 23 sediment samples collected at various depths at locations SD-01 through SD-13.

Pesticides. A total of nine organochlorine pesticides were detected in at least one of the sediment samples, none of them exceeded the screening criteria (endrin ketone and methoxychlor do not have a screening criteria). The nine organochlorine pesticides (alpha BHC, beta BHC, endosulfan sulfate, endrin ketone, gamma BHC, methoxychlor, P, P'-DDD, P, P'-DDE, and P,P'-DDT) were detected in sediment samples at various depths collected from locations SD-01 through SD-13. The lowest concentration was 0.00047 mg/kg in SD-01-Z0 (0 to 1 foot BGS) for beta BHC and the highest concentration was 0.0097 mg/kg in SD-12-Z0 (0 to 1 foot BGS) for P,P'-DDD. SD-01 is located just west of the Gallagher Beach

shoreline in Lake Erie. SB-12 is the sediment sample collection location that is located farthest west in Lake Erie.

PCBs. None of the sediment samples contained detectable concentrations for PCBs.

VOCs. A total of four VOCs were detected in at least one of the sediment samples, none of them exceeded the screening criteria of acetone (100 mg/kg), chloroform (49 mg/kg), and methyl ethyl ketone (2-butanone; 100 mg/kg). Carbon disulfide does not have an established screening criterion. The four VOCs were detected in 14 sediment samples from various depths collected from locations SD-05 through SD-13. The concentrations ranged from 0.0071 mg/kg in SD-10-Z2 (2 to 3 feet BGS) to 0.22 mg/kg in SD-12-Z6 (6 to 7.3 feet BGS) for acetone; 0.021 mg/kg in SD-13-Z0 (0 to 1 foot BGS) to 0.06 mg/kg in SD-12-Z6 (6 to 7.3 feet BGS) for methyl ethyl ketone (2-butanone). Carbon disulfide and chloroform were detected at concentrations of 0.0037 mg/kg in SD-12-Z3 (3 to 4 feet BGS) and 0.0023 mg/kg in SD-05-Z0 (0 to 1 foot BGS), respectively.

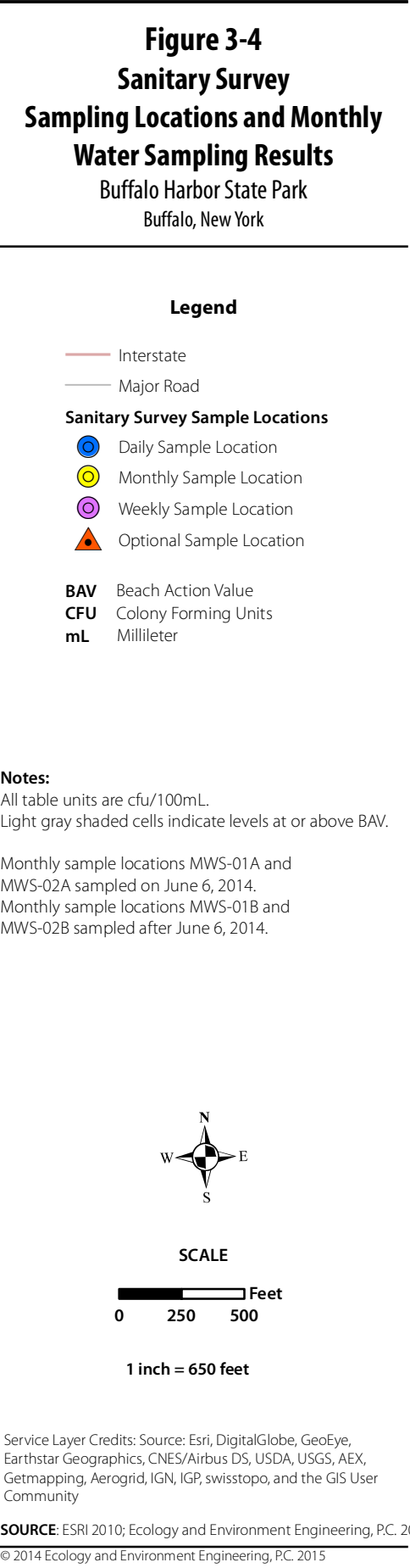
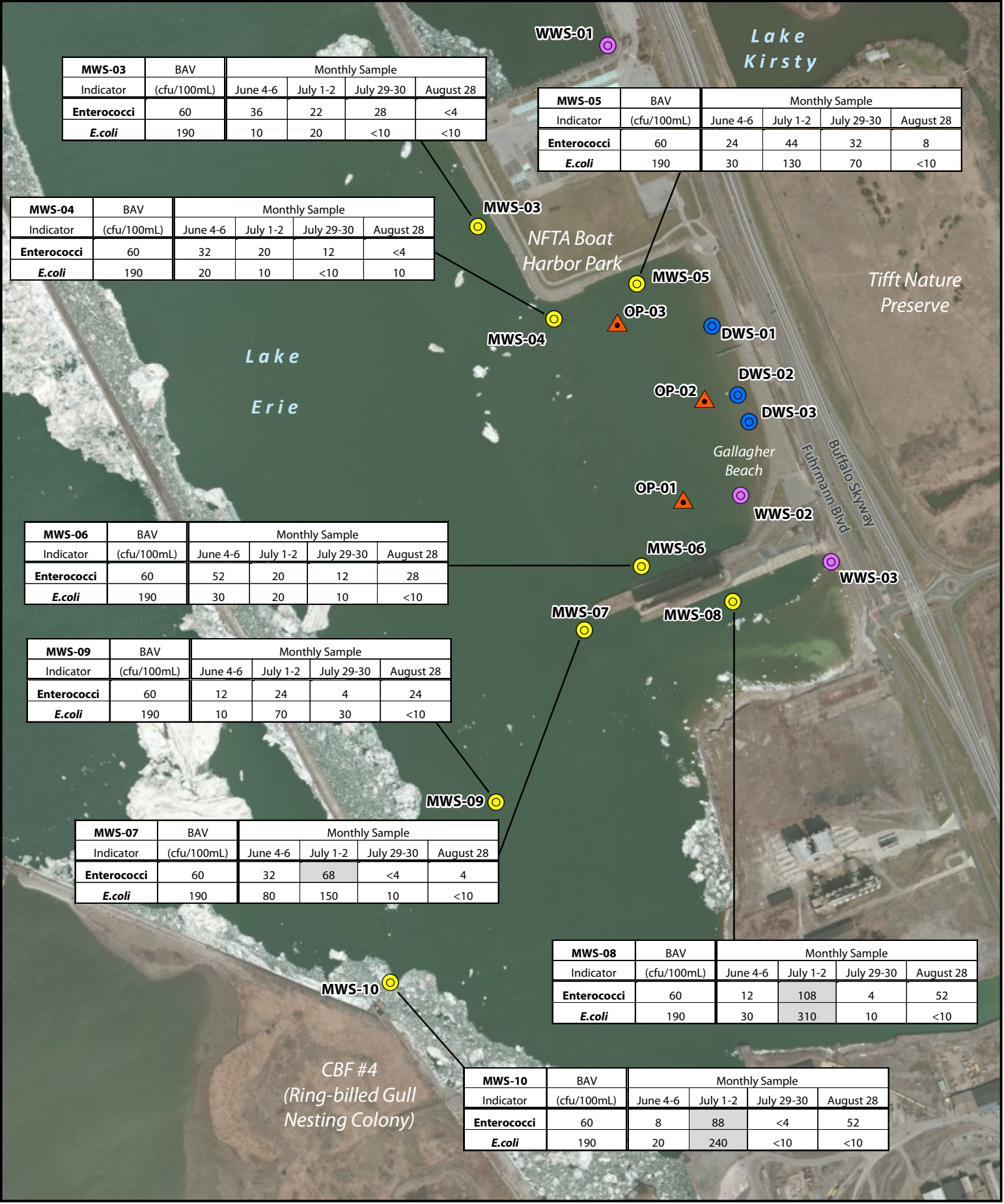
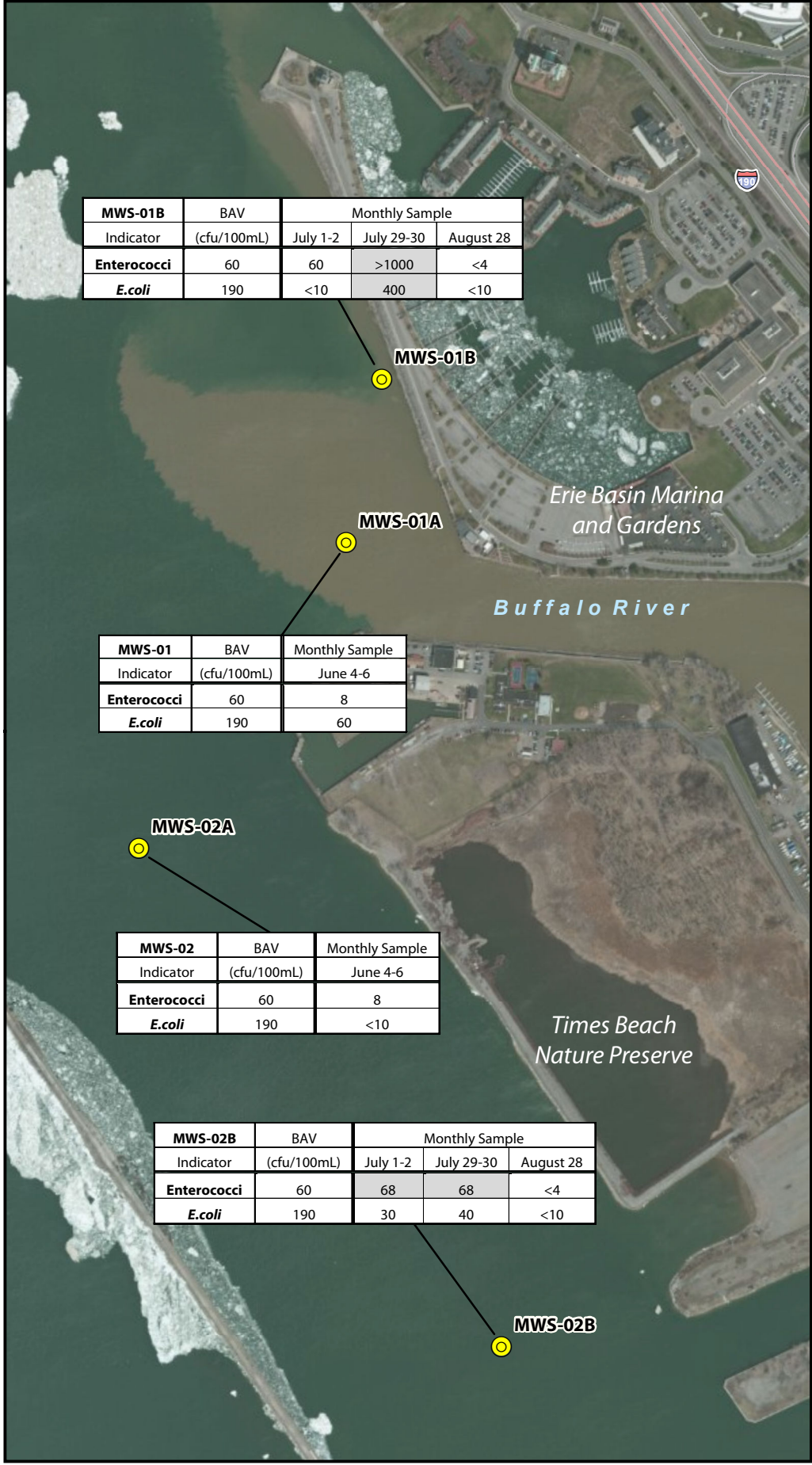
SVOCs. A total of 22 SVOCs were detected in at least one of the sediment samples, and four of them (12 samples out of 92) exceeded the screening criteria (13%) of benzo(a)anthracene (1 mg/kg), benzo(a)pyrene (1 mg/kg), benzo(b)fluoranthene (1 mg/kg), and indeno(1,2,3-c,d)pyrene (0.5 mg/kg). Five of the 22 SVOCs (2-methylnaphthalene, acetophenone, benzaldehyde, biphenyl, and carbazole) do not have a screening criterion. The SVOC concentrations exceeded screening criteria in four sediment samples collected from SD-06-Z0, SD-10-Z0, SD-12-Z0 and SD-12-Z3. Concentrations ranged from 1.1 mg/kg in SD-10-Z0 (0 to 1 foot BGS) to 1.3 mg/kg in SD-12-Z0 (0 to 1 foot BGS) for benzo(a)anthracene; 1.2 mg/kg in SD-06-Z0 and SD-10-Z0 (both 0 to 1 foot BGS) to SD-12-Z0 (0 to 1 foot BGS) for benzo(a)pyrene; 1.2 mg/kg in SD-12-Z3 (3 to 4 feet BGS) to 1.7 mg/kg in SD-12-Z0 (0 to 1 foot BGS) for benzo(b)fluoranthene; and 0.52 mg/kg in SD-12-Z0 (0 to 1 foot BGS) to 0.76 mg/kg in SD-06-Z0 (0 to 1 foot BGS) for indeno(1,2,3-c,d)pyrene. The highest concentrations were in location SD-12, the most western sediment sample collected in Lake Erie.

3.3 2014 Sanitary Survey Sampling

3.3.1 Sampling Locations

A total of 16 locations were sampled as part of the sanitary survey sampling completed between May and August 2014 (see Figure 3-4). These samples included surface water samples at all 16 locations, sediment samples at three locations, and beach sand samples at three locations.

The samples were collected in accordance with the approved SAP (EEEP 2013a) and were analyzed for *Enterococci* using EPA Method 1603 and *E. coli* using EPA Method 1600. All samples were collected and submitted to the laboratory by EEEPC and OPRHP staff. Bacteriological analyses of samples were completed by the NYSDOH-certified Erie County Public Health Laboratory in Buffalo, New York.



3.3.2 Sample Collection

Samples were collected in bottles provided by the laboratory. Sampling staff followed standard procedures for sampling to assure that samples were not contaminated. The samples were immediately placed on ice and delivered to the laboratory within six hours.

Water quality samples were collected daily; weekly and monthly from the locations shown on Figure 3-4. In addition, measurements of the water flow direction and velocity in the vicinity of the BHSP were measured at the monthly surface water sampling locations to determine flow patterns in the survey area.

Temperature and turbidity measurements were collected at the time of sampling at each sampling location, and pH measurements was also collected during the monthly sampling. BHSP field sheets were used during collection of each water sample to document the information in addition to the conditions during sampling, including weather, wave height, current direction, odor, debris, wildlife presence, etc. Appendix B contains a summary of observations made during the daily and weekly sampling, and Table 3-3 provides the field parameters and water flow direction/velocities recorded during the monthly sampling.

Daily Sampling

Daily water samples were collected by OPRHP staff from May 31 through August 31, 2014, at three locations; DWS-01, DWS-02, and DWS-03 from the center of potential swimming areas along the beach (see Figure 3-4). The daily water samples were collected to satisfy the sampling requirements for eight continuous weeks of sampling called for in NYS Sanitary Code Subpart 6-2. The daily water sampling also satisfied the requirement for collection of water samples for five consecutive days after a heavy rain event.

Weekly Sampling

Weekly water samples were collected by OPRHP staff once a week between May 31 and August 31, 2014, at three locations: WWS-01 at the outfall in the BHSP small boat harbor; WWS-02 at the windsurfing area at the southern end of the beach; and WWS-03 at the stormwater outfall south of the beach, when flowing (see Figure 3-4). Additionally, the weekly sample locations were sampled on the days following each rain events greater than 0.5 inch.

Monthly Sampling

EEEP staff collected four rounds of monthly water samples from 10 locations, including two locations near the discharge of the Buffalo River and two adjacent to the ring-billed gull nesting colony on CDF No. 4 (see Figure 3-4). In accordance with the SAP, the team attempted to collect one set of samples on a calm day (wind speed less than 5 mph), one set on a moderate day (wind speeds between 5 and 20 mph), one set on a high wind day (winds greater than 20 mph), and set one after a rain storm (rainfall greater than 0.5 inch), while still spreading out the sampling events at roughly monthly intervals. In addition, the sampling team was supposed to collect samples after either the high wind day or the event

after the rain storm and specifically target an event where winds were from the north in order to assess the potential for CSO impacted water from the mouth of the Buffalo River to flow towards the beach area. As described in Section 2.3.3, during the monthly water sampling, water velocity and flow direction measurements were taken at each of the 10 sampling locations.

Two of these monthly water sample locations were adjusted after the first round of sampling in June. Sampling site MWS-01 was moved to MWS-01B and sampling site MWS-02 was moved to MWS-02B, respectively (see Figure 3-4), after it was discovered sampling at the original locations was not practical and posed safety concerns due to high wind and wave action.

As shown in Table 3-3 and described below, the monthly samples were collected during a variety of weather conditions. Rainfall amounts for each day during the sampling period from May through August 2014 are presented in Table 2-2.

- The first monthly sampling event took place on June 4 and 6, 2014. Wind speeds averaged at 8 mph, with a maximum wind speed of 8.5 mph. Winds were generally from the southwest. There was 0.77 inches of rainfall the day before the sampling event on June 3, 2014.
- The second monthly sampling event took place on July 1 and 2, 2014. Wind speeds averaged 12 mph with a maximum wind speed of 24 mph. Winds were generally from the west/southwest. There was 0.13 inch of rainfall the day before the event on June 30, 2014.
- The third monthly sampling event took place on July 29 and 30, 2014. Samples were collected with wind speeds averaging 5 mph, with a maximum wind speed of 10.5 mph. Winds were generally from the west/southwest. There was 1.06 inches of rainfall the day before the sampling event on July 28, 2014.
- The fourth monthly event took place on August 28, 2014. Samples were collected with wind speeds averaging 6.8 mph with a maximum wind speed of 8.7 mph. Winds were generally from the northwest. There was no rainfall on August 28, 2014, and rainfall was not collected the day before the sampling event.

Beach Sand and Sediment Sampling

Sediment samples (0 to 2-inch) were collected from each of the three daily water sampling locations and surface sand samples (0 to 2-inch) were collected from the beach at the wave line adjacent to the three swimming area daily water sample points (DWS -01, -02, and -03). Sediment samples were collected once on June 6, 2014. The surface sand samples were planned for collection twice during the bathing season; once during high lake level conditions and once during low lake level conditions. However, lake levels did not fluctuate significantly during the bathing season to merit collection of the second round of surface sand samples. One round of surface sand samples was collected on June 4, 2014.

Table 3-3 Buffalo Harbor State Park - Gallagher Beach Sanitary Survey Monthly Sampling Field Parameters

			Air Temp (°F)	Rainfall (in)	Wind Speed (mph)	Wind Direction	Water Temp (°F)	Wave Height (ft)	Wave Direction (degrees)	Wave Dirction (bearing)	Average Turbidity (NTU)	Total Depth (ft)	Velocity				
													Surface	Mid	Bottom	Direction (degrees)	Direction (bearing)
8/28/2014																	
MWS-01B	8/28/2014	Mostly Sunny	68	0	6	NW	73.04	0.5	90	E	2.07	2	NA	NA	NA	NA	NA
MWS-02B	8/28/2014	Mostly Cloudy	63.2	0	8.7	NW	73.04	0.5	110	ESE	1.07	31	0.4	0.2	0.2	150	SSE
MWS-03	8/28/2014	Mostly Sunny	63	0	5.9	NW	72.32	0.5	140	SE	2.85	20	0.2	0.1	0	140	SE
MWS-04	8/28/2014	Mostly Sunny	65.5	0	6.8	NW	72.86	0.5	120	ESE	1.4	16.5	0.2	0	0	160	SSE
MWS-05	8/28/2014	Mostly Sunny	62	0	8.6	NW	71.96	0.5	105	ESE	1.42	15	0.1	0.2	0	105	ESE
MWS-06	8/28/2014	Mostly Sunny	68.3	0	5.8	NW	72.5	0.5	150	SSE	0.93	23	0.3	0.1	0	180	S
MWS-07	8/28/2014	Mostly Cloudy	63.8	0	6.7	NW	72.86	1	100	E	1.39	30	0.7	0.4	0	310	NW
MWS-08	8/28/2014	Mostly Cloudy	66.2	0	6.8	SW	72.5	0.5	220	SW	1.4	28	0.2	0	0	220	SW
MWS-09	8/28/2014	Partly Cloudy	68.1	0	8.6	NW	72.68	0.5	140	SE	2.43	32.5	0.3	0	0	140	SE
MWS-10	8/28/2014	Partly Cloudy	68.1	0	4.1	NW	73.22	0.5	90	E	1	37	0.7	0.5	0.3	100	E
				Avg	6.8												
				Max	8.7												

Notes:

1. Measurements not collected from MWS-01B location, estimates provided based on field observations. MWS-01B location was sampled from shore.

Key:

°F - degrees fahrenheit

ft - feet

ft/s - feet per second

in - inches

mph - miles per hour

NA - Not Applicable

NC - Not Collected

NTU - nephelometric turbidity units

3.3.3 Sampling and Field Notes

Field staff were responsible for recording water quality and environmental data at the time of sample collection. Rainfall data was recorded daily by OPRHP personnel. Data was collected for water quality parameters, including wave height, water temperature, odor, turbidity, floatables, debris, litter, algae, and wildlife and domestic animals. Data on weather conditions was also collected. OPRHP field forms were completed for each sample location at the time of sampling. Examples of the field forms are included in Appendix D and Table 3-4 describes the methods/equipment used to obtain the data.

Table 3-4 Water Quality Field Parameters

Parameter	Measured (M) or Estimated (E)	Equipment/Method Used
Wave Height	E	Visual/Wave height stick
Water Temperature	M	Liquid-in-glass thermometer
Odor	E	Noticeable odor recorded
Turbidity	M	Hach turbidity meter
Floatables	E	Visual assessment
Debris/Litter	E	Visual Assessment
Algae	E	Visual Assessment
Wildlife and Domestic Animals	M	Direct count

Daily Water Sampling

The average water temperature measured during the daily water sampling events was 67°F (ranging from 51 to 73°F). The wave height at these locations varied from 0.5 to 6 inches, averaging approximately 1.3 inches. Turbidity ranged from 0.84 to 6.97 NTUs, and the average turbidity was 2.23 NTUs.

Some algae was noted during all of the daily sampling events in 2014. Litter and natural debris quantities on the shoreline were low on most days during the 2014 sampling, consisting of mostly plastics, aquatic vegetation, feathers, and/or sticks.

Canada geese and gulls were the primary wildlife observed on the beach shore. Their counts ranged from 0 to 150 geese and 0 to 16 gulls. The lowest counts were observed by field staff earlier in the season, while higher counts were observed in August. Geese and gulls were also observed in the water near the beach area.

Weekly Water Sampling

The average water temperature measured during the weekly water sampling events was 68.5°F (ranging from 59 to 79°F). The wave height at these locations varied from 0.5 to 4 inches, averaging approximately 1.4 inches. Turbidity ranged from 1.13 to 74.3 NTUs at the weekly water sampling locations. The average turbidity at the weekly water sampling locations was 6.02 NTUs.

Little to no algae was noted during all of the weekly sampling events in 2014. Litter and natural debris quantities on the shoreline were low on most days during the 2014 sampling at these locations, consisting of mostly plastics, aquatic vegetation, and/or sticks.

Canada geese, gulls, ducks, and fish were the primary wildlife observed at these locations. Their numbers varied during each event, but the geese and gulls were noted more in August than in the earlier months of the 2014 field work.

Monthly Water Sampling

The average water temperature measured during the monthly water sampling events was 68.6°F (ranging from 60 to 73°F). The wave height at these locations varied from 0 to 30 inches, averaging approximately 10 inches. Turbidity ranged from 0.93 to 6.1 NTUs at the monthly water sampling locations. The average turbidity at the monthly water sampling locations was 3.3 NTUs.

No algae was noted during the monthly sampling events in 2014. Litter and natural debris quantities on the shoreline were low on most days during the 2014 sampling at these locations, consisting of mostly aquatic vegetation and/or woody debris.

Canada geese and gulls were the primary wildlife observed at these locations. Their numbers varied during each event and by sampling location, with numbers ranging between 0 and 50.

3.3.4 Bacteriological Results

Enterococci and *E. Coli* were sampled for and detected in varying concentrations at each of the 2014 sample locations. The bacteriological results vary significantly over the summer months. The results show days having acceptable water quality with low levels of *Enterococci* and *E. Coli*, while other days have elevated levels of bacteria. *Enterococci* concentrations ranged from <4 CFU/100 mL to 5,500 CFU/100 mL. The BAV for *Enterococci* that the samples were screened against is 60 CFU/100 mL. *E. coli* concentrations ranged from 10 CFU/100 mL to 10,000 CFU/100 mL. The BAV for *E. Coli* that was used to screen the sampling results is 190 CFU/100 mL. Tables 3-5 through 3-7 provide a listing of the daily, weekly, and monthly water sampling and sediment/sand bacteriological results screened against the BAVs. Figures 3-5 through 3-9 provide the daily water sampling results plotted together with the BAVs and daily rainfall. Figures 3-10 through 3-14 provide the weekly water sampling results plotted together with the BAVs and daily rainfall.

Table 3-5 Daily Water Sampling Bacteriological Results

Location ID:	DWS-01		DWS-02		DWS-03	
Date	<i>Enterococci</i> , cfu	<i>E. coli</i> , cfu	<i>Enterococci</i> , cfu	<i>E. coli</i> , cfu	<i>Enterococci</i> , cfu	<i>E. coli</i> , cfu
5/31/2014	40	30	35	<10	35	<10
6/1/2014	88	10	84	<10	28	30
6/2/2014	8	20	8	20	68	120
6/3/2014	136	100	140	60	72	<10
6/4/2014	96	30	140	30	116	40
6/5/2014	8	700	12	130	4	20
6/6/2014	64	20	60	20	88	40
6/7/2014	80	250	36	<10	52	10
6/8/2014	88	20	52	40	112	30
6/9/2014	56	30	--	40	--	10
6/10/2014	96	40	100	10	48	30
6/11/2014	92	<10	120	30	144	60
6/12/2014	140	500	212	2,700	60	40
6/13/2014	48	40	88	140	52	30
6/14/2014	188	140	160	130	172	110
6/15/2014	40	30	20	30	44	30
6/16/2014	56	90	44	50	72	120
6/17/2014	48	30	56	40	64	<10
6/18/2014	530	580	310	320	380	220
6/19/2014	48	40	76	40	96	40
6/20/2014	36	40	28	10	16	50
6/21/2014	68	<10	<68	<10	40	10
6/22/2014	92	10	64	20	52	10
6/23/2014	20	<10	<20	<10	32	20
6/24/2014	32	20	28	30	40	80
6/25/2014	212	280	32	70	32	10
6/26/2014	550	110	420	450	230	700

Table 3-5 Daily Water Sampling Bacteriological Results

Location ID:	DWS-01		DWS-02		DWS-03	
Date	<i>Enterococci</i> , cfu	<i>E. coli</i> , cfu	<i>Enterococci</i> , cfu	<i>E. coli</i> , cfu	<i>Enterococci</i> , cfu	<i>E. coli</i> , cfu
6/27/2014	80	20	40	70	60	40
6/28/2014	32	<10	12	80	32	170
6/29/2014	124	160	470	520	24	50
6/30/2014	228	590	<420	900	540	680
7/1/2014	64	80	136	50	136	40
7/2/2014	60	180	68	120	92	70
7/3/2014	32	<10	228	10	680	<10
7/4/2014	570	730	410	270	250	170
7/5/2014	1,000	160	1,000	70	1,000	170
7/6/2014	16	40	24	30	20	50
7/7/2014	550	1,300	350	550	230	1,600
7/8/2014	--	--	--	--	--	--
7/9/2014	108	100	64	150	88	70
7/10/2014	28	240	12	40	16	60
7/11/2014	16	<10	24	300	24	60
7/12/2014	36	10	36	160	40	50
7/13/2014	430	600	1,000	4,000	1,000	10,000
7/14/2014	160	630	132	330	1,000	4,200
7/15/2014	76	160	32	100	24	180
7/16/2014	44	200	32	190	24	160
7/17/2014	120	40	216	30	188	40
7/18/2014	8	90	8	20	4	10
7/19/2014	<4	120	24	30	4	10
7/20/2014	40	<150	8	40	4	70
7/21/2014	24	50	12	60	36	50
7/22/2014	40	110	4	20	16	20
7/23/2014	1,000	1,000	440	1,700	216	1,000

Table 3-5 Daily Water Sampling Bacteriological Results

Location ID:	DWS-01		DWS-02		DWS-03	
Date	<i>Enterococci</i> , cfu	<i>E. coli</i> , cfu	<i>Enterococci</i> , cfu	<i>E. coli</i> , cfu	<i>Enterococci</i> , cfu	<i>E. coli</i> , cfu
7/24/2014	56	430	8	150	8	60
7/25/2014	12	70	4	10	12	60
7/26/2014	24	30	20	40	8	50
7/27/2014	360	1,000	1,000	2,100	600	1,300
7/28/2014	<172	550	88	320	160	360
7/29/2014	100	300	44	60	56	90
7/30/2014	16	30	4	20	4	10
7/31/2014	4,300	170	4,200	170	5,500	350
8/1/2014	60	40	252	10	60	20
8/2/2014	12	50	4	20	12	10
8/3/2014	188	350	12	<10	8	20
8/4/2014	44	210	8	60	8	30
8/5/2014	160	450	24	20	4	20
8/6/2014	270	290	128	130	68	80
8/7/2014	430	80	104	180	104	230
8/8/2014	100	100	96	30	108	30
8/9/2014	76	130	4	10	8	30
8/10/2014	48	110	4	30	4	20
8/11/2014	124	100	20	20	16	10
8/12/2014	100	100	56	60	48	40
8/13/2014	1,000	1,600	1,000	1,100	440	900
8/14/2014	112	290	44	240	44	300
8/15/2014	48	170	56	100	56	70
8/16/2014	12	70	12	30	4	<10
8/17/2014	124	160	92	90	96	150
8/18/2014	92	60	260	160	48	40
8/19/2014	12	70	8	10	4	10

Table 3-5 Daily Water Sampling Bacteriological Results

Location ID:	DWS-01		DWS-02		DWS-03	
Date	<i>Enterococci</i> , cfu	<i>E. coli</i> , cfu	<i>Enterococci</i> , cfu	<i>E. coli</i> , cfu	<i>Enterococci</i> , cfu	<i>E. coli</i> , cfu
8/20/2014	28	110	16	120	28	50
8/21/2014	24	30	92	30	52	<10
8/22/2014	16	30	16	<10	<4	10
8/23/2014	4	<10	104	10	4	<10
8/24/2014	<4	20	<4	20	8	<10
8/25/2014	16	50	160	40	300	150
8/26/2014	4	<10	160	30	4	<10
8/27/2014	132	50	116	110	52	20
8/28/2014	36	170	20	230	20	110
8/29/2014	450	30	520	<10	128	<10
8/30/2014	12	10	4	40	<4	10
8/31/2014	28	<10	20	<10	<4	<10

Key:

-- = Data not collected

cfu = colony forming unit

Bold values denote exceedance of Beach Action Value (BAV).

BAV for Enterococci = 60 cfu

BAV for E.coli = 190 cfu

Table 3-6 Weekly Water Sampling Bacteriological Results

Location ID:	WWS-01		WWS-02		WWS-03	
Date	<i>Enterococci</i> , cfu	<i>E. coli</i> , cfu	<i>Enterococci</i> , cfu	<i>E.coli</i> , cfu	<i>Enterococci</i> , cfu	<i>E. coli</i> , cfu
06/03/14	44	10	88	30	1,000	2,600
06/05/14	60	50	12	10	--	--
06/09/14	144	10	36	10	--	--
06/12/14	32	60	76	10	--	--
06/13/14	320	120	84	70	--	--
06/19/14	40	40	68	20	--	--
06/26/14	40	340	600	900	--	--
07/03/14	20	30	196	30	--	--
07/07/14	350	160	280	250	1,000	380
07/09/14	76	50	200	250	--	--
07/10/14	8	<10	28	40	--	--
07/14/14	56	40	176	2,500	--	--
07/17/14	60	20	228	40	--	--
07/24/14	8	<20	<4	20	--	--
07/28/14	<92	140	128	270	>1,000	2,500
07/31/14	430	80	3,400	180	--	--
08/07/14	4	10	620	700	--	--
08/14/14	48	90	164	190	--	--
08/21/14	10	<10	172	20	--	--
08/28/14	20	<10	68	110	--	--
08/31/14	20	20	36	10	--	--

Key:

-- = Data not collected

cfu = colony forming unit

Bold values denote exceedance of Beach Action Value (BAV).

BAV for Enterococci = 60 cfu

BAV for E.coli = 190 cfu

Table 3-7 Monthly Water Sampling, Sand, and Sediment Bacteriological Results

Location ID	Matrix	Date	<i>Enterococci</i> , cfu	<i>E.coli</i> , cfu
MWS-01	Water	6/6/14	8	60
MWS-01B	Water	NA	--	--
MWS-02	Water	6/6/14	8	<10
MWS-02B	Water	NA	--	--
MWS-02BD	Water	NA	--	--
MWS-03	Water	6/6/14	36	10
MWS-04	Water	6/4/14	32	20
MWS-04D	Water	NA	--	--
MWS-05	Water	6/4/14	24	30
MWS-05D	Water	6/4/14	12	30
MWS-06	Water	6/4/14	52	30
MWS-07	Water	6/4/14	32	80
MWS-08	Water	6/4/14	12	30
MWS-09	Water	6/4/14	12	10
MWS-10	Water	6/4/14	8	20
MWS-F01	Blank sample	6/6/14	4	<10
MWS-F02	Blank sample	NA	--	--
MWS-01	Water	NA	--	--
MWS-01B	Water	7/1/14	60	<10
MWS-02	Water	NA	--	--
MWS-02B	Water	7/2/14	68	30
MWS-02BD	Water	7/2/14	32	150
MWS-03	Water	7/2/14	22	20
MWS-04	Water	7/1/14	20	10
MWS-04D	Water	NA	--	--
MWS-05	Water	7/1/14	44	130
MWS-05D	Water	NA	--	--
MWS-06	Water	7/2/14	20	20
MWS-07	Water	7/2/14	68	150
MWS-08	Water	7/2/14	108	310
MWS-09	Water	7/2/14	24	70
MWS-10	Water	7/2/14	88	240
MWS-F01	Blank sample	NA	--	--
MWS-F02	Blank sample	NA	--	--
MWS-01	Water	NA	--	--
MWS-01B	Water	7/30/14	>1,000	400
MWS-02	Water	NA	--	--
MWS-02B	Water	7/29/14	68	40
MWS-02BD	Water	7/29/14	52	10
MWS-03	Water	7/29/14	28	<10

Key at end of table.

Table 3-7 Monthly Water Sampling, Sand, and Sediment Bacteriological Results

Location ID	Matrix	Date	Enterococci, cfu	E.coli, cfu
MWS-04	Water	7/29/14	12	<10
MWS-04D	Water	NA	--	--
MWS-05	Water	7/30/14	32	70
MWS-05D	Water	NA	--	--
MWS-06	Water	7/29/14	12	10
MWS-07	Water	7/30/14	<4	10
MWS-08	Water	7/30/14	4	10
MWS-09	Water	7/29/14	4	30
MWS-10	Water	7/29/14	<4	<10
MWS-F01	Blank sample	NA	--	--
MWS-F02	Blank sample	7/29/14	<4	<10
MWS-01	Water	NA	--	--
MWS-01B	Water	8/28/14	<4	<10
MWS-02	Water	NA	--	--
MWS-02B	Water	8/28/14	<4	<10
MWS-02BD	Water	NA	--	--
MWS-03	Water	8/28/14	<4	<10
MWS-04	Water	8/28/14	<4	10
MWS-04D	Water	8/28/14	<4	<10
MWS-05	Water	8/28/14	8	<10
MWS-05D	Water	NA	--	--
MWS-06	Water	8/28/14	28	<10
MWS-07	Water	8/28/14	4	<10
MWS-08	Water	8/28/14	52	<10
MWS-09	Water	8/28/14	24	<10
MWS-10	Water	8/28/14	52	<10
MWS-F01	Blank sample	NA	--	--
MWS-F02	Blank sample	NA	--	--
MWS-SS01	Sand (0-2-inch)	6/4/14	>10000	3,400
MWS-SS02	Sand (0-2-inch)	6/4/14	430	>10,000
MWS-SS02D	Sand (0-2-inch)	6/4/14	490	4,800
MWS-SS03	Sand (0-2-inch)	6/4/14	>10,000	1,000
MWS-SD01	Sediment (0-2-inch)	6/6/14	24	310
MWS-SD02	Sediment (0-2-inch)	6/6/14	12	140
MWS-SD03	Sediment (0-2-inch)	6/6/14	100	30

Key:

-- = Data not collected

cfu = colony forming unit

D = Denotes duplicate sample

NA = Not applicable

Bold values denote exceedance of Beach Action Value (BAV).

BAV for Enterococci = 60 cfu

BAV for E.coli = 190 cfu

Key at end of table.

Daily Water Samples

As indicated in Table 3-8, *Enterococci* exceeded the BAV for 45% of the daily water samples and *E. coli* exceeded the BAV for 19% of the daily water samples. DWS-01 had the greatest number of exceedances for both *Enterococci* and *E. coli*. DWS-03 had the least number of exceedances. DWS-01 was collected from the northern most of the proposed beach areas and DWS-03 was collected from the southernmost proposed beach area (see Figure 3-4). Figures 3-5 through 3-7 show the *Enterococci* and *E. coli* sample results for each of the three DWS locations in relation to corresponding BAV values and to daily rainfall. Figures 3-8 provides the *Enterococci* results for the three daily water sample locations, and Figure 3-9 provides the *E. Coli* results for the three daily water sampling locations.

Table 3-8 Water Sample Percent Exceedances of Beach Action Values by Location

Sample Location	Percent Exceedance <i>Enterococci</i>	Percent Exceedance <i>E. Coli</i>
DWS-01	50	25
DWS-02	46	17
DWS-03	37	14
DWS Average Summary	45	19
WWS-01	29	5
WWS-02	76	29
WWS-03	100	100
MWS-01	50	25
MWS-02	50	0
MWS-03	0	0
MWS-04	0	0
MWS-05	0	0
MWS-06	0	0
MWS-07	25	0
MWS-08	25	25
MWS-09	0	0
MWS-10	25	25

Key:

DWS = Daily Water Sample
MWS = Monthly Water Sample
WWS = Weekly Water Sample

The DWS-03 sample location had the single sample maximum for *Enterococci* at 5,500 CFU/100 mL, and for *E. coli* at 10,000 CFU/100 mL. While location DWS-03 had the single sample maximum, it was also the location that had the lowest amount of samples exceeding the *Enterococci* and *E. coli* BAVs at only 37% and 14% exceedance, respectively.

Figure 3-5: Daily Water Sample (DWS-01), Bacteriological Results and Rainfall

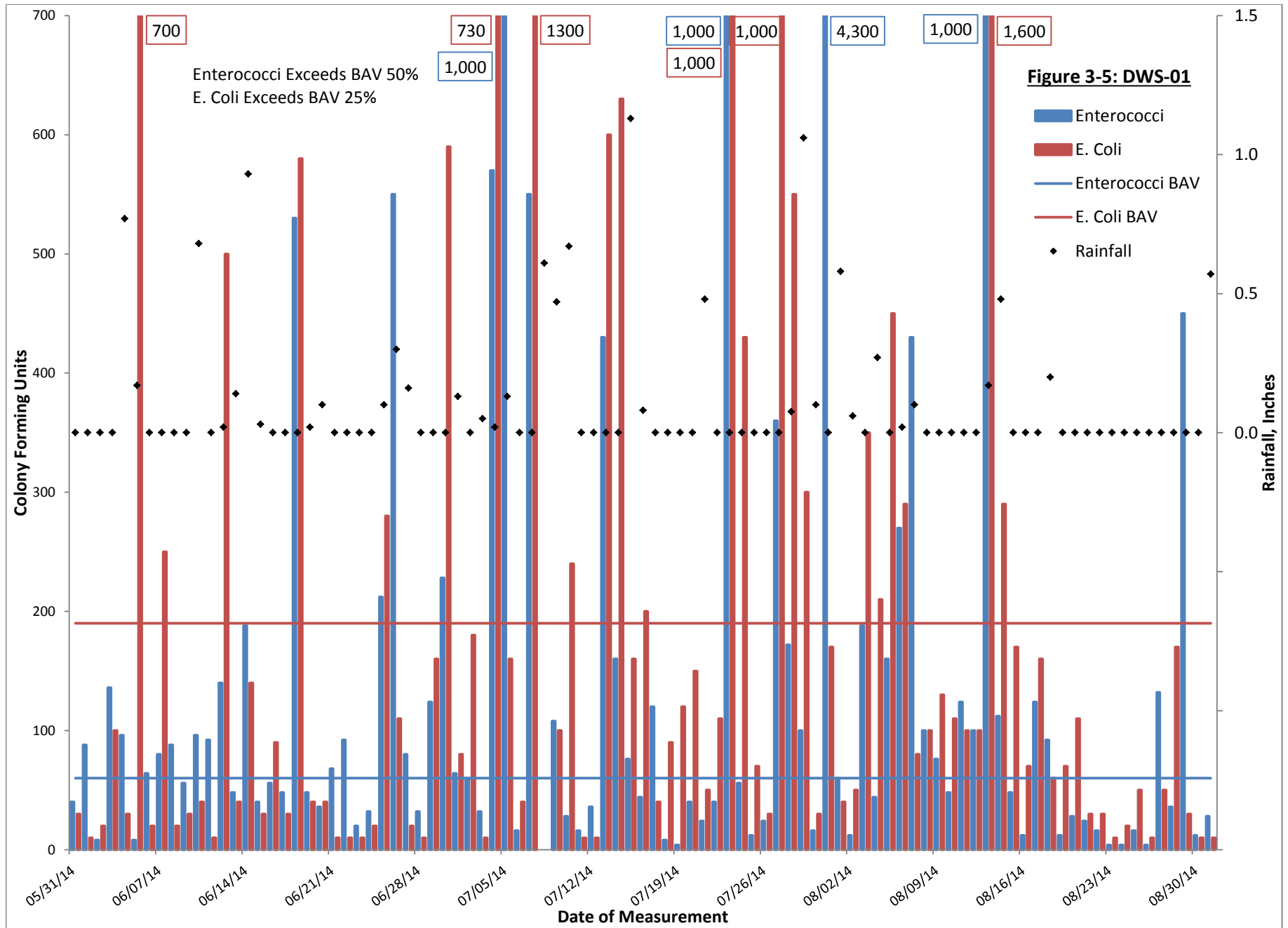


Figure 3-6: Daily Water Sample (DWS-02), Bacteriological Results and Rainfall

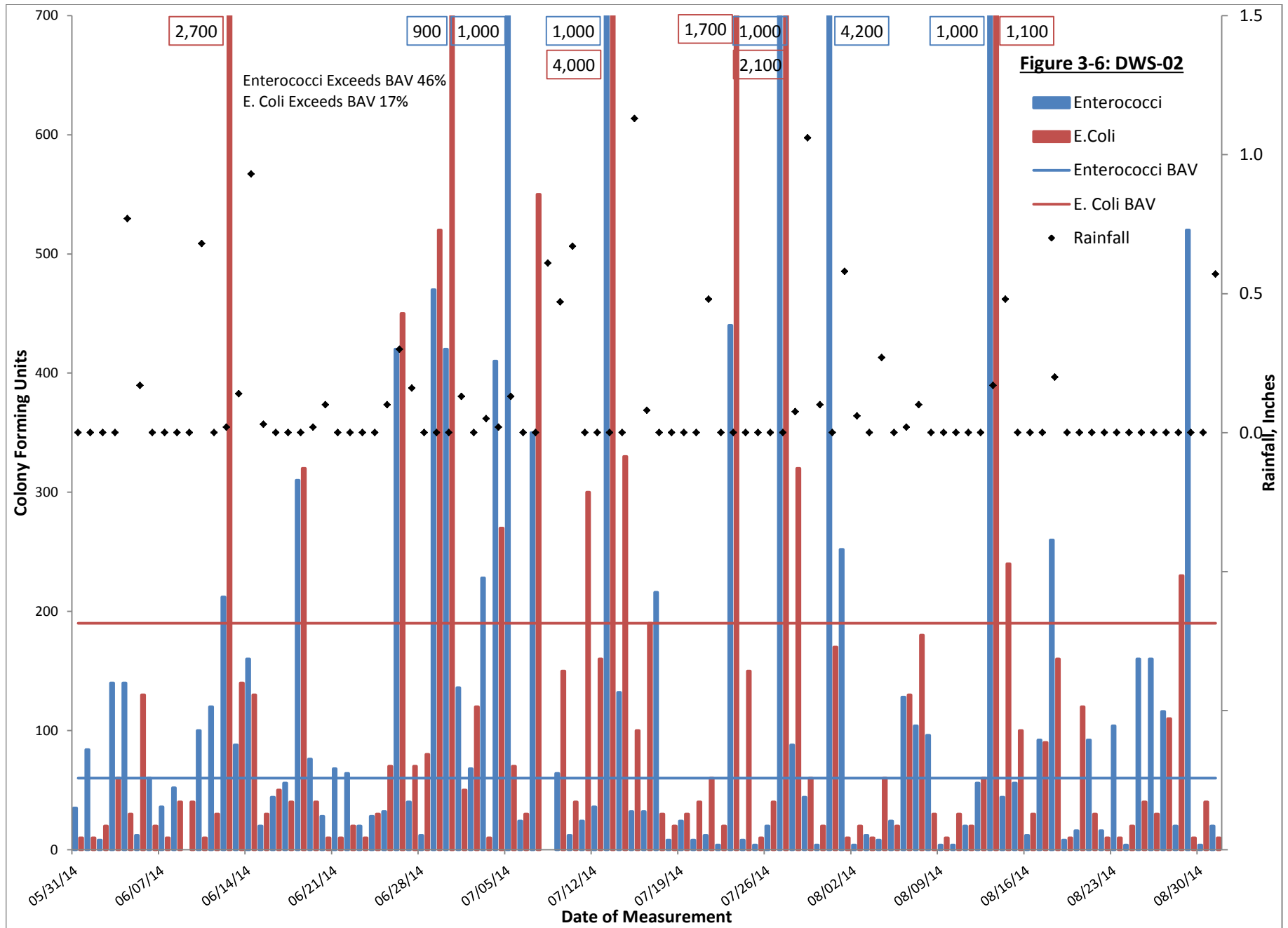


Figure 3-7: Daily Water Sample (DWS-03), Bacteriological Results and Rainfall

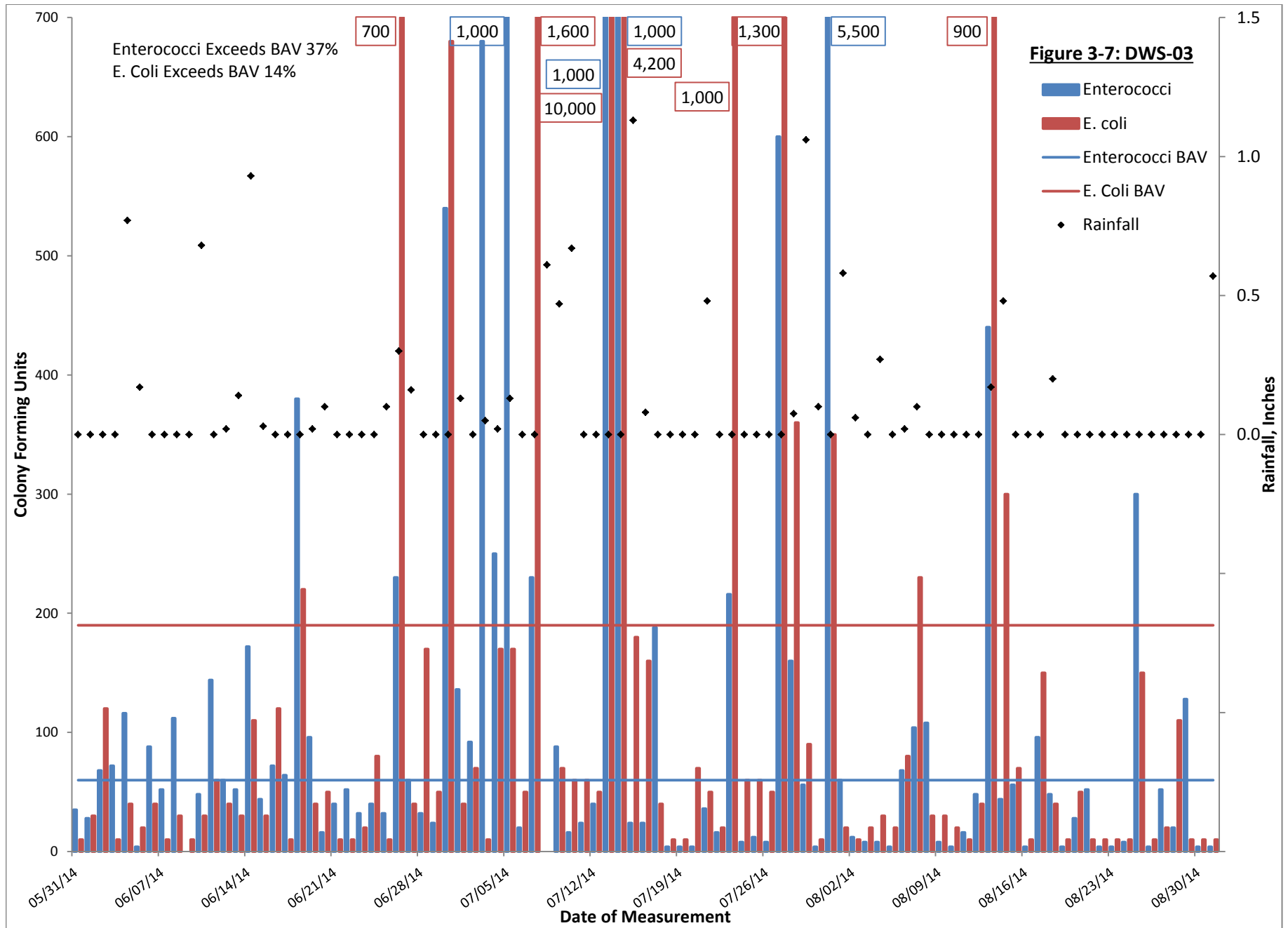


Figure 3-8: Daily Water Sample Enterococci Summary

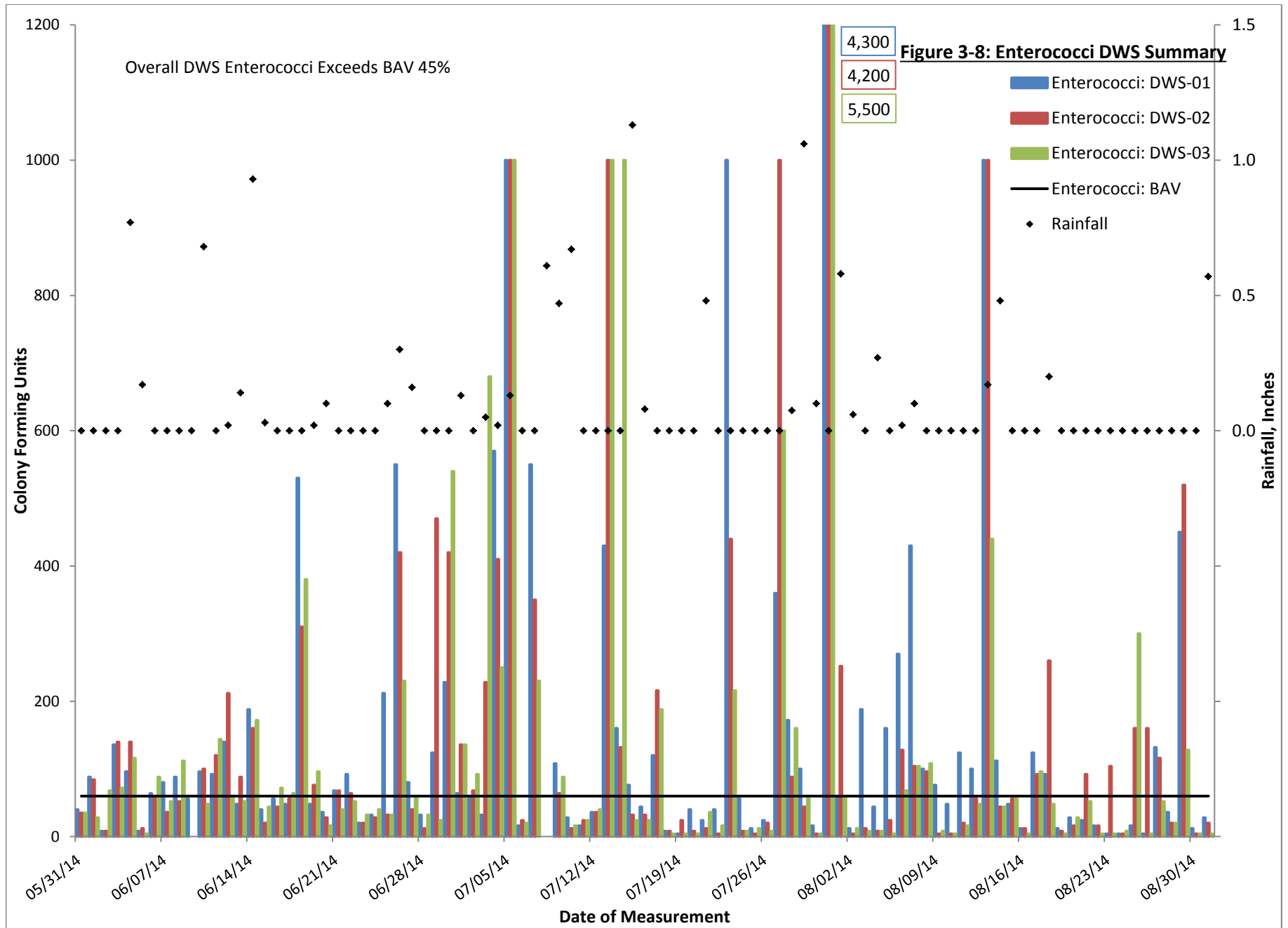
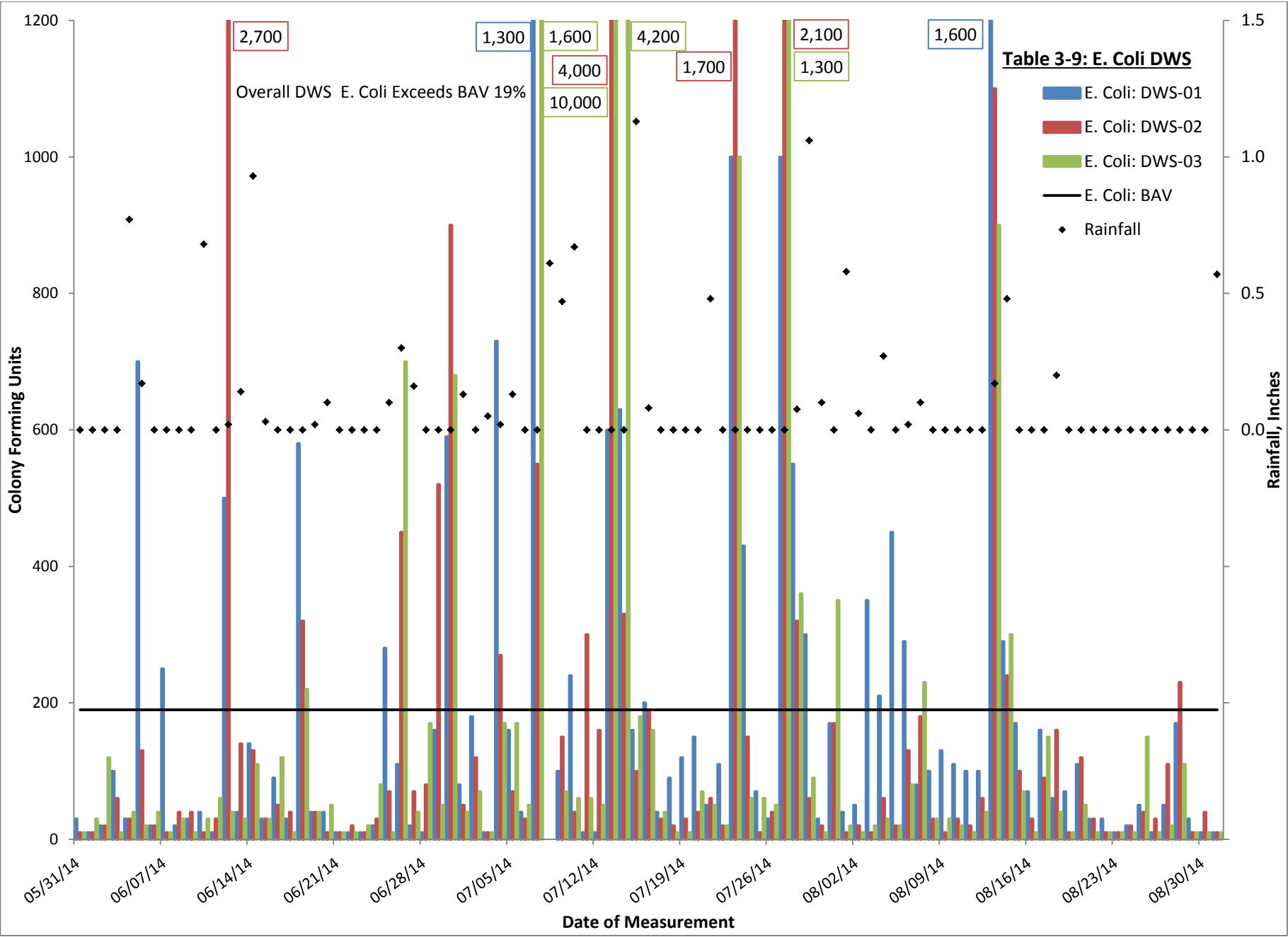


Figure 3-9: Daily Water Sample E. Coli Summary



The *E. coli* concentration on July 12, 2014 (i.e., the July 13, 2014 maximum result of 10,000 CFU/100 mL) was 50 CFU/100 mL, while the July 14, 2014, sample resulted in 4,200 CFU/100 mL. There was 1.13 inches of rainfall recorded on July 14, 2014. The *Enterococci* results at this location in chronological order over this time period was 40, 1,000, and 1,000 CFU/100 mL, respectively. The samples at DWS-01, DWS-02, and WWS-02 from July 12 and 13 also greatly exceeded the BAVs.

Weekly Water Samples

As indicated in Table 3-8, WWS-03 had the greatest percentage of exceedances for both *Enterococci* and *E. coli* at 100% each. Three samples were collected at this location. This location is a stormwater outfall, and samples could only be collected when water was observed flowing from the outfall into Lake Erie. The fewest exceedances were encountered at location WWS-01, which is located at an outfall north of Gallagher Beach in the BHSP small boat harbor (see Figure 3-4). Samples at this location exceeded for *Enterococci* and *E. coli* at 29% and 5%, respectively. At location WWS-02, located the closest to Gallagher Beach and south of the proposed beach areas, exceedances for *Enterococci* and *E. coli* were 76% and 29% respectively. Figures 3-10 and 3-12 show the *Enterococci* and *E. coli* sample results for each of the three weekly water sampling locations in relation to corresponding BAV values and to daily rainfall. Figure 3-13 provides the *Enterococci* results for the three weekly water sampling locations, and Figure 3-14 provides the *E. coli* results for the three weekly water sampling locations.

The WWS-02 sample location had the single sample maximum for *Enterococci* of the weekly water sample locations at 3,400 CFU/100 mL on July 31, 2014. The WWS-03 sample location had the single sample maximum for *E. coli* of the weekly water sample locations at 2,600 CFU/100 mL on June 3, 2014. It is noted that on the date of both of these events, there was recorded rainfall of 0.58 and 0.77 inches, respectively.

Monthly Water Samples

As indicated in Table 3-8, five of the 10 monthly sample locations never exceeded the BAVs for *Enterococci* and *E. coli* (MWS-03, MWS-04, MWS-05, MWS-06, and MWS-09). Three of these locations are located within the Gallagher Beach embayment (see Figure 3-4). Results of the monthly sampling are shown on Figure 3-4 and Table 3-7. The greatest number of exceedances were found at the MWS-01 and MWS-02 locations, which are located approximately 3 miles north of Gallagher Beach.

The greatest single sample maximum for *Enterococci* and *E. coli* of the monthly sample locations was at MWS-01B, at >1,000 CFU/mL and 400 CFU/mL, respectively. This sample was collected on July 30, 2014. This location is right along the shoreline at the mouth of the Buffalo River. It is noted that two days prior to collection of this sample, there was a recorded rainfall of 1.06 inches.

MWS-09 and MWS-10 are located adjacent to CDF No. 4 and the Ring-billed Gull nesting colony, which are potential bacteriological contaminant sources. MWS-10 sample results indicate one of the four samples for each parameter exceeded the BAVs taken on July 2, 2014. *Enterococci* was measured at 88 CFU/100 mL while *E. coli* was reported at 240 CFU/100 mL. Sample location MWS-09 is located just northeast of MWS-10 and did not have any BAV exceedances. It should be noted that the ring-billed gulls have been observed to be present at the nesting area from March through September. The greatest number of Ring-billed Gulls has been observed in the spring and early summer months, but the number declines towards the end of summer and into fall.

Sediment and Sand Samples

Results from the beach sand and sediment samples are shown in Table 3-7. The results from all three beach sand sample locations exceeded the water sample BAVs for *Enterococci* and *E. coli*, with results of >10,000 CFU/100 mL for *Enterococci* at locations MWS-SS01 and MWS-SS03, and >10,000 CFU/100 mL of *E. coli* at MWS-SS02. The sediment samples only exceeded water sample BAVs at one location (MWS-SD01) for *E. coli* (310 CFU/100 mL) and at (MWS-SD03) for *Enterococci* (100 CFU/100 mL).

3.4 Radiation Testing

A total of 31 locations at Gallagher Beach were screened for radiation on May 1, 2014. Radiation levels were measured with a gamma scintillator and pancake Geiger-Mueller. Both surface and subsurface samples were screened. Four samples were analyzed using EPA Method 901.1 for full gamma spectrometry by the TestAmerica St. Louis laboratory. All of the sample results were below the action levels for the radiation indicating radiation is not a concern at the site.

3.5 2015 Source Tracking

Three surface water samples were collected on August 17, 2015, from the three daily water sampling locations (DWS-01 through DWS-03) along the shoreline of Gallagher Beach (see Figure 3-4). These samples were analyzed for Bacteroides using the Polymerase Chain Reaction (PCR) method. Bacteroides results are used to support the hypothesis that the *E. coli/enterococci bacteria* could be associated with a source of human fecal pollution. All three samples had a positive result for Bacteroides that were typical of those associated with human fecal pollution. Two independent primer sets were used for each sample. The laboratory results for these samples can be found in Appendix F.

Figure 3-10: Weekly Water Sample (WWS-01), Bacteriological Results and Rainfall

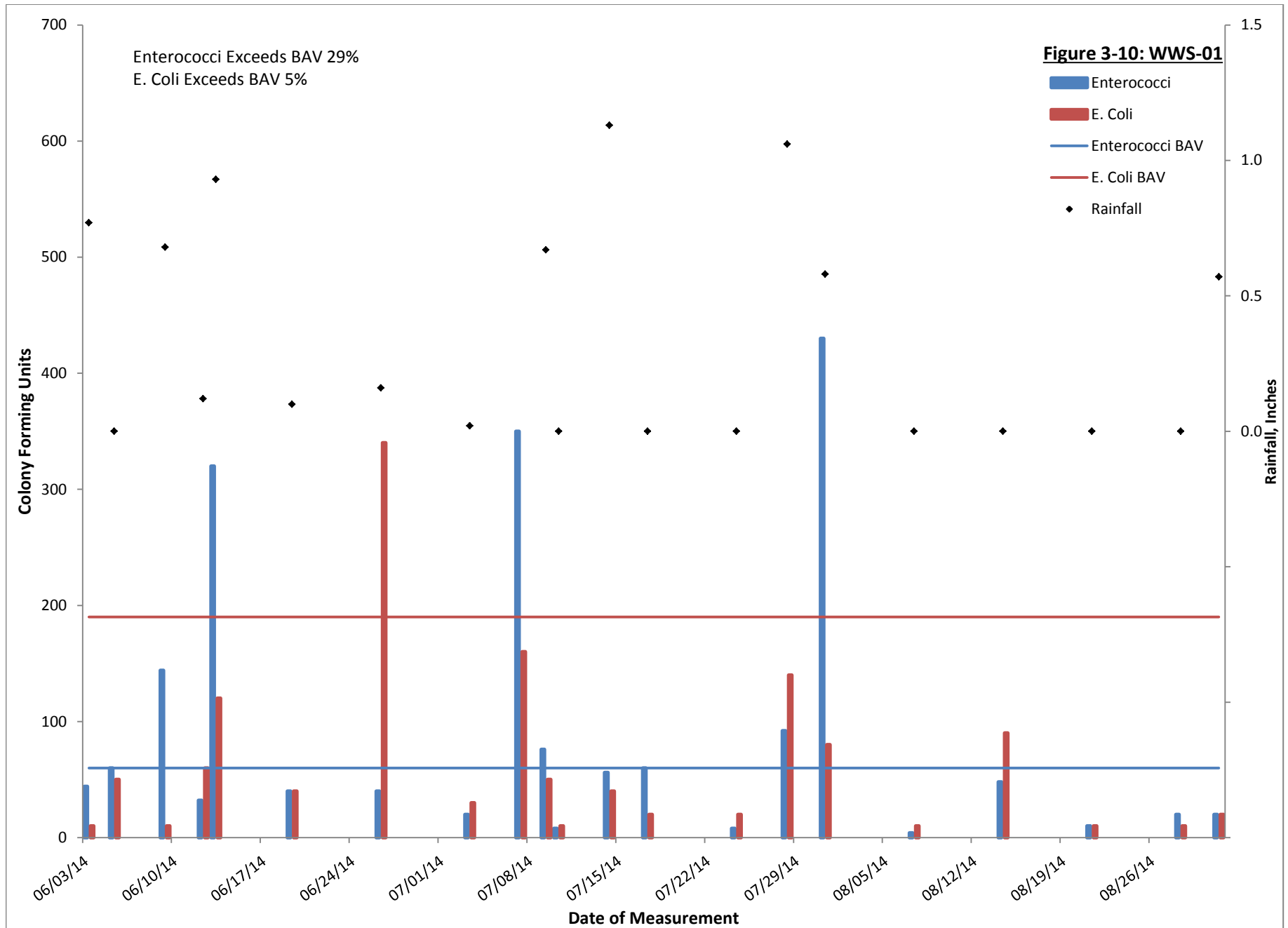


Figure 3-11: Weekly Water Sample (WWS-02), Bacteriological Results and Rainfall

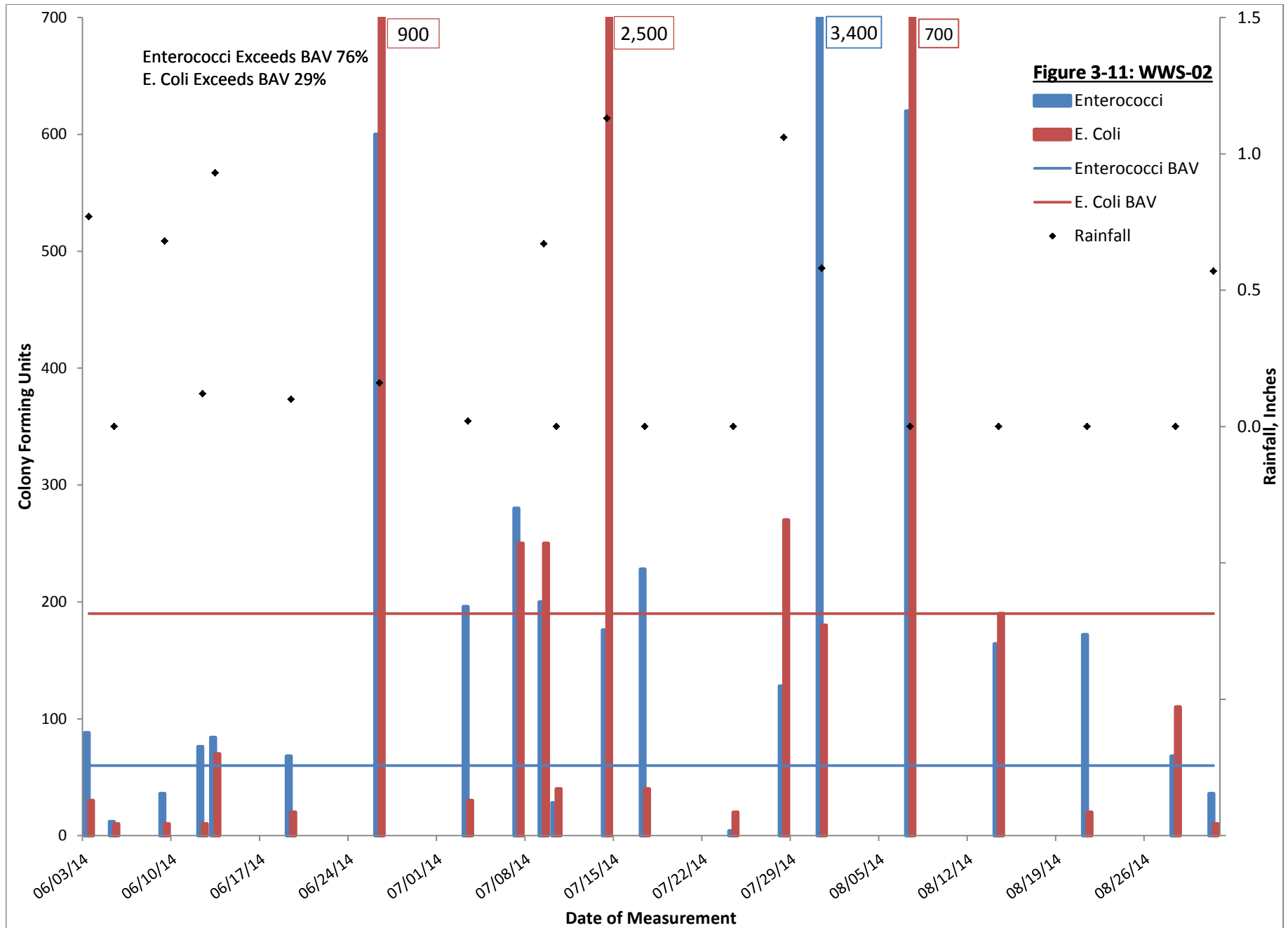


Figure 3-12: Weekly Water Sample (WWS-03), Bacteriological Results and Rainfall

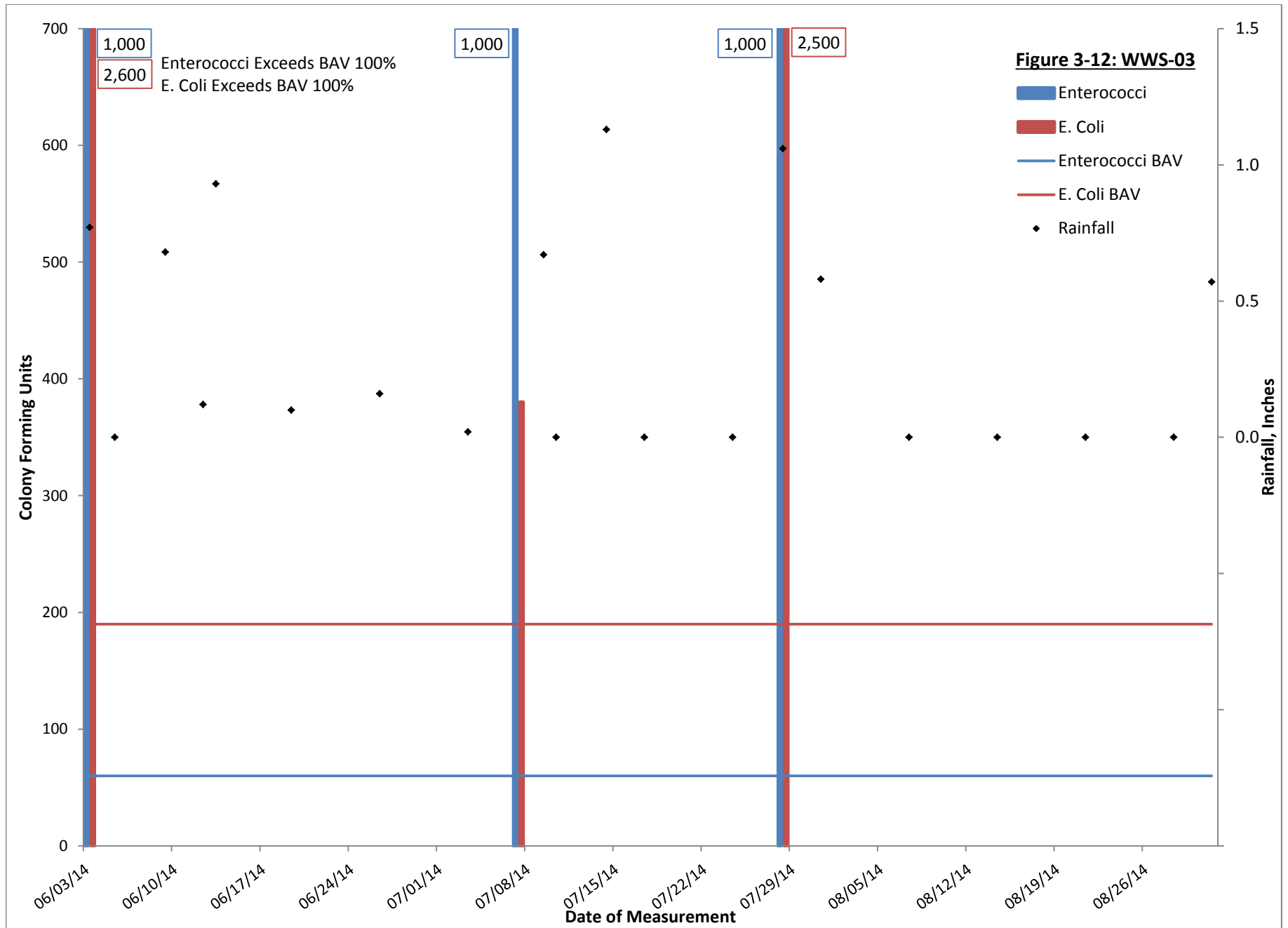


Figure 3-13: Weekly Water Sample Enterococci Summary

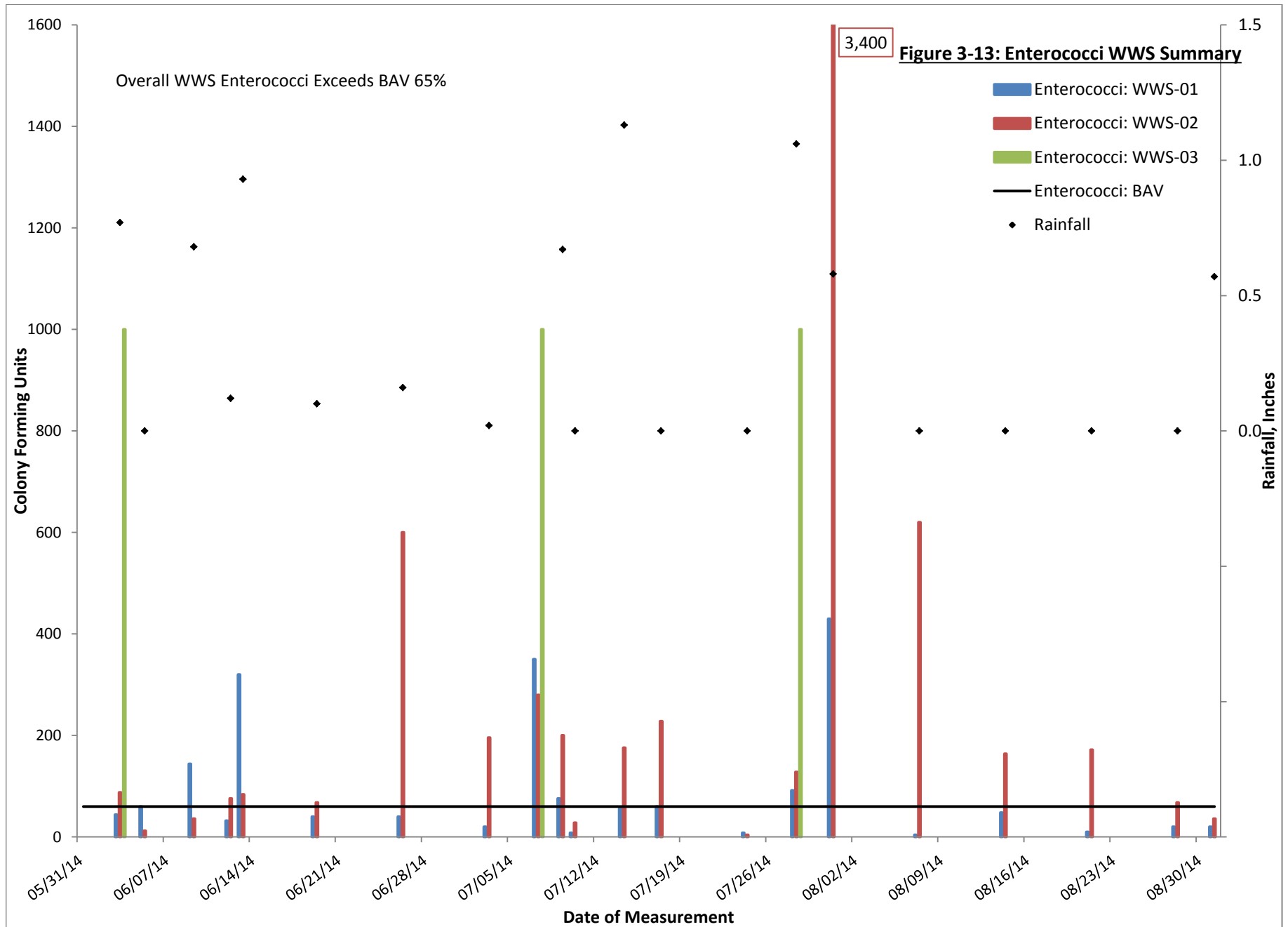
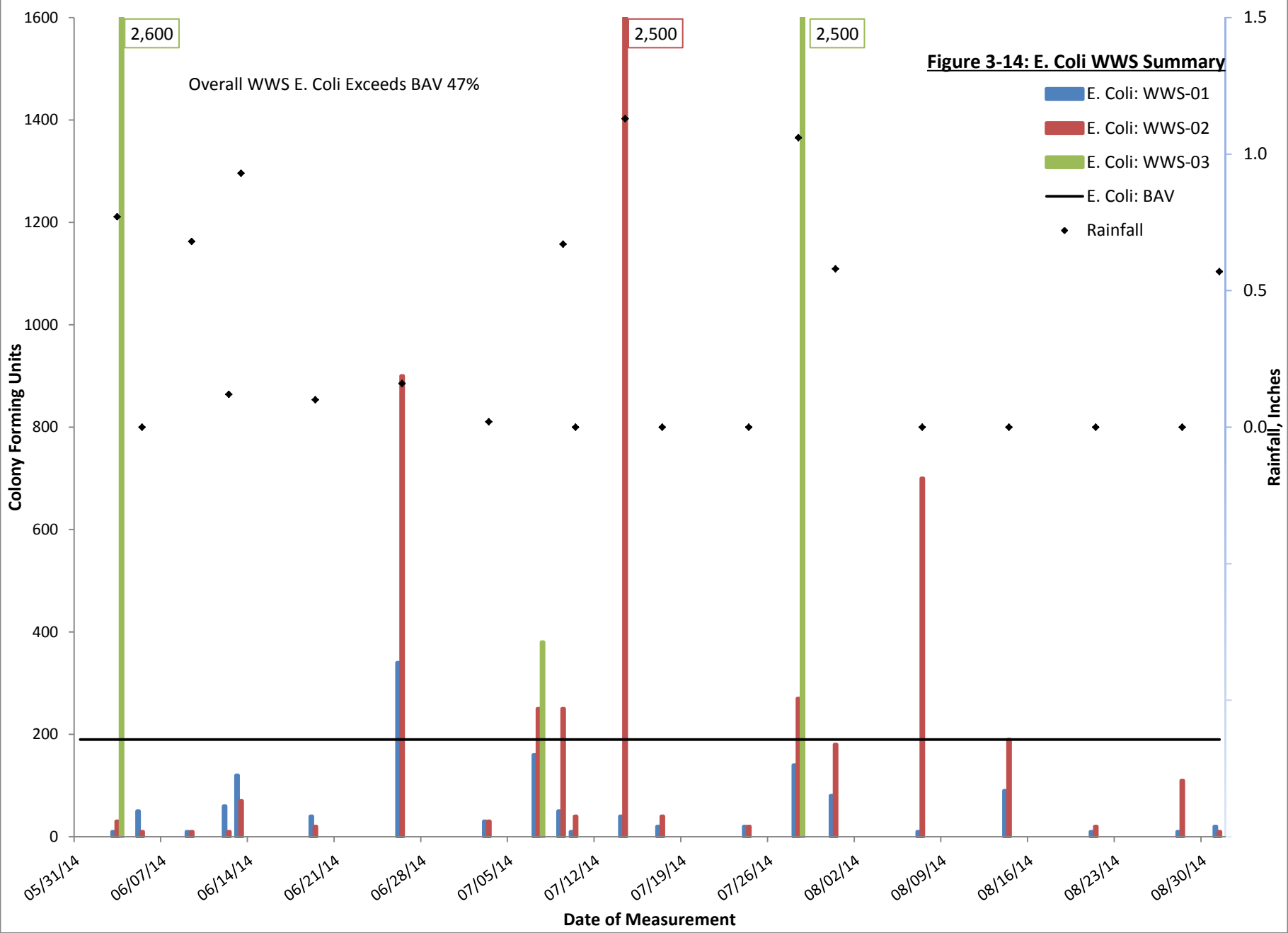


Figure 3-14: Weekly Water Sample E. Coli Summary



4

Potential Pollution Sources

4.1 Introduction

Potential sources of contamination for Gallagher Beach include stormwater runoff from urban watersheds, discharges from CSOs, and run off from nearby industrial sites. Algae deposition, high turbidity levels, and avian populations are also of potential concern. A summary of the potential pollution sources is provided in Table 4-1 and Figure 2-2.

4.2 Land Use

Land use in the watershed was quantified through an analysis of EPA's 2011 National Land Cover Data (see Figure 4-1). Land use in the watershed is predominantly forest (47%). Agricultural uses, including pasture and hay, constitutes 14% of the watershed and cultivated crops make up 6.7% of the watershed. Shrub/scrub, woody wetlands, herbaceous, and emergent herbaceous wetlands account for 6.8% of the watershed. Most of these uses appear to be in the outer areas of the watershed. Agricultural uses do not appear to be a major source of pollution affecting the beach.

The land uses within direct proximity to the beach is predominantly developed. These include heavily urbanized uses, such as factories, former industrial sites, highways, rail yards, hazardous waste sites, and residential areas. Based on an analysis of land uses from the maps, runoff from urban and industrial sites could contribute to pollution at Gallagher Beach.

4.3 Combined Sewer Overflows

The Buffalo Sewer Authority (BSA) owns and operates a combined sewer system with 52 permitted CSOs. In 2014, the BSA finalized a Long-Term Control Plan (LTCP) for abatement of CSOs in accordance with the CSO Control Policy issued by the EPA in 1994. The closest CSOs to the BHSP are located on the Buffalo River, are all permitted by NYSDEC, and are required to have a State Pollutant Discharge Elimination System permit (see Figure 2-2).

The mouth of the Buffalo River is approximately 3 miles north of Gallagher Beach. Flow measurements collected at sample points near the mouth of the Buffalo River indicate that lake currents in the area were generally to the north/northeast. Samples collected during the last monthly sample event on August 28, 2014, were collected when prevailing winds were out of the northwest.

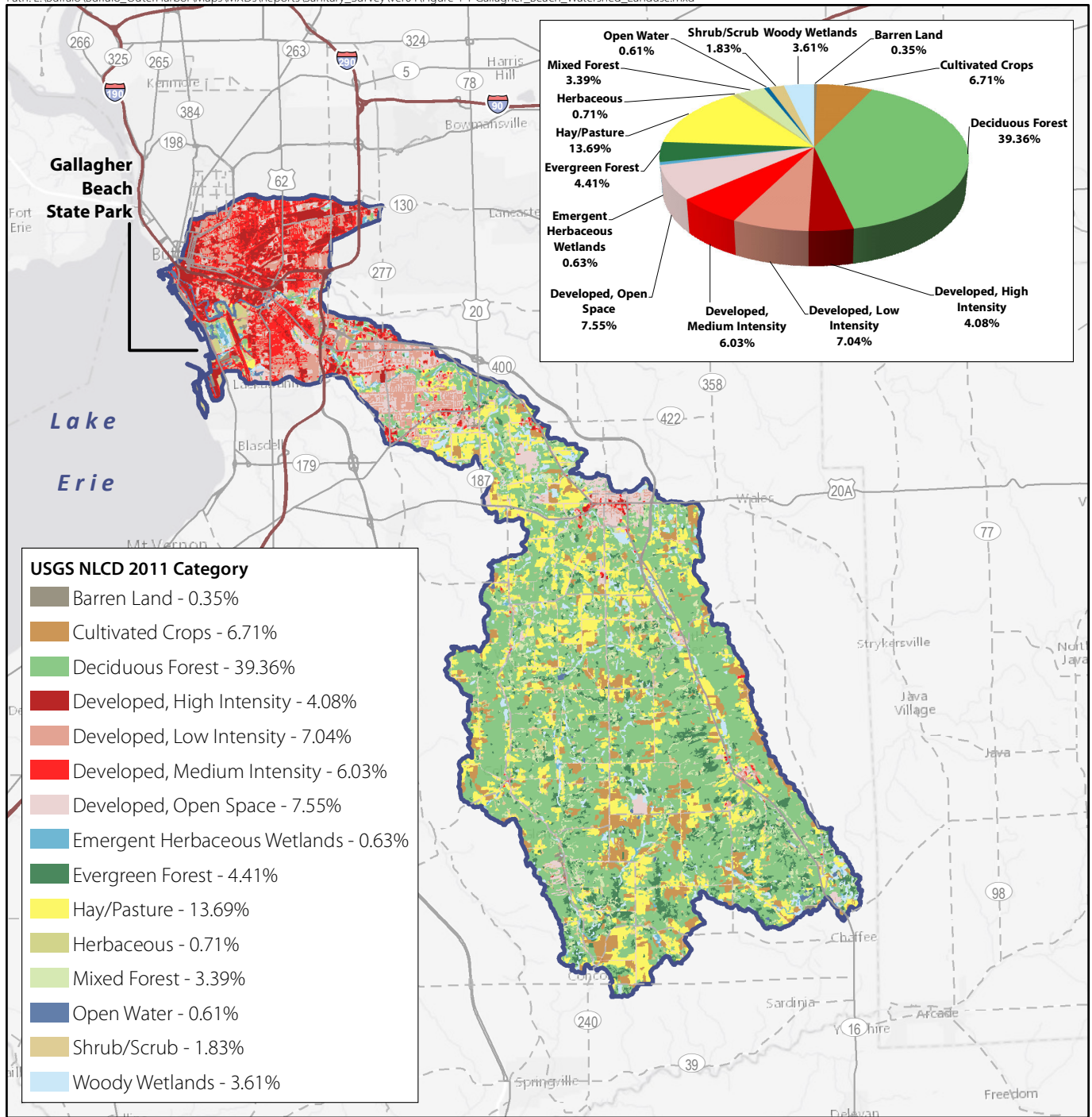
Table 4-1 Potential Pollution Sources

Pollution Source	Average Level of Concern	Source Location	Contribution to Pollution	Frequency of Contribution
Combined Sewer Overflows (CSOs)	M	Along Buffalo River	Possible contribution of bacteriological contamination	Common after rainfall, potential with prevailing winds out of the north
Stormwater Outfalls	M	South of BHSP into ship canals and area creeks	Possible contribution of bacteriological contamination	After rainfall
Urban Runoff	M	Surrounding area	Possible contribution of bacteriological contamination	Following rainfall and snow melt
Algae	L	BHSP shore-line	Harbors bacteria and promotes growth	Summer
Leafy Debris	L	BHSP shore-line	Harbors bacteria and promotes growth	Daily
Birds	L	Lake Erie	Feces may contribute to elevated bacteria levels at beach	Often
Tift Farm Nature Preserve	L	Directly east of BHSP	Contaminated soils and groundwater	Unknown
Lehigh Valley Railroad	L	¾-mile east of BHSP	Contaminated groundwater	Unknown
Buffalo Outer Harbor – Radio Tower Area	L	1-mile north of BHSP	Contaminated groundwater	Unknown
Hanna Furnace	L	½-mile south of BHSP	Contaminated soil	Unknown
Bethlehem Steel	M	1-mile south of BHSP	Contaminated soil and groundwater	Unknown
Boats with Marine Sanitation Devices	L	Lake Erie	Boats illegally emptying marine sanitation devices	Spring, Summer, Fall
Marinas and Harbors	L	Lake Erie	Nearest harbor is ½-mile north of BHSP	Spring, Summer Fall
Groundwater Seepage	L	Unknown	None detected	Unknown

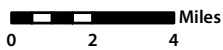
Key:

L = Low

M = Moderate



SCALE



Legend

- Interstate
- Major Road
- - - Other Major Road
- Buffalo River HUC-10 Watershed Boundary

Service Layer Credits: Copyright: ©2014 Esri, DeLorme, HERE

SOURCE: ESRI 2010; USGS NLCD 2011; Ecology and Environment Engineering, P.C., 2015.

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Flow data collected during this event indicated that the flow direction at the sample point just south of the mouth of the Buffalo River (MWS-02B) was to the south-southeast (see Table 2-2). This indicates that a change in the prevailing winds can affect lake currents in the area. Monthly water quality samples collected during this sampling event had some of the lowest concentrations of *Enterococci* and *E. Coli* out of the four monthly sampling events (see Table 3-7). Daily water samples collected at the beach on August 28, 2014, also had *Enterococci* and *E. coli* results below the BAV, with the exception of the *E. coli* result at DWS-02.

4.4 NYSDEC Superfund Sites

Sites within the vicinity of Gallagher Beach that were part of the NYSDEC Superfund Program that might be potential sources of pollution for Gallagher Beach are indicated on Figure 2-2 and described below. Information was obtained from the NYSDEC's online Environmental Remediation Database.

The Buffalo Outer Harbor-Radio Tower Area is located north of the site, in the southeast corner of a larger parcel of waterfront land owned by the NFTA. The majority of the NFTA's Buffalo Outer Harbor property is reclaimed land, created primarily with sediments dredged from the harbor shipping channels over a 100-year period ending in the mid-1960s. A completed remedial action at the site has treated and stabilized the soils. Due to the limited migration of groundwater contamination and the low permeability of the fill material, chemical loading to Lake Erie is minimal. Post-remedial sampling of the surface waters of Lake Erie concluded that there are no present impacts to water quality from the Radio Tower Area.

The Tift Nature Preserve is a 264-acre inactive landfill currently owned by the City of Buffalo and has been operated by the Buffalo Museum of Science as a nature preserve since 1976. The Tift Nature Preserve site is located along Buffalo Outer Harbor on the eastern shore of Lake Erie east of Gallagher Beach across Fuhrmann Boulevard. There are three surface waterbodies situated on the property, including remnants of canals, which have been filled in with debris. Lisa Pond and Beth Pond are located in the north portion of the property and Lake Kirsty is located in the western-middle portion of the property. These ponds drain to the BHSP small boat harbor. Wetlands cover almost half of the site, the eastern portion, and also border Tift Street in the southern portion of the site. Post-Remediation, residual contamination exists at this site due to its proximity to rail yards and steel mills, as well as its former industrial uses. This site is designated as a significant coastal fish and wildlife zone by NYSDEC. Low levels of contaminants still remain in the area of Tift Nature Preserve. A clay cover was placed over the mounds area. A clay barrier wall has been installed in conjunction with a leachate collection system. The site is properly closed and there are no present impacts to water quality in Lake Erie.

The Lehigh Valley Railroad site is an approximately 28-acre portion of Lehigh Valley Railroad property north of Tift Street, and adjacent to the eastern bounda-

ry of the Tifft Nature Preserve. The site is bounded by railroad to the east, a highway to the south, and a regulated wetland to the west. Residual contamination from a previous cleanup remains within the site. However, removal of hazardous dye and industrial debris wastes from the site with NYSDEC oversight has mitigated threats to public health and the environment. Groundwater monitoring has verified that impacts to groundwater have been limited. There are no present impacts to water quality in Lake Erie.

The Hanna Furnace property is located near NY-5 at the southern limit of the City of Buffalo, south of Gallagher Beach. The site is the 20-acre portion of the property surrounding the Union Ship Canal which leads to the Buffalo Outer Harbor. Surface water samples collected from the canal during site investigations found few detectable organic contaminants, and the metals were present at concentrations below water quality standards. Groundwater was, therefore, not considered a significant pathway for off-site contaminant migration. Remedial activities at this site have been completed and there is no present impact to water quality in Lake Erie.

The Bethlehem Steel Site is a 1,100-acre property located along the west side of NY-5, Lackawanna, comprising a significant portion of the former Bethlehem Steel Corporation, Lackawanna facility. This site is located southwest of Gallagher Beach, beyond the CDF No. 4. The main site features consist of what remains of a sprawling former steel manufacturing complex. Extensive groundwater, surface water, soil, sediment and waste characterization has been completed. Significant groundwater contamination has been confirmed in the slag fill area adjacent to Lake Erie, and near the now-closed coke batteries located along the Ship Canal. Groundwater contaminants are primarily associated with historic coke making operations. Contaminants include VOCs (e.g., benzene) and SVOCs (e.g., naphthlene and tars). A corrective measures study is in progress to identify potential remedial alternatives to address these concerns. Studies are ongoing to determine if releases from the site have adversely impacted the water courses that pass through the site and Lake Erie that abuts the west edge of the site.

4.5 Stormwater Outfalls

Erie County has several storm sewer systems that are separate from its sanitary wastewater systems. Untreated stormwater in these systems flows directly into streams and other waterbodies. The Western New York Stormwater Coalition (Coalition) coordinates efforts by municipalities to comply with the EPA Phase II Stormwater Rule. The Coalition has mapped stormwater outfalls in Erie County. Stormwater outfalls within the vicinity of BHSP are shown on Figure 2-2.

Two outfalls just south of the site were identified by the Coalition. The northern most outfall is a storm sewer that drains Fuhrmann Boulevard. Piping installed during the Southtowns/Outer Harbor Parkway Project in 2009 originates in the area between Fuhrmann Boulevard and NY-5, confirming that discharge from this outfall would only be stormwater discharge from the immediate vicinity.

Flow measurements collected during the monthly sampling events in 2014 indicate that stormwater flow in the area of this outfall is to the east towards the shoreline. Three weekly samples were collected at WWS-03 near this location during the 2014 sampling event. All samples exceeded the BAV for *Enterococci* and *E. coli*.

The second outfall identified by the Coalition is located south of the first outfall. Field investigators could not locate either this outfall or any drainage piping that could potentially discharge to this area, there is no visual evidence suggesting an outfall is actually present and, as such, sampling at the alleged outfall was not performed.

4.6 Wildlife

The presence of wildlife in the vicinity of the beach area were recorded during the daily and weekly water sampling events and are summarized in Appendix B.

Ring-Billed Gull

The NHP has identified the presence of a ring-billed gull nesting colony on the CDF No. 4 located approximately 4,000 feet southwest of Gallagher Beach. The gull colony is one of the largest ring-billed gull colonies on the Great Lakes. NYSDEC has counted approximately 25,000 nests. The gulls begin gathering at the CDF No. 4 in March and the area is heavily used through the spring and early summer. It is in full use in early June with many chicks, but gulls are completely gone by early September. Gulls were observed on and around the CDF No. 4 and the nearby breakwater during each of the monthly sampling events. The two water flow tracking events that started near CDF No. 4 indicate lake currents flow from the area of the gull colony northeasterly towards the beach.

Monthly sampling point MWS-10 is located adjacent to CDF No. 4 and the ring-billed gull nesting colony. MWS-10 sample results indicate only one set of the four samples for each parameter taken at this location exceeded the BAVs. The exceedances occurred during the second sampling event on July 1, 2014. *Enterococci* was detected at 88 CFU/100 mL, *E. coli* was reported at 240 CFU/100 mL. Sampling point MWS-09 is located northeast of MWS-10. No exceedances of BAV were noted at this location.

Canada Goose

Migratory Canada geese have been observed at Gallagher Beach and in the surrounding waters. The Canada goose has been spotted in larger numbers towards the end of the summer season (i.e., August/September). During the sampling events, geese were noted at MWS-08 during the second sampling event on July 2, 2014, at MWS-03 and MWS-04 during the third sampling event on July 29, 2014, and at MWS-02B, MWS-03, and MWS-05 during the fourth sampling event on August 28, 2014.

4.7 Natural Materials

The presence of natural materials in the vicinity of the beach area was recorded during the daily and weekly water sampling events (see Appendix B).

Algae

Algae blooms typically occur in Lake Erie during the summer months. Algae mats can prevent natural ultraviolet sunlight from reaching and radiating through the water and destroying the bacteria. Decaying algae and organic matter can lead to bacteriological exceedances. During the routine sampling and monitoring completed in 2014 large algae blooms were not observed.

Leafy Debris

Leafy debris is associated with rainfall or snowmelt moving over and through the ground potentially picking up and carrying pollutants and bacteria into lakes, rivers, and streams. Nonpoint source pollution, such as leafy debris, can harbor bacteria and can be a source of contamination at beaches. The routine sampling and monitoring completed in 2014 indicates that there is minimal presence of leafy debris at Gallagher Beach.

5

Summary of Findings

5.1 Overview

Gallagher Beach at the BHSP is considered an urban beach. The sanitary survey was performed to evaluate the conditions at Gallagher Beach for use as a bathing beach as required by in Subpart 6-2 (Bathing Beaches) of the New York State Sanitary Code and the United States Environmental Protection Agency's (EPA's), Beaches Environmental Assessment and Coastal Health Act of 2000. Several types of data were collected and analyzed to evaluate water quality at the beach, including bacteriological, chemical, biological, meteorological, and water flow direction/speed. This report presents the information collected during the 2013 Environmental Investigation and the 2014 bacteriological sampling at Gallagher Beach and the surrounding area. It discusses potential pollution sources that could negatively impact water quality and the use of the beach. The beach is currently used by jet skiers, wind surfers, sunbathers, and hikers/dog walkers are often seen on the property.

Weather parameters related to sampling (i.e., temperature, wind speed/direction, wave height, rainfall, and general weather conditions) were recorded daily during each sampling event throughout the bathing season. The weather at BHSP - Gallagher Beach is typical for a NYS park beach on the Great Lakes with significant fluctuations of temperatures throughout the operating season. Wind speeds varied between 0 mph and 24 mph during the sampling events. Wind direction was predominantly from the southwest. Rainfall during the 2014 sampling season was typical for the area with the month of July being wetter than normal. Lake currents in Lake Erie are typically counter clockwise (i.e., currents in the vicinity of Gallagher Beach are northerly in direction). Flow measurements taken during sampling and additional current tracking performed indicated flows in the area of the beach are typically to the north/northeast towards the shoreline. During sampling completed while prevailing winds were from the north, flows were to the south/southeast. Lake current measurements indicated that flow is from the south towards the Gallagher Beach embayment.

5.2 Sampling Summary

5.2.1 2013 Environmental Investigation Sampling

In 2013, an environmental investigation was performed on the BHSP property to determine if contaminants of concern were present in the water, sediment, soils, and groundwater. These samples included surface water samples and sediment samples from Lake Erie near Gallagher Beach. Water and sediment samples were

5 Summary of Findings

analyzed for Target Compound List volatile organic compounds, SVOCs, pesticides, PCBs, metals, *Enterococci*, fecal coliform, and *E. coli*. Analytical results for water samples were compared to Class “B” ambient water quality standards, with the exception of the results for *E. coli*, fecal coliform, and *Enterococci* which were compared to NYSDOH limits for bathing beaches. Sediment sample results were compared to restricted-residential Soil Cleanup Objectives. Exceedances of the selected screening criteria and a complete listing of all the analytical data collected is provided in the BHSP Data Summary dated May 7, 2013 (see Appendix E).

Of the bacteriological parameters analyzed, only *Enterococci* was detected at levels exceeding NYSDOH limits in the surface water samples collected near Gallagher Beach. Two metals (aluminum and iron) exceeded the Class B surface water standards in at least one sample. Eight pesticides were detected in at least one surface water sample above Class B standards. One SVOC exceed the Class B surface water standard in one of the samples. No PCBs or VOCs were detected in the surface water samples.

All three bacteriological parameters were detected at levels exceeding the standard at one of the stormwater samples collected at an outfall south of the beach. The outfall drains from Fuhrmann Boulevard and a drainage ditch east of NY-5. Decaying food waste was found in this ditch during inspections in 2014. Two metals (aluminum and iron) were found at levels exceeding standards in the sample collected from the outfall. Four pesticides were detected at levels exceeding screening criteria at four different nearshore/stormwater sampling locations. One VOC (acetone) was detected in the stormwater sample from the outfall south of the beach, but there is no screening value for this parameter. No PCBs or SVOCs were detected in the nearshore/stormwater samples.

Sediment samples were collected from 13 locations in 2013. Oil, grease, and TOC were detected in all sediment samples, but there are no screening criteria for these parameters. A total of 22 inorganics (metals) were detected in at least one of the sediment samples, but none exceed the screening criteria. Nine pesticides were detected in at least one of the sediment samples, but none of them exceed the screening criteria. Four VOCs were detected in at least one sediment sample, but did not exceed screening criteria. A total of 22 SVOCs were detected in at least one sediment sample, but only four of them exceeded the screening criteria. No PCBs were detected in the sediment samples.

The 2013 sampling results were reviewed with OPRHP, ECHDC, NYSDOH and NYSDEC. NYSDOH and NYSDEC provided an interpretation of the data and guidance for additional sampling and mitigation measures for the proposed future use of the property. NYSDOH and NYSDEC concluded that the sediment does not represent an exposure concern and that no mitigation was required. Chemical results in the surface water and surface water discharges/runoff do not represent an exposure concern, but it was recommended that additional sanitary survey sampling (bacteriological sampling) be completed. Chemical results in the

sand/gravel at the beach do not represent an exposure concern, but non-native fill (beneath 0.5 to 4.0 feet of sand/gravel) represents an exposure concern for prolonged exposure. NYSDEC and NYSDOH recommended a cover and demarcation layer for bathing beach and maintenance of existing cover for non-bathing beach.

5.2.2 2014 Sanitary Survey Sampling

Bacteriological monitoring of fecal indicator organisms took place in 2014 as part of the Sanitary Survey to gain a better understanding of the acceptability of the water at Gallagher Beach for swimming consistent with the requirements in Subpart 6-2 (Bathing Beaches) of the NYS Sanitary Code and the EPA's Beaches Environmental Assessment and Coastal Health Act of 2000. Daily, weekly, and monthly water samples were collected between May and August 2014 as part of this sampling event. Additionally, one round of sediment and beach sand sampling was completed during this time period. Field staff members were responsible for recording water quality and environmental data at the time of sample collection, and OPRHP field forms were completed for each sample location at the time of sampling.

Samples were analyzed for *Enterococci* and *E. coli*, and results were compared with the BAVs. These BAVs are based on the National Beach Guidance and Required Performance Criteria for Grants (EPA 2014). This document outlines the performance criteria that an eligible coastal or Great Lakes state, territorial, tribal, or local government must meet to receive grants to implement coastal recreation water monitoring and public notification programs. Any new coastal beaches will need to meet these EPA criteria by 2017. Daily water samples were collected from three potential swimming areas along the beach. Daily water samples exceeded the BAV for *Enterococci* in 45% of the samples and for *E. coli* in 19% of the samples, with 68% of the days exceeding for one of the bacteria. As shown in Table 3-8 in Section 3, daily water sample location DWS-03 had the least percentage of exceedances for *Enterococci* and *E. coli* at 37% and 14%, respectively. Location DWS-01 had the greatest percentage of exceedances. DWS-01 is located in the northern proposed beach station, and DWS-03 was located in the southernmost proposed beach station.

Weekly water samples were collected from three locations, one at the discharge of a stormwater outfall north of the embayment in the NFTA small boat harbor, one at Gallagher Beach near the wind surfer access point (south of proposed beach areas), and one south of the embayment at the discharge of a stormwater outfall. Sample exceedance percentages at the weekly sampling points varied based on location. The samples collected from a stormwater outfall located south of the embayment had 100% exceedance for both *Enterococci* and *E. coli* in all three sampling events. The samples collected at the location closest to the beach area where windsurfers access the embayment, had exceedances for *Enterococci* and *E. coli* of 76% and 29% respectively, with 86% of the days exceeding for one of the bacteria. The 10 monthly water samples were collected from locations extending north from the CDF No. 4, past the Gallagher Beach embayment to the

mouth of the Buffalo River. Five of the monthly locations never exceeded the BAVs. Three of these locations are located within the Gallagher Beach embayment. The greatest number of exceedances was found at the two sampling locations located at the mouth of the Buffalo River, approximately 3 miles north of Gallagher Beach. The sampling location adjacent to CDF No. 4 and the ring-billed gull nesting colony, located approximately 3,800 feet southwest of the beach, had one sample result for each parameter exceed the BAVs. Sample results at the location just northeast of this area though did not exceed the BAVs.

Beach sand samples were collected at the wave line in three locations adjacent to the daily water sample locations (proposed beach areas). Sediment samples were collected in the same location as the daily water samples. The beach sand samples all exceeded the BAVs for *Enterococci* and *E. coli*. The sediment samples only exceeded the BAVs at one location.

In addition to the bacterial sampling in 2014, radiation screening was performed at 31 locations at Gallagher Beach. All of the sample results were below the action levels for radiation indicating that radiation is not a concern at the beach.

5.2.3 2015 Source Tracking Sampling

As part of the sanitary survey investigation, samples were collected for *Bacteroides* analysis to determine if *E. coli/enterococci* bacteria could be associated with a source of human fecal pollution. Three surface water samples were collected from Gallagher Beach on August 17, 2015, from the three daily water sampling locations (DWS-01 through DWS-03) along the shoreline of Gallagher Beach (see Figure 3-4), and all samples had a positive result, indicating that while the bacteria could be associated with human fecal pollution, the result is not entirely conclusive because Lake Erie receives treated wastewater that typically contains the genetic material from human-specific *Bacteroides*. Even so, human sources cannot be ruled out and should take priority for further investigation to identify the pollution sources(s) affecting the beach.

5.3 Potential Pollution Sources Summary

As part of the sanitary survey investigation, potential pollution sources to the beach were also evaluated. Surrounding land use, CSOs, stormwater outfalls, nearby remedial sites, wildlife, and natural materials were evaluated for their potential to cause pollution that may affect water quality at Gallagher Beach. The beach is located in the Buffalo River watershed, which has a variety of land uses throughout. In the immediate vicinity of the beach, land use is predominantly developed, including heavily urbanized areas (e.g., factories, former industrial sites, and highways) and residential areas. Based on an analysis of these land uses, runoff from urban and industrial sites could contribute to pollution at Gallagher Beach.

No CSOs discharge directly to the beach area. The closest CSOs are located on Buffalo River which discharges into Lake Erie 3 miles north of the beach. Flow measurements at the mouth of the river indicate that lake currents in the area were

5 Summary of Findings

generally to the north/northeast, which the exception of when winds are out of the north and lake currents shift to the south/southeast. Results of the monthly and daily water sampling completed while winds were from the north did not have any BAV exceedances with the exception of *E. coli* at one of the daily water sampling locations.

Five former industrial sites that have been designated as NYSDEC Superfund Sites were also evaluated for their potential to affect water quality at Gallagher Beach. Four of these sites have undergone remediation and do not present impacts to water quality in Lake Erie, and would not be expected to impact the beach. Only one site currently has the potential to affect the beach, the Bethlehem Steel Site, which is located south of the beach. Extensive characterization of the site has been completed and significant groundwater contamination has been confirmed in the slag fill area adjacent to Lake Erie. A corrective measures study is in progress to identify potential remedial alternatives, and studies are ongoing to determine if releases from the site have adversely impacted Lake Erie. Sample results from the 2013 field investigation at Gallagher Beach do not indicate the presence of contaminants that may be associated with the former industrial site.

As described above samples were collected weekly from a stormwater outfall located south of the Gallagher Beach embayment. All samples from this location exceeded the BAV for *Enterococci* and *E. coli*. Flow direction measurements indicated that the lake current in this area is to the east towards the shoreline and that water in this area does not flow toward the beach during typical weather conditions (i.e., winds coming from the southwest).

The presence of ring-billed gulls and Canada geese were noted in the vicinity of the beach during sampling. No correlation between their presence and exceedances of bacterial indicators were noted during the sampling event. Additionally, minimal amounts of algae and leafy debris were noted at the beach during sampling, and do not appear to be a substantial pollution source to water quality.

6

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A

Photographic Log



Photo No.:	001	Direction:	South
Date:	October 2013	Subject:	Gallagher Beach



Photo No.:	002	Direction:	North
Date:	October 2013	Subject:	Gallagher Beach



Photo No.:	003	Direction:	South
Date:	October 2013	Subject:	Geoprobe setup



Photo No.:	004	Direction:	North
Date:	October 2013	Subject:	Sediment coring vessel



Photo No.:	005	Direction:	North
Date:	October 2013	Subject:	Crew preparing to collect sediment core



Photo No.:	006	Direction:	Down
Date:	October 2013	Subject:	Sediment core



Photo No.:	007	Direction:	North
Date:	October 2013	Subject:	Gallagher Beach prior to radiation survey



Photo No.:	008	Direction:	South
Date:	May 2014	Subject:	Gallagher Beach radiation survey



Photo No.:	009	Direction:	Down
Date:	May 2014	Subject:	Gallagher Beach radiation survey



Photo No.:	010	Direction:	South
Date:	October 2013	Subject:	Screening and logging soil cores



Photo No.:	011	Direction:	Down
Date:	October 2013	Subject:	Monitoring well development setup



Photo No.:	012	Direction:	North
Date:	October 2013	Subject:	Surface soil sample collection



Photo No.:	013	Direction:	South
Date:	June 2014	Subject:	Current tracking device



Photo No.:	014	Direction:	East
Date:	June 2014	Subject:	Current tracking west of Gallagher Beach



Photo No.:	015	Direction:	West
Date:	June 2014	Subject:	Flow measurement near Gallagher Beach



Photo No.:	016	Direction:	West
Date:	July 2014	Subject:	Flow measurement at Gallagher Beach

B

Water Quality Field Data

See CD.

C

New York State Natural Heritage Program Report on State-Listed Animals

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Division of Fish, Wildlife & Marine Resources
New York Natural Heritage Program
625 Broadway, 5th Floor, Albany, New York 12233-4757
Phone: (518) 402-8935 • **Fax:** (518) 402-8925
Website: www.dec.ny.gov



Joe Martens
Commissioner

October 18, 2013

Joseph Carlo
Ecology and Environment
368 Pleasant View Drive
Lancaster, NY 14051

Re: Proposed Buffalo Boat Harbor Project
Town/City: City Of Buffalo. County: Erie.

Dear Joseph Carlo :

In response to your recent request, we have reviewed the New York Natural Heritage Program database with respect to the above project

Enclosed is a report of rare or state-listed animals and plants, and significant natural communities, which our databases indicate occur, or may occur, on your site or in the immediate vicinity of your site.

For most sites, comprehensive field surveys have not been conducted; the enclosed report only includes records from our databases. We cannot provide a definitive statement as to the presence or absence of all rare or state-listed species or significant natural communities. This information should not be substituted for on-site surveys that may be required for environmental impact assessment.

Our databases are continually growing as records are added and updated. If this proposed project is still under development one year from now, we recommend that you contact us again so that we may update this response with the most current information.

The presence of the plants and animals identified in the enclosed report may result in this project requiring additional review or permit conditions. For further guidance, and for information regarding other permits that may be required under state law for regulated areas or activities (e.g., regulated wetlands), please contact the appropriate NYS DEC Regional Office, Division of Environmental Permits, as listed at www.dec.ny.gov/about/39381.html.

Sincerely,

Andrea Chaloux
Environmental Review Specialist
New York Natural Heritage Program



**The following state-listed animals have been documented
at your project site, or in its vicinity.**

The following list includes animals that are listed by NYS as Endangered, Threatened, or Special Concern; and/or that are federally listed or are candidates for federal listing. The list may also include significant natural communities that can serve as habitat for Endangered or Threatened animals, and/or other rare animals and rare plants found at these habitats.

For information about potential impacts of your project on these populations, how to avoid, minimize, or mitigate any impacts, and any permit considerations, contact the Wildlife Manager or the Fisheries Manager at the NYSDEC Regional Office for the region where the project is located. A listing of Regional Offices is at <http://www.dec.ny.gov/about/558.html>.

The following species and habitats have been documented at or near the project site, generally within 0.5 mile. Potential onsite and offsite impacts from the project may need to be addressed.

COMMON NAME	SCIENTIFIC NAME	NY STATE LISTING	FEDERAL LISTING
Birds			
Least Bittern <i>Breeding</i>	<i>Ixobrychus exilis</i>	Threatened	10893
Peregrine Falcon <i>Breeding</i>	<i>Falco peregrinus</i>	Endangered	13796
Pied-billed Grebe <i>Breeding</i>	<i>Podilymbus podiceps</i>	Threatened	10636
Fish			
Lake Sturgeon	<i>Acipenser fulvescens</i>	Threatened	11154
Lake Sturgeon is found at your project site.			

This report only includes records from the NY Natural Heritage databases. For most sites, comprehensive field surveys have not been conducted, and we cannot provide a definitive statement as to the presence or absence of all rare or state-listed species. This information should not be substituted for on-site surveys that may be required for environmental impact assessment.

If any rare plants or animals are documented during site visits, we request that information on the observations be provided to the New York Natural Heritage Program so that we may update our database.

Information about many of the listed animals in New York, including habitat, biology, identification, conservation, and management, are available online in Natural Heritage's Conservation Guides at www.guides.nynhp.org, and from NYSDEC at <http://www.dec.ny.gov/animals/7494.html>.

Information about many of the rare plants and animals, and natural community types, in New York are available online in Natural Heritage's Conservation Guides at www.guides.nynhp.org, and from NatureServe Explorer at <http://www.natureserve.org/explorer>.



**The following rare plants, rare animals, and significant natural communities
have been documented at your project site, or in its vicinity.**

We recommend that potential onsite and offsite impacts of the proposed project on these species or communities be addressed as part of any environmental assessment or review conducted as part of the planning, permitting and approval process, such as reviews conducted under SEQR. Field surveys of the project site may be necessary to determine the status of a species at the site, particularly for sites that are currently undeveloped and may still contain suitable habitat. Final requirements of the project to avoid, minimize, or mitigate potential impacts are determined by the lead permitting agency or the government body approving the project.

The following animals, while not listed by New York State as Endangered or Threatened, are of conservation concern to the state, and are considered rare by the New York Natural Heritage Program.

COMMON NAME	SCIENTIFIC NAME	NY STATE LISTING	HERITAGE CONSERVATION STATUS
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Animal Assemblages

Gull Colony

Stony Point, 1985-05-14: Dredge spoil disposal site separated by dikes from Lake Erie. Low lying, gravelly, sparsely vegetated beach. Open water will eventually be eliminated as dredge spoils fill site. Huge slag pile at southern end, with steep banks down to beach. Surrounding land use is industrial.

7534

Crustaceans

Devil Crawfish	<i>Cambarus diogenes</i>	Unlisted	Imperiled in NYS
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Tift Farm Marsh, 2007-07-07: The area is a reclaimed cattail marsh and Lisa Pond is most likely man-made and appears degraded. Cattails, herbaceous plants, sedges, and shrubs were present. A deer was observed browsing in the pond perimeter and pond dwelling odonates (*Plathemis lydia* and *Anax junius*) were observed.

12691

This report only includes records from the NY Natural Heritage databases. For most sites, comprehensive field surveys have not been conducted, and we cannot provide a definitive statement as to the presence or absence of all rare or state-listed species. This information should not be substituted for on-site surveys that may be required for environmental impact assessment.

If any rare plants or animals are documented during site visits, we request that information on the observations be provided to the New York Natural Heritage Program so that we may update our database.

Information about many of the rare animals and plants in New York, including habitat, biology, identification, conservation, and management, are available online in Natural Heritage's Conservation Guides at www.guides.nynhp.org, from NatureServe Explorer at <http://www.natureserve.org/explorer>, and from USDA's Plants Database at <http://plants.usda.gov/index.html> (for plants).

Information about many of the natural community types in New York, including identification, dominant and characteristic vegetation, distribution, conservation, and management, is available online in Natural Heritage's Conservation Guides at www.guides.nynhp.org. For descriptions of all community types, go to <http://www.dec.ny.gov/animals/29384.html> and click on Draft Ecological Communities of New York State.

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2014 Sanitary Survey Example Field Sheet



BUFFALO HARBOR STATE PARK –FIELD SHEET

SAMPLED BY: _____

DATE: ____ / ____ / 2014

WEATHER CONDITIONS

Current Weather: ☐ Sunny ☐ Mostly Sunny ☐ Partly Cloudy ☐ Mostly Cloudy ☐ Cloudy ☐ Hazy

☐ Rain (_____ inches) Air Temperature: _____°C

Wind Conditions: ☐ Calm (___ mph), ☐ Breezy (___ mph), ☐ Windy (___ mph) Direction From: _____

Notes on Weather: _____

DAILEY STATION DWS-01

Collected at 2.5 ft depth? Yes No Depth _____ Collection time: _____

Time replicate: _____ Time field blank: _____ Pathogen sample collection time: _____

Number of People on Beach (____) in Water (____) Notes: _____

Wildlife (# and type observed near station) On Shore: _____ In Water: _____

Field measurements and notes:

Water Temperature: _____°C Water Level: Low Normal High Water Odor: _____

Wave Height (measuring stick): Max Height _____ - Min Height _____ = _____ inches or _____ ft Est.

Drift Direction: to _____ Wave Direction (angle): _____° Wave Conditions: Glassy Normal Choppy

Water Clarity: clear slightly turbid turbid opaque Water Color clear green brown other: _____

Turbidity Measurements: 1st Reading _____ 2nd Reading _____ 3rd reading (if needed) _____ NTU

Average (of 2 measurements that agree within 15% for >10 or within 1.5 NTU if <10 NTU) _____ NTU

Algae (circle): (1) None (2) Some (3) Visible floating (4) Thick layer (5) Multiple thick layers Type: Clumps Mat

Algal Clumps Size: <Peanut Peanut Golf-ball Orange Frisbee Mat Dimensions: _____ ft

Algae Buoyancy: Floating Suspended Bottom Algae Color: Green Brown Black _____ Algae In Sample Bottle: Y N

Debris (circle): (1) None (2) Some (3) Visible floating (4) Thick layer (5) Multiple thick layers

Litter on Shoreline (tar, oil/grease, plastics): None Low Moderate High Types: _____

Natural Debris on Shoreline (feathers, sticks, plants): None Low Moderate High Types: _____

Floatables (Litter) Present in Water: None Low Moderate High Types: _____

Floatables (Natural) Present in Water: None Low Moderate High Types: _____

Fecal material (circle): (1) None (2) Sparse (3) Some (4) Some multiple areas (5) all along shoreline



BUFFALO HARBOR STATE PARK –FIELD SHEET

SAMPLED BY: _____

DATE: ____ / ____ / 2014

WEATHER CONDITIONS

Current Weather: ☐ Sunny ☐ Mostly Sunny ☐ Partly Cloudy ☐ Mostly Cloudy ☐ Cloudy ☐ Hazy

☐ Rain (_____ inches) Air Temperature: _____°C

Wind Conditions: ☐ Calm (___ mph), ☐ Breezy (___ mph), ☐ Windy (___ mph) Direction From: _____

Notes on Weather: _____

DAILEY STATION DWS-02

Collected at 2.5 ft depth? Yes No Depth _____ Collection time: _____

Time replicate: _____ Time field blank: _____ Pathogen sample collection time: _____

Number of People on Beach (____) in Water (____) Notes: _____

Wildlife (# and type observed near station) On Shore: _____ In Water: _____

Field measurements and notes:

Water Temperature: _____°C Water Level: Low Normal High Water Odor: _____

Wave Height (measuring stick): Max Height _____ - Min Height _____ = _____ inches or _____ ft Est.

Drift Direction: to _____ Wave Direction (angle): _____° Wave Conditions: Glassy Normal Choppy

Water Clarity: clear slightly turbid turbid opaque Water Color clear green brown other: _____

Turbidity Measurements: 1st Reading _____ 2nd Reading _____ 3rd reading (if needed) _____ NTU

Average (of 2 measurements that agree within 15% for >10 or within 1.5 NTU if <10 NTU) _____ NTU

Algae (circle): (1) None (2) Some (3) Visible floating (4) Thick layer (5) Multiple thick layers Type: Clumps Mat

Algal Clumps Size: <Peanut Peanut Golf-ball Orange Frisbee Mat Dimensions: _____ ft

Algae Buoyancy: Floating Suspended Bottom Algae Color: Green Brown Black _____ Algae In Sample Bottle: Y N

Debris (circle): (1) None (2) Some (3) Visible floating (4) Thick layer (5) Multiple thick layers

Litter on Shoreline (tar, oil/grease, plastics): None Low Moderate High Types: _____

Natural Debris on Shoreline (feathers, sticks, plants): None Low Moderate High Types: _____

Floatables (Litter) Present in Water: None Low Moderate High Types: _____

Floatables (Natural) Present in Water: None Low Moderate High Types: _____

Fecal material (circle): (1) None (2) Sparse (3) Some (4) Some multiple areas (5) all along shoreline



BUFFALO HARBOR STATE PARK –FIELD SHEET

SAMPLED BY: _____

DATE: ____ / ____ / 2014

WEATHER CONDITIONS

Current Weather: ☐ Sunny ☐ Mostly Sunny ☐ Partly Cloudy ☐ Mostly Cloudy ☐ Cloudy ☐ Hazy

☐ Rain (_____ inches) Air Temperature: _____°C

Wind Conditions: ☐ Calm (___ mph), ☐ Breezy (___ mph), ☐ Windy (___ mph) Direction From: _____

Notes on Weather: _____

DAILY STATION DWS-03

Collected at 2.5 ft depth? Yes No Depth _____ Collection time: _____

Time replicate: _____ Time field blank: _____ Pathogen sample collection time: _____

Number of People on Beach (____) in Water (____) Notes: _____

Wildlife (# and type observed near station) On Shore: _____ In Water: _____

Field measurements and notes:

Water Temperature: _____°C Water Level: Low Normal High Water Odor: _____

Wave Height (measuring stick): Max Height _____ - Min Height _____ = _____ inches or _____ ft Est.

Drift Direction: to _____ Wave Direction (angle): _____° Wave Conditions: Glassy Normal Choppy

Water Clarity: clear slightly turbid turbid opaque Water Color clear green brown other: _____

Turbidity Measurements: 1st Reading _____ 2nd Reading _____ 3rd reading (if needed) _____ NTU

Average (of 2 measurements that agree within 15% for >10 or within 1.5 NTU if <10 NTU) _____ NTU

Algae (circle): (1) None (2) Some (3) Visible floating (4) Thick layer (5) Multiple thick layers Type: Clumps Mat

Algal Clumps Size: <Peanut Peanut Golf-ball Orange Frisbee Mat Dimensions: _____ ft

Algae Buoyancy: Floating Suspended Bottom Algae Color: Green Brown Black _____ Algae In Sample Bottle: Y N

Debris (circle): (1) None (2) Some (3) Visible floating (4) Thick layer (5) Multiple thick layers

Litter on Shoreline (tar, oil/grease, plastics): None Low Moderate High Types: _____

Natural Debris on Shoreline (feathers, sticks, plants): None Low Moderate High Types: _____

Floatables (Litter) Present in Water: None Low Moderate High Types: _____

Floatables (Natural) Present in Water: None Low Moderate High Types: _____

Fecal material (circle): (1) None (2) Sparse (3) Some (4) Some multiple areas (5) all along shoreline



BUFFALO HARBOR STATE PARK –FIELD SHEET

SAMPLED BY: _____

DATE: ____ / ____ / 2014

WEATHER CONDITIONS

Current Weather: ☐ Sunny ☐ Mostly Sunny ☐ Partly Cloudy ☐ Mostly Cloudy ☐ Cloudy ☐ Hazy

☐ Rain (_____ inches) Air Temperature: _____°C

Wind Conditions: ☐ Calm (___ mph), ☐ Breezy (___ mph), ☐ Windy (___ mph) Direction From: _____

Notes on Weather: _____

WEEKLY STATION WWS-01

Collection Depth _____ Collection time: _____

Time replicate: _____ Time field blank: _____ Pathogen sample collection time: _____

Number of People on Beach (____) in Water (____) Notes: _____

Wildlife (# and type observed near station) On Shore: _____ In Water: _____

Field measurements and notes:

Water Temperature: _____°C Water Level: Low Normal High Water Odor: _____

Wave Height (measuring stick): Max Height _____ - Min Height _____ = _____ inches or _____ ft Est.

Drift Direction: to _____ Wave Direction (angle): _____° Wave Conditions: Glassy Normal Choppy

Water Clarity: clear slightly turbid turbid opaque Water Color clear green brown other: _____

Turbidity Measurements: 1st Reading _____ 2nd Reading _____ 3rd reading (if needed) _____ NTU

Average (of 2 measurements that agree within 15% for >10 or within 1.5 NTU if <10 NTU) _____ NTU

Algae (circle): (1) None (2) Some (3) Visible floating (4) Thick layer (5) Multiple thick layers Type: Clumps Mat

Algal Clumps Size: <Peanut Peanut Golf-ball Orange Frisbee Mat Dimensions: _____ ft

Algae Buoyancy: Floating Suspended Bottom Algae Color: Green Brown Black _____ Algae In Sample Bottle: Y N

Debris (circle): (1) None (2) Some (3) Visible floating (4) Thick layer (5) Multiple thick layers

Litter on Shoreline (tar, oil/grease, plastics): None Low Moderate High Types: _____

Natural Debris on Shoreline (feathers, sticks, plants): None Low Moderate High Types: _____

Floatables (Litter) Present in Water: None Low Moderate High Types: _____

Floatables (Natural) Present in Water: None Low Moderate High Types: _____

Fecal material (circle): (1) None (2) Sparse (3) Some (4) Some multiple areas (5) all along shoreline



BUFFALO HARBOR STATE PARK –FIELD SHEET

SAMPLED BY: _____

DATE: ____ / ____ / 2014

WEATHER CONDITIONS

Current Weather: ☐ Sunny ☐ Mostly Sunny ☐ Partly Cloudy ☐ Mostly Cloudy ☐ Cloudy ☐ Hazy

☐ Rain (_____ inches) Air Temperature: _____°C

Wind Conditions: ☐ Calm (___ mph), ☐ Breezy (___ mph), ☐ Windy (___ mph) Direction From: _____

Notes on Weather: _____

WEEKLY STATION WWS-02

Collection Depth _____ Collection time: _____

Time replicate: _____ Time field blank: _____ Pathogen sample collection time: _____

Number of People on Beach (____) in Water (____) Notes: _____

Wildlife (# and type observed near station) On Shore: _____ In Water: _____

Field measurements and notes:

Water Temperature: _____°C Water Level: Low Normal High Water Odor: _____

Wave Height (measuring stick): Max Height _____ - Min Height _____ = _____ inches or _____ ft Est.

Drift Direction: to _____ Wave Direction (angle): _____° Wave Conditions: Glassy Normal Choppy

Water Clarity: clear slightly turbid turbid opaque Water Color clear green brown other: _____

Turbidity Measurements: 1st Reading _____ 2nd Reading _____ 3rd reading (if needed) _____ NTU

Average (of 2 measurements that agree within 15% for >10 or within 1.5 NTU if <10 NTU) _____ NTU

Algae (circle): (1) None (2) Some (3) Visible floating (4) Thick layer (5) Multiple thick layers Type: Clumps Mat

Algal Clumps Size: <Peanut Peanut Golf-ball Orange Frisbee Mat Dimensions: _____ ft

Algae Buoyancy: Floating Suspended Bottom Algae Color: Green Brown Black _____ Algae In Sample Bottle: Y N

Debris (circle): (1) None (2) Some (3) Visible floating (4) Thick layer (5) Multiple thick layers

Litter on Shoreline (tar, oil/grease, plastics): None Low Moderate High Types: _____

Natural Debris on Shoreline (feathers, sticks, plants): None Low Moderate High Types: _____

Floatables (Litter) Present in Water: None Low Moderate High Types: _____

Floatables (Natural) Present in Water: None Low Moderate High Types: _____

Fecal material (circle): (1) None (2) Sparse (3) Some (4) Some multiple areas (5) all along shoreline



BUFFALO HARBOR STATE PARK –FIELD SHEET

SAMPLED BY: _____

DATE: ____ / ____ / 2014

WEATHER CONDITIONS

Current Weather: ☐ Sunny ☐ Mostly Sunny ☐ Partly Cloudy ☐ Mostly Cloudy ☐ Cloudy ☐ Hazy

☐ Rain (_____ inches) Air Temperature: _____°C

Wind Conditions: ☐ Calm (___ mph), ☐ Breezy (___ mph), ☐ Windy (___ mph) Direction From: _____

Notes on Weather: _____

WEEKLY STATION WWS-03

Collection Depth _____ Collection time: _____

Time replicate: _____ Time field blank: _____ Pathogen sample collection time: _____

Number of People on Beach (____) in Water (____) Notes: _____

Wildlife (# and type observed near station) On Shore: _____ In Water: _____

Field measurements and notes:

Water Temperature: _____°C Water Level: Low Normal High Water Odor: _____

Wave Height (measuring stick): Max Height _____ - Min Height _____ = _____ inches or _____ ft Est.

Drift Direction: to _____ Wave Direction (angle): _____° Wave Conditions: Glassy Normal Choppy

Water Clarity: clear slightly turbid turbid opaque Water Color clear green brown other: _____

Turbidity Measurements: 1st Reading _____ 2nd Reading _____ 3rd reading (if needed) _____ NTU

Average (of 2 measurements that agree within 15% for >10 or within 1.5 NTU if <10 NTU) _____ NTU

Algae (circle): (1) None (2) Some (3) Visible floating (4) Thick layer (5) Multiple thick layers Type: Clumps Mat

Algal Clumps Size: <Peanut Peanut Golf-ball Orange Frisbee Mat Dimensions: _____ ft

Algae Buoyancy: Floating Suspended Bottom Algae Color: Green Brown Black _____ Algae In Sample Bottle: Y N

Debris (circle): (1) None (2) Some (3) Visible floating (4) Thick layer (5) Multiple thick layers

Litter on Shoreline (tar, oil/grease, plastics): None Low Moderate High Types: _____

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Floatables (Litter) Present in Water: None Low Moderate High Types: _____

Floatables (Natural) Present in Water: None Low Moderate High Types: _____

Fecal material (circle): (1) None (2) Sparse (3) Some (4) Some multiple areas (5) all along shoreline



BUFFALO HARBOR STATE PARK –FIELD SHEET

SAMPLED BY: _____

DATE: ____ / ____ / 2014

WEATHER CONDITIONS

Current Weather: ☐ Sunny ☐ Mostly Sunny ☐ Partly Cloudy ☐ Mostly Cloudy ☐ Cloudy ☐ Hazy

☐ Rain (_____ inches) Air Temperature: _____°C

Wind Conditions: ☐ Calm (___ mph), ☐ Breezy (___ mph), ☐ Windy (___ mph) Direction From: _____

Notes on Weather: _____

MONTHLY STATION MWS-01

Collection Depth _____ Collection time: _____

Time replicate: _____ Time field blank: _____ Pathogen sample collection time: _____

Number of People on Beach (____) in Water (____) Notes: _____

Wildlife (# and type observed near station) On Shore: _____ In Water: _____

Field measurements and notes:

Water Temperature: _____°C Water Level: Low Normal High Water Odor: _____

Wave Height (measuring stick): Max Height _____ - Min Height _____ = _____ inches or _____ ft Est.

Drift Direction: to _____ Wave Direction (angle): _____° Wave Conditions: Glassy Normal Choppy

Water Clarity: clear slightly turbid turbid opaque Water Color clear green brown other: _____

Turbidity Measurements: 1st Reading _____ 2nd Reading _____ 3rd reading (if needed) _____ NTU

Average (of 2 measurements that agree within 15% for >10 or within 1.5 NTU if <10 NTU) _____ NTU

Algae (circle): (1) None (2) Some (3) Visible floating (4) Thick layer (5) Multiple thick layers Type: Clumps Mat

Algal Clumps Size: <Peanut Peanut Golf-ball Orange Frisbee Mat Dimensions: _____ ft

Algae Buoyancy: Floating Suspended Bottom Algae Color: Green Brown Black _____ Algae In Sample Bottle: Y N

Debris (circle): (1) None (2) Some (3) Visible floating (4) Thick layer (5) Multiple thick layers

Litter on Shoreline (tar, oil/grease, plastics): None Low Moderate High Types: _____

Natural Debris on Shoreline (feathers, sticks, plants): None Low Moderate High Types: _____

Floatables (Litter) Present in Water: None Low Moderate High Types: _____

Floatables (Natural) Present in Water: None Low Moderate High Types: _____

Fecal material (circle): (1) None (2) Sparse (3) Some (4) Some multiple areas (5) all along shoreline



BUFFALO HARBOR STATE PARK –FIELD SHEET

FLOW MEASUREMENTS

MWS-01:

<i>Depth of Measurement</i>	<i>Velocity</i>	<i>Direction</i>	<i>Notes</i>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Notes: _____



BUFFALO HARBOR STATE PARK –FIELD SHEET

SAMPLED BY: _____

DATE: ____ / ____ / 2014

WEATHER CONDITIONS

Current Weather: ☐ Sunny ☐ Mostly Sunny ☐ Partly Cloudy ☐ Mostly Cloudy ☐ Cloudy ☐ Hazy

☐ Rain (_____ inches) Air Temperature: _____°C

Wind Conditions: ☐ Calm (___ mph), ☐ Breezy (___ mph), ☐ Windy (___ mph) Direction From: _____

Notes on Weather: _____

MONTHLY STATION MWS-02

Collection Depth _____ Collection time: _____

Time replicate: _____ Time field blank: _____ Pathogen sample collection time: _____

Number of People on Beach (____) in Water (____) Notes: _____

Wildlife (# and type observed near station) On Shore: _____ In Water: _____

Field measurements and notes:

Water Temperature: _____°C Water Level: Low Normal High Water Odor: _____

Wave Height (measuring stick): Max Height _____ - Min Height _____ = _____ inches or _____ ft Est.

Drift Direction: to _____ Wave Direction (angle): _____° Wave Conditions: Glassy Normal Choppy

Water Clarity: clear slightly turbid turbid opaque Water Color clear green brown other: _____

Turbidity Measurements: 1st Reading _____ 2nd Reading _____ 3rd reading (if needed) _____ NTU

Average (of 2 measurements that agree within 15% for >10 or within 1.5 NTU if <10 NTU) _____ NTU

Algae (circle): (1) None (2) Some (3) Visible floating (4) Thick layer (5) Multiple thick layers Type: Clumps Mat

Algal Clumps Size: <Peanut Peanut Golf-ball Orange Frisbee Mat Dimensions: _____ ft

Algae Buoyancy: Floating Suspended Bottom Algae Color: Green Brown Black _____ Algae In Sample Bottle: Y N

Debris (circle): (1) None (2) Some (3) Visible floating (4) Thick layer (5) Multiple thick layers

Litter on Shoreline (tar, oil/grease, plastics): None Low Moderate High Types: _____

Natural Debris on Shoreline (feathers, sticks, plants): None Low Moderate High Types: _____

Floatables (Litter) Present in Water: None Low Moderate High Types: _____

Floatables (Natural) Present in Water: None Low Moderate High Types: _____

Fecal material (circle): (1) None (2) Sparse (3) Some (4) Some multiple areas (5) all along shoreline



BUFFALO HARBOR STATE PARK –FIELD SHEET

FLOW MEASUREMENTS

MWS-02:

<i>Depth of Measurement</i>	<i>Velocity</i>	<i>Direction</i>	<i>Notes</i>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Notes: _____



BUFFALO HARBOR STATE PARK –FIELD SHEET

SAMPLED BY: _____

DATE: ____ / ____ / 2014

WEATHER CONDITIONS

Current Weather: ☐ Sunny ☐ Mostly Sunny ☐ Partly Cloudy ☐ Mostly Cloudy ☐ Cloudy ☐ Hazy

☐ Rain (_____ inches) Air Temperature: _____°C

Wind Conditions: ☐ Calm (___ mph), ☐ Breezy (___ mph), ☐ Windy (___ mph) Direction From: _____

Notes on Weather: _____

MONTHLY STATION MWS-03

Collection Depth _____ Collection time: _____

Time replicate: _____ Time field blank: _____ Pathogen sample collection time: _____

Number of People on Beach (____) in Water (____) Notes: _____

Wildlife (# and type observed near station) On Shore: _____ In Water: _____

Field measurements and notes:

Water Temperature: _____°C Water Level: Low Normal High Water Odor: _____

Wave Height (measuring stick): Max Height _____ - Min Height _____ = _____ inches or _____ ft Est.

Drift Direction: to _____ Wave Direction (angle): _____° Wave Conditions: Glassy Normal Choppy

Water Clarity: clear slightly turbid turbid opaque Water Color clear green brown other: _____

Turbidity Measurements: 1st Reading _____ 2nd Reading _____ 3rd reading (if needed) _____ NTU

Average (of 2 measurements that agree within 15% for >10 or within 1.5 NTU if <10 NTU) _____ NTU

Algae (circle): (1) None (2) Some (3) Visible floating (4) Thick layer (5) Multiple thick layers Type: Clumps Mat

Algal Clumps Size: <Peanut Peanut Golf-ball Orange Frisbee Mat Dimensions: _____ ft

Algae Buoyancy: Floating Suspended Bottom Algae Color: Green Brown Black _____ Algae In Sample Bottle: Y N

Debris (circle): (1) None (2) Some (3) Visible floating (4) Thick layer (5) Multiple thick layers

Litter on Shoreline (tar, oil/grease, plastics): None Low Moderate High Types: _____

Natural Debris on Shoreline (feathers, sticks, plants): None Low Moderate High Types: _____

Floatables (Litter) Present in Water: None Low Moderate High Types: _____

Floatables (Natural) Present in Water: None Low Moderate High Types: _____

Fecal material (circle): (1) None (2) Sparse (3) Some (4) Some multiple areas (5) all along shoreline



BUFFALO HARBOR STATE PARK –FIELD SHEET

FLOW MEASUREMENTS

MWS-03:

<i>Depth of Measurement</i>	<i>Velocity</i>	<i>Direction</i>	<i>Notes</i>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Notes: _____



BUFFALO HARBOR STATE PARK –FIELD SHEET

SAMPLED BY: _____

DATE: ____ / ____ / 2014

WEATHER CONDITIONS

Current Weather: ☐ Sunny ☐ Mostly Sunny ☐ Partly Cloudy ☐ Mostly Cloudy ☐ Cloudy ☐ Hazy

☐ Rain (_____ inches) Air Temperature: _____°C

Wind Conditions: ☐ Calm (___ mph), ☐ Breezy (___ mph), ☐ Windy (___ mph) Direction From: _____

Notes on Weather: _____

MONTHLY STATION MWS-04

Collection Depth _____ Collection time: _____

Time replicate: _____ Time field blank: _____ Pathogen sample collection time: _____

Number of People on Beach (____) in Water (____) Notes: _____

Wildlife (# and type observed near station) On Shore: _____ In Water: _____

Field measurements and notes:

Water Temperature: _____°C Water Level: Low Normal High Water Odor: _____

Wave Height (measuring stick): Max Height _____ - Min Height _____ = _____ inches or _____ ft Est.

Drift Direction: to _____ Wave Direction (angle): _____° Wave Conditions: Glassy Normal Choppy

Water Clarity: clear slightly turbid turbid opaque Water Color clear green brown other: _____

Turbidity Measurements: 1st Reading _____ 2nd Reading _____ 3rd reading (if needed) _____ NTU

Average (of 2 measurements that agree within 15% for >10 or within 1.5 NTU if <10 NTU) _____ NTU

Algae (circle): (1) None (2) Some (3) Visible floating (4) Thick layer (5) Multiple thick layers Type: Clumps Mat

Algal Clumps Size: <Peanut Peanut Golf-ball Orange Frisbee Mat Dimensions: _____ ft

Algae Buoyancy: Floating Suspended Bottom Algae Color: Green Brown Black _____ Algae In Sample Bottle: Y N

Debris (circle): (1) None (2) Some (3) Visible floating (4) Thick layer (5) Multiple thick layers

Litter on Shoreline (tar, oil/grease, plastics): None Low Moderate High Types: _____

Natural Debris on Shoreline (feathers, sticks, plants): None Low Moderate High Types: _____

Floatables (Litter) Present in Water: None Low Moderate High Types: _____

Floatables (Natural) Present in Water: None Low Moderate High Types: _____

Fecal material (circle): (1) None (2) Sparse (3) Some (4) Some multiple areas (5) all along shoreline



BUFFALO HARBOR STATE PARK –FIELD SHEET

FLOW MEASUREMENTS

MWS-04:

<i>Depth of Measurement</i>	<i>Velocity</i>	<i>Direction</i>	<i>Notes</i>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Notes: _____



BUFFALO HARBOR STATE PARK –FIELD SHEET

SAMPLED BY: _____

DATE: ____ / ____ / 2014

WEATHER CONDITIONS

Current Weather: ☐ Sunny ☐ Mostly Sunny ☐ Partly Cloudy ☐ Mostly Cloudy ☐ Cloudy ☐ Hazy

☐ Rain (_____ inches) Air Temperature: _____°C

Wind Conditions: ☐ Calm (___ mph), ☐ Breezy (___ mph), ☐ Windy (___ mph) Direction From: _____

Notes on Weather: _____

MONTHLY STATION MWS-05

Collection Depth _____ Collection time: _____

Time replicate: _____ Time field blank: _____ Pathogen sample collection time: _____

Number of People on Beach (____) in Water (____) Notes: _____

Wildlife (# and type observed near station) On Shore: _____ In Water: _____

Field measurements and notes:

Water Temperature: _____°C Water Level: Low Normal High Water Odor: _____

Wave Height (measuring stick): Max Height _____ - Min Height _____ = _____ inches or _____ ft Est.

Drift Direction: to _____ Wave Direction (angle): _____° Wave Conditions: Glassy Normal Choppy

Water Clarity: clear slightly turbid turbid opaque Water Color clear green brown other: _____

Turbidity Measurements: 1st Reading _____ 2nd Reading _____ 3rd reading (if needed) _____ NTU

Average (of 2 measurements that agree within 15% for >10 or within 1.5 NTU if <10 NTU) _____ NTU

Algae (circle): (1) None (2) Some (3) Visible floating (4) Thick layer (5) Multiple thick layers Type: Clumps Mat

Algal Clumps Size: <Peanut Peanut Golf-ball Orange Frisbee Mat Dimensions: _____ ft

Algae Buoyancy: Floating Suspended Bottom Algae Color: Green Brown Black _____ Algae In Sample Bottle: Y N

Debris (circle): (1) None (2) Some (3) Visible floating (4) Thick layer (5) Multiple thick layers

Litter on Shoreline (tar, oil/grease, plastics): None Low Moderate High Types: _____

Natural Debris on Shoreline (feathers, sticks, plants): None Low Moderate High Types: _____

Floatables (Litter) Present in Water: None Low Moderate High Types: _____

Floatables (Natural) Present in Water: None Low Moderate High Types: _____

Fecal material (circle): (1) None (2) Sparse (3) Some (4) Some multiple areas (5) all along shoreline



BUFFALO HARBOR STATE PARK –FIELD SHEET

FLOW MEASUREMENTS

MWS-05:

<i>Depth of Measurement</i>	<i>Velocity</i>	<i>Direction</i>	<i>Notes</i>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Notes: _____



BUFFALO HARBOR STATE PARK –FIELD SHEET

SAMPLED BY: _____

DATE: ____ / ____ / 2014

WEATHER CONDITIONS

Current Weather: ☐ Sunny ☐ Mostly Sunny ☐ Partly Cloudy ☐ Mostly Cloudy ☐ Cloudy ☐ Hazy

☐ Rain (_____ inches) Air Temperature: _____°C

Wind Conditions: ☐ Calm (___ mph), ☐ Breezy (___ mph), ☐ Windy (___ mph) Direction From: _____

Notes on Weather: _____

MONTHLY STATION MWS-06

Collection Depth _____ Collection time: _____

Time replicate: _____ Time field blank: _____ Pathogen sample collection time: _____

Number of People on Beach (____) in Water (____) Notes: _____

Wildlife (# and type observed near station) On Shore: _____ In Water: _____

Field measurements and notes:

Water Temperature: _____°C Water Level: Low Normal High Water Odor: _____

Wave Height (measuring stick): Max Height _____ - Min Height _____ = _____ inches or _____ ft Est.

Drift Direction: to _____ Wave Direction (angle): _____° Wave Conditions: Glassy Normal Choppy

Water Clarity: clear slightly turbid turbid opaque Water Color clear green brown other: _____

Turbidity Measurements: 1st Reading _____ 2nd Reading _____ 3rd reading (if needed) _____ NTU

Average (of 2 measurements that agree within 15% for >10 or within 1.5 NTU if <10 NTU) _____ NTU

Algae (circle): (1) None (2) Some (3) Visible floating (4) Thick layer (5) Multiple thick layers Type: Clumps Mat

Algal Clumps Size: <Peanut Peanut Golf-ball Orange Frisbee Mat Dimensions: _____ ft

Algae Buoyancy: Floating Suspended Bottom Algae Color: Green Brown Black _____ Algae In Sample Bottle: Y N

Debris (circle): (1) None (2) Some (3) Visible floating (4) Thick layer (5) Multiple thick layers

Litter on Shoreline (tar, oil/grease, plastics): None Low Moderate High Types: _____

Natural Debris on Shoreline (feathers, sticks, plants): None Low Moderate High Types: _____

Floatables (Litter) Present in Water: None Low Moderate High Types: _____

Floatables (Natural) Present in Water: None Low Moderate High Types: _____

Fecal material (circle): (1) None (2) Sparse (3) Some (4) Some multiple areas (5) all along shoreline



BUFFALO HARBOR STATE PARK –FIELD SHEET

FLOW MEASUREMENTS

MWS-06:

<i>Depth of Measurement</i>	<i>Velocity</i>	<i>Direction</i>	<i>Notes</i>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Notes: _____



BUFFALO HARBOR STATE PARK –FIELD SHEET

SAMPLED BY: _____

DATE: ____ / ____ / 2014

WEATHER CONDITIONS

Current Weather: ☐ Sunny ☐ Mostly Sunny ☐ Partly Cloudy ☐ Mostly Cloudy ☐ Cloudy ☐ Hazy

☐ Rain (_____ inches) Air Temperature: _____°C

Wind Conditions: ☐ Calm (___ mph), ☐ Breezy (___ mph), ☐ Windy (___ mph) Direction From: _____

Notes on Weather: _____

MONTHLY STATION MWS-07

Collection Depth _____ Collection time: _____

Time replicate: _____ Time field blank: _____ Pathogen sample collection time: _____

Number of People on Beach (____) in Water (____) Notes: _____

Wildlife (# and type observed near station) On Shore: _____ In Water: _____

Field measurements and notes:

Water Temperature: _____°C Water Level: Low Normal High Water Odor: _____

Wave Height (measuring stick): Max Height _____ - Min Height _____ = _____ inches or _____ ft Est.

Drift Direction: to _____ Wave Direction (angle): _____° Wave Conditions: Glassy Normal Choppy

Water Clarity: clear slightly turbid turbid opaque Water Color clear green brown other: _____

Turbidity Measurements: 1st Reading _____ 2nd Reading _____ 3rd reading (if needed) _____ NTU

Average (of 2 measurements that agree within 15% for >10 or within 1.5 NTU if <10 NTU) _____ NTU

Algae (circle): (1) None (2) Some (3) Visible floating (4) Thick layer (5) Multiple thick layers Type: Clumps Mat

Algal Clumps Size: <Peanut Peanut Golf-ball Orange Frisbee Mat Dimensions: _____ ft

Algae Buoyancy: Floating Suspended Bottom Algae Color: Green Brown Black _____ Algae In Sample Bottle: Y N

Debris (circle): (1) None (2) Some (3) Visible floating (4) Thick layer (5) Multiple thick layers

Litter on Shoreline (tar, oil/grease, plastics): None Low Moderate High Types: _____

Natural Debris on Shoreline (feathers, sticks, plants): None Low Moderate High Types: _____

Floatables (Litter) Present in Water: None Low Moderate High Types: _____

Floatables (Natural) Present in Water: None Low Moderate High Types: _____

Fecal material (circle): (1) None (2) Sparse (3) Some (4) Some multiple areas (5) all along shoreline



BUFFALO HARBOR STATE PARK –FIELD SHEET

FLOW MEASUREMENTS

MWS-07:

<i>Depth of Measurement</i>	<i>Velocity</i>	<i>Direction</i>	<i>Notes</i>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Notes: _____



BUFFALO HARBOR STATE PARK –FIELD SHEET

SAMPLED BY: _____

DATE: ____ / ____ / 2014

WEATHER CONDITIONS

Current Weather: ☐ Sunny ☐ Mostly Sunny ☐ Partly Cloudy ☐ Mostly Cloudy ☐ Cloudy ☐ Hazy

☐ Rain (_____ inches) Air Temperature: _____°C

Wind Conditions: ☐ Calm (___ mph), ☐ Breezy (___ mph), ☐ Windy (___ mph) Direction From: _____

Notes on Weather: _____

MONTHLY STATION MWS-08

Collection Depth _____ Collection time: _____

Time replicate: _____ Time field blank: _____ Pathogen sample collection time: _____

Number of People on Beach (____) in Water (____) Notes: _____

Wildlife (# and type observed near station) On Shore: _____ In Water: _____

Field measurements and notes:

Water Temperature: _____°C Water Level: Low Normal High Water Odor: _____

Wave Height (measuring stick): Max Height _____ - Min Height _____ = _____ inches or _____ ft Est.

Drift Direction: to _____ Wave Direction (angle): _____° Wave Conditions: Glassy Normal Choppy

Water Clarity: clear slightly turbid turbid opaque Water Color clear green brown other: _____

Turbidity Measurements: 1st Reading _____ 2nd Reading _____ 3rd reading (if needed) _____ NTU

Average (of 2 measurements that agree within 15% for >10 or within 1.5 NTU if <10 NTU) _____ NTU

Algae (circle): (1) None (2) Some (3) Visible floating (4) Thick layer (5) Multiple thick layers Type: Clumps Mat

Algal Clumps Size: <Peanut Peanut Golf-ball Orange Frisbee Mat Dimensions: _____ ft

Algae Buoyancy: Floating Suspended Bottom Algae Color: Green Brown Black _____ Algae In Sample Bottle: Y N

Debris (circle): (1) None (2) Some (3) Visible floating (4) Thick layer (5) Multiple thick layers

Litter on Shoreline (tar, oil/grease, plastics): None Low Moderate High Types: _____

Natural Debris on Shoreline (feathers, sticks, plants): None Low Moderate High Types: _____

Floatables (Litter) Present in Water: None Low Moderate High Types: _____

Floatables (Natural) Present in Water: None Low Moderate High Types: _____

Fecal material (circle): (1) None (2) Sparse (3) Some (4) Some multiple areas (5) all along shoreline



BUFFALO HARBOR STATE PARK –FIELD SHEET

FLOW MEASUREMENTS

MWS-08:

<i>Depth of Measurement</i>	<i>Velocity</i>	<i>Direction</i>	<i>Notes</i>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Notes: _____



BUFFALO HARBOR STATE PARK –FIELD SHEET

SAMPLED BY: _____

DATE: ____ / ____ / 2014

WEATHER CONDITIONS

Current Weather: ☐ Sunny ☐ Mostly Sunny ☐ Partly Cloudy ☐ Mostly Cloudy ☐ Cloudy ☐ Hazy

☐ Rain (_____ inches) Air Temperature: _____°C

Wind Conditions: ☐ Calm (___ mph), ☐ Breezy (___ mph), ☐ Windy (___ mph) Direction From: _____

Notes on Weather: _____

MONTHLY STATION MWS-09

Collection Depth _____ Collection time: _____

Time replicate: _____ Time field blank: _____ Pathogen sample collection time: _____

Number of People on Beach (____) in Water (____) Notes: _____

Wildlife (# and type observed near station) On Shore: _____ In Water: _____

Field measurements and notes:

Water Temperature: _____°C Water Level: Low Normal High Water Odor: _____

Wave Height (measuring stick): Max Height _____ - Min Height _____ = _____ inches or _____ ft Est.

Drift Direction: to _____ Wave Direction (angle): _____° Wave Conditions: Glassy Normal Choppy

Water Clarity: clear slightly turbid turbid opaque Water Color clear green brown other: _____

Turbidity Measurements: 1st Reading _____ 2nd Reading _____ 3rd reading (if needed) _____ NTU

Average (of 2 measurements that agree within 15% for >10 or within 1.5 NTU if <10 NTU) _____ NTU

Algae (circle): (1) None (2) Some (3) Visible floating (4) Thick layer (5) Multiple thick layers Type: Clumps Mat

Algal Clumps Size: <Peanut Peanut Golf-ball Orange Frisbee Mat Dimensions: _____ ft

Algae Buoyancy: Floating Suspended Bottom Algae Color: Green Brown Black _____ Algae In Sample Bottle: Y N

Debris (circle): (1) None (2) Some (3) Visible floating (4) Thick layer (5) Multiple thick layers

Litter on Shoreline (tar, oil/grease, plastics): None Low Moderate High Types: _____

Natural Debris on Shoreline (feathers, sticks, plants): None Low Moderate High Types: _____

Floatables (Litter) Present in Water: None Low Moderate High Types: _____

Floatables (Natural) Present in Water: None Low Moderate High Types: _____

Fecal material (circle): (1) None (2) Sparse (3) Some (4) Some multiple areas (5) all along shoreline



BUFFALO HARBOR STATE PARK –FIELD SHEET

FLOW MEASUREMENTS

MWS-09:

<i>Depth of Measurement</i>	<i>Velocity</i>	<i>Direction</i>	<i>Notes</i>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Notes: _____



BUFFALO HARBOR STATE PARK –FIELD SHEET

SAMPLED BY: _____

DATE: ____ / ____ / 2014

WEATHER CONDITIONS

Current Weather: ☐ Sunny ☐ Mostly Sunny ☐ Partly Cloudy ☐ Mostly Cloudy ☐ Cloudy ☐ Hazy

☐ Rain (_____ inches) Air Temperature: _____°C

Wind Conditions: ☐ Calm (___ mph), ☐ Breezy (___ mph), ☐ Windy (___ mph) Direction From: _____

Notes on Weather: _____

MONTHLY STATION MWS-10

Collection Depth _____ Collection time: _____

Time replicate: _____ Time field blank: _____ Pathogen sample collection time: _____

Number of People on Beach (____) in Water (____) Notes: _____

Wildlife (# and type observed near station) On Shore: _____ In Water: _____

Field measurements and notes:

Water Temperature: _____°C Water Level: Low Normal High Water Odor: _____

Wave Height (measuring stick): Max Height _____ - Min Height _____ = _____ inches or _____ ft Est.

Drift Direction: to _____ Wave Direction (angle): _____° Wave Conditions: Glassy Normal Choppy

Water Clarity: clear slightly turbid turbid opaque Water Color clear green brown other: _____

Turbidity Measurements: 1st Reading _____ 2nd Reading _____ 3rd reading (if needed) _____ NTU

Average (of 2 measurements that agree within 15% for >10 or within 1.5 NTU if <10 NTU) _____ NTU

Algae (circle): (1) None (2) Some (3) Visible floating (4) Thick layer (5) Multiple thick layers Type: Clumps Mat

Algal Clumps Size: <Peanut Peanut Golf-ball Orange Frisbee Mat Dimensions: _____ ft

Algae Buoyancy: Floating Suspended Bottom Algae Color: Green Brown Black _____ Algae In Sample Bottle: Y N

Debris (circle): (1) None (2) Some (3) Visible floating (4) Thick layer (5) Multiple thick layers

Litter on Shoreline (tar, oil/grease, plastics): None Low Moderate High Types: _____

Natural Debris on Shoreline (feathers, sticks, plants): None Low Moderate High Types: _____

Floatables (Litter) Present in Water: None Low Moderate High Types: _____

Floatables (Natural) Present in Water: None Low Moderate High Types: _____

Fecal material (circle): (1) None (2) Sparse (3) Some (4) Some multiple areas (5) all along shoreline



BUFFALO HARBOR STATE PARK –FIELD SHEET

FLOW MEASUREMENTS

MWS-10:

<i>Depth of Measurement</i>	<i>Velocity</i>	<i>Direction</i>	<i>Notes</i>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Notes: _____



2013 Buffalo Harbor State Park Data Summary Report

2013 Buffalo Harbor State Park Data Summary Erie County, Buffalo, New York

Ecology and Environment Engineering, P.C. (EEEPC), under contract to the New York State Office of Parks, Recreation, and Historic Preservation (ORPHP), conducted sampling of the Buffalo Harbor State Park (BHSP) property, located in Erie County, Buffalo, New York. The BHSP sampling area includes an existing beach and greenspace area (see Figure 1). This letter provides the analytical data obtained and the evaluation of these data.

Numerous investigations of the area were conducted beginning in the 1980s. Historical reports were reviewed and considered in the evaluation of the BHSP investigation area. Based on the review of those reports, a Sampling Analysis Plan (SAP) was prepared by EEEPC and submitted to OPRHP, the Erie County Department of Health (ECDOH), New York State Department of Health (NYSDOH), the New York State Department of Environmental Conservation (NYSDEC), Erie Canal Harbor Development Corporation (ECHDC), and United States Army Corps of Engineers for review and comment. Comments received from the agencies were incorporated into the SAP. Field activities were conducted during the fourth quarter of 2013.

Field Investigation

The purpose of the sampling was to evaluate the environmental conditions at the BHSP investigation area. Environmental sampling for chemical and/or bacteriological parameters of the following media was performed:

- Surface water (see Table 1 and 2 for analytical results) - from beach embayment (including pre- and post-rain event);
- Storm water outfall (see Table 2 for analytical results) – from two locations following a rain event;
- Sediment (see Table 3 for analytical results) - from beach embayment;
- Surface and subsurface soil (see Tables 4, 5, and 6 for analytical results) - from beach and greenspace (which consists of a former confined disposal facility [CDF]); and
- Groundwater (see Table 7 for analytical results) - from newly installed temporary groundwater monitor wells.

Figure 2 shows the sample locations, and Figures 3 and 4 show geologic cross sections of the area.

The following data was also collected during field activities:

- Groundwater elevation measurements (see Figure 5);

- Submerged aquatic vegetation beds in Lake Erie near the beach (see Figure 6); and
- Bathymetric survey of the beach embayment (see Figure 7).

Evaluation

The sample results were reviewed with OPRHP, ECHDC, NYSDOH and NYSDEC. NYSDOH and NYSDEC provided an interpretation of the data and guidance for additional sampling and mitigation measures for the proposed future use of the property. The following table contains a summary of the review and discussions held with OPRHP, NYSDOH and NYSDEC:

Bathing Beach	Evaluation	Mitigation/Future Studies
Sediment	Does not represent an exposure concern.	No mitigation required.
Surface Water	<ul style="list-style-type: none"> ■ Chemical results do not represent an exposure concern. ■ Bacteriological parameters - Sanitary Survey sampling required. 	<p>No mitigation required (chemical).</p> <p>Sanitary Survey.</p>
Surface water discharges/runoff	<ul style="list-style-type: none"> ■ Chemical results do not represent an exposure concern. ■ Bacteriological parameters - Sanitary Survey sampling required at southern outfall. 	<p>No mitigation required (chemical).</p> <p>Sanitary Survey.</p>
Soil/fill	<ul style="list-style-type: none"> ■ Sand/Gravel chemical results do not represent an exposure concern. ■ Non-native fill (beneath 0.5 to 4.0 feet of sand/gravel) represents an exposure concern for prolonged exposure. ■ Further characterize fill/slag present beneath the surface sand and gravel layer. 	<ul style="list-style-type: none"> ■ Recommended cover and demarcation layer for bathing beach and maintain existing cover for non-bathing beach. ■ 3-foot cover. ■ Demarcation. ■ Site Management Plan. <p>Potential further mitigation pending fill characterization.</p>

Bathing Beach	Evaluation	Mitigation/Future Studies
Groundwater	<ul style="list-style-type: none"> ■ Shallow groundwater chemical results do not represent an exposure concern. ■ Reduce potential for direct contact with groundwater. 	<ul style="list-style-type: none"> ■ 3-foot cover and demarcation layer placement. ■ Continue to restrict all uses of groundwater in the Site Management Plan as is currently done.
Greenspace		
Soil	<ul style="list-style-type: none"> ■ Current surface materials provide a barrier to dredge materials. ■ Recommend improvement of existing cover material. 	<ul style="list-style-type: none"> ■ 2-foot cover/buffer (total). ■ Demarcation. ■ Pavement where present or proposed serves as the cover. ■ Soil Management Plan. ■ Site Management Plan.
Groundwater	<ul style="list-style-type: none"> ■ Should not be used. 	<ul style="list-style-type: none"> ■ Maintain existing cover. ■ Clay dams in utility trenches. ■ Continue to restrict all uses of groundwater in the Site Management Plan as is currently done.

Upcoming 2014 Activities

After conferring with OPRHP, ECHDC, NYSDOH and NYSDEC it was decided that additional testing was required during the summer months. The following activities are planned for 2014:

- Sanitary Survey – including daily, weekly, and monthly sampling of surface water and storm water in the project area during the spring/summer months for bacteriological parameters;
- Further characterization of fill/slag present beneath the surface sand and gravel layer on the beach; and
- Design of greenspace enhancements incorporating mitigation measures listed above with construction scheduled for fall 2014.

Table 1 Summary of Analytical Results for Surface Water Samples
Buffalo Harbor State Park, Buffalo, New York

PRELIMINARY REPORT

Analyte	Location ID:	SD-01	SD-02	SD-03	SD-04	SD-04	SD-05	SD-06	SD-07	SD-08	SD-09	SD-10	SD-10	SD-11	SD-12	SD-13
	Sample Name:	SD-01-WS	SD-02-WS	SD-03-WS	SD-04-WS	SD-04-WS-FD	SD-05-WS	SD-06-WS	SD-07-WS	SD-08-WS	SD-09-WS	SD-10-WS	SD-10-WS-FD	SD-11-WS	SD-12-WS	SD-13-WS
	Depth ¹ :	0 - 4.8 ft	0 - 4 ft	0 - 4 ft	0 - 3.1 ft	0 - 3.1 ft	0 - 1.9 ft	0 - 7.5 ft	0 - 8.5 ft	0 - 16 ft	0 - 9 ft	0 - 9 ft	0 - 9 ft	0 - 13 ft	1 - 9.6 ft	0 - 14 ft
	Date:	10/25/13	10/25/13	10/25/13	10/25/13	10/25/13	10/25/13	10/25/13	10/25/13	10/25/13	10/25/13	10/25/13	10/25/13	10/25/13	10/22/13	10/25/13
Bacteriological Parameters by multiple methods (cfu/100ml)																
COLIFORM		690	720	610	650	610	680	920	680	510	770	460	490	600		340
ESCHERICHIA COLI (E. COLI)		20	30	10	30	40	20	90	10	10	20	10	10	50	40	20
FECAL COLIFORM		ND	10	10	10	ND	ND	30	ND	ND	20	20 J	40 J	ND	ND	20
ENTEROCOCCI		12 J	165 J	276 J	1203 J	1986 J	ND	ND	ND	ND	ND	1553 J	2420 J	980 J	4 J	1300 J
General Analytical Chemistry by multiple methods (mg/L)																
HARDNESS (AS CaCO3)		119	122	119	119	121	119	120	120	117	117	117	115	117	119	114
SULFATE (AS SO4)		32.8	32.8	33.7	33.3	33.1	33.6	32.8	32.9	51.9	32.9	33.1	32.7	33.3	50.5	32.4
OIL & GREASE, TOTAL REC		ND	ND	ND	3.6 J	1.6 J	ND	ND	3.4 J	3.6 J	3.8 J	ND	1.5 J	ND	1.5 J	ND
NITROGEN, KJELDAHL, TOTAL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.2	ND
NITROGEN, NITRATE-NITRITE		0.096	0.1	0.098	0.099	0.1	0.1 J	0.1 J	0.12	0.1	0.12	0.11	0.11	0.11	0.18	0.11
COD - CHEMICAL OXYGEN DEMAND		12.7	10.8	10.5	10.2	14.3	9 J	14.3	14.3	ND	ND	ND	ND	ND	11.2	ND
TOTAL DISSOLVED SOLIDS		154	176	169	165	164	199	171	160	165	162	145	152	164	173	162
PHOSPHORUS		ND	ND	ND	0.0077 J	0.0077 J	0.0058 J	0.011	0.017	0.0077 J	0.0058 J	0.024	ND	ND	ND	ND
BIOCHEMICAL OXYGEN DEMAND (BOD)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Metals by Method SW6010C (µg/L)																
ALUMINUM		ND	ND	ND	ND	ND	ND	ND	590	ND	ND	ND	ND	ND	260	ND
ANTIMONY		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ARSENIC		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BARIUM		25	26	25	25	25	24	25	28	24	24	25	25	25	26	25
BERYLLIUM		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CADMIUM		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CALCIUM		32900	33700	33000	33000	33500	32500	33100	33600	32500	32300	32200	31800	32400	32800	31600
CHROMIUM, TOTAL		ND	1.2 J	ND	ND	ND	ND	1.0 J	2.0 J	ND	ND	ND	ND	1.1 J	ND	ND
COBALT		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
COPPER		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.9 J
IRON		90	200	170	120	110	90	180	700	110	130	170	190	150	300	160
LEAD		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MAGNESIUM		8800	9100	8900	9000	9100	8800	9000	8800	8800	8700	8900	8700	8800	9000	8500
MANGANESE		6.7	11	9.4	7.5	7.2	6	12	32	7.6	8.7	9.5	9.7	8.8	17	11
NICKEL		ND	ND	ND	ND	ND	ND	ND	1.4 J	ND	1.3 J	ND	ND	ND	ND	1.3 J
POTASSIUM		1600	1700	1700	1700	1700	1600	1700	1800	1600	1600	1700	1600	1600	1600	1500
SELENIUM		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SILVER		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SODIUM		10100	10600	10100	10100	10400	10100	9900	10000	9900	9800	9800	9800	9800	9900	9600
THALLIUM		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
VANADIUM		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ZINC		5.9 J	7.2 J	3.6 J	8.6 J	7.1 J	6.9 J	2.6 J	7.5 J	19	4.4 J	10	7.7 J	17	ND	12
Mercury by Method SW7470A (µg/L)																
MERCURY		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cyanide by Method SW9012 (mg/L)																
CYANIDE		ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0056 J	ND	ND	ND	ND	ND
Organochlorine Pesticides by Method SW8081B (µg/L)																
ALDRIN		ND	ND	ND	ND	ND	ND	ND	0.0065 J	ND	ND	0.0065 J	ND	ND	ND	ND
ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)		0.0089 J	0.0085 J	0.0079 J	0.0092 J	ND	0.0074 J	0.0091 J	ND	0.015 J	ND	0.009 J	0.0099 J	0.018 J	0.0092 J	0.0079 J
ALPHA CHLORDANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ALPHA ENDOSULFAN		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BETA BHC (BETA HEXACHLOROCYCLOHEXANE)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BETA ENDOSULFAN		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DELTA BHC (DELTA HEXACHLOROCYCLOHEXANE)		0.081	0.094	0.064	0.057 J	0.18 J	0.064	0.016 J	0.07	0.28	0.012 J	0.072	0.031 J	0.22	ND	0.11
DIELDRIN		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ENDOSULFAN SULFATE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ENDRIN		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ENDRIN ALDEHYDE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ENDRIN KETONE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GAMMA BHC (LINDANE)		0.0075 J	0.0073 J	0.0068 J	0.0073 J	0.0066 J	0.0075 J	0.0074 J	0.0086 J	0.0068 J	0.0073 J	0.0078 J	0.0077 J	0.0072 J	0.0079 J	0.0087 J
GAMMA CHLORDANE		ND	0.037 J	0.042 J	ND	0.027 J	ND	ND	ND	0.026 J	ND	ND	ND	0.032 J	0.022 J	ND
HEPTACHLOR		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
HEPTACHLOR EPOXIDE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
METHOXYCHLOR		ND	ND	ND	ND	ND	ND	ND	ND	0.015 J	0.017 J	ND	ND	ND	ND	ND
P,P'-DDD		ND	0.011 J	0.012 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.01 J	ND
P,P'-DDE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.012 J	ND	ND
P,P'-DDT		ND	ND	ND	0.015 J	ND	0.016 J	0.015 J	0.015 J	0.014 J	ND	ND	0.014 J	0.017 J	ND	ND
TOXAPHENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table 1 Summary of Analytical Results for Surface Water Samples
Buffalo Harbor State Park, Buffalo, New York

PRELIMINARY REPORT

Analyte	Location ID:	SD-01	SD-02	SD-03	SD-04	SD-04	SD-05	SD-06	SD-07	SD-08	SD-09	SD-10	SD-10	SD-11	SD-12	SD-13
	Sample Name:	SD-01-WS	SD-02-WS	SD-03-WS	SD-04-WS	SD-04-WS-FD	SD-05-WS	SD-06-WS	SD-07-WS	SD-08-WS	SD-09-WS	SD-10-WS	SD-10-WS-FD	SD-11-WS	SD-12-WS	SD-13-WS
	Depth ¹ :	0 - 4.8 ft	0 - 4 ft	0 - 4 ft	0 - 3.1 ft	0 - 3.1 ft	0 - 1.9 ft	0 - 7.5 ft	0 - 8.5 ft	0 - 16 ft	0 - 9 ft	0 - 9 ft	0 - 9 ft	0 - 13 ft	1 - 9.6 ft	0 - 14 ft
	Date:	10/25/13	10/25/13	10/25/13	10/25/13	10/25/13	10/25/13	10/25/13	10/25/13	10/25/13	10/25/13	10/25/13	10/25/13	10/25/13	10/22/13	10/25/13
Polychlorinated Biphenyls by Method SW8082A (µg/L)																
PCB-1016 (AROCLOR 1016)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1221 (AROCLOR 1221)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1232 (AROCLOR 1232)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1242 (AROCLOR 1242)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1248 (AROCLOR 1248)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1254 (AROCLOR 1254)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1260 (AROCLOR 1260)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Volatile Organics by Method SW8260C (µg/L)																
1,1,1-TRICHLOROETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-TETRACHLOROETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-TRICHLOROETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-DICHLOROETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-DICHLOROETHENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-TRICHLOROBENZENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-TRIMETHYLBENZENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-DIBROMO-3-CHLOROPROPANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-DICHLOROBENZENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-DICHLOROETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-DICHLOROPROPANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-TRIMETHYLBENZENE (MESITYLENE)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-DICHLOROBENZENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-DICHLOROBENZENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-DIOXANE (P-DIOXANE)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-HEXANONE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ACETONE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BENZENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BROMODICHLROMETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BROMOFORM	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BROMOMETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CARBON DISULFIDE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CARBON TETRACHLORIDE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CHLOROBENZENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CHLOROETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CHLOROFORM	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CHLOROMETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CIS-1,2-DICHLOROETHYLENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CIS-1,3-DICHLOROPROPENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CYCLOHEXANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DIBROMOCHLOROMETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DICHLORODIFLUOROMETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ETHYLBENZENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ISOPROPYLBENZENE (CUMENE)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
METHYL ACETATE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
METHYL ETHYL KETONE (2-BUTANONE)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
METHYLCYCLOHEXANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
METHYLENE CHLORIDE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
N-BUTYLBENZENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
N-PROPYLBENZENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SEC-BUTYLBENZENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
STYRENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
T-BUTYLBENZENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TERT-BUTYL METHYL ETHER	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TETRACHLOROETHYLENE (PCE)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TOLUENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TRANS-1,2-DICHLOROETHENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TRANS-1,3-DICHLOROPROPENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TRICHLOROETHYLENE (TCE)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TRICHLOROFLUOROMETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
VINYL CHLORIDE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table 1 Summary of Analytical Results for Surface Water Samples
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PRELIMINARY REPORT

Analyte	Location ID:	SD-01	SD-02	SD-03	SD-04	SD-04	SD-05	SD-06	SD-07	SD-08	SD-09	SD-10	SD-10	SD-11	SD-12	SD-13
	Sample Name:	SD-01-WS	SD-02-WS	SD-03-WS	SD-04-WS	SD-04-WS-FD	SD-05-WS	SD-06-WS	SD-07-WS	SD-08-WS	SD-09-WS	SD-10-WS	SD-10-WS-FD	SD-11-WS	SD-12-WS	SD-13-WS
	Depth ¹ :	0 - 4.8 ft	0 - 4 ft	0 - 4 ft	0 - 3.1 ft	0 - 3.1 ft	0 - 1.9 ft	0 - 7.5 ft	0 - 8.5 ft	0 - 16 ft	0 - 9 ft	0 - 9 ft	0 - 9 ft	0 - 13 ft	1 - 9.6 ft	0 - 14 ft
	Date:	10/25/13	10/25/13	10/25/13	10/25/13	10/25/13	10/25/13	10/25/13	10/25/13	10/25/13	10/25/13	10/25/13	10/25/13	10/25/13	10/22/13	10/25/13
XYLENES, TOTAL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Semivolatile Organics by Method SW8270D (µg/L)																
2,4,5-TRICHLOROPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4,6-TRICHLOROPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-DICHLOROPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-DIMETHYLPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-DINITROPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-DINITROTOLUENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,6-DINITROTOLUENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-CHLORONAPHTHALENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-CHLOROPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-METHYLNAPHTHALENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-METHYLPHENOL (O-CRESOL)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-NITROANILINE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-NITROPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3,3'-DICHLOROBENZIDINE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3-NITROANILINE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4,6-DINITRO-2-METHYLPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-BROMOPHENYL PHENYL ETHER		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-CHLORO-3-METHYLPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-CHLOROANILINE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-CHLOROPHENYL PHENYL ETHER		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-METHYLPHENOL (P-CRESOL)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-NITROANILINE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-NITROPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ACENAPHTHENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ACENAPHTHYLENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ACETOPHENONE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ANTHRACENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ATRAZINE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BENZALDEHYDE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BENZO(A)ANTHRACENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BENZO(A)PYRENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BENZO(B)FLUORANTHENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BENZO(G,H,I)PERYLENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BENZO(K)FLUORANTHENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BENZYL BUTYL PHTHALATE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.2 J	ND
BIPHENYL (DIPHENYL)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BIS(2-CHLOROETHOXY) METHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BIS(2-CHLOROISOPROPYL) ETHER		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BIS(2-ETHYLHEXYL) PHTHALATE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.3 J	ND
CAPROLACTAM		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CARBAZOLE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CHRYSENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DIBENZ(A,H)ANTHRACENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DIBENZOFURAN		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DIETHYL PHTHALATE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DIMETHYL PHTHALATE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DI-N-BUTYL PHTHALATE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DI-N-OCTYLPHTHALATE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
FLUORANTHENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
FLUORENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
HEXACHLORO BENZENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
HEXACHLOROBUTADIENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
HEXACHLOROCYCLOPENTADIENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
HEXACHLOROETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
INDENO(1,2,3-C,D)PYRENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ISOPHORONE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
NAPHTHALENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
NITROBENZENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
N-NITROSODI-N-PROPYLAMINE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
N-NITROSODIPHENYLAMINE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table 1 Summary of Analytical Results for Surface Water Samples
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PRELIMINARY REPORT

Analyte	Location ID:	SD-01	SD-02	SD-03	SD-04	SD-04	SD-05	SD-06	SD-07	SD-08	SD-09	SD-10	SD-10	SD-11	SD-12	SD-13
	Sample Name:	SD-01-WS	SD-02-WS	SD-03-WS	SD-04-WS	SD-04-WS-FD	SD-05-WS	SD-06-WS	SD-07-WS	SD-08-WS	SD-09-WS	SD-10-WS	SD-10-WS-FD	SD-11-WS	SD-12-WS	SD-13-WS
	Depth ¹ :	0 - 4.8 ft	0 - 4 ft	0 - 4 ft	0 - 3.1 ft	0 - 3.1 ft	0 - 1.9 ft	0 - 7.5 ft	0 - 8.5 ft	0 - 16 ft	0 - 9 ft	0 - 9 ft	0 - 9 ft	0 - 13 ft	1 - 9.6 ft	0 - 14 ft
	Date:	10/25/13	10/25/13	10/25/13	10/25/13	10/25/13	10/25/13	10/25/13	10/25/13	10/25/13	10/25/13	10/25/13	10/25/13	10/25/13	10/22/13	10/25/13
PENTACHLOROPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PHENANTHRENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PYRENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Field Measurements																
CONDUCTIVITY (µS/cm)		347.5	294.1	288.3	286.4		286.4	288.5	286.7	287.6	286.9	285.7		285.2	896.2	283.7
PH (standard units)		5.21	5.82	6.62	6.83		7.12	7.77	7.48	7.23	7.81	7.56		7.41	6.63	7.74
TEMPERATURE (°C)		9.5	10.0	9.8	10.0		10.3	9.9	10.3	10.2	10.4	10.6		10.5	11.2	10.6
TURBIDITY (ntu)		3.10	4.38	3.70	2.95		2.87	3.31	3.78	3.27	3.52	5.65		4.11	5.18	4.20

Notes:

¹ Sample portions tested for bacteriological parameters were collected as grab samples from a

Key:

"-FD" denotes field duplicate sample

°C = degrees Celsius

µg/L = micrograms per liter

µS/cm = microSiemens per centimeter

cfu/100ml = colony forming units per 100 milliliters

J = estimated value

mg/L = milligrams per liter

ND = not detected

ntu = Nephelometric turbidity units

PCBs = polychlorinated biphenyls

Analyte	Location ID:	SW-01	SW-01	SW-02	SW-03	WST-01	WST-02
	Sample Name:	SW-01-20131031	SW-01-20131031-FD	SW-02-20131031	SW-03-20131031	WST-01-20131031	WST-02-20131031
	Depth:	1 - 1 ft	1 - 1 ft	1 - 1 ft	1 - 1 ft		
	Date:	10/31/13	10/31/13	10/31/13	10/31/13	10/31/13	10/31/13
Bacteriological Parameters by multiple methods (cfu/100ml)							
ESCHERICHIA COLI (E. COLI)		40	50	10	20	40	2100
FECAL COLIFORM		ND	10	ND	10	ND	2000
ENTEROCOCCI		4	4	3	5	3	1732
General Analytical Chemistry by multiple methods (mg/L)							
HARDNESS (AS CaCO3)		117	120	117	119	124	37.9
SULFATE (AS SO4)		33.6	33.6	33.2	32.8	37.2	ND
OIL & GREASE, TOTAL REC		ND	ND	ND	ND	ND	ND
NITROGEN, KJELDAHL, TOTAL		0.38	0.49	0.23 J	0.43	0.46 J	0.62
NITROGEN, NITRATE-NITRITE		0.079	0.078	0.078	0.075	0.081	0.34
COD - CHEMICAL OXYGEN DEMAND		11.5	7.7 J	9 J	6.7 J	13.4	32
TOTAL DISSOLVED SOLIDS		135	136	146	139	183	65
PHOSPHORUS		ND	ND	0.0058 J	ND	ND	0.039
BIOCHEMICAL OXYGEN DEMAND (BOD)		ND	ND	ND	3.1	ND	3.6
Metals by Method SW6010C (µg/L)							
ALUMINUM		76 J	74 J	75 J	66 J	77 J	340
ANTIMONY		ND	ND	ND	ND	ND	ND
ARSENIC		ND	ND	ND	ND	ND	ND
BARIUM		23	23	23	23	33	17
BERYLLIUM		ND	ND	ND	ND	ND	ND
CADMIUM		ND	ND	ND	ND	ND	ND
CALCIUM		32800	33700	32800	33400	35700	14400
CHROMIUM, TOTAL		ND	ND	ND	ND	ND	5.3
COBALT		ND	ND	ND	ND	ND	ND
COPPER		ND	ND	ND	ND	ND	ND
IRON		88	83	82	74	71	500
LEAD		ND	ND	ND	ND	ND	3.4 J
MAGNESIUM		8500	8700	8500	8700	8500	470
MANGANESE		6.5	6.4	6.3	6.6	8.6	21
NICKEL		ND	ND	ND	ND	ND	ND
POTASSIUM		1600	1600	1400	1400	2200	610
SELENIUM		ND	ND	ND	ND	ND	ND
SILVER		ND	ND	ND	ND	ND	ND
SODIUM		11300	11300	10100	10500	15900	5400
THALLIUM		ND	ND	ND	ND	ND	ND
VANADIUM		ND	ND	ND	ND	ND	1.7 J
ZINC		6.8 J	2.7 J	2.2 J	2 J	7.9 J	43
Mercury by Method SW7470A (mg/L)							
MERCURY		ND	ND	ND	ND	ND	ND

Analyte	Location ID:	SW-01	SW-01	SW-02	SW-03	WST-01	WST-02
	Sample Name:	SW-01-20131031	SW-01-20131031-FD	SW-02-20131031	SW-03-20131031	WST-01-20131031	WST-02-20131031
	Depth:	1 - 1 ft	1 - 1 ft	1 - 1 ft	1 - 1 ft		
	Date:	10/31/13	10/31/13	10/31/13	10/31/13	10/31/13	10/31/13
Cyanide by Method SW9012 (mg/L)							
CYANIDE		ND	ND	ND	ND	ND	ND
Organochlorine Pesticides by Method SW8081B (µg/L)							
ALDRIN		ND	ND	ND	ND	ND	ND
ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)		0.0085 J	ND	0.0074 J	ND	0.0076 J	0.01 J
ALPHA CHLORDANE		ND	ND	ND	ND	ND	ND
ALPHA ENDOSULFAN		ND	ND	ND	ND	ND	ND
BETA BHC (BETA HEXACHLOROCYCLOHEXANE)		ND	ND	ND	ND	ND	0.069
BETA ENDOSULFAN		ND	ND	ND	ND	ND	ND
DELTA BHC (DELTA HEXACHLOROCYCLOHEXANE)		ND	ND	ND	ND	ND	ND
DIELDRIN		ND	ND	ND	ND	ND	ND
ENDOSULFAN SULFATE		ND	ND	ND	ND	ND	ND
ENDRIN		ND	ND	ND	ND	ND	ND
ENDRIN ALDEHYDE		ND	ND	ND	ND	ND	ND
ENDRIN KETONE		ND	ND	ND	ND	ND	ND
GAMMA BHC (LINDANE)		ND	ND	ND	ND	0.0067 J	0.011 J
GAMMA CHLORDANE		ND	0.013 J	0.014 J	0.015 J	ND	0.011 J
HEPTACHLOR		ND	ND	ND	ND	ND	ND
HEPTACHLOR EPOXIDE		ND	ND	ND	ND	ND	ND
METHOXYCHLOR		ND	ND	ND	ND	ND	ND
P,P'-DDD		ND	ND	ND	ND	ND	ND
P,P'-DDE		ND	ND	ND	ND	ND	ND
P,P'-DDT		ND	ND	ND	ND	ND	ND
TOXAPHENE		ND	ND	ND	ND	ND	ND
Polychlorinated Biphenyls by Method SW8082A (µg/L)							
PCB-1016 (AROCLOR 1016)		ND	ND	ND	ND	ND	ND
PCB-1221 (AROCLOR 1221)		ND	ND	ND	ND	ND	ND
PCB-1232 (AROCLOR 1232)		ND	ND	ND	ND	ND	ND
PCB-1242 (AROCLOR 1242)		ND	ND	ND	ND	ND	ND
PCB-1248 (AROCLOR 1248)		ND	ND	ND	ND	ND	ND
PCB-1254 (AROCLOR 1254)		ND	ND	ND	ND	ND	ND
PCB-1260 (AROCLOR 1260)		ND	ND	ND	ND	ND	ND
Volatile Organics by Method SW8260C (µg/L)							
1,1,1-TRICHLOROETHANE		ND	ND	ND	ND	ND	ND
1,1,2,2-TETRACHLOROETHANE		ND	ND	ND	ND	ND	ND
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE		ND	ND	ND	ND	ND	ND
1,1,2-TRICHLOROETHANE		ND	ND	ND	ND	ND	ND
1,1-DICHLOROETHANE		ND	ND	ND	ND	ND	ND
1,1-DICHLOROETHENE		ND	ND	ND	ND	ND	ND

Analyte	Location ID:	SW-01	SW-01	SW-02	SW-03	WST-01	WST-02
	Sample Name:	SW-01-20131031	SW-01-20131031-FD	SW-02-20131031	SW-03-20131031	WST-01-20131031	WST-02-20131031
	Depth:	1 - 1 ft	1 - 1 ft	1 - 1 ft	1 - 1 ft		
	Date:	10/31/13	10/31/13	10/31/13	10/31/13	10/31/13	10/31/13
1,2,4-TRICHLOROBENZENE		ND	ND	ND	ND	ND	ND
1,2,4-TRIMETHYLBENZENE		ND	ND	ND	ND	ND	ND
1,2-DIBROMO-3-CHLOROPROPANE		ND	ND	ND	ND	ND	ND
1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)		ND	ND	ND	ND	ND	ND
1,2-DICHLOROBENZENE		ND	ND	ND	ND	ND	ND
1,2-DICHLOROETHANE		ND	ND	ND	ND	ND	ND
1,2-DICHLOROPROPANE		ND	ND	ND	ND	ND	ND
1,3,5-TRIMETHYLBENZENE (MESITYLENE)		ND	ND	ND	ND	ND	ND
1,3-DICHLOROBENZENE		ND	ND	ND	ND	ND	ND
1,4-DICHLOROBENZENE		ND	ND	ND	ND	ND	ND
1,4-DIOXANE (P-DIOXANE)		ND	ND	ND	ND	ND	ND
2-HEXANONE		ND	ND	ND	ND	ND	ND
ACETONE		ND	ND	ND	ND	ND	10
BENZENE		ND	ND	ND	ND	ND	ND
BROMODICHLROMETHANE		ND	ND	ND	ND	ND	ND
BROMOFORM		ND	ND	ND	ND	ND	ND
BROMOMETHANE		ND	ND	ND	ND	ND	ND
CARBON DISULFIDE		ND	ND	ND	ND	ND	ND
CARBON TETRACHLORIDE		ND	ND	ND	ND	ND	ND
CHLOROBENZENE		ND	ND	ND	ND	ND	ND
CHLOROETHANE		ND	ND	ND	ND	ND	ND
CHLOROFORM		ND	ND	ND	ND	ND	ND
CHLOROMETHANE		ND	ND	ND	ND	ND	ND
CIS-1,2-DICHLOROETHYLENE		ND	ND	ND	ND	ND	ND
CIS-1,3-DICHLOROPROPENE		ND	ND	ND	ND	ND	ND
CYCLOHEXANE		ND	ND	ND	ND	ND	ND
DIBROMOCHLOROMETHANE		ND	ND	ND	ND	ND	ND
DICHLORODIFLUOROMETHANE		ND	ND	ND	ND	ND	ND
ETHYLBENZENE		ND	ND	ND	ND	ND	ND
ISOPROPYLBENZENE (CUMENE)		ND	ND	ND	ND	ND	ND
METHYL ACETATE		ND	ND	ND	ND	ND	ND
METHYL ETHYL KETONE (2-BUTANONE)		ND	ND	ND	ND	ND	ND
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)		ND	ND	ND	ND	ND	ND
METHYLCYCLOHEXANE		ND	ND	ND	ND	ND	ND
METHYLENE CHLORIDE		ND	ND	ND	ND	ND	ND
N-BUTYLBENZENE		ND	ND	ND	ND	ND	ND
N-PROPYLBENZENE		ND	ND	ND	ND	ND	ND
SEC-BUTYLBENZENE		ND	ND	ND	ND	ND	ND

Analyte	Location ID:	SW-01	SW-01	SW-02	SW-03	WST-01	WST-02
	Sample Name:	SW-01-20131031	SW-01-20131031-FD	SW-02-20131031	SW-03-20131031	WST-01-20131031	WST-02-20131031
	Depth:	1 - 1 ft	1 - 1 ft	1 - 1 ft	1 - 1 ft		
	Date:	10/31/13	10/31/13	10/31/13	10/31/13	10/31/13	10/31/13
STYRENE		ND	ND	ND	ND	ND	ND
T-BUTYLBENZENE		ND	ND	ND	ND	ND	ND
TERT-BUTYL METHYL ETHER		ND	ND	ND	ND	ND	ND
TETRACHLOROETHYLENE (PCE)		ND	ND	ND	ND	ND	ND
TOLUENE		ND	ND	ND	ND	ND	ND
TRANS-1,2-DICHLOROETHENE		ND	ND	ND	ND	ND	ND
TRANS-1,3-DICHLOROPROPENE		ND	ND	ND	ND	ND	ND
TRICHLOROETHYLENE (TCE)		ND	ND	ND	ND	ND	ND
TRICHLOROFLUOROMETHANE		ND	ND	ND	ND	ND	ND
VINYL CHLORIDE		ND	ND	ND	ND	ND	ND
XYLENES, TOTAL		ND	ND	ND	ND	ND	ND
Semivolatile Organics by Method SW8270D (µg/L)							
2,4,5-TRICHLOROPHENOL		ND	ND	ND	ND	ND	ND
2,4,6-TRICHLOROPHENOL		ND	ND	ND	ND	ND	ND
2,4-DICHLOROPHENOL		ND	ND	ND	ND	ND	ND
2,4-DIMETHYLPHENOL		ND	ND	ND	ND	ND	ND
2,4-DINITROPHENOL		ND	ND	ND	ND	ND	ND
2,4-DINITROTOLUENE		ND	ND	ND	ND	ND	ND
2,6-DINITROTOLUENE		ND	ND	ND	ND	ND	ND
2-CHLORONAPHTHALENE		ND	ND	ND	ND	ND	ND
2-CHLOROPHENOL		ND	ND	ND	ND	ND	ND
2-METHYLNAPHTHALENE		ND	ND	ND	ND	ND	ND
2-METHYLPHENOL (O-CRESOL)		ND	ND	ND	ND	ND	ND
2-NITROANILINE		ND	ND	ND	ND	ND	ND
2-NITROPHENOL		ND	ND	ND	ND	ND	ND
3,3'-DICHLOROBENZIDINE		ND	ND	ND	ND	ND	ND
3-NITROANILINE		ND	ND	ND	ND	ND	ND
4,6-DINITRO-2-METHYLPHENOL		ND	ND	ND	ND	ND	ND
4-BROMOPHENYL PHENYL ETHER		ND	ND	ND	ND	ND	ND
4-CHLORO-3-METHYLPHENOL		ND	ND	ND	ND	ND	ND
4-CHLOROANILINE		ND	ND	ND	ND	ND	ND
4-CHLOROPHENYL PHENYL ETHER		ND	ND	ND	ND	ND	ND
4-METHYLPHENOL (P-CRESOL)		ND	ND	ND	ND	ND	ND
4-NITROANILINE		ND	ND	ND	ND	ND	ND
4-NITROPHENOL		ND	ND	ND	ND	ND	ND
ACENAPHTHENE		ND	ND	ND	ND	ND	ND
ACENAPHTHYLENE		ND	ND	ND	ND	ND	ND
ACETOPHENONE		ND	ND	ND	ND	ND	ND
ANTHRACENE		ND	ND	ND	ND	ND	ND

Analyte	Location ID:	SW-01	SW-01	SW-02	SW-03	WST-01	WST-02
	Sample Name:	SW-01-20131031	SW-01-20131031-FD	SW-02-20131031	SW-03-20131031	WST-01-20131031	WST-02-20131031
	Depth:	1 - 1 ft	1 - 1 ft	1 - 1 ft	1 - 1 ft		
	Date:	10/31/13	10/31/13	10/31/13	10/31/13	10/31/13	10/31/13
ATRAZINE		ND	ND	ND	ND	ND	ND
BENZALDEHYDE		ND	ND	ND	ND	ND	ND
BENZO(A)ANTHRACENE		ND	ND	ND	ND	ND	ND
BENZO(A)PYRENE		ND	ND	ND	ND	ND	ND
BENZO(B)FLUORANTHENE		ND	ND	ND	ND	ND	ND
BENZO(G,H,I)PERYLENE		ND	ND	ND	ND	ND	ND
BENZO(K)FLUORANTHENE		ND	ND	ND	ND	ND	ND
BENZYL BUTYL PHTHALATE		ND	ND	ND	ND	ND	ND
BIPHENYL (DIPHENYL)		ND	ND	ND	ND	ND	ND
BIS(2-CHLOROETHOXY) METHANE		ND	ND	ND	ND	ND	ND
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)		ND	ND	ND	ND	ND	ND
BIS(2-CHLOROISOPROPYL) ETHER		ND	ND	ND	ND	ND	ND
BIS(2-ETHYLHEXYL) PHTHALATE		ND	ND	ND	ND	ND	ND
CAPROLACTAM		ND	ND	ND	ND	ND	ND
CARBAZOLE		ND	ND	ND	ND	ND	ND
CHRYSENE		ND	ND	ND	ND	ND	ND
DIBENZ(A,H)ANTHRACENE		ND	ND	ND	ND	ND	ND
DIBENZOFURAN		ND	ND	ND	ND	ND	ND
DIETHYL PHTHALATE		ND	ND	ND	ND	ND	ND
DIMETHYL PHTHALATE		ND	ND	ND	ND	ND	ND
DI-N-BUTYL PHTHALATE		ND	ND	ND	ND	ND	ND
DI-N-OCTYLPHTHALATE		ND	ND	ND	ND	ND	ND
FLUORANTHENE		ND	ND	ND	ND	ND	ND
FLUORENE		ND	ND	ND	ND	ND	ND
HEXACHLOROBENZENE		ND	ND	ND	ND	ND	ND
HEXACHLOROBUTADIENE		ND	ND	ND	ND	ND	ND
HEXACHLOROCYCLOPENTADIENE		ND	ND	ND	ND	ND	ND
HEXACHLOROETHANE		ND	ND	ND	ND	ND	ND
INDENO(1,2,3-C,D)PYRENE		ND	ND	ND	ND	ND	ND
ISOPHORONE		ND	ND	ND	ND	ND	ND
NAPHTHALENE		ND	ND	ND	ND	ND	ND
NITROBENZENE		ND	ND	ND	ND	ND	ND
N-NITROSODI-N-PROPYLAMINE		ND	ND	ND	ND	ND	ND
N-NITROSODIPHENYLAMINE		ND	ND	ND	ND	ND	ND
PENTACHLOROPHENOL		ND	ND	ND	ND	ND	ND
PHENANTHRENE		ND	ND	ND	ND	ND	ND
PHENOL		ND	ND	ND	ND	ND	ND
PYRENE		ND	ND	ND	ND	ND	ND

Table 2 Summary of Analytical Results for Storm Water and Near-Shore Surface Water Samples
Buffalo Harbor State Park, Buffalo, New York

PRELIMINARY REPORT

Analyte	Location ID:	SW-01	SW-01	SW-02	SW-03	WST-01	WST-02
	Sample Name:	SW-01-20131031	SW-01-20131031-FD	SW-02-20131031	SW-03-20131031	WST-01-20131031	WST-02-20131031
	Depth:	1 - 1 ft	1 - 1 ft	1 - 1 ft	1 - 1 ft		
	Date:	10/31/13	10/31/13	10/31/13	10/31/13	10/31/13	10/31/13
Field Measurements							
CONDUCTIVITY (µS/cm)		292.5		294.5	285.2	300.0	104.7
PH (standard units)		8.70		8.73	8.77	8.01	8.76
TEMPERATURE (°C)		13.8		13.9	14.0	12.0	14.7
TURBIDITY (ntu)		2.71		3.13	2.83	4.28	13.9

Key:

"-FD" denotes field duplicate sample

°C = degrees Celsius

µg/L = micrograms per liter

µS/cm = microSiemens per centimeter

cfu/100ml = colony forming units per 100 milliliters

J = Estimated value

mg/L = milligrams per liter

ND = Not detected

ntu = Nephelometric turbidity units

Table 3 Summary of Analytical Results for Sediment Samples
Buffalo Harbor State Park, Buffalo, NY

PRELIMINARY REPORT

Analyte	Location ID:	SD-01	SD-02	SD-03	SD-03	SD-04	SD-05	SD-05	SD-06	SD-06	SD-07	SD-07	SD-08	SD-08	SD-09
	Sample Name:	SD-01-Z0	SD-02-Z0	SD-03-Z0	FD	SD-04-Z0	SD-05-Z0	FD	SD-06-Z0	SD-06-Z2	SD-07-Z0	SD-07-Z2	SD-08-Z0	SD-08-Z3	SD-09-Z0
	Depth:	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	2 - 3 ft	0 - 1 ft	2 - 3 ft	0 - 2 ft	3 - 4 ft	0 - 1 ft
	Date:	10/28/13	10/28/13	10/28/13	10/28/13	10/29/13	10/29/13	10/29/13	10/28/13	10/28/13	10/28/13	10/28/13	10/29/13	10/29/13	10/28/13
Oil & Grease (n-Hexane Extractable Material) by Method E1664A (mg/kg)															
OIL & GREASE, TOTAL REC		440	481	320	190	220	248	ND	389	ND	292	ND	ND	ND	273
TOC by Lloyd Kahn Method (mg/kg)															
TOTAL ORGANIC CARBON		2430	3070	2710	3090	2220	6180	3260	15400	29200	67500	3490	20900	19500	22900
Metals by Method SW6010C (mg/kg)															
ALUMINUM		1730 J	2120 J	1960	1970	1910	2050	1630	5070	9820	7080	1800	5080 J	6280	4700
ANTIMONY		ND	ND	ND	ND	ND	0.47 J	ND	ND	ND	ND	ND	ND	ND	ND
ARSENIC		2.8	2.3	2.9	3.2	2.9	5.3 J	2.4 J	6.9	4.9	6.1	2.7	4.3	6.8	3.9
BARIUM		8.3	10.6	8.2	8.2	8.7	19.3 J	8.3 J	37.3	64.1	99.2	9.4	38.3	44.6	33.5
BERYLLIUM		0.14 J	0.16 J	0.14 J	0.14 J	0.12 J	0.21	0.12 J	0.42	0.53	0.48	0.15 J	0.34	0.41	0.29
CADMIUM		0.063 J	0.066 J	0.042 J	0.046 J	ND	0.062 J	0.044 J	0.42	0.17 J	0.59	0.065 J	0.35	0.46	0.46
CALCIUM		12100	14100	13100	14400	11300	16100	12400	36900	34000	29600	12000	24700	28500	45000
CHROMIUM, TOTAL		4.9	5.6	3.7	5.3	3.1	7.2 J	3 J	19.3	14.8	21.3	4.3	20.9 J	22.4	11.4
COBALT		2.4	2.4	2.6	2.6	2.5	1.9	2.2	5.4	12.4	5.3	2.8	4.9 J	6.2	4.8
COPPER		6.6	5.7	5.6	6.8	5.3	6	4.4	19.7	27.4	33.1	4.2	20.2 J	26.3	13
IRON		7820	6750 J	6500	6620	5600	11200	5380	16900	25000	14400	8240	13400	16200	11500
LEAD		5.7	5.3	4.4	4.6	3.6	22.8 J	3.3 J	45.9	16.5	15.3	4.6	27.8 J	50.1	13.2
MAGNESIUM		3190	2990	2720	2850	3050	2750	3310	5490	11900	4260	3190	3870 J	6530	6590
MANGANESE		134 J	145 J	113	140	114	260	124	388	438	264	107	289	442	216
NICKEL		6	6.6	7.1	7.1	6.5	5.6	5.5	15.7	33.5	19.6	6.2	15.5 J	19	13.1
POTASSIUM		331	392	406	410	400	266	344	905	1830	1110	400	776 J	1100	1110
SELENIUM		ND	ND	ND	ND	ND	ND	ND	0.65 J	0.73 J	2 J	ND	0.78 J	0.5 J	1.1 J
SILVER		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SODIUM		70.2 J	78.9 J	191	207	138 J	106 J	124 J	101 J	139 J	82.4 J	67.5 J	71.4 J	93.9 J	111 J
THALLIUM		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
VANADIUM		10.9	8.1	7.5	8.6	5.5	10.1	5.4	13.6	16.4	16.7	11.6	12.8 J	14.4	10
ZINC		29.8	27.4	25.4	23.9	19.7	63.2 J	21.2 J	147	72	93	23.2	100	173	110
Mercury by Method SW7471B (mg/kg)															
MERCURY		ND	0.0087 J	ND	ND	ND	ND	ND	0.066	0.011 J	0.065	ND	0.06	0.07	0.029
Cyanide by Method SW9012 (mg/kg)															
CYANIDE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Organochlorine Pesticides by Method SW8081B (mg/kg)															
ALDRIN		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)		ND	ND	ND	ND	ND	ND	ND	ND	ND	0.002 J	ND	ND	ND	0.0021 J
ALPHA CHLORDANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ALPHA ENDOSULFAN		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BETA BHC (BETA HEXACHLOROCYCLOHEXANE)		0.00047 J	ND	ND	ND	ND	ND	ND	ND	0.0087 J	ND	ND	ND	ND	0.0014 J
BETA ENDOSULFAN		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DELTA BHC (DELTA HEXACHLOROCYCLOHEXANE)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DIELDRIN		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ENDOSULFAN SULFATE		ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0012 J	ND	ND	0.0033 J	ND
ENDRIN		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ENDRIN ALDEHYDE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ENDRIN KETONE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table 3 Summary of Analytical Results for Sediment Samples
Buffalo Harbor State Park, Buffalo, NY

PRELIMINARY REPORT

Analyte	Location ID:	SD-01	SD-02	SD-03	SD-03	SD-04	SD-05	SD-05	SD-06	SD-06	SD-07	SD-07	SD-08	SD-08	SD-09
	Sample Name:	SD-01-Z0	SD-02-Z0	SD-03-Z0	FD	SD-04-Z0	SD-05-Z0	FD	SD-06-Z0	SD-06-Z2	SD-07-Z0	SD-07-Z2	SD-08-Z0	SD-08-Z3	SD-09-Z0
	Depth:	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	2 - 3 ft	0 - 1 ft	2 - 3 ft	0 - 2 ft	3 - 4 ft	0 - 1 ft
	Date:	10/28/13	10/28/13	10/28/13	10/28/13	10/29/13	10/29/13	10/29/13	10/28/13	10/28/13	10/28/13	10/28/13	10/29/13	10/29/13	10/28/13
GAMMA BHC (LINDANE)		ND	0.00089 J	ND	ND	0.00057 J	0.0012 J	0.00058 J	ND	ND	0.0012 J	ND	0.0042 J	0.0029 J	0.00079 J
GAMMA CHLORDANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
HEPTACHLOR		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
HEPTACHLOR EPOXIDE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
METHOXYCHLOR		ND	0.0017 J	ND	ND	ND	ND	ND	0.015 J	ND	0.0022 J	ND	ND	ND	0.0012 J
P,P'-DDD		ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0016 J	ND	ND	ND	ND
P,P'-DDE		ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0018 J	ND	ND	ND	0.0012 J
P,P'-DDT		0.00066 J	0.00068 J	ND	0.0068 J	0.00068 J	0.00063 J	0.00051 J	ND	ND	0.0028 J	ND	0.0027 J	0.004 J	0.0019 J
TOXAPHENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCBs by Method SW8082A (mg/kg)															
PCB-1016 (AROCLOR 1016)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1221 (AROCLOR 1221)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1232 (AROCLOR 1232)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1242 (AROCLOR 1242)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1248 (AROCLOR 1248)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1254 (AROCLOR 1254)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1260 (AROCLOR 1260)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total PCBs		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Volatile Organics by Method SW8260C (mg/kg)															
1,1,1-TRICHLOROETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-TETRACHLOROETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-TRICHLOROETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-DICHLOROETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-DICHLOROETHENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-TRICHLOROBENZENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-TRIMETHYLBENZENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-DIBROMO-3-CHLOROPROPANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-DICHLOROBENZENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-DICHLOROETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-DICHLOROPROPANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-TRIMETHYLBENZENE (MESITYLENE)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-DICHLOROBENZENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-DICHLOROBENZENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-DIOXANE (P-DIOXANE)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-HEXANONE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ACETONE		ND	ND	ND	ND	ND	ND	ND	0.027 J	ND	0.21	ND	0.047 J	0.0086 J	0.041
BENZENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BROMODICHLOROMETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BROMOFORM		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BROMOMETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CARBON DISULFIDE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table 3 Summary of Analytical Results for Sediment Samples
Buffalo Harbor State Park, Buffalo, NY

PRELIMINARY REPORT

Analyte	Location ID:	SD-01	SD-02	SD-03	SD-03	SD-04	SD-05	SD-05	SD-06	SD-06	SD-07	SD-07	SD-08	SD-08	SD-09
	Sample Name:	SD-01-Z0	SD-02-Z0	SD-03-Z0	FD	SD-04-Z0	SD-05-Z0	FD	SD-06-Z0	SD-06-Z2	SD-07-Z0	SD-07-Z2	SD-08-Z0	SD-08-Z3	SD-09-Z0
	Depth:	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	2 - 3 ft	0 - 1 ft	2 - 3 ft	0 - 2 ft	3 - 4 ft	0 - 1 ft
	Date:	10/28/13	10/28/13	10/28/13	10/28/13	10/29/13	10/29/13	10/29/13	10/28/13	10/28/13	10/28/13	10/28/13	10/29/13	10/29/13	10/28/13
CARBON TETRACHLORIDE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CHLOROBENZENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CHLOROETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CHLOROFORM		ND	ND	ND	ND	ND	0.0023 J	ND	ND	ND	ND	ND	ND	ND	ND
CHLOROMETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CIS-1,2-DICHLOROETHYLENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CIS-1,3-DICHLOROPROPENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CYCLOHEXANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DIBROMOCHLOROMETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DICHLORODIFLUOROMETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ETHYLBENZENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ISOPROPYLBENZENE (CUMENE)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
METHYL ACETATE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
METHYL ETHYL KETONE (2-BUTANONE)		ND	ND	ND	ND	ND	ND	ND	ND	ND	0.058	ND	ND	ND	ND
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
METHYLCYCLOHEXANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
METHYLENE CHLORIDE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
N-BUTYLBENZENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
N-PROPYLBENZENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SEC-BUTYLBENZENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
STYRENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
T-BUTYLBENZENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TERT-BUTYL METHYL ETHER		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TETRACHLOROETHYLENE (PCE)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TOLUENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TRANS-1,2-DICHLOROETHENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TRANS-1,3-DICHLOROPROPENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TRICHLOROETHYLENE (TCE)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TRICHLOROFLUOROMETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
VINYL CHLORIDE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
XYLENES, TOTAL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Semivolatile Organics by Method SW8270D (mg/kg)															
2,4,5-TRICHLOROPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4,6-TRICHLOROPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-DICHLOROPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-DIMETHYLPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-DINITROPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-DINITROTOLUENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,6-DINITROTOLUENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-CHLORONAPHTHALENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-CHLOROPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-METHYLNAPHTHALENE		ND	ND	ND	ND	ND	ND	ND	0.019 J	ND	ND	ND	0.017 J	0.018 J	ND
2-METHYLPHENOL (O-CRESOL)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table 3 Summary of Analytical Results for Sediment Samples
Buffalo Harbor State Park, Buffalo, NY

PRELIMINARY REPORT

Analyte	Location ID:	SD-01	SD-02	SD-03	SD-03	SD-04	SD-05	SD-05	SD-06	SD-06	SD-07	SD-07	SD-08	SD-08	SD-09
	Sample Name:	SD-01-Z0	SD-02-Z0	SD-03-Z0	FD	SD-04-Z0	SD-05-Z0	FD	SD-06-Z0	SD-06-Z2	SD-07-Z0	SD-07-Z2	SD-08-Z0	SD-08-Z3	SD-09-Z0
	Depth:	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	2 - 3 ft	0 - 1 ft	2 - 3 ft	0 - 2 ft	3 - 4 ft	0 - 1 ft
	Date:	10/28/13	10/28/13	10/28/13	10/28/13	10/29/13	10/29/13	10/29/13	10/28/13	10/28/13	10/28/13	10/28/13	10/29/13	10/29/13	10/28/13
2-NITROANILINE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-NITROPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3,3'-DICHLOROBENZIDINE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3-NITROANILINE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4,6-DINITRO-2-METHYLPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-BROMOPHENYL PHENYL ETHER		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-CHLORO-3-METHYLPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-CHLOROANILINE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-CHLOROPHENYL PHENYL ETHER		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-METHYLPHENOL (P-CRESOL)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-NITROANILINE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-NITROPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ACENAPHTHENE		ND	ND	ND	ND	ND	ND	ND	0.092 J	ND	ND	ND	0.048 J	0.043 J	ND
ACENAPHTHYLENE		ND	ND	ND	ND	ND	ND	ND	0.17 J	ND	ND	ND	0.055 J	0.06 J	ND
ACETOPHENONE		ND	ND	ND	ND	ND	ND	ND	0.37 J	ND	ND	ND	ND	ND	ND
ANTHRACENE		ND	ND	ND	ND	ND	ND	ND	0.39 J	ND	0.12 J	ND	0.14 J	0.15 J	0.046 J
ATRAZINE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BENZALDEHYDE		ND	ND	ND	ND	ND	ND	ND	0.11 J	ND	0.07 J	ND	ND	ND	0.048 J
BENZO(A)ANTHRACENE		0.026 J	0.074 J	ND	ND	ND	0.044 J	ND	1.2 J	ND	0.31 J	0.037 J	0.44 J	0.45 J	0.18 J
BENZO(A)PYRENE		0.024 J	0.053 J	ND	ND	ND	0.032 J	ND	1.2 J	ND	0.27 J	0.059 J	0.43 J	0.42 J	0.17 J
BENZO(B)FLUORANTHENE		0.032 J	0.095 J	ND	ND	ND	0.063 J	ND	1.6 J	ND	0.34 J	ND	0.52 J	0.54 J	0.26 J
BENZO(G,H,I)PERYLENE		ND	ND	ND	ND	ND	0.021 J	ND	0.82 J	ND	0.16 J	0.013 J	0.22 J	0.16 J	0.13 J
BENZO(K)FLUORANTHENE		0.019 J	0.09 J	ND	ND	ND	0.02 J	ND	0.71 J	ND	0.18 J	ND	0.25 J	0.28 J	0.094 J
BENZYL BUTYL PHTHALATE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BIPHENYL (DIPHENYL)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BIS(2-CHLOROETHOXY) METHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BIS(2-CHLOROISOPROPYL) ETHER		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BIS(2-ETHYLHEXYL) PHTHALATE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CAPROLACTAM		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CARBAZOLE		ND	ND	ND	ND	ND	ND	ND	0.073 J	ND	ND	ND	0.056 J	0.035 J	0.012 J
CHRYSENE		0.044 J	0.084 J	ND	ND	ND	0.053 J	ND	1.4 J	ND	0.33 J	0.039 J	0.47 J	0.49 J	0.2 J
DIBENZ(A,H)ANTHRACENE		ND	ND	ND	ND	ND	ND	ND	0.23 J	ND	0.065 J	ND	0.061 J	0.058 J	0.044 J
DIBENZOFURAN		ND	ND	ND	ND	ND	ND	ND	0.058 J	ND	ND	ND	0.037 J	0.033 J	ND
DIETHYL PHTHALATE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DIMETHYL PHTHALATE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DI-N-BUTYL PHTHALATE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DI-N-OCTYLPHTHALATE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
FLUORANTHENE		0.084 J	0.21 J	ND	ND	0.018 J	0.093 J	0.018 J	2.7 J	ND	0.56 J	0.059 J	0.91 J	0.89 J	0.35 J
FLUORENE		ND	ND	ND	ND	ND	ND	ND	0.12 J	ND	ND	ND	0.065 J	0.062 J	ND
HEXACHLOROBENZENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
HEXACHLOROBUTADIENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
HEXACHLOROCYCLOPENTADIENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table 3 Summary of Analytical Results for Sediment Samples
Buffalo Harbor State Park, Buffalo, NY

PRELIMINARY REPORT

Analyte	Location ID:	SD-01	SD-02	SD-03	SD-03	SD-04	SD-05	SD-05	SD-06	SD-06	SD-07	SD-07	SD-08	SD-08	SD-09
	Sample Name:	SD-01-Z0	SD-02-Z0	SD-03-Z0	FD	SD-04-Z0	SD-05-Z0	FD	SD-06-Z0	SD-06-Z2	SD-07-Z0	SD-07-Z2	SD-08-Z0	SD-08-Z3	SD-09-Z0
	Depth:	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	2 - 3 ft	0 - 1 ft	2 - 3 ft	0 - 2 ft	3 - 4 ft	0 - 1 ft
	Date:	10/28/13	10/28/13	10/28/13	10/28/13	10/29/13	10/29/13	10/29/13	10/28/13	10/28/13	10/28/13	10/28/13	10/29/13	10/29/13	10/28/13
HEXACHLOROETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
INDENO(1,2,3-C,D)PYRENE		0.015 J	0.03 J	ND	ND	ND	0.024 J	ND	0.76 J	ND	0.15 J	0.016 J	0.24 J	0.18 J	0.11 J
ISOPHORONE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
NAPHTHALENE		ND	ND	ND	ND	ND	ND	ND	0.11 J	ND	ND	ND	0.062 J	0.078 J	ND
NITROBENZENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
N-NITROSODI-N-PROPYLAMINE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
N-NITROSODIPHENYLAMINE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PENTACHLOROPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PHENANTHRENE		0.032 J	0.056 J	ND	ND	ND	0.057 J	ND	1.1 J	ND	0.24 J	0.051 J	0.5 J	0.48 J	0.15 J
PHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PYRENE		0.062 J	0.14 J	ND	ND	ND	0.07 J	0.016 J	2 J	ND	0.43 J	0.048 J	0.66 J	0.63 J	0.27 J

Key:
J = estimated value
mg/kg = milligrams per kilogram
ND = not detected
PCBs = polychlorinated biphenyl

Table 3 Summary of Analytical Results for Sediment Samples
Buffalo Harbor State Park, Buffalo, NY

PRELIMINARY REPORT

Analyte	Location ID:	SD-09	SD-09	SD-10	SD-10	SD-10	SD-11	SD-11	SD-12	SD-12	SD-12	SD-13	SD-13
	Sample Name:	FD	SD-09-Z3	SD-10-Z0	SD-10-Z2	SD-10-Z4	SD-11-Z0	SD-11-Z1	SD-12-Z0	SD-12-Z3	SD-12-Z6	SD-13-Z0	SD-13-Z1
	Depth:	0 - 1 ft	3 - 3.5 ft	0 - 1 ft	2 - 3 ft	4 - 5 ft	0 - 1 ft	1 - 2.5 ft	0 - 1 ft	3 - 4 ft	6 - 7.3 ft	0 - 1 ft	1 - 2 ft
	Date:	10/28/13	10/28/13	10/29/13	10/29/13	10/29/13	10/29/13	10/29/13	10/29/13	10/29/13	10/29/13	10/29/13	10/29/13
Oil & Grease (n-Hexane Extractable Material) by Method E1664A (m													
OIL & GREASE, TOTAL REC		216	ND	330	229	212	ND	268	280	208	ND	236	ND
TOC by Lloyd Kahn Method (mg/kg)													
TOTAL ORGANIC CARBON		21000	40000	20800	14300	12000	12000	17100	23900	15900	25900	22600	13200
Metals by Method SW6010C (mg/kg)													
ALUMINUM		4940	5880	7300	7380	3600	10200	8350	7870	8410	5480	6080	8940
ANTIMONY		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ARSENIC		4.1	7	8.9	5.3	3.6	8.7	7.9	8	8.1	5.2	5.1	4.4
BARIUM		35.5	52.7	58.6	53	24.9	68.5	57.9	56.4	76.2	41.3	38.4	51.8
BERYLLIUM		0.32	0.37	0.61	0.61	0.21 J	0.53	0.43	0.66	0.82	0.41	0.37	0.46
CADMIUM		0.22	0.19 J	0.43	0.17 J	0.12 J	0.12 J	0.079 J	0.67	0.33	0.17 J	0.23	0.12 J
CALCIUM		52700	28000	30500	23000	20700	29400	22400	25800	27400	19800	18800	35800
CHROMIUM, TOTAL		13.3	9	22.6	8.7	5.5	16.1	12.7	41.6	16	7.5	15.5	13.4
COBALT		5.5	6.8	6	5.2	3.9	10.7	8.5	7.1	5.8	4.9	6.5	9.5
COPPER		14.4	18.5	24	17.4	10	26	21	26.3	23	16.3	20	25.7
IRON		12900	14300	23600	13700	8630	20700	16700	25800	19900	11100	14800	19200
LEAD		15.1	8.8	57.2	23.8	7.3	13.6	10.5	72.3	46.4	16.3	17.7	11.3
MAGNESIUM		9500	8900	5000	5350	6140	11100	8210	5460	6330	4900	6410	13200
MANGANESE		270	251	629	454	149	356	285	799	635	296	327	376
NICKEL		14.4	18.1	17	14	10.3	28	22.8	20.4	15.7	13.8	18	25.2
POTASSIUM		1210	1240	1020	1060	635	2000	2490	1150	1070	746	970	1640
SELENIUM		1 J	0.94 J	ND	0.56 J	ND	0.71 J	ND	1 J	0.53 J	ND	0.53 J	ND
SILVER		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SODIUM		120 J	130 J	90.1 J	121 J	68.8 J	137 J	116 J	89.8 J	130 J	90 J	73.3 J	130 J
THALLIUM		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
VANADIUM		11.5	11.9	14.7	9.8	8	18	14.6	18.1	13.9	8.5	13.2	16
ZINC		62	39.5	239	57.2	35.8	63.2	50.2	315	186	44	70.6	55.8
Mercury by Method SW7471B (mg/kg)													
MERCURY		0.032	0.016 J	0.15	0.03	ND	0.011 J	0.012 J	0.16	0.096	0.032	0.04	ND
Cyanide by Method SW9012 (mg/kg)													
CYANIDE		ND	0.75 J	0.65 J	0.52 J	ND	ND	ND	ND	ND	ND	ND	ND
Organochlorine Pesticides by Method SW8081B (mg/kg)													
ALDRIN		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)		0.0017 J	0.00098 J	ND	ND	ND	ND	ND	0.013 J	ND	ND	ND	ND
ALPHA CHLORDANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ALPHA ENDOSULFAN		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BETA BHC (BETA HEXACHLOROCYCLOHEXANE)		0.0019 J	0.0012 J	ND	ND	ND	ND	ND	ND	0.0079 J	ND	ND	ND
BETA ENDOSULFAN		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DELTA BHC (DELTA HEXACHLOROCYCLOHEXANE)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DIELDRIN		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ENDOSULFAN SULFATE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ENDRIN		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ENDRIN ALDEHYDE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ENDRIN KETONE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0012 J

Table 3 Summary of Analytical Results for Sediment Samples
Buffalo Harbor State Park, Buffalo, NY

PRELIMINARY REPORT

Analyte	Location ID:	SD-09	SD-09	SD-10	SD-10	SD-10	SD-11	SD-11	SD-12	SD-12	SD-12	SD-13	SD-13
	Sample Name:	FD	SD-09-Z3	SD-10-Z0	SD-10-Z2	SD-10-Z4	SD-11-Z0	SD-11-Z1	SD-12-Z0	SD-12-Z3	SD-12-Z6	SD-13-Z0	SD-13-Z1
	Depth:	0 - 1 ft	3 - 3.5 ft	0 - 1 ft	2 - 3 ft	4 - 5 ft	0 - 1 ft	1 - 2.5 ft	0 - 1 ft	3 - 4 ft	6 - 7.3 ft	0 - 1 ft	1 - 2 ft
	Date:	10/28/13	10/28/13	10/29/13	10/29/13	10/29/13	10/29/13	10/29/13	10/29/13	10/29/13	10/29/13	10/29/13	10/29/13
GAMMA BHC (LINDANE)		ND	ND	ND	0.012 J	ND	0.00058 J	ND	ND	ND	0.0013 J	ND	ND
GAMMA CHLORDANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
HEPTACHLOR		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
HEPTACHLOR EPOXIDE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
METHOXYCHLOR		0.0012 J	ND	0.0078 J	0.0063 J	0.00055 J	ND	ND	0.009 J	0.0068 J	0.00061 J	ND	ND
P,P'-DDD		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
P,P'-DDE		0.0012 J	ND	ND	ND	ND	ND	ND	0.0075 J	ND	0.00072 J	0.0041 J	ND
P,P'-DDT		0.0019 J	ND	0.0093 J	0.0095 J	ND	ND	0.00056 J	0.0097 J	ND	ND	ND	ND
TOXAPHENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCBs by Method SW8082A (mg/kg)													
PCB-1016 (AROCLOR 1016)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1221 (AROCLOR 1221)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1232 (AROCLOR 1232)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1242 (AROCLOR 1242)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1248 (AROCLOR 1248)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1254 (AROCLOR 1254)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1260 (AROCLOR 1260)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total PCBs		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Volatile Organics by Method SW8260C (mg/kg)													
1,1,1-TRICHLOROETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-TETRACHLOROETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-TRICHLOROETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-DICHLOROETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-DICHLOROETHENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-TRICHLOROBENZENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-TRIMETHYLBENZENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-DIBROMO-3-CHLOROPROPANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-DICHLOROBENZENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-DICHLOROETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-DICHLOROPROPANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-TRIMETHYLBENZENE (MESITYLENE)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-DICHLOROBENZENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-DICHLOROBENZENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-DIOXANE (P-DIOXANE)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-HEXANONE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ACETONE		0.032	0.19	0.021 J	0.0071 J	0.013 J	0.0088 J	ND	0.029	ND	0.22	0.066	ND
BENZENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BROMODICHLOROMETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BROMOFORM		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BROMOMETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CARBON DISULFIDE		ND	ND	ND	ND	ND	ND	ND	ND	0.0037 J	ND	ND	ND

Table 3 Summary of Analytical Results for Sediment Samples
Buffalo Harbor State Park, Buffalo, NY

PRELIMINARY REPORT

Analyte	Location ID:	SD-09	SD-09	SD-10	SD-10	SD-10	SD-11	SD-11	SD-12	SD-12	SD-12	SD-13	SD-13
	Sample Name:	FD	SD-09-Z3	SD-10-Z0	SD-10-Z2	SD-10-Z4	SD-11-Z0	SD-11-Z1	SD-12-Z0	SD-12-Z3	SD-12-Z6	SD-13-Z0	SD-13-Z1
	Depth:	0 - 1 ft	3 - 3.5 ft	0 - 1 ft	2 - 3 ft	4 - 5 ft	0 - 1 ft	1 - 2.5 ft	0 - 1 ft	3 - 4 ft	6 - 7.3 ft	0 - 1 ft	1 - 2 ft
	Date:	10/28/13	10/28/13	10/29/13	10/29/13	10/29/13	10/29/13	10/29/13	10/29/13	10/29/13	10/29/13	10/29/13	10/29/13
CARBON TETRACHLORIDE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CHLOROBENZENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CHLOROETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CHLOROFORM		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CHLOROMETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CIS-1,2-DICHLOROETHYLENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CIS-1,3-DICHLOROPROPENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CYCLOHEXANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DIBROMOCHLOROMETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DICHLORODIFLUOROMETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ETHYLBENZENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ISOPROPYLBENZENE (CUMENE)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
METHYL ACETATE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
METHYL ETHYL KETONE (2-BUTANONE)		ND	0.051	ND	ND	ND	ND	ND	ND	ND	0.06	0.021 J	ND
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
METHYLCYCLOHEXANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
METHYLENE CHLORIDE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
N-BUTYLBENZENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
N-PROPYLBENZENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SEC-BUTYLBENZENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
STYRENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
T-BUTYLBENZENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TERT-BUTYL METHYL ETHER		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TETRACHLOROETHYLENE (PCE)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TOLUENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TRANS-1,2-DICHLOROETHENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TRANS-1,3-DICHLOROPROPENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TRICHLOROETHYLENE (TCE)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TRICHLOROFLUOROMETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
VINYL CHLORIDE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
XYLENES, TOTAL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Semivolatile Organics by Method SW8270D (mg/kg)													
2,4,5-TRICHLOROPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4,6-TRICHLOROPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-DICHLOROPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-DIMETHYLPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-DINITROPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-DINITROTOLUENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,6-DINITROTOLUENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-CHLORONAPHTHALENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-CHLOROPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-METHYLNAPHTHALENE		ND	ND	0.024 J	ND	ND	ND	ND	0.036 J	0.037 J	ND	ND	ND
2-METHYLPHENOL (O-CRESOL)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table 3 Summary of Analytical Results for Sediment Samples
Buffalo Harbor State Park, Buffalo, NY

PRELIMINARY REPORT

Analyte	Location ID:	SD-09	SD-09	SD-10	SD-10	SD-10	SD-11	SD-11	SD-12	SD-12	SD-12	SD-13	SD-13
	Sample Name:	FD	SD-09-Z3	SD-10-Z0	SD-10-Z2	SD-10-Z4	SD-11-Z0	SD-11-Z1	SD-12-Z0	SD-12-Z3	SD-12-Z6	SD-13-Z0	SD-13-Z1
	Depth:	0 - 1 ft	3 - 3.5 ft	0 - 1 ft	2 - 3 ft	4 - 5 ft	0 - 1 ft	1 - 2.5 ft	0 - 1 ft	3 - 4 ft	6 - 7.3 ft	0 - 1 ft	1 - 2 ft
	Date:	10/28/13	10/28/13	10/29/13	10/29/13	10/29/13	10/29/13	10/29/13	10/29/13	10/29/13	10/29/13	10/29/13	10/29/13
2-NITROANILINE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-NITROPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3,3'-DICHLOROBENZIDINE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3-NITROANILINE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4,6-DINITRO-2-METHYLPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-BROMOPHENYL PHENYL ETHER		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-CHLORO-3-METHYLPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-CHLOROANILINE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-CHLOROPHENYL PHENYL ETHER		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-METHYLPHENOL (P-CRESOL)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-NITROANILINE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-NITROPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ACENAPHTHENE		ND	ND	0.078 J	0.012 J	0.011 J	ND	ND	0.076 J	0.034 J	0.0094 J	0.03 J	ND
ACENAPHTHYLENE		ND	ND	0.12 J	ND	ND	ND	ND	0.21 J	0.084 J	ND	0.04 J	ND
ACETOPHENONE		ND	ND	0.21 J	0.1 J	0.061 J	ND	ND	0.3 J	0.27 J	0.11 J	0.1 J	0.029 J
ANTHRACENE		0.038 J	ND	0.3 J	0.066 J	ND	ND	ND	0.38 J	0.24 J	0.045 J	0.095 J	ND
ATRAZINE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BENZALDEHYDE		ND	ND	0.059 J	ND	ND	ND	ND	0.072 J	0.042 J	0.041 J	0.065 J	ND
BENZO(A)ANTHRACENE		0.13 J	ND	1.1 J	0.3 J	0.022 J	ND	ND	1.3 J	0.9 J	0.17 J	0.36 J	ND
BENZO(A)PYRENE		0.12 J	ND	1.2 J	0.26 J	0.16 J	ND	ND	1.3 J	0.94 J	0.17 J	0.31 J	ND
BENZO(B)FLUORANTHENE		0.19 J	ND	1.6 J	0.35 J	ND	ND	ND	1.7 J	1.2 J	0.22 J	0.44 J	ND
BENZO(G,H,I)PERYLENE		0.081 J	ND	0.43 J	0.15 J	0.012 J	ND	ND	0.44 J	0.37 J	0.1 J	0.16 J	ND
BENZO(K)FLUORANTHENE		0.066 J	ND	0.79 J	0.15 J	ND	ND	ND	1.2 J	0.54 J	0.092 J	0.17 J	ND
BENZYL BUTYL PHTHALATE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BIPHENYL (DIPHENYL)		ND	ND	ND	ND	ND	ND	ND	ND	0.023 J	ND	ND	ND
BIS(2-CHLOROETHOXY) METHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BIS(2-CHLOROISOPROPYL) ETHER		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BIS(2-ETHYLHEXYL) PHTHALATE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CAPROLACTAM		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CARBAZOLE		ND	ND	0.069 J	ND	ND	ND	ND	0.042 J	0.06 J	ND	ND	ND
CHRYSENE		0.14 J	ND	1.2 J	0.32 J	0.032 J	ND	ND	1.4 J	1 J	0.22 J	0.37 J	ND
DIBENZ(A,H)ANTHRACENE		0.027 J	ND	0.14 J	0.052 J	ND	ND	ND	0.15 J	0.11 J	0.026 J	0.049 J	ND
DIBENZOFURAN		ND	ND	0.064 J	ND	0.01 J	ND	ND	0.081 J	0.058 J	ND	ND	ND
DIETHYL PHTHALATE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DIMETHYL PHTHALATE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DI-N-BUTYL PHTHALATE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DI-N-OCTYLPHTHALATE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
FLUORANTHENE		0.26 J	ND	1.9 J	0.5 J	0.037 J	ND	ND	2.2 J	1.5 J	0.28 J	0.56 J	ND
FLUORENE		ND	ND	0.11 J	ND	ND	ND	ND	0.22 J	0.12 J	ND	0.043 J	ND
HEXACHLOROBENZENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
HEXACHLOROBUTADIENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
HEXACHLOROCYCLOPENTADIENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table 3 Summary of Analytical Results for Sediment Samples
Buffalo Harbor State Park, Buffalo, NY

PRELIMINARY REPORT

Analyte	Location ID:	SD-09	SD-09	SD-10	SD-10	SD-10	SD-11	SD-11	SD-12	SD-12	SD-12	SD-13	SD-13
	Sample Name:	FD	SD-09-Z3	SD-10-Z0	SD-10-Z2	SD-10-Z4	SD-11-Z0	SD-11-Z1	SD-12-Z0	SD-12-Z3	SD-12-Z6	SD-13-Z0	SD-13-Z1
	Depth:	0 - 1 ft	3 - 3.5 ft	0 - 1 ft	2 - 3 ft	4 - 5 ft	0 - 1 ft	1 - 2.5 ft	0 - 1 ft	3 - 4 ft	6 - 7.3 ft	0 - 1 ft	1 - 2 ft
	Date:	10/28/13	10/28/13	10/29/13	10/29/13	10/29/13	10/29/13	10/29/13	10/29/13	10/29/13	10/29/13	10/29/13	10/29/13
HEXACHLOROETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
INDENO(1,2,3-C,D)PYRENE		0.081 J	ND	0.45 J	0.14 J	ND	ND	ND	0.52 J	0.36 J	0.1 J	0.14 J	ND
ISOPHORONE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
NAPHTHALENE		ND	ND	0.19 J	0.037 J	ND	ND	ND	0.35 J	0.2 J	ND	0.071 J	ND
NITROBENZENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
N-NITROSODI-N-PROPYLAMINE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
N-NITROSODIPHENYLAMINE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PENTACHLOROPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PHENANTHRENE		0.12 J	ND	0.78 J	0.21 J	0.026 J	ND	ND	1.2 J	0.71 J	0.14 J	0.23 J	ND
PHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PYRENE		0.2 J	ND	1.3 J	0.41 J	0.039 J	ND	ND	1.5 J	1.1 J	0.25 J	0.46 J	ND

Key:
J = estimated value
mg/kg = milligrams per kilogram
ND = not detected
PCBs = polychlorinated biphenyl

Table 4 Summary of Analytical Results for Surface Soil Samples
Buffalo Harbor State Park, Buffalo, NY

PRELIMINARY REPORT

Analyte	Location ID:	SS-01	SS-02	SS-03	SS-04	SS-05	SS-05	SS-06
	Sample Name:	SS-01-Z0	SS-02-Z0	SS-03-Z0	SS-04-Z0	SS-05-Z0	SS-05-Z0-FD	SS-06-Z0
	Depth:	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
	Date:	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13
Oil & Grease (n-Hexane Extractable Material) by Method E1664A (mg/kg)								
OIL & GREASE, TOTAL REC		1290	604	580	459	482	759	951
Metals by Method SW6010C (mg/kg)								
ALUMINUM		2350 J	3030	4120 J	6550	3170	4440	4010
ANTIMONY		ND	ND	ND	ND	ND	ND	ND
ARSENIC		2.5	2.7	4.6	6.8	4.7	3.5	4.8
BARIUM		20.8 J	17.2	33 J-	69.6	29.9	19.4	31.5
BERYLLIUM		0.15 J	0.18 J	0.19 J	0.61	0.2 J	0.2 J	0.37
CADMIUM		0.036 J	ND	0.25	ND	0.053 J	ND	0.087 J
CALCIUM		72900 J	37900	142000 J	41900	103000 J	46700 J	75200
CHROMIUM, TOTAL		6.4 J	20.8	36.4 J	58.9	5.6	6.5	9.8
COBALT		1.4	2.1	3.5	2.6	2.8	3.3	3
COPPER		6.2 J	8.6	12.5 J	20.5	9.4 J	21.8 J	11.5
IRON		9190 J	8900	15500	32300	8710	12400	10800
LEAD		10.9	5.4	12.4	35.5	10.6	8.9	17.2
MAGNESIUM		23300 J	4320	4810 J	5690	14100 J	3330 J	10400
MANGANESE		483 J	880	1990	3320	433	470	593
NICKEL		4.5 J	6.2	9.9	10.4	8.8	10.5	8.9
POTASSIUM		324	385	489	685	454	426	525
SELENIUM		ND	ND	ND	2.2 J	ND	ND	ND
SILVER		ND	ND	ND	ND	ND	ND	ND
SODIUM		ND	123 J	178	277	115 J	86 J	138
THALLIUM		ND	ND	ND	ND	ND	ND	ND
VANADIUM		7.1 J	9.6	27.1	43	7	8.5	9.4
ZINC		39.1 J	28.9	69.9 J	71.3	41	51.8	48.5
Mercury by Method SW7471B (mg/kg)								
MERCURY		0.039	ND	0.029	0.0096 J	ND	ND	ND
Cyanide by Method SW9012 (mg/kg)								
CYANIDE		0.54 J	ND	ND	ND	ND	0.52 J	ND
Organochlorine Pesticides by Method SW8081B (mg/kg)								
ALDRIN		ND	ND	ND	ND	ND	ND	ND
ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)		ND	ND	ND	ND	ND	ND	ND
ALPHA CHLORDANE		ND	ND	ND	ND	ND	ND	ND
ALPHA ENDOSULFAN		ND	ND	ND	ND	ND	ND	ND
BETA BHC (BETA HEXACHLOROCYCLOHEXANE)		ND	ND	ND	ND	ND	ND	ND
BETA ENDOSULFAN		ND	ND	ND	ND	ND	ND	ND
DELTA BHC (DELTA HEXACHLOROCYCLOHEXANE)		ND	0.0041 J	ND	0.0042 J	ND	ND	ND
DIELDRIN		ND	ND	ND	ND	ND	ND	ND
ENDOSULFAN SULFATE		ND	ND	ND	ND	ND	ND	ND
ENDRIN		ND	ND	ND	ND	ND	ND	ND

Table 4 Summary of Analytical Results for Surface Soil Samples
Buffalo Harbor State Park, Buffalo, NY

PRELIMINARY REPORT

Analyte	Location ID:	SS-01	SS-02	SS-03	SS-04	SS-05	SS-05	SS-06
	Sample Name:	SS-01-Z0	SS-02-Z0	SS-03-Z0	SS-04-Z0	SS-05-Z0	SS-05-Z0-FD	SS-06-Z0
	Depth:	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
	Date:	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13
ENDRIN ALDEHYDE		ND	ND	ND	ND	ND	ND	ND
ENDRIN KETONE		ND	ND	ND	ND	ND	ND	ND
GAMMA BHC (LINDANE)		ND	ND	ND	ND	ND	ND	ND
GAMMA CHLORDANE		ND	ND	ND	ND	ND	ND	ND
HEPTACHLOR		ND	ND	ND	ND	ND	ND	ND
HEPTACHLOR EPOXIDE		ND	ND	ND	ND	ND	ND	ND
METHOXYCHLOR		ND	ND	ND	ND	ND	ND	ND
P,P'-DDD		ND	ND	ND	ND	ND	ND	ND
P,P'-DDE		ND	ND	ND	ND	ND	ND	ND
P,P'-DDT		ND	ND	0.0029 J	0.0034 J	0.0028 J	0.0042 J	0.0027 J
TOXAPHENE		ND	ND	ND	ND	ND	ND	ND
PCBs by Method SW8082A (mg/kg)								
PCB-1016 (AROCLOR 1016)		ND	ND	ND	ND	ND	ND	ND
PCB-1221 (AROCLOR 1221)		ND	ND	ND	ND	ND	ND	ND
PCB-1232 (AROCLOR 1232)		ND	ND	ND	ND	ND	ND	ND
PCB-1242 (AROCLOR 1242)		ND	ND	ND	ND	ND	ND	ND
PCB-1248 (AROCLOR 1248)		ND	ND	ND	ND	ND	ND	ND
PCB-1254 (AROCLOR 1254)		ND	ND	ND	ND	ND	ND	ND
PCB-1260 (AROCLOR 1260)		ND	ND	ND	ND	ND	ND	ND
Total PCBs		ND	ND	ND	ND	ND	ND	ND
Volatile Organics by Method SW8260C (mg/kg)								
1,1,1-TRICHLOROETHANE		ND	ND	ND	ND	ND	ND	ND
1,1,2,2-TETRACHLOROETHANE		ND	ND	ND	ND	ND	ND	ND
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE		ND	ND	ND	ND	ND	ND	ND
1,1,2-TRICHLOROETHANE		ND	ND	ND	ND	ND	ND	ND
1,1-DICHLOROETHANE		ND	ND	ND	ND	ND	ND	ND
1,1-DICHLOROETHENE		ND	ND	ND	ND	ND	ND	ND
1,2,4-TRICHLOROBENZENE		ND	ND	ND	ND	ND	ND	ND
1,2,4-TRIMETHYLBENZENE		ND	ND	ND	ND	ND	ND	ND
1,2-DIBROMO-3-CHLOROPROPANE		ND	ND	ND	ND	ND	ND	ND
1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)		ND	ND	ND	ND	ND	ND	ND
1,2-DICHLOROBENZENE		ND	ND	ND	ND	ND	ND	ND
1,2-DICHLOROETHANE		ND	ND	ND	ND	ND	ND	ND
1,2-DICHLOROPROPANE		ND	ND	ND	ND	ND	ND	ND
1,3,5-TRIMETHYLBENZENE (MESITYLENE)		ND	ND	ND	ND	ND	ND	ND
1,3-DICHLOROBENZENE		ND	ND	ND	ND	ND	ND	ND
1,4-DICHLOROBENZENE		ND	ND	ND	ND	ND	ND	ND
1,4-DIOXANE (P-DIOXANE)		ND	ND	ND	ND	ND	ND	ND

Table 4 Summary of Analytical Results for Surface Soil Samples
Buffalo Harbor State Park, Buffalo, NY

PRELIMINARY REPORT

Analyte	Location ID:	SS-01	SS-02	SS-03	SS-04	SS-05	SS-05	SS-06
	Sample Name:	SS-01-Z0	SS-02-Z0	SS-03-Z0	SS-04-Z0	SS-05-Z0	SS-05-Z0-FD	SS-06-Z0
	Depth:	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
	Date:	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13
2-HEXANONE		ND	ND	ND	ND	ND	ND	ND
ACETONE		ND	ND	ND	ND	ND	ND	ND
BENZENE		ND	ND	ND	ND	ND	ND	ND
BROMODICHLOROMETHANE		ND	ND	ND	ND	ND	ND	ND
BROMOFORM		ND	ND	ND	ND	ND	ND	ND
BROMOMETHANE		ND	ND	ND	ND	ND	ND	ND
CARBON DISULFIDE		ND	ND	ND	ND	ND	ND	ND
CARBON TETRACHLORIDE		ND	ND	ND	ND	ND	ND	ND
CHLOROBENZENE		ND	ND	ND	ND	0.0037 J	0.0042 J	0.0024 J
CHLOROETHANE		ND	ND	ND	ND	ND	ND	ND
CHLOROFORM		ND	ND	ND	ND	ND	ND	ND
CHLOROMETHANE		ND	ND	ND	ND	ND	ND	ND
CIS-1,2-DICHLOROETHYLENE		ND	ND	ND	ND	ND	ND	ND
CIS-1,3-DICHLOROPROPENE		ND	ND	ND	ND	ND	ND	ND
CYCLOHEXANE		ND	ND	ND	ND	ND	ND	ND
DIBROMOCHLOROMETHANE		ND	ND	ND	ND	ND	ND	ND
DICHLORODIFLUOROMETHANE		ND	ND	ND	ND	ND	ND	ND
ETHYLBENZENE		ND	ND	ND	ND	ND	ND	ND
ISOPROPYLBENZENE (CUMENE)		ND	ND	ND	ND	ND	ND	ND
METHYL ACETATE		ND	ND	ND	ND	ND	ND	ND
METHYL ETHYL KETONE (2-BUTANONE)		ND	ND	ND	ND	ND	ND	ND
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)		ND	ND	ND	ND	ND	ND	ND
METHYLCYCLOHEXANE		ND	ND	ND	ND	ND	ND	ND
METHYLENE CHLORIDE		ND	ND	ND	ND	ND	ND	ND
N-BUTYLBENZENE		ND	ND	ND	ND	ND	ND	ND
N-PROPYLBENZENE		ND	ND	ND	ND	ND	ND	ND
SEC-BUTYLBENZENE		ND	ND	ND	ND	ND	ND	ND
STYRENE		ND	ND	ND	ND	ND	ND	ND
T-BUTYLBENZENE		ND	ND	ND	ND	ND	ND	ND
TERT-BUTYL METHYL ETHER		ND	ND	ND	ND	ND	ND	ND
TETRACHLOROETHYLENE (PCE)		ND	ND	ND	ND	ND	ND	ND
TOLUENE		ND	ND	ND	ND	ND	ND	ND
TRANS-1,2-DICHLOROETHENE		ND	ND	ND	ND	ND	ND	ND
TRANS-1,3-DICHLOROPROPENE		ND	ND	ND	ND	ND	ND	ND
TRICHLOROETHYLENE (TCE)		ND	ND	ND	ND	ND	ND	ND
TRICHLOROFLUOROMETHANE		ND	ND	ND	ND	ND	ND	ND
VINYL CHLORIDE		ND	ND	ND	ND	ND	ND	ND
XYLENES, TOTAL		ND	ND	ND	ND	ND	ND	ND

Table 4 Summary of Analytical Results for Surface Soil Samples
Buffalo Harbor State Park, Buffalo, NY

PRELIMINARY REPORT

Analyte	Location ID:	SS-01	SS-02	SS-03	SS-04	SS-05	SS-05	SS-06
	Sample Name:	SS-01-Z0	SS-02-Z0	SS-03-Z0	SS-04-Z0	SS-05-Z0	SS-05-Z0-FD	SS-06-Z0
	Depth:	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
	Date:	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13
Semivolatile Organics by Method SW8270D (mg/kg)								
2,4,5-TRICHLOROPHENOL		ND	ND	ND	ND	ND	ND	ND
2,4,6-TRICHLOROPHENOL		ND	ND	ND	ND	ND	ND	ND
2,4-DICHLOROPHENOL		ND	ND	ND	ND	ND	ND	ND
2,4-DIMETHYLPHENOL		ND	ND	ND	ND	ND	ND	ND
2,4-DINITROPHENOL		ND	ND	ND	ND	ND	ND	ND
2,4-DINITROTOLUENE		ND	ND	ND	ND	ND	ND	ND
2,6-DINITROTOLUENE		ND	ND	ND	ND	ND	ND	ND
2-CHLORONAPHTHALENE		ND	ND	ND	ND	ND	ND	ND
2-CHLOROPHENOL		ND	ND	ND	ND	ND	ND	ND
2-METHYLNAPHTHALENE		ND	ND	ND	ND	ND	ND	ND
2-METHYLPHENOL (O-CRESOL)		ND	ND	ND	ND	ND	ND	ND
2-NITROANILINE		ND	ND	ND	ND	ND	ND	ND
2-NITROPHENOL		ND	ND	ND	ND	ND	ND	ND
3,3'-DICHLOROBENZIDINE		ND	ND	ND	ND	ND	ND	ND
3-NITROANILINE		ND	ND	ND	ND	ND	ND	ND
4,6-DINITRO-2-METHYLPHENOL		ND	ND	ND	ND	ND	ND	ND
4-BROMOPHENYL PHENYL ETHER		ND	ND	ND	ND	ND	ND	ND
4-CHLORO-3-METHYLPHENOL		ND	ND	ND	ND	ND	ND	ND
4-CHLOROANILINE		ND	ND	ND	ND	ND	ND	ND
4-CHLOROPHENYL PHENYL ETHER		ND	ND	ND	ND	ND	ND	ND
4-METHYLPHENOL (P-CRESOL)		ND	ND	ND	ND	ND	ND	ND
4-NITROANILINE		ND	ND	ND	ND	ND	ND	ND
4-NITROPHENOL		ND	ND	ND	ND	ND	ND	ND
ACENAPHTHENE		ND	ND	ND	ND	ND	0.061 J+	0.02 J
ACENAPHTHYLENE		ND	ND	ND	ND	ND	ND	ND
ACETOPHENONE		0.22 J	0.15 J	ND	ND	ND	ND	ND
ANTHRACENE		0.014 J	ND	ND	ND	0.061 J	0.13 J+	0.074 J
ATRAZINE		ND	ND	ND	ND	ND	ND	ND
BENZALDEHYDE		ND	ND	ND	ND	ND	ND	ND
BENZO(A)ANTHRACENE		0.058 J	0.048 J	0.1 J+	0.24 J+	0.22 J	0.29 J+	0.33 J
BENZO(A)PYRENE		0.05 J	0.04 J	0.074 J+	0.23 J+	0.15 J	0.21 J+	0.28 J
BENZO(B)FLUORANTHENE		0.08 J	0.063 J	0.099 J+	0.35 J+	0.23 J	0.32 J+	0.42
BENZO(G,H,I)PERYLENE		0.032 J	0.036 J	0.06 J+	0.15 J+	0.079 J	0.1 J+	0.098 J
BENZO(K)FLUORANTHENE		0.044 J	0.03 J	0.064 J+	0.18 J+	0.1 J	0.14 J+	0.19 J
BENZYL BUTYL PHTHALATE		ND	ND	ND	ND	ND	ND	ND
BIPHENYL (DIPHENYL)		ND	ND	ND	ND	ND	ND	ND
BIS(2-CHLOROETHOXY) METHANE		ND	ND	ND	ND	ND	ND	ND

Table 4 Summary of Analytical Results for Surface Soil Samples
Buffalo Harbor State Park, Buffalo, NY

PRELIMINARY REPORT

Analyte	Location ID:	SS-01	SS-02	SS-03	SS-04	SS-05	SS-05	SS-06
	Sample Name:	SS-01-Z0	SS-02-Z0	SS-03-Z0	SS-04-Z0	SS-05-Z0	SS-05-Z0-FD	SS-06-Z0
	Depth:	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
	Date:	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)		ND	ND	ND	ND	ND	ND	ND
BIS(2-CHLOROISOPROPYL) ETHER		ND	ND	ND	ND	ND	ND	ND
BIS(2-ETHYLHEXYL) PHTHALATE		ND	1.2	ND	ND	ND	ND	ND
CAPROLACTAM		ND	ND	ND	ND	ND	ND	ND
CARBAZOLE		ND	ND	ND	ND	ND	0.08 J+	0.035 J
CHRYSENE		0.063 J	0.055 J	0.11 J+	0.3 J+	0.22 J	0.33 J+	0.35
DIBENZ(A,H)ANTHRACENE		ND	0.013 J	0.027 J+	0.059 J+	0.036 J	0.045 J+	0.049 J
DIBENZOFURAN		ND	ND	ND	ND	ND	0.05 J+	ND
DIETHYL PHTHALATE		ND	ND	ND	ND	ND	ND	0.046 J
DIMETHYL PHTHALATE		ND	ND	ND	ND	ND	ND	ND
DI-N-BUTYL PHTHALATE		ND	ND	ND	ND	ND	ND	ND
DI-N-OCTYLPHTHALATE		ND	ND	ND	ND	ND	ND	ND
FLUORANTHENE		0.13 J	0.083 J	0.18 J+	0.38 J+	0.43	0.69 J+	0.66
FLUORENE		ND	ND	ND	ND	ND	0.068 J+	ND
HEXACHLOROBENZENE		ND	ND	ND	ND	ND	ND	ND
HEXACHLOROBUTADIENE		ND	ND	ND	ND	ND	ND	ND
HEXACHLOROCYCLOPENTADIENE		ND	ND	ND	ND	ND	ND	ND
HEXACHLOROETHANE		ND	ND	ND	ND	ND	ND	ND
INDENO(1,2,3-C,D)PYRENE		0.028 J	0.029 J	0.056 J+	0.18 J+	0.084 J	0.12 J+	0.11 J
ISOPHORONE		ND	ND	ND	ND	ND	ND	ND
NAPHTHALENE		ND	ND	ND	ND	ND	ND	ND
NITROBENZENE		ND	ND	ND	ND	ND	ND	ND
N-NITROSODI-N-PROPYLAMINE		ND	ND	ND	ND	ND	ND	ND
N-NITROSODIPHENYLAMINE		ND	ND	ND	ND	ND	ND	ND
PENTACHLOROPHENOL		ND	ND	ND	ND	ND	ND	ND
PHENANTHRENE		0.076 J	0.046 J	0.089 J+	0.13 J+	0.34 J	0.59 J+	0.35
PHENOL		ND	ND	ND	ND	ND	ND	ND
PYRENE		0.082 J	0.062 J	0.13 J+	0.33 J+	0.33 J	0.5 J+	0.46

Key:

"-FD" denotes field duplicate sample

J = estimated value

J- = estimated value with low bias

J+ = estimated value with high bias

mg/kg = milligrams per kilogram

ND = not detected

Table 5 Summary of Analytical Results for Subsurface Soil Samples from Soil Borings

Buffalo Harbor State Park, Buffalo, NY

PRELIMINARY REPORT

Analyte	Location ID:	SB-01	SB-01	SB-02	SB-02	SB-02	SB-03	SB-03	SB-04	SB-04	SB-04	SB-05	SB-05	SB-06	SB-06	SB-07
	Sample Name:	SB-01-Z0	SB-01-Z2	SB-02-Z0	SB-02-Z2	FD	SB-03-Z0	SB-03-Z2	SB-04-Z0	SB-04-Z2	FD	SB-05-Z0	SB-05-Z2	SB-06-Z0	SB-06-Z2	SB-07-Z18
	Depth:	0 - 2 ft	2 - 4 ft	0 - 2 ft	2 - 4 ft	2 - 4 ft	0 - 2 ft	2 - 4 ft	0 - 2 ft	2 - 4 ft	2 - 4 ft	0 - 2 ft	2 - 4 ft	0 - 2 ft	2 - 4 ft	18 - 19 ft
	Date:	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13
Oil & Grease (n-Hexane Extractable Material) by Method E1664A (mg/kg)																
OIL & GREASE, TOTAL REC		1410	ND	747	296	588	ND	304	1020	494	403	480	289	1290	402	1400
Metals by Method SW6010C (mg/kg)																
ALUMINUM		4080	8700	3440	5790	6790	7320	5950	4440	6310	4000	5400	6570 J	6320	10800	10700
ANTIMONY		ND	ND	ND	ND	ND	1 J	0.57 J	ND	ND	ND	ND	ND	1 J	1.3 J	3.4 J
ARSENIC		3.4	7.2	3.3	7.2	6.6	17.6	6.3	5.9	3.9 J	41.2 J	6.1	7.4	14.5	12	131
BARIUM		33.2	97.5	37.6	82.4	51.9	60.1	51.7	32.7	38.5	30.4	38.3	51.8 J	75	94.3	105
BERYLLIUM		0.29	0.29	0.43	0.3	0.37	0.46	0.26	0.26	0.22 J	0.15 J	0.3	0.29	0.41	0.47	0.66
CADMIUM		0.036 J	ND	ND	0.14 J	0.2 J	1.6	ND	0.035 J	ND	ND	0.04 J	ND	ND	ND	19.2
CALCIUM		47500	88300	79700	71200	52700	32900	40700	34800	41000	31900	43000	30800	47900	44800	15000
CHROMIUM, TOTAL		8.7	399	49.9	214 J	74.1 J	72.8	31.7	8.8	9	6.8	18.9	20.3	97.3	38.5	658
COBALT		2.2	2.8	1.8	2.3	2.2	2.9	2.5	3.8	2.2	2	4.8	3.1	7.4	6.7	15.6
COPPER		10.3	17.9	22.3	235 J	46.5 J	43.4	28.6	29	10	9.1	20.6	34.6 J	53.6	76.6	579
IRON		12900	51800	12800	32800	21000	21500	25200	13100	16800	26000	17500	28500	108000	70700	81900
LEAD		11.8	24	57.7	71	61.9	347	55	19	24.2 J	1920 J	17	28.3 J	62.6	60.1	2260
MAGNESIUM		3290	13200	7990	7260	5690	5580	3840	4270	3670	3000	6540	2800 J	5990	2910	6040
MANGANESE		1060	13100	1560	6160 J	2590 J	2660	2170	581	957	556	1040	1390	4960	2690	965
NICKEL		6.6	48.5	11.1	9.8	17.7	25.5	7.7	12.5	5.6 J	4.9 J	13.8	9	33.2	20.8	81.9
POTASSIUM		399	542	351	415	681	921	668	515	714	468	693	779	607	1180	1050
SELENIUM		0.74 J	7.3	0.47 J	3.5 J	1.7 J	1.7 J	1.3 J	ND	0.97 J	ND	ND	1 J	3.3 J	1.4 J	3.6 J
SILVER		ND	ND	ND	0.26 J	ND	0.35 J	ND	ND	ND	ND	ND	ND	ND	0.42 J	5.4
SODIUM		109 J	474	171	385	478	562	525	128 J	286	181	143 J	228	267	589	139 J
THALLIUM		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.57 J
VANADIUM		10	150	21	112 J	30.7 J	28.9	22.1	9.5	14	11.3	18.6	26.3 J	118	42.9	28.3
ZINC		43.7	39.6	144	123	90.7	276	59.2	57.4	24.5	22.8	54.2	100 J	106	77.3	3450
Mercury by Method SW7471B (mg/kg)																
MERCURY		ND	0.033	0.0095 J	0.029	0.026	0.024	0.028	ND	ND	ND	ND	0.016 J	0.023	0.01 J	11.9
Cyanide by Method SW9012 (mg/kg)																
CYANIDE		ND	ND	0.61 J	ND	ND	0.64 J	ND	ND	ND	ND	ND	0.51 J	1.5	0.79 J	3.8
Organochlorine Pesticides by Method SW8081B (mg/kg)																
ALDRIN		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ALPHA CHLORDANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ALPHA ENDOSULFAN		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BETA BHC (BETA HEXACHLOROCYCLOHEXANE)		ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0018 J	0.00093 J	ND	ND	ND	0.018 J
BETA ENDOSULFAN		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.025 J
DELTA BHC (DELTA HEXACHLOROCYCLOHEXANE)		ND	0.0051 J	ND	0.0009 J	0.00093 J	ND	0.00095 J	ND	ND	ND	0.00091 J	0.00088 J	ND	0.00098 J	0.095 J
DIELDRIN		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.072 J
ENDOSULFAN SULFATE		ND	ND	ND	0.00092 J	ND	ND	0.0015 J	ND	ND	ND	ND	ND	ND	0.0019 J	0.02 J
ENDRIN		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ENDRIN ALDEHYDE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ENDRIN KETONE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GAMMA BHC (LINDANE)		ND	0.0032 J	ND	ND	ND	ND	0.00078 J	ND	0.00066 J	0.00067 J	0.00056 J	0.00067 J	ND	0.00062 J	ND
GAMMA CHLORDANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
HEPTACHLOR		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.022 J
HEPTACHLOR EPOXIDE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table 5 Summary of Analytical Results for Subsurface Soil Samples from Soil Borings
Buffalo Harbor State Park, Buffalo, NY

PRELIMINARY REPORT

Analyte	Location ID:	SB-01	SB-01	SB-02	SB-02	SB-02	SB-03	SB-03	SB-04	SB-04	SB-04	SB-05	SB-05	SB-06	SB-06	SB-07
	Sample Name:	SB-01-Z0	SB-01-Z2	SB-02-Z0	SB-02-Z2	FD	SB-03-Z0	SB-03-Z2	SB-04-Z0	SB-04-Z2	FD	SB-05-Z0	SB-05-Z2	SB-06-Z0	SB-06-Z2	SB-07-Z18
	Depth:	0 - 2 ft	2 - 4 ft	0 - 2 ft	2 - 4 ft	2 - 4 ft	0 - 2 ft	2 - 4 ft	0 - 2 ft	2 - 4 ft	2 - 4 ft	0 - 2 ft	2 - 4 ft	0 - 2 ft	2 - 4 ft	18 - 19 ft
	Date:	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13
METHOXYCHLOR		ND	ND	ND	0.002 J	0.0018 J	ND	ND	ND	ND	ND	ND	ND	0.021 J	0.0012 J	ND
P,P'-DDD		ND	ND	ND	ND	ND	ND	ND	ND	0.00097 J	ND	ND	ND	ND	ND	0.11
P,P'-DDE		ND	ND	ND	ND	ND	0.0044 J	ND	ND	0.001 J	0.0011 J	ND	ND	ND	ND	ND
P,P'-DDT		ND	0.005 J	ND	0.0018 J	ND	0.0068 J	ND	ND	ND	ND	ND	ND	ND	ND	0.089 J
TOXAPHENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCBs by Method SW8082A (mg/kg)																
PCB-1016 (AROCLOR 1016)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1221 (AROCLOR 1221)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1232 (AROCLOR 1232)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1242 (AROCLOR 1242)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1248 (AROCLOR 1248)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.7 J
PCB-1254 (AROCLOR 1254)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.6 J
PCB-1260 (AROCLOR 1260)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.82 J
Total PCBs		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Volatile Organics by Method SW8260C (mg/kg)																
1,1,1-TRICHLOROETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-TETRACHLOROETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-TRICHLOROETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-DICHLOROETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-DICHLOROETHENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-TRICHLOROBENZENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.3 J
1,2,4-TRIMETHYLBENZENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.6
1,2-DIBROMO-3-CHLOROPROPANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-DICHLOROBENZENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.39
1,2-DICHLOROETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-DICHLOROPROPANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-TRIMETHYLBENZENE (MESITYLENE)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.6
1,3-DICHLOROBENZENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.4
1,4-DICHLOROBENZENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.7
1,4-DIOXANE (P-DIOXANE)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-HEXANONE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ACETONE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BENZENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.9
BROMODICHLOROMETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BROMOFORM		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BROMOMETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CARBON DISULFIDE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CARBON TETRACHLORIDE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CHLOROBENZENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	280
CHLOROETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CHLOROFORM		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CHLOROMETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table 5 Summary of Analytical Results for Subsurface Soil Samples from Soil Borings
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PRELIMINARY REPORT

Analyte	Location ID:	SB-01	SB-01	SB-02	SB-02	SB-02	SB-03	SB-03	SB-04	SB-04	SB-04	SB-05	SB-05	SB-06	SB-06	SB-07
	Sample Name:	SB-01-Z0	SB-01-Z2	SB-02-Z0	SB-02-Z2	FD	SB-03-Z0	SB-03-Z2	SB-04-Z0	SB-04-Z2	FD	SB-05-Z0	SB-05-Z2	SB-06-Z0	SB-06-Z2	SB-07-Z18
	Depth:	0 - 2 ft	2 - 4 ft	0 - 2 ft	2 - 4 ft	2 - 4 ft	0 - 2 ft	2 - 4 ft	0 - 2 ft	2 - 4 ft	2 - 4 ft	0 - 2 ft	2 - 4 ft	0 - 2 ft	2 - 4 ft	18 - 19 ft
	Date:	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13
CIS-1,2-DICHLOROETHYLENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CIS-1,3-DICHLOROPROPENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CYCLOHEXANE		ND	0.0014 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.2
DIBROMOCHLOROMETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DICHLORODIFLUOROMETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ETHYLBENZENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.9
ISOPROPYLBENZENE (CUMENE)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.34
METHYL ACETATE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
METHYL ETHYL KETONE (2-BUTANONE)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
METHYLCYCLOHEXANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.9 J
METHYLENE CHLORIDE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
N-BUTYLBENZENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.5
N-PROPYLBENZENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.78
SEC-BUTYLBENZENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.47
STYRENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
T-BUTYLBENZENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TERT-BUTYL METHYL ETHER		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TETRACHLOROETHYLENE (PCE)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TOLUENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1
TRANS-1,2-DICHLOROETHENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TRANS-1,3-DICHLOROPROPENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TRICHLOROETHYLENE (TCE)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TRICHLOROFLUOROMETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
VINYL CHLORIDE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
XYLENES, TOTAL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.3
Semivolatile Organics by Method SW8270D (mg/kg)																
2,4,5-TRICHLOROPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4,6-TRICHLOROPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-DICHLOROPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-DIMETHYLPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-DINITROPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-DINITROTOLUENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,6-DINITROTOLUENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-CHLORONAPHTHALENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-CHLOROPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-METHYLNAPHTHALENE		ND	2.3 J+	ND	0.076 J	0.089 J+	0.034 J	0.39 J	ND	ND	0.051 J	ND	0.15 J+	0.11 J	ND	14 J+
2-METHYLPHENOL (O-CRESOL)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-NITROANILINE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-NITROPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3,3'-DICHLOROBENZIDINE		ND	0.55 J+	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.7 J+
3-NITROANILINE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4,6-DINITRO-2-METHYLPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-BROMOPHENYL PHENYL ETHER		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table 5 Summary of Analytical Results for Subsurface Soil Samples from Soil Borings
Buffalo Harbor State Park, Buffalo, NY

PRELIMINARY REPORT

Analyte	Location ID:	SB-01	SB-01	SB-02	SB-02	SB-02	SB-03	SB-03	SB-04	SB-04	SB-04	SB-05	SB-05	SB-06	SB-06	SB-07
	Sample Name:	SB-01-Z0	SB-01-Z2	SB-02-Z0	SB-02-Z2	FD	SB-03-Z0	SB-03-Z2	SB-04-Z0	SB-04-Z2	FD	SB-05-Z0	SB-05-Z2	SB-06-Z0	SB-06-Z2	SB-07-Z18
	Depth:	0 - 2 ft	2 - 4 ft	0 - 2 ft	2 - 4 ft	2 - 4 ft	0 - 2 ft	2 - 4 ft	0 - 2 ft	2 - 4 ft	2 - 4 ft	0 - 2 ft	2 - 4 ft	0 - 2 ft	2 - 4 ft	18 - 19 ft
	Date:	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13
4-CHLORO-3-METHYLPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-CHLOROANILINE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-CHLOROPHENYL PHENYL ETHER		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-METHYLPHENOL (P-CRESOL)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-NITROANILINE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-NITROPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ACENAPHTHENE		ND	2.5 J+	0.02 J	0.096 J	0.22 J+	0.23 J	1.1 J	0.073 J	0.038 J	0.022 J	ND	0.12 J+	0.45	ND	15 J+
ACENAPHTHYLENE		ND	0.27 J+	ND	0.067 J	0.076 J+	ND	ND	0.037 J	ND	ND	ND	ND	0.1 J	0.082 J	1.6 J+
ACETOPHENONE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ANTHRACENE		ND	5.5 J+	0.12 J	0.23 J	0.5 J+	0.2 J	2.5	0.19 J	0.072 J	0.048 J	ND	0.39 J+	1	0.24 J	34 J+
ATRAZINE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BENZALDEHYDE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BENZO(A)ANTHRACENE		0.07 J	1.8 J+	0.32 J	0.64	0.98 J+	0.99	4.6	0.42	ND	0.08 J	0.15 J	0.56 J+	2.6	0.78	11 J+
BENZO(A)PYRENE		0.046 J	1.2 J+	0.21 J	0.43	0.62 J+	0.7	3	0.31 J	0.077 J	ND	0.11 J	0.39 J+	1.7	0.51	7.1 J+
BENZO(B)FLUORANTHENE		0.09 J	1.8 J+	0.36	0.75	1.1 J+	1.3	4.6	0.45	0.12 J	ND	0.22 J	0.62 J+	3.1	0.94	11 J+
BENZO(G,H,I)PERYLENE		ND	0.16 J+	0.071 J	0.16 J	0.2 J+	0.27 J	1.6 J	0.091 J	ND	ND	0.043 J	0.11 J+	0.51	0.21 J	0.92 J+
BENZO(K)FLUORANTHENE		0.029 J	1.2 J+	0.16 J	0.36 J	0.38 J+	0.57	2.3	0.2 J	0.059 J	ND	0.087 J	0.26 J+	1.1	0.42	4.5 J+
BENZYL BUTYL PHTHALATE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.12 J+	ND	ND	ND
BIPHENYL (DIPHENYL)		ND	0.21 J+	ND	0.026 J	0.037 J+	ND	0.14 J	ND	0.025 J	ND	ND	ND	0.033 J	ND	1.2 J+
BIS(2-CHLOROETHOXY) METHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BIS(2-CHLOROISOPROPYL) ETHER		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BIS(2-ETHYLHEXYL) PHTHALATE		ND	0.82 J+	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.11 J	ND	4.6 J+
CAPROLACTAM		ND	7.1 J+	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	41 J+
CARBAZOLE		ND	0.4 J+	ND	0.11 J	0.24 J+	0.19 J	1.6 J	0.086 J	0.027 J	ND	ND	0.15 J+	0.49	ND	2.4 J+
CHRYSENE		0.056 J	1.8 J+	0.35 J	0.74	0.93 J+	1.1	5	0.44	0.12 J	0.078 J	0.18 J	0.57 J+	2.7	0.82	12 J+
DIBENZ(A,H)ANTHRACENE		ND	ND	ND	ND	ND	ND	0.57 J	0.043 J	ND	ND	ND	0.058 J+	ND	ND	ND
DIBENZOFURAN		ND	1.5 J+	ND	0.11 J	0.23 J+	0.11 J	1.4 J	0.039 J	0.049 J	0.033 J	ND	0.15 J+	0.34 J	ND	8.9 J+
DIETHYL PHTHALATE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DIMETHYL PHTHALATE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DI-N-BUTYL PHTHALATE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DI-N-OCTYLPHTHALATE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
FLUORANTHENE		0.098 J	6 J+	0.69	1.3	2 J+	2.1	11	0.97	0.24 J	0.13 J	0.22 J	1.3 J+	5.9	1.6	35 J+
FLUORENE		ND	5 J+	0.056 J	0.14 J	0.28 J+	0.12 J	1.8 J	0.087 J	0.086 J	ND	ND	0.17 J+	0.6	ND	22 J+
HEXACHLOROBENZENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
HEXACHLOROBUTADIENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
HEXACHLOROCYCLOPENTADIENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
HEXACHLOROETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
INDENO(1,2,3-C,D)PYRENE		0.024 J	0.18 J+	0.092 J	0.2 J	0.24 J+	0.33 J	1.7 J	0.12 J	0.025 J	ND	0.055 J	0.15 J+	0.66	0.29 J	1.2 J+
ISOPHORONE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
NAPHTHALENE		ND	1.9 J+	ND	0.13 J	0.2 J+	0.11 J	1.1 J	ND	0.17 J	ND	ND	0.14 J+	0.25 J	0.058 J	11 J+
NITROBENZENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
N-NITROSODI-N-PROPYLAMINE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
N-NITROSODIPHENYLAMINE		ND	6 J+	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	33 J+

Analyte	Location ID:	SB-01	SB-01	SB-02	SB-02	SB-02	SB-03	SB-03	SB-04	SB-04	SB-04	SB-05	SB-05	SB-06	SB-06	SB-07
	Sample Name:	SB-01-Z0	SB-01-Z2	SB-02-Z0	SB-02-Z2	FD	SB-03-Z0	SB-03-Z2	SB-04-Z0	SB-04-Z2	FD	SB-05-Z0	SB-05-Z2	SB-06-Z0	SB-06-Z2	SB-07-Z18
	Depth:	0 - 2 ft	2 - 4 ft	0 - 2 ft	2 - 4 ft	2 - 4 ft	0 - 2 ft	2 - 4 ft	0 - 2 ft	2 - 4 ft	2 - 4 ft	0 - 2 ft	2 - 4 ft	0 - 2 ft	2 - 4 ft	18 - 19 ft
	Date:	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13	10/23/13
PENTACHLOROPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PHENANTHRENE		ND	8.7 J+	0.51	0.92	1.8 J+	1.6	13	0.77	0.31 J	0.23 J	0.098 J	1.4 J+	4.6	0.75	53 J+
PHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PYRENE		0.067 J	3.3 J+	0.46	0.92	1.5 J+	1.5	8.6	0.65	0.17 J	0.1 J	0.17 J	0.92 J+	4	1.1	20 J+

Key:

J = estimated value

J- = estimated value with low bias

N = tentative idenfication

mg/kg = milligrams per kilogram

ND = not detected

PCBs = polychlorinated biphenyl

Table 6 Summary of Analytical Results for Subsurface Soil Samples from Monitoring Well Borings

Buffalo Harbor State Park, Buffalo, NY

PRELIMINARY REPORT

Analyte	Location ID:	MW-01	MW-01	MW-01	MW-01	MW-02	MW-02	MW-02	MW-02	MW-03	MW-03	MW-03	MW-03
	Sample Name:	MW-01-Z0	MW-01-Z3	MW-01-Z9	MW-01-Z17	MW-02-Z0	MW-02-Z7	MW-02-Z11	MW-02-Z13	MW-03-Z0	MW-03-Z7	MW-03-Z9	MW-03-Z12
	Depth:	0 - 2 ft	3 - 4 ft	9 - 10 ft	17 - 19 ft	0 - 2 ft	7 - 8 ft	11 - 12 ft	13 - 14 ft	0 - 2 ft	7 - 8 ft	9 - 10 ft	12 - 14 ft
	Date:	10/21/13	10/21/13	10/21/13	10/21/13	10/21/13	10/21/13	10/21/13	10/21/13	10/22/13	10/21/13	10/21/13	10/21/13
Oil & Grease (n-Hexane Extractable Material) by Method E1664A (mg/kg)													
OIL & GREASE, TOTAL REC		ND	ND	ND	734	550	8410	486	481	ND	476	564	1650 J
Metals by Method SW6010C (mg/kg)													
ALUMINUM		19400	8070	12000	12800 J	13700	7710	3190	4280	6560	11000	14100	14400
ANTIMONY		ND	ND	ND	ND	ND	ND	ND	2.9 J	ND	ND	ND	ND
ARSENIC		5.9	2.9	18.9	34.9 J	8.7	6.7	6.1	15.8	3.1	27.9	48.8	38.2
BARIUM		170	68.7	108	173 J	123	95.5	29.5	58.7	57.7	108	135	154
BERYLLIUM		3.1	0.44	0.95	0.81	1.8	0.64	0.24	0.29	0.44	0.79	0.81	0.84
CADMIUM		0.31	0.14 J	2.8	10.1	0.53	0.43	0.35	1.1	0.16 J	3	5.4	7.9
CALCIUM		83900	127000	29800	35200	97000	83700	11300	16400	65400	36600	27200	26300
CHROMIUM, TOTAL		12.3	9.9	118	207 J	21.3	9.7	20.7	65.2	10.2	150	209	232
COBALT		5	5.9	10.4	12.2	6.3	4.3	3.9	6	5.5	11.1	14.5	13.8
COPPER		19.9	12.4	118	197 J	30.2	22	21.8	66.1	13.1	119	191	220
IRON		17300	12500	28300	35800	19300	16000	13300	22000	11600	36800	35900	37500
LEAD		31.8	16.3	198	428	87.6	199	42	132	9.7	188	266	413
MAGNESIUM		17500	15300	9640	11800 J	14800	11400	3270	4330	21000	8910	9700	10000
MANGANESE		1080	425	590	687	888	404	189	405	321	1470	537	575
NICKEL		13.5	13.4	34.3	45.3 J	25.8	10.6	12.7	21.2	12.4	36.9	45.4	48.4
POTASSIUM		1820	1530	1350	1490 J	1460	1080	542	653	1720	1180	1580	1540
SELENIUM		2.3 J	ND	0.98 J	1.2 J	2.5 J	1.1 J	ND	0.58 J	ND	1.8 J	1.9 J	1.7 J
SILVER		ND	ND	0.48 J	2.8	ND	ND	ND	ND	ND	0.51 J	0.66 J	2.4
SODIUM		544	183	185 J	165 J	341	311	76.6 J	83.3 J	246	227	220 J	216 J
THALLIUM		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
VANADIUM		12.6	14	19.9	26.9	15.3	13.2	7.5	10	15	29.9	26.5	26.4
ZINC		55.1	48.1	321	771	89.5	107	83	220	48	381	717	738
Mercury by Method SW7471B (mg/kg)													
MERCURY		0.15	0.028	1.7	4.3	0.18	0.17	0.2	0.55	0.049	2	4.1	3.7 J
Cyanide by Method SW9012 (mg/kg)													
CYANIDE		ND	ND	0.72 J	ND	3.1	0.55 J	ND	0.99 J	ND	ND	1 J	1.8
Organochlorine Pesticides by Method SW8081B (mg/kg)													
ALDRIN		ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0053 J+	0.015 J+	ND
ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)		ND	ND	0.00089 J	ND	ND	ND	0.004 J	ND	ND	0.0019 J+	0.0019 J+	0.011 J
ALPHA CHLORDANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.041 J
ALPHA ENDOSULFAN		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0026 J+	ND
BETA BHC (BETA HEXACHLOROCYCLOHEXANE)		ND	ND	0.0028 J	0.0083 J	ND	ND	ND	0.0049 J	ND	0.005 J+	0.0031 J+	0.029 J
BETA ENDOSULFAN		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0038 J+	0.022 J
DELTA BHC (DELTA HEXACHLOROCYCLOHEXANE)		0.00084 J	0.019 J	ND	ND	ND	ND	ND	ND	ND	0.0038 J+	0.012 J+	0.11
DIELDRIN		ND	ND	0.005	0.084	ND	ND	ND	0.015 J	ND	0.0044 J+	0.0082 J+	0.15
ENDOSULFAN SULFATE		0.0025 J	0.043 J	0.0017 J	0.01 J	ND	ND	ND	ND	ND	0.0027 J+	0.0022 J+	0.062
ENDRIN		ND	ND	0.0051	ND	0.0027 J	ND	ND	0.0052 J	ND	0.004 J+	0.0034 J+	0.027 J
ENDRIN ALDEHYDE		ND	ND	0.0018 J	0.04 J	0.0013 J	ND	ND	ND	ND	0.0031 J+	0.0028 J+	0.1
ENDRIN KETONE		ND	ND	0.0022 J	ND	ND	ND	ND	ND	ND	ND	ND	ND
GAMMA BHC (LINDANE)		ND	ND	ND	0.012 J	ND	ND	0.0041 J	0.004 J	ND	0.0022 J+	0.0037 J+	0.026 J
GAMMA CHLORDANE		ND	ND	0.0041 J	ND	ND	ND	ND	ND	ND	0.0049 J+	0.0086 J+	0.038 J

Table 6 Summary of Analytical Results for Subsurface Soil Samples from Monitoring Well Borings

Buffalo Harbor State Park, Buffalo, NY

PRELIMINARY REPORT

Analyte	Location ID:	MW-01	MW-01	MW-01	MW-01	MW-02	MW-02	MW-02	MW-02	MW-03	MW-03	MW-03	MW-03
	Sample Name:	MW-01-Z0	MW-01-Z3	MW-01-Z9	MW-01-Z17	MW-02-Z0	MW-02-Z7	MW-02-Z11	MW-02-Z13	MW-03-Z0	MW-03-Z7	MW-03-Z9	MW-03-Z12
	Depth:	0 - 2 ft	3 - 4 ft	9 - 10 ft	17 - 19 ft	0 - 2 ft	7 - 8 ft	11 - 12 ft	13 - 14 ft	0 - 2 ft	7 - 8 ft	9 - 10 ft	12 - 14 ft
	Date:	10/21/13	10/21/13	10/21/13	10/21/13	10/21/13	10/21/13	10/21/13	10/21/13	10/22/13	10/21/13	10/21/13	10/21/13
HEPTACHLOR		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0017 J+	0.02 J
HEPTACHLOR EPOXIDE		ND	ND	0.0012 J	ND	ND	ND	0.0059 J	ND	ND	ND	ND	0.072
METHOXYCHLOR		0.0016 J	0.031 J	0.0019 J	ND	0.0021 J	ND	ND	ND	ND	ND	ND	ND
P,P'-DDD		0.0011 J	ND	0.0048	0.016 J	ND	ND	0.0052 J	0.032	ND	0.0069 J+	0.011 J+	0.28 J
P,P'-DDE		0.0013 J	ND	0.0022 J	0.013 J	0.0012 J	0.0085 J	0.0053 J	0.0061 J	0.00093 J	0.0041 J+	0.011 J+	0.029 J
P,P'-DDT		0.0024 J	ND	ND	0.029 J	ND	0.018 J	ND	0.013 J	0.0015 J	0.01 J+	0.014 J+	0.17 J
TOXAPHENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCBs by Method SW8082A (mg/kg)													
PCB-1016 (AROCLOR 1016)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1221 (AROCLOR 1221)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1232 (AROCLOR 1232)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1242 (AROCLOR 1242)		ND	ND	ND	ND	ND	ND	0.11 J	ND	ND	ND	ND	ND
PCB-1248 (AROCLOR 1248)		ND	ND	ND	4.1	ND	ND	ND	0.64	ND	ND	1.9	13 J
PCB-1254 (AROCLOR 1254)		ND	ND	0.24 J	3.1 J	ND	ND	ND	ND	ND	0.21 J	ND	ND
PCB-1260 (AROCLOR 1260)		ND	ND	ND	0.72 J	ND	ND	ND	ND	ND	ND	ND	ND
Total PCBs		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Volatile Organics by Method SW8260C (mg/kg)													
1,1,1-TRICHLOROETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-TETRACHLOROETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-TRICHLOROETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-DICHLOROETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-DICHLOROETHENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-TRICHLOROBENZENE		ND	ND	ND	0.21	ND	ND	ND	0.23	ND	ND	ND	0.034 J
1,2,4-TRIMETHYLBENZENE		ND	ND	ND	0.35 J	ND	0.0091	ND	0.024 J	ND	ND	ND	0.036 J
1,2-DIBROMO-3-CHLOROPROPANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-DICHLOROBENZENE		ND	ND	0.0028 J	0.12 J	ND	ND	0.00078 J	0.074	ND	0.0014 J	0.0011 J	0.0049 J
1,2-DICHLOROETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-DICHLOROPROPANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-TRIMETHYLBENZENE (MESITYLENE)		ND	ND	ND	0.095 J	ND	0.0016 J	ND	ND	ND	ND	ND	0.012
1,3-DICHLOROBENZENE		ND	ND	0.0023 J	0.3	ND	ND	0.0023 J	0.0043 J	ND	0.0022 J	0.0012 J	0.2 J
1,4-DICHLOROBENZENE		ND	0.0016 J	0.013	1.8	ND	ND	0.012	0.017	ND	0.0095	0.0056 J	0.680 J-
1,4-DIOXANE (P-DIOXANE)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-HEXANONE		ND	ND	ND	ND	ND	ND	ND	0.4	ND	ND	ND	ND
ACETONE		ND	0.0057 J	0.12	ND	ND	0.014 J	0.038	0.019 J	ND	0.062	0.042	0.087
BENZENE		ND	ND	0.0053 J	0.12 J	ND	0.0082	ND	0.014	ND	0.0022 J	0.00071 J	0.11
BROMODICHLOROMETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BROMOFORM		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BROMOMETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CARBON DISULFIDE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CARBON TETRACHLORIDE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CHLOROBENZENE		ND	0.004 J	0.12	9.8	ND	ND	0.22	2.6	ND	0.083	0.088	1.5 J-

Table 6 Summary of Analytical Results for Subsurface Soil Samples from Monitoring Well Borings

Buffalo Harbor State Park, Buffalo, NY

PRELIMINARY REPORT

Analyte	Location ID:	MW-01	MW-01	MW-01	MW-01	MW-02	MW-02	MW-02	MW-02	MW-03	MW-03	MW-03	MW-03
	Sample Name:	MW-01-Z0	MW-01-Z3	MW-01-Z9	MW-01-Z17	MW-02-Z0	MW-02-Z7	MW-02-Z11	MW-02-Z13	MW-03-Z0	MW-03-Z7	MW-03-Z9	MW-03-Z12
	Depth:	0 - 2 ft	3 - 4 ft	9 - 10 ft	17 - 19 ft	0 - 2 ft	7 - 8 ft	11 - 12 ft	13 - 14 ft	0 - 2 ft	7 - 8 ft	9 - 10 ft	12 - 14 ft
	Date:	10/21/13	10/21/13	10/21/13	10/21/13	10/21/13	10/21/13	10/21/13	10/21/13	10/22/13	10/21/13	10/21/13	10/21/13
CHLOROETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CHLOROFORM		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CHLOROMETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CIS-1,2-DICHLOROETHYLENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CIS-1,3-DICHLOROPROPENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CYCLOHEXANE		ND	ND	ND	0.35	ND	ND	0.02	0.024	ND	ND	ND	0.054
DIBROMOCHLOROMETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DICHLORODIFLUOROMETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ETHYLBENZENE		ND	ND	ND	0.82 J	ND	0.0057	ND	ND	ND	ND	ND	0.27 J
ISOPROPYLBENZENE (CUMENE)		ND	ND	ND	0.026 J	ND	0.0023 J	0.0013 J	0.0019 J	ND	ND	ND	0.0026 J
METHYL ACETATE		ND	ND	ND	0.68	ND	ND	ND	0.082	ND	ND	ND	ND
METHYL ETHYL KETONE (2-BUTANONE)		ND	ND	0.039	ND	ND	0.0047 J	0.012 J	0.0073 J	ND	0.02 J	0.016 J	0.023 J
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
METHYLCYCLOHEXANE		ND	ND	0.0023 J	0.79	ND	ND	0.016	0.048	ND	ND	ND	0.1 J
METHYLENE CHLORIDE		ND	ND	ND	ND	ND	ND	ND	0.0023 J	ND	ND	ND	ND
N-BUTYLBENZENE		ND	ND	ND	0.16	ND	ND	0.0006 J	0.0029 J	ND	ND	ND	ND
N-PROPYLBENZENE		ND	ND	ND	0.071 J	ND	0.004 J	ND	0.0026 J	ND	ND	ND	0.0053 J
SEC-BUTYLBENZENE		ND	ND	ND	ND	ND	0.00089 J	0.0018 J	0.0021 J	ND	ND	ND	0.0026 J
STYRENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
T-BUTYLBENZENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TERT-BUTYL METHYL ETHER		ND	ND	ND	ND	ND	ND	ND	0.0013 J	ND	ND	ND	ND
TETRACHLOROETHYLENE (PCE)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TOLUENE		ND	ND	0.00066 J	0.094 J	ND	0.00077 J	ND	0.00077 J	ND	0.0007 J	0.00057 J	ND
TRANS-1,2-DICHLOROETHENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TRANS-1,3-DICHLOROPROPENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TRICHLOROETHYLENE (TCE)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TRICHLOROFLUOROMETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
VINYL CHLORIDE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
XYLENES, TOTAL		ND	ND	0.0014 J	0.41	ND	0.0022 J	0.0042 J	0.0085 J	ND	0.0016 J	0.0012 J	0.047
Semivolatile Organics by Method SW8270D (mg/kg)													
2,4,5-TRICHLOROPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4,6-TRICHLOROPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-DICHLOROPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-DIMETHYLPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-DINITROPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-DINITROTOLUENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,6-DINITROTOLUENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-CHLORONAPHTHALENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-CHLOROPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-METHYLNAPHTHALENE		0.014 J	0.037 J	0.036 J	0.60 J	0.052 J	0.11 J	0.03 J	0.58	ND	0.033 J	0.014 J	0.20 J
2-METHYLPHENOL (O-CRESOL)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-NITROANILINE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-NITROPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table 6 Summary of Analytical Results for Subsurface Soil Samples from Monitoring Well Borings

Buffalo Harbor State Park, Buffalo, NY

PRELIMINARY REPORT

Analyte	Location ID:	MW-01	MW-01	MW-01	MW-01	MW-02	MW-02	MW-02	MW-02	MW-03	MW-03	MW-03	MW-03
	Sample Name:	MW-01-Z0	MW-01-Z3	MW-01-Z9	MW-01-Z17	MW-02-Z0	MW-02-Z7	MW-02-Z11	MW-02-Z13	MW-03-Z0	MW-03-Z7	MW-03-Z9	MW-03-Z12
	Depth:	0 - 2 ft	3 - 4 ft	9 - 10 ft	17 - 19 ft	0 - 2 ft	7 - 8 ft	11 - 12 ft	13 - 14 ft	0 - 2 ft	7 - 8 ft	9 - 10 ft	12 - 14 ft
	Date:	10/21/13	10/21/13	10/21/13	10/21/13	10/21/13	10/21/13	10/21/13	10/21/13	10/22/13	10/21/13	10/21/13	10/21/13
3,3'-DICHLOROBENZIDINE		ND	ND	ND	ND	ND	ND	ND	0.51	ND	ND	ND	ND
3-NITROANILINE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4,6-DINITRO-2-METHYLPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-BROMOPHENYL PHENYL ETHER		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-CHLORO-3-METHYLPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-CHLOROANILINE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-CHLOROPHENYL PHENYL ETHER		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-METHYLPHENOL (P-CRESOL)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-NITROANILINE		ND	ND	ND	ND	ND	ND	ND	0.065 J	ND	ND	ND	ND
4-NITROPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ACENAPHTHENE		0.019 J	0.14 J	0.044 J	0.39 J	0.21 J	0.15 J	0.087 J	0.84	ND	ND	0.035 J	1.3
ACENAPHTHYLENE		ND	0.11 J	0.071 J	0.12 J	0.042 J	0.034 J	0.048 J	0.15 J	ND	0.13 J	0.05 J	0.18 J
ACETOPHENONE		ND	ND	ND	0.26 J	ND	ND	ND	ND	ND	0.028 J	ND	ND
ANTHRACENE		0.061 J	0.52	0.17 J	1.2 J	0.49	0.3 J	0.17 J	1.7	ND	0.18 J	0.14 J	0.5 J
ATRAZINE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BENZALDEHYDE		ND	ND	0.056 J	ND	ND	ND	0.073 J	0.069 J	ND	ND	0.086 J	0.26 J
BENZO(A)ANTHRACENE		0.25 J	1.6	0.4 J	0.57	1.1	0.71	0.35 J	1	0.023 J	0.65	0.16 J	0.66
BENZO(A)PYRENE		0.22 J	1.3	0.48	0.5 J	1	0.65	0.36 J	0.92	ND	0.75	0.22 J	0.87
BENZO(B)FLUORANTHENE		0.29 J	2.1	0.73	0.81 J	1.6	1.1	0.66	1.3	0.032 J	0.95	0.23 J	1.2
BENZO(G,H,I)PERYLENE		0.064 J	0.19 J	0.11 J	0.075 J	0.19 J	0.19 J	0.1 J	0.15 J	ND	0.23 J	0.092 J	0.19 J
BENZO(K)FLUORANTHENE		0.12 J	0.91	0.33 J	0.28 J	0.63	0.57	0.34 J	0.7	0.023 J	0.42 J	0.15 J	0.46 J
BENZYL BUTYL PHTHALATE		ND	ND	ND	ND	ND	0.11 J	ND	ND	ND	ND	ND	ND
BIPHENYL (DIPHENYL)		ND	ND	ND	0.088 J	ND	0.024 J	ND	0.078 J	ND	ND	ND	0.21 J
BIS(2-CHLOROETHOXY) METHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BIS(2-CHLOROISOPROPYL) ETHER		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BIS(2-ETHYLHEXYL) PHTHALATE		ND	ND	0.18 J	0.71	ND	0.18 J	0.46	0.28 J	ND	0.19 J	0.18 J	1.7
CAPROLACTAM		ND	ND	0.23 J	3.7 J	ND	0.19 J	ND	1.1	ND	0.35 J	ND	1.3
CARBAZOLE		0.021 J	0.26 J	0.058 J	0.075 J	0.27 J	0.16 J	0.047 J	0.16 J	ND	0.04 J	ND	0.049 J
CHRYSENE		0.27 J	1.6	0.47	0.62	1.2	0.81	0.39 J	1	0.023 J	0.72	0.21 J	0.89
DIBENZ(A,H)ANTHRACENE		0.032 J	0.11 J	0.062 J	ND	0.097 J	0.054 J	ND	0.075 J	ND	0.1 J	ND	0.067 J
DIBENZOFURAN		ND	0.099 J	0.039 J	0.22 J	0.15 J	0.11 J	ND	0.24 J	ND	0.044 J	0.016 J	0.18 J
DIETHYL PHTHALATE		ND	ND	ND	ND	ND	ND	ND	ND	0.13 J	ND	ND	ND
DIMETHYL PHTHALATE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DI-N-BUTYL PHTHALATE		ND	ND	ND	ND	ND	ND	ND	ND	0.14 J	ND	ND	ND
DI-N-OCTYLPHTHALATE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
FLUORANTHENE		0.5	3.4	0.7	1.4 J	2.7	2	0.81	2.8	0.034 J	0.95	0.26 J	1
FLUORENE		0.023 J	0.18 J	ND	0.82 J	0.26 J	0.19 J	ND	0.8	ND	0.084 J	ND	0.12 J
HEXACHLOROBENZENE		ND	ND	ND	ND	ND	ND	ND	0.45	ND	ND	ND	ND
HEXACHLOROBUTADIENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
HEXACHLOROCYCLOPENTADIENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
HEXACHLOROETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
INDENO(1,2,3-C,D)PYRENE		0.081 J	0.28 J	0.14 J	0.098 J	0.28 J	0.21 J	0.093 J	0.17 J	ND	0.28 J	0.084 J	0.19 J

Analyte	Location ID:	MW-01	MW-01	MW-01	MW-01	MW-02	MW-02	MW-02	MW-02	MW-03	MW-03	MW-03	MW-03
	Sample Name:	MW-01-Z0	MW-01-Z3	MW-01-Z9	MW-01-Z17	MW-02-Z0	MW-02-Z7	MW-02-Z11	MW-02-Z13	MW-03-Z0	MW-03-Z7	MW-03-Z9	MW-03-Z12
	Depth:	0 - 2 ft	3 - 4 ft	9 - 10 ft	17 - 19 ft	0 - 2 ft	7 - 8 ft	11 - 12 ft	13 - 14 ft	0 - 2 ft	7 - 8 ft	9 - 10 ft	12 - 14 ft
	Date:	10/21/13	10/21/13	10/21/13	10/21/13	10/21/13	10/21/13	10/21/13	10/21/13	10/22/13	10/21/13	10/21/13	10/21/13
ISOPHORONE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
NAPHTHALENE		ND	0.054 J	0.13 J	0.88 J	0.12 J	0.16 J	0.069 J	0.69	ND	0.18 J	0.045 J	0.34 J
NITROBENZENE		ND	ND	ND	ND	ND	ND	ND	0.066 J	ND	ND	ND	ND
N-NITROSODI-N-PROPYLAMINE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
N-NITROSODIPHENYLAMINE		ND	ND	0.28 J	2.2 J	ND	ND	0.097 J	3.3	ND	0.21 J	0.24 J	0.52 J
PENTACHLOROPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PHENANTHRENE		0.26 J	2.2	0.42 J	1.6 J	2	1.3	0.34 J	2.4	ND	0.42 J	0.083 J	0.56
PHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PYRENE		0.37 J	2.1	0.46 J	1	1.6	1.3	0.46	1.7	0.019 J	0.69	0.26 J	1.2

Key:
J = estimated value
J- = estimated value with low bias
J+ = estimated value with high bias
mg/kg = milligrams per kilogram
ND = not detected
PCBs = polychlorinated biphenyl

	Location ID:	MW-03	MW-04	MW-04	MW-04	MW-05	MW-05	MW-05	MW-06	MW-06	MW-06	MW-06
	Sample Name:	FD	MW-04-Z0	MW-04-Z2	MW-04-Z11	MW-05-Z0	MW-05-Z7	MW-05-Z10	MW-06-Z0	MW-06-Z5	MW-06-Z11	FD
	Depth:	12 - 14 ft	0 - 2 ft	2 - 4 ft	11 - 12 ft	0 - 2 ft	7 - 8 ft	10 - 11 ft	0 - 2 ft	5 - 6 ft	11 - 13 ft	11 - 13 ft
Analyte	Date:	10/21/13	10/22/13	10/22/13	10/22/13	10/22/13	10/22/13	10/22/13	10/22/13	10/22/13	10/22/13	10/22/13
Oil & Grease (n-Hexane Extractable Material) by Method E1664A (mg/kg)												
OIL & GREASE, TOTAL REC		621 J	643	1040	ND	585	ND	305	682	4180	396	434
Metals by Method SW6010C (mg/kg)												
ALUMINUM		11300	10800	11100	5110	13000	9740	3610	12600	13800	9000	6580
ANTIMONY		ND	ND	ND	ND	ND	0.67 J	ND	ND	ND	ND	ND
ARSENIC		34.3	7	8.2 J	4.2	6.2	7.9	3.1	30.3 J	8.1	17.9	ND
BARIUM		166	133	89.1	27.5	105	63.1	17.3	128 J	118	118	96.5
BERYLLIUM		0.73	1.1	0.53 J	0.18 J	1	0.35	0.13 J	1.6	1.1	0.96	0.73
CADMIUM		9.7	0.64	ND	ND	0.27	0.13 J	ND	0.81 J	0.17 J	0.74	1
CALCIUM		29000	47000	201000	30000	31300	28900	34700	68600	24000	64800	105000
CHROMIUM, TOTAL		205	23.6	916	9.7	15.7	16.7	5.4	49.9 J	17.3	96.1 J	450 J
COBALT		10.9	5.9	1.3 J	2.1	7.3	3.6	2	3.2 J	9.1	2.8	3.6
COPPER		193	46.4	27.9	32.3	18.7	35.9	6	27.5	18.6	34.4	33.8
IRON		27800	15300	112000	21200	18700	30000	9280	18100	25000	37600	59300
LEAD		402	119	80.6	14.6	39.3	97.3	6.6	71.1	35.4	121	91.6
MAGNESIUM		9660	12700	20700	3390	10700	3190	3920	15000	9280	6370 J	21500 J
MANGANESE		533	770	41800	617	656	2390	136	2590 J	354	4590 J	21400 J
NICKEL		41	16.7	8.7 J	4.9 J	16.9	9.5	4.8 J	10.8	26	10.2	13.1
POTASSIUM		1080	1360	938	588	1380	1200	492	1240 J	1860	1090	774
SELENIUM		1.5 J	0.87 J	21.7	ND	1.1 J	1.6 J	ND	14.9 J	ND	3.1 J	7.2 J
SILVER		3.5	ND	1.7 J	ND	ND	ND	ND	ND	ND	0.25 J	1.8 J
SODIUM		196	266	315	384	164 J	370	244	305	187	752	665
THALLIUM		ND	ND	43.6	ND	ND	1.4 J	ND	7.6	ND	ND	3.5 J
VANADIUM		23	16.5	426	13.1	23	32	11.8	18.4 J	22	54.8 J	172 J
ZINC		628	132	59.9	22.6	80.7	81.7	19.9	86.3 J	67	149	169
Mercury by Method SW7471B (mg/kg)												
MERCURY		1.2 J	0.1	0.073	ND	0.3	0.025	ND	0.055	0.04	0.12	0.14
Cyanide by Method SW9012 (mg/kg)												
CYANIDE		1 J	0.64 J	1.2	0.62 J	0.86 J	ND	ND	0.55 J	0.66 J	ND	0.8 J
Organochlorine Pesticides by Method SW8081B (mg/kg)												
ALDRIN		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)		0.01 J	ND	ND	0.00076 J	ND	0.00095 J+	0.00079 J	ND	ND	ND	ND
ALPHA CHLORDANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ALPHA ENDOSULFAN		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BETA BHC (BETA HEXACHLOROCYCLOHEXANE)		0.019 J	ND	ND	ND	ND	0.0048 J+	0.0035 J	ND	ND	ND	ND
BETA ENDOSULFAN		0.01 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DELTA BHC (DELTA HEXACHLOROCYCLOHEXANE)		0.13	0.0018 J	0.0072 J	ND	0.0016 J	0.00074 J+	0.0013 J	ND	ND	ND	0.014 J
DIELDRIN		0.1	0.0045 J	ND	ND	ND	ND	ND	ND	ND	ND	ND
ENDOSULFAN SULFATE		0.04 J	0.0064 J	ND	ND	0.0057 J	0.0044 J+	ND	ND	ND	ND	ND
ENDRIN		0.022 J	0.0031 J	ND	ND	ND	ND	0.0025 J	ND	ND	ND	ND
ENDRIN ALDEHYDE		ND	0.0025 J	ND	ND	ND	ND	ND	ND	ND	ND	ND
ENDRIN KETONE		ND	ND	0.01 J	ND	0.0034 J	0.0025 J+	ND	ND	ND	ND	ND
GAMMA BHC (LINDANE)		0.029 J	0.0014 J	ND	ND	ND	0.00075 J+	0.00087 J	ND	0.014 J	ND	ND
GAMMA CHLORDANE		0.042 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Analyte	Location ID:	MW-03	MW-04	MW-04	MW-04	MW-05	MW-05	MW-05	MW-06	MW-06	MW-06	MW-06
	Sample Name:	FD	MW-04-Z0	MW-04-Z2	MW-04-Z11	MW-05-Z0	MW-05-Z7	MW-05-Z10	MW-06-Z0	MW-06-Z5	MW-06-Z11	FD
	Depth:	12 - 14 ft	0 - 2 ft	2 - 4 ft	11 - 12 ft	0 - 2 ft	7 - 8 ft	10 - 11 ft	0 - 2 ft	5 - 6 ft	11 - 13 ft	11 - 13 ft
	Date:	10/21/13	10/22/13	10/22/13	10/22/13	10/22/13	10/22/13	10/22/13	10/22/13	10/22/13	10/22/13	10/22/13
HEPTACHLOR		0.022 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
HEPTACHLOR EPOXIDE		0.08	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
METHOXYCHLOR		ND	0.0035 J	ND	ND	0.0032 J	0.0047 J+	0.0015 J	ND	ND	0.0055 J	0.0055 J
P,P'-DDD		0.12 J	ND	0.01 J	0.00096 J	ND	ND	ND	ND	ND	ND	ND
P,P'-DDE		0.032 J	0.0026 J	0.0094 J	0.0011 J	0.0044 J	0.0012 J+	0.0013 J	ND	0.01 J	ND	ND
P,P'-DDT		0.076 J	ND	0.017 J	ND	0.0067 J	0.0014 J+	ND	0.014 J	0.018 J	0.014 J	0.014 J
TOXAPHENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCBs by Method SW8082A (mg/kg)												
PCB-1016 (AROCLOR 1016)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1221 (AROCLOR 1221)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1232 (AROCLOR 1232)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1242 (AROCLOR 1242)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1248 (AROCLOR 1248)		6.1 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1254 (AROCLOR 1254)		ND	0.14 J	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1260 (AROCLOR 1260)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total PCBs		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Volatile Organics by Method SW8260C (mg/kg)												
1,1,1-TRICHLOROETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-TETRACHLOROETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-TRICHLOROETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-DICHLOROETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-DICHLOROETHENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-TRICHLOROBENZENE		3.4 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-TRIMETHYLBENZENE		1.1 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-DIBROMO-3-CHLOROPROPANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-DICHLOROBENZENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-DICHLOROETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-DICHLOROPROPANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-TRIMETHYLBENZENE (MESITYLENE)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-DICHLOROBENZENE		6.5 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-DICHLOROBENZENE		31 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-DIOXANE (P-DIOXANE)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-HEXANONE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ACETONE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BENZENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BROMODICHLOROMETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BROMOFORM		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BROMOMETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CARBON DISULFIDE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CARBON TETRACHLORIDE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CHLOROBENZENE		68 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Analyte	Location ID:	MW-03	MW-04	MW-04	MW-04	MW-05	MW-05	MW-05	MW-06	MW-06	MW-06	MW-06
	Sample Name:	FD	MW-04-Z0	MW-04-Z2	MW-04-Z11	MW-05-Z0	MW-05-Z7	MW-05-Z10	MW-06-Z0	MW-06-Z5	MW-06-Z11	FD
	Depth:	12 - 14 ft	0 - 2 ft	2 - 4 ft	11 - 12 ft	0 - 2 ft	7 - 8 ft	10 - 11 ft	0 - 2 ft	5 - 6 ft	11 - 13 ft	11 - 13 ft
	Date:	10/21/13	10/22/13	10/22/13	10/22/13	10/22/13	10/22/13	10/22/13	10/22/13	10/22/13	10/22/13	10/22/13
CHLOROETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CHLOROFORM		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CHLOROMETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CIS-1,2-DICHLOROETHYLENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CIS-1,3-DICHLOROPROPENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CYCLOHEXANE		ND	ND	0.0013 J	ND	ND	ND	ND	ND	ND	0.0011 J	ND
DIBROMOCHLOROMETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DICHLORODIFLUOROMETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ETHYLBENZENE		4.2 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ISOPROPYLBENZENE (CUMENE)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
METHYL ACETATE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
METHYL ETHYL KETONE (2-BUTANONE)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
METHYLCYCLOHEXANE		1.2 J	ND	0.0018 J	ND	ND	ND	ND	ND	ND	0.00097 J	0.0011 J
METHYLENE CHLORIDE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
N-BUTYLBENZENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
N-PROPYLBENZENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SEC-BUTYLBENZENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
STYRENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
T-BUTYLBENZENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TERT-BUTYL METHYL ETHER		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TETRACHLOROETHYLENE (PCE)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TOLUENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TRANS-1,2-DICHLOROETHENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TRANS-1,3-DICHLOROPROPENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TRICHLOROETHYLENE (TCE)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TRICHLOROFLUOROMETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
VINYL CHLORIDE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
XYLENES, TOTAL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Semivolatile Organics by Method SW8270D (mg/kg)												
2,4,5-TRICHLOROPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4,6-TRICHLOROPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-DICHLOROPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-DIMETHYLPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-DINITROPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-DINITROTOLUENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,6-DINITROTOLUENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-CHLORONAPHTHALENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-CHLOROPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-METHYLNAPHTHALENE		0.29 J	0.022 J	0.089 J	0.029 J	0.063 J	0.11 J	0.031 J	ND	ND	0.076 J	0.052 J
2-METHYLPHENOL (O-CRESOL)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-NITROANILINE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-NITROPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Analyte	Location ID:	MW-03	MW-04	MW-04	MW-04	MW-05	MW-05	MW-05	MW-06	MW-06	MW-06	MW-06
	Sample Name:	FD	MW-04-Z0	MW-04-Z2	MW-04-Z11	MW-05-Z0	MW-05-Z7	MW-05-Z10	MW-06-Z0	MW-06-Z5	MW-06-Z11	FD
	Depth:	12 - 14 ft	0 - 2 ft	2 - 4 ft	11 - 12 ft	0 - 2 ft	7 - 8 ft	10 - 11 ft	0 - 2 ft	5 - 6 ft	11 - 13 ft	11 - 13 ft
	Date:	10/21/13	10/22/13	10/22/13	10/22/13	10/22/13	10/22/13	10/22/13	10/22/13	10/22/13	10/22/13	10/22/13
3,3'-DICHLOROBENZIDINE		0.54	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3-NITROANILINE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4,6-DINITRO-2-METHYLPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-BROMOPHENYL PHENYL ETHER		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-CHLORO-3-METHYLPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-CHLOROANILINE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-CHLOROPHENYL PHENYL ETHER		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-METHYLPHENOL (P-CRESOL)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-NITROANILINE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-NITROPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ACENAPHTHENE		1.8	0.037 J	0.021 J	0.01 J	0.19 J	0.056 J	ND	0.2 J	0.022 J	0.25 J	0.11 J
ACENAPHTHYLENE		0.088 J	0.062 J	0.2 J	ND	0.053 J	ND	ND	0.16 J	ND	0.17 J	0.26 J
ACETOPHENONE		ND	ND	0.034 J	ND	ND	ND	ND	ND	ND	ND	ND
ANTHRACENE		0.8	0.13 J	0.11 J	0.027 J	0.41	0.13 J	ND	0.42	0.035 J	0.83	0.82
ATRAZINE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BENZALDEHYDE		0.26 J	ND	ND	ND	ND	0.097 J	ND	ND	ND	ND	ND
BENZO(A)ANTHRACENE		0.32 J	0.52	0.81	0.054 J	0.94	0.27 J	0.025 J	1.5	0.13 J	1.9	2.1
BENZO(A)PYRENE		0.39 J	0.48	0.86	0.041 J	0.73	0.25 J	0.045 J	1.6	0.13 J	1.5	1.8
BENZO(B)FLUORANTHENE		0.55 J	1.1	2.1	0.084 J	1.5	0.52	0.054 J	2.7	0.19 J	2.7	2.7
BENZO(G,H,I)PERYLENE		0.074 J	0.12 J	0.2 J	ND	0.13 J	0.057 J	ND	0.49	0.051 J	0.4	0.51
BENZO(K)FLUORANTHENE		0.24 J	0.41	0.91	0.027 J	0.59	0.19 J	0.051 J	1.4	0.077 J	0.93	1.2
BENZYL BUTYL PHTHALATE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BIPHENYL (DIPHENYL)		0.31 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BIS(2-CHLOROETHOXY) METHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BIS(2-CHLOROISOPROPYL) ETHER		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BIS(2-ETHYLHEXYL) PHTHALATE		1	ND	ND	ND	ND	ND	ND	ND	ND	0.31 J	0.25 J
CAPROLACTAM		1.9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CARBAZOLE		ND	0.057 J	0.052 J	ND	0.25 J	0.076 J	ND	0.19 J	ND	0.32 J	0.18 J
CHRYSENE		0.41 J	0.58	0.91	0.072 J	0.87	0.31 J	0.05 J	1.6	0.13 J	1.8	2.2
DIBENZ(A,H)ANTHRACENE		ND	0.054 J	0.092 J	ND	0.062 J	ND	ND	0.18 J	ND	0.19 J	0.24 J
DIBENZOFURAN		0.24 J	ND	0.043 J	0.023 J	0.14 J	0.09 J	0.024 J	0.16 J	ND	0.19 J	0.11 J
DIETHYL PHTHALATE		ND	0.14 J	0.18 J	0.12 J	0.062 J	0.061 J	0.048 J	ND	0.045 J	0.056 J	0.047 J
DIMETHYL PHTHALATE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DI-N-BUTYL PHTHALATE		ND	ND	0.25 J	0.18 J	ND	ND	ND	ND	ND	ND	ND
DI-N-OCTYLPHTHALATE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
FLUORANTHENE		0.53	1.2	1.4	0.13 J	2.2	0.73	0.051 J	2.5	0.27 J	4.2	4.6
FLUORENE		0.11 J	0.05 J	0.029 J	ND	0.26 J	0.064 J	ND	0.21 J	ND	0.33 J	0.21 J
HEXACHLOROBENZENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
HEXACHLOROBUTADIENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
HEXACHLOROCYCLOPENTADIENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
HEXACHLOROETHANE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
INDENO(1,2,3-C,D)PYRENE		0.081 J	0.14 J	0.24 J	ND	0.17 J	0.066 J	ND	0.58	0.055 J	0.54	0.68

Table 6 Summary of Analytical Results for Subsurface Soil Samples from Monitoring Well Borings
Buffalo Harbor State Park, Buffalo, NY

PRELIMINARY REPORT

Analyte	Location ID:	MW-03	MW-04	MW-04	MW-04	MW-05	MW-05	MW-05	MW-06	MW-06	MW-06	MW-06
	Sample Name:	FD	MW-04-Z0	MW-04-Z2	MW-04-Z11	MW-05-Z0	MW-05-Z7	MW-05-Z10	MW-06-Z0	MW-06-Z5	MW-06-Z11	FD
	Depth:	12 - 14 ft	0 - 2 ft	2 - 4 ft	11 - 12 ft	0 - 2 ft	7 - 8 ft	10 - 11 ft	0 - 2 ft	5 - 6 ft	11 - 13 ft	11 - 13 ft
	Date:	10/21/13	10/22/13	10/22/13	10/22/13	10/22/13	10/22/13	10/22/13	10/22/13	10/22/13	10/22/13	10/22/13
ISOPHORONE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
NAPHTHALENE		0.4 J	0.036 J	0.073 J	0.053 J	0.17 J	0.11 J	0.046 J	0.22 J	ND	0.15 J	0.13 J
NITROBENZENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
N-NITROSODI-N-PROPYLAMINE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
N-NITROSODIPHENYLAMINE		0.85	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PENTACHLOROPHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PHENANTHRENE		0.45 J	0.55	0.4	0.11 J	1.8	0.72	0.096 J	1.6	0.19 J	3	2.2
PHENOL		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PYRENE		0.58	0.69	0.91	0.09 J	1.2	0.43	0.031 J	1.8	0.2 J	2.5	3

Key:
J = estimated value
J- = estimated value with low bias
J+ = estimated value with high bias
mg/kg = milligrams per kilogram
ND = not detected
PCBs = polychlorinated biphenyl

Table 7 Summary of Analytical Results for Groundwater Samples
Buffalo Harbor State Park, Buffalo, New York

PRELIMINARY REPORT

Analyte	MW-01	MW-02	MW-02	MW-03	MW-04	MW-05	MW-06	SB-02	SB-04
	MW-01-WG	MW-02-WG	MW-02-WG-FD	MW-03-WG	MW-04-WG	MW-05-WG	MW-06-WG	SB-02-WG	SB-04-WG
	6 - 16 ft	6 - 16 ft	6 - 16 ft	8 - 18 ft	8 - 18 ft	8 - 18 ft	8 - 18 ft	1 - 4 ft	2 - 4 ft
	10/29/13	10/28/13	10/28/13	10/29/13	10/28/13	10/28/13	10/28/13	10/23/13	10/23/13
Metals by Method SW6010C (µg/L)									
ALUMINUM	880	110 J	83 J	150 J	ND	170 J	120 J	270	190 J
ANTIMONY	ND	ND	ND	ND	ND	ND	ND	ND	ND
ARSENIC	10	110	110	19	ND	7.2 J	ND	ND	ND
BARIUM	130	160	150	190	44	32	59	20	9
BERYLLIUM	ND	ND	ND	ND	ND	ND	ND	ND	ND
CADMIUM	0.64 J	ND	ND	ND	ND	ND	ND	ND	ND
CALCIUM	272000	274000	267000	371000	117000	83000	104000	74700	29300
CHROMIUM, TOTAL	15	6.2	5.5	11	5.6	ND	1.3 J	5.2	ND
COBALT	2.1 J	1.6 J	1.4 J	6	ND	ND	ND	ND	ND
COPPER	11	2.2 J	2.3 J	3.5 J	3.6 J	1.7 J	2.3 J	9.1 J	2.6 J
IRON	4000	43500	42500	20200	1100	180	ND	1400	380
LEAD	13	ND	ND	5	ND	ND	ND	10	ND
MAGNESIUM	76100	69000	67400	87600	13000	7100	130 J	8900	5700
MANGANESE	900	1200	1200	580	110	190	4.6	240	63
NICKEL	8.2 J	1.8 J	2.7 J	11	1.8 J	1.4 J	ND	ND	ND
POTASSIUM	16900	17700	17500	19300	10400	18400 J+	34100	6300	4900
SELENIUM	ND	ND	ND	ND	ND	ND	ND	ND	ND
SILVER	ND	ND	ND	ND	ND	ND	ND	ND	ND
SODIUM	42400	57600	56600	76800	567000	610000	923000	287000	100000
THALLIUM	ND	ND	ND	ND	ND	ND	ND	ND	ND
VANADIUM	2 J	ND	ND	ND	5.5	10	61	8.2	ND
ZINC	64	4.9 J	4.7 J	83	2.2 J	3.2 J	ND	6.2 J	7.9 J
Mercury by Method SW7470A (µg/L)									
MERCURY	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cyanide by Method SW9012 (µg/L)									
CYANIDE	6.2 J	7.3 J	6.8 J	7.7 J	5 J	5.3 J	11	ND	ND
Organochlorine Pesticides by Method SW8081B (µg/L)									
ALDRIN	ND	ND	ND	ND	ND	ND	ND	ND	ND
ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)	ND	0.015 J	0.23 J	ND	0.021 J	ND	0.013 J	ND	0.0079 J
ALPHA CHLORDANE	ND	ND	ND	ND	ND	ND	ND	ND	ND
ALPHA ENDOSULFAN	ND	ND	ND	ND	ND	ND	ND	ND	ND
BETA BHC (BETA HEXACHLOROCYCLOHEXANE)	ND	ND	ND	ND	ND	ND	ND	ND	ND
BETA ENDOSULFAN	ND	ND	ND	ND	ND	ND	ND	ND	ND
DELTA BHC (DELTA HEXACHLOROCYCLOHEXANE)	ND	ND	ND	ND	ND	ND	ND	ND	ND
DIELDRIN	ND	ND	ND	ND	ND	ND	ND	ND	ND
ENDOSULFAN SULFATE	ND	ND	ND	ND	ND	ND	ND	ND	ND
ENDRIN	ND	0.036 J	ND	ND	ND	ND	ND	ND	ND
ENDRIN ALDEHYDE	ND	ND	ND	ND	0.02 J	ND	ND	ND	ND
ENDRIN KETONE	ND	ND	ND	ND	ND	ND	ND	ND	ND
GAMMA BHC (LINDANE)	ND	0.01 J	ND	ND	0.0096 J	0.0094 J	0.0092 J	ND	ND

Table 7 Summary of Analytical Results for Groundwater Samples
Buffalo Harbor State Park, Buffalo, New York

PRELIMINARY REPORT

Analyte	MW-01	MW-02	MW-02	MW-03	MW-04	MW-05	MW-06	SB-02	SB-04
	MW-01-WG	MW-02-WG	MW-02-WG-FD	MW-03-WG	MW-04-WG	MW-05-WG	MW-06-WG	SB-02-WG	SB-04-WG
	6 - 16 ft	6 - 16 ft	6 - 16 ft	8 - 18 ft	8 - 18 ft	8 - 18 ft	8 - 18 ft	1 - 4 ft	2 - 4 ft
	10/29/13	10/28/13	10/28/13	10/29/13	10/28/13	10/28/13	10/28/13	10/23/13	10/23/13
GAMMA CHLORDANE	ND	0.022 J	ND	ND	0.019 J	0.022 J	0.027 J	ND	0.027 J
HEPTACHLOR	ND	ND	ND	ND	ND	ND	ND	ND	ND
HEPTACHLOR EPOXIDE	ND	ND	ND	ND	ND	ND	ND	ND	ND
METHOXYCHLOR	ND	ND	ND	ND	ND	ND	ND	ND	ND
P,P'-DDD	ND	ND	ND	ND	ND	ND	ND	0.052 J	ND
P,P'-DDE	ND	ND	ND	ND	ND	ND	ND	ND	ND
P,P'-DDT	ND	ND	ND	ND	ND	ND	ND	ND	ND
TOXAPHENE	ND	ND	ND	ND	ND	ND	ND	ND	ND
Polychlorinated Biphenyls by Method SW8082A (µg									
PCB-1016 (AROCLOR 1016)	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1221 (AROCLOR 1221)	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1232 (AROCLOR 1232)	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1242 (AROCLOR 1242)	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1248 (AROCLOR 1248)	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1254 (AROCLOR 1254)	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1260 (AROCLOR 1260)	ND	ND	ND	ND	ND	ND	ND	ND	ND
Volatile Organics by Method SW8260C (µg/L)									
1,1,1-TRICHLOROETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-TETRACHLOROETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-TRICHLOROETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-DICHLOROETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-DICHLOROETHENE	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-TRICHLOROBENZENE	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-TRIMETHYLBENZENE	ND	ND	ND	11	ND	ND	ND	ND	ND
1,2-DIBROMO-3-CHLOROPROPANE	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-DICHLOROBENZENE	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-DICHLOROETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-DICHLOROPROPANE	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-TRIMETHYLBENZENE (MESITYLENE)	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-DICHLOROBENZENE	ND	ND	ND	30	ND	ND	ND	ND	ND
1,4-DICHLOROBENZENE	6.5	ND	ND	160	ND	ND	ND	ND	ND
1,4-DIOXANE (P-DIOXANE)	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-HEXANONE	ND	ND	ND	ND	ND	ND	ND	ND	ND
ACETONE	ND	ND	ND	21 J	ND	ND	ND	ND	ND
BENZENE	13	7 J	7.7 J	580	ND	ND	ND	ND	ND
BROMODICHLOROMETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND
BROMOFORM	ND	ND	ND	ND	ND	ND	ND	ND	ND
BROMOMETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table 7 Summary of Analytical Results for Groundwater Samples
Buffalo Harbor State Park, Buffalo, New York

PRELIMINARY REPORT

Analyte	MW-01	MW-02	MW-02	MW-03	MW-04	MW-05	MW-06	SB-02	SB-04
	MW-01-WG	MW-02-WG	MW-02-WG-FD	MW-03-WG	MW-04-WG	MW-05-WG	MW-06-WG	SB-02-WG	SB-04-WG
	6 - 16 ft	6 - 16 ft	6 - 16 ft	8 - 18 ft	8 - 18 ft	8 - 18 ft	8 - 18 ft	1 - 4 ft	2 - 4 ft
	10/29/13	10/28/13	10/28/13	10/29/13	10/28/13	10/28/13	10/28/13	10/23/13	10/23/13
CARBON DISULFIDE	ND	ND	ND	ND	ND	ND	ND	ND	ND
CARBON TETRACHLORIDE	ND	ND	ND	ND	ND	ND	ND	ND	ND
CHLOROBENZENE	120	130	130	7600	5.9	5.3	ND	ND	ND
CHLOROETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND
CHLOROFORM	ND	ND	ND	ND	ND	ND	ND	ND	ND
CHLOROMETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND
CIS-1,2-DICHLOROETHYLENE	ND	ND	ND	ND	ND	ND	ND	ND	ND
CIS-1,3-DICHLOROPROPENE	ND	ND	ND	ND	ND	ND	ND	ND	ND
CYCLOHEXANE	ND	ND	ND	3.3 J	ND	ND	ND	ND	ND
DIBROMOCHLOROMETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND
DICHLORODIFLUOROMETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND
ETHYLBENZENE	ND	ND	ND	81	ND	ND	ND	ND	ND
ISOPROPYLBENZENE (CUMENE)	ND	ND	ND	ND	ND	ND	ND	ND	ND
METHYL ACETATE	ND	ND	ND	ND	ND	ND	ND	ND	ND
METHYL ETHYL KETONE (2-BUTANONE)	ND	ND	ND	ND	ND	ND	ND	ND	ND
METHYL ISOBUTYL KETONE (4-METHYL-2-PEN	ND	ND	ND	ND	ND	ND	ND	ND	ND
METHYLCYCLOHEXANE	2.1 J	4 J	4.3 J	4.2 J	ND	ND	ND	ND	ND
METHYLENE CHLORIDE	ND	ND	ND	ND	ND	ND	ND	ND	ND
N-BUTYLBENZENE	ND	ND	ND	ND	ND	ND	ND	ND	ND
N-PROPYLBENZENE	ND	ND	ND	ND	ND	ND	ND	ND	ND
SEC-BUTYLBENZENE	ND	ND	ND	ND	ND	ND	ND	ND	ND
STYRENE	ND	ND	ND	ND	ND	ND	ND	ND	ND
T-BUTYLBENZENE	ND	ND	ND	ND	ND	ND	ND	ND	ND
TERT-BUTYL METHYL ETHER	ND	3.2 J	3.1 J	ND	ND	ND	ND	ND	ND
TETRACHLOROETHYLENE(PCE)	ND	ND	ND	ND	ND	ND	ND	ND	ND
TOLUENE	ND	ND	ND	6.1	ND	ND	ND	ND	ND
TRANS-1,2-DICHLOROETHENE	ND	ND	ND	ND	ND	ND	ND	ND	ND
TRANS-1,3-DICHLOROPROPENE	ND	ND	ND	ND	ND	ND	ND	ND	ND
TRICHLOROETHYLENE (TCE)	ND	ND	ND	ND	ND	ND	ND	ND	ND
TRICHLOROFLUOROMETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND
VINYL CHLORIDE	ND	ND	ND	ND	ND	ND	ND	ND	ND
XYLENES, TOTAL	ND	ND	ND	27	ND	ND	ND	ND	ND
Semivolatile Organics by Method SW8270D (µg/L)									
2,4,5-TRICHLOROPHENOL	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4,6-TRICHLOROPHENOL	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-DICHLOROPHENOL	ND	ND	ND	1.3 J	ND	ND	ND	ND	ND
2,4-DIMETHYLPHENOL	ND	ND	ND	1 J	ND	ND	ND	ND	ND
2,4-DINITROPHENOL	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-DINITROTOLUENE	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,6-DINITROTOLUENE	ND	ND	ND	ND	ND	ND	ND	ND	ND

Analyte	MW-01	MW-02	MW-02	MW-03	MW-04	MW-05	MW-06	SB-02	SB-04
	MW-01-WG	MW-02-WG	MW-02-WG-FD	MW-03-WG	MW-04-WG	MW-05-WG	MW-06-WG	SB-02-WG	SB-04-WG
	6 - 16 ft	6 - 16 ft	6 - 16 ft	8 - 18 ft	8 - 18 ft	8 - 18 ft	8 - 18 ft	1 - 4 ft	2 - 4 ft
	10/29/13	10/28/13	10/28/13	10/29/13	10/28/13	10/28/13	10/28/13	10/23/13	10/23/13
2-CHLORONAPHTHALENE	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-CHLOROPHENOL	0.94 J	1.6 J	1.7 J	42	ND	ND	ND	ND	ND
2-METHYLNAPHTHALENE	0.67 J	ND	ND	3.6 J	ND	ND	ND	ND	ND
2-METHYLPHENOL (O-CRESOL)	ND	ND	ND	0.38 J	ND	ND	ND	ND	ND
2-NITROANILINE	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-NITROPHENOL	ND	ND	ND	ND	ND	ND	ND	ND	ND
3,3'-DICHLOROBENZIDINE	ND	ND	ND	ND	ND	ND	ND	ND	ND
3-NITROANILINE	ND	ND	ND	ND	ND	ND	ND	ND	ND
4,6-DINITRO-2-METHYLPHENOL	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-BROMOPHENYL PHENYL ETHER	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-CHLORO-3-METHYLPHENOL	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-CHLOROANILINE	0.96 J	ND	ND	39	ND	ND	ND	ND	ND
4-CHLOROPHENYL PHENYL ETHER	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-METHYLPHENOL (P-CRESOL)	ND	0.69 J	0.89 J	ND	ND	ND	1.3 J	ND	ND
4-NITROANILINE	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-NITROPHENOL	ND	ND	ND	ND	ND	ND	ND	ND	ND
ACENAPHTHENE	0.76 J	0.8 J	0.69 J	2.4 J	ND	ND	ND	ND	ND
ACENAPHTHYLENE	ND	ND	ND	ND	ND	ND	ND	ND	ND
ACETOPHENONE	ND	ND	ND	0.87 J	ND	ND	ND	ND	ND
ANTHRACENE	ND	ND	ND	0.36 J	ND	ND	ND	ND	ND
ATRAZINE	ND	ND	ND	ND	ND	ND	ND	ND	ND
BENZALDEHYDE	ND	ND	ND	ND	ND	ND	ND	ND	ND
BENZO(A)ANTHRACENE	ND	ND	ND	ND	ND	ND	ND	0.46 J	ND
BENZO(A)PYRENE	ND	ND	ND	ND	ND	ND	ND	ND	ND
BENZO(B)FLUORANTHENE	ND	ND	ND	ND	ND	ND	ND	0.48 J	ND
BENZO(G,H,I)PERYLENE	ND	ND	ND	ND	ND	ND	ND	ND	ND
BENZO(K)FLUORANTHENE	ND	ND	ND	ND	ND	ND	ND	ND	ND
BENZYL BUTYL PHTHALATE	0.59 J	ND	ND	ND	ND	ND	ND	ND	ND
BIPHENYL (DIPHENYL)	ND	ND	ND	0.7 J	ND	ND	ND	ND	ND
BIS(2-CHLOROETHOXY) METHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHY	ND	ND	ND	ND	ND	ND	ND	ND	ND
BIS(2-CHLOROISOPROPYL) ETHER	ND	ND	ND	ND	ND	ND	ND	ND	ND
BIS(2-ETHYLHEXYL) PHTHALATE	ND	ND	ND	ND	ND	ND	ND	ND	ND
CAPROLACTAM	ND	ND	ND	ND	ND	ND	ND	ND	ND
CARBAZOLE	0.36 J	ND	0.51 J	1 J	ND	ND	0.42 J	ND	ND
CHRYSENE	ND	ND	ND	ND	ND	ND	ND	0.41 J	ND
DIBENZ(A,H)ANTHRACENE	ND	ND	ND	ND	0.55 J	0.55 J	ND	ND	ND
DIBENZOFURAN	ND	ND	ND	ND	ND	ND	ND	ND	ND
DIETHYL PHTHALATE	0.35 J	ND	ND	ND	ND	ND	ND	ND	ND
DIMETHYL PHTHALATE	ND	ND	ND	ND	ND	ND	ND	ND	ND

Analyte	MW-01	MW-02	MW-02	MW-03	MW-04	MW-05	MW-06	SB-02	SB-04
	MW-01-WG	MW-02-WG	MW-02-WG-FD	MW-03-WG	MW-04-WG	MW-05-WG	MW-06-WG	SB-02-WG	SB-04-WG
	6 - 16 ft	6 - 16 ft	6 - 16 ft	8 - 18 ft	8 - 18 ft	8 - 18 ft	8 - 18 ft	1 - 4 ft	2 - 4 ft
	10/29/13	10/28/13	10/28/13	10/29/13	10/28/13	10/28/13	10/28/13	10/23/13	10/23/13
DI-N-BUTYL PHTHALATE	ND	ND	ND	ND	ND	ND	ND	ND	ND
DI-N-OCTYLPHTHALATE	ND	ND	ND	ND	ND	ND	ND	ND	ND
FLUORANTHENE	ND	ND	ND	ND	ND	ND	ND	0.97 J	ND
FLUORENE	0.47 J	ND	ND	0.71 J	ND	ND	ND	ND	ND
HEXACHLOROBENZENE	ND	ND	ND	ND	ND	ND	ND	ND	ND
HEXACHLOROBUTADIENE	ND	ND	ND	ND	ND	ND	ND	ND	ND
HEXACHLOROCYCLOPENTADIENE	ND	ND	ND	ND	ND	ND	ND	ND	ND
HEXACHLOROETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND
INDENO(1,2,3-C,D)PYRENE	ND	ND	ND	ND	1.8 J	ND	1.8 J	ND	ND
ISOPHORONE	ND	ND	ND	ND	ND	ND	ND	ND	ND
NAPHTHALENE	1.1 J	ND	ND	22	ND	ND	1.4 J	ND	ND
NITROBENZENE	ND	ND	ND	ND	ND	ND	ND	ND	ND
N-NITROSODI-N-PROPYLAMINE	ND	ND	ND	ND	ND	ND	ND	ND	ND
N-NITROSODIPHENYLAMINE	3.5 J	1.2 J	1.2 J	24	ND	ND	ND	ND	ND
PENTACHLOROPHENOL	3.7 J	ND	ND	7.8 J	ND	ND	ND	ND	ND
PHENANTHRENE	ND	ND	ND	0.6 J	ND	ND	ND	0.64 J	ND
PHENOL	ND	ND	0.42 J	6.0	ND	0.43 J-	1.6 J	ND	ND
PYRENE	ND	ND	ND	ND	ND	ND	ND	0.7 J	ND

Key:

"-FD" denotes field duplicate sample

µg/L = Micrograms per liter

J = Estimated value

J- = Estimated value with low bias

J+ = Estimated value with high bias

mg/L = Milligrams per liter

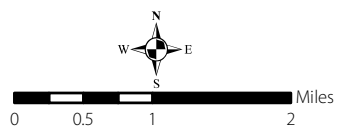
ND = Not detected



Legend

- Buffalo Harbor State Park Project Site Boundary

Figure 1
Site Location Map
Buffalo Harbor State Park
 Buffalo, New York



Service Layer Credits: Copyright: © 2013 National Geographic Society
 SOURCE: Ecology and Environment Engineering, P.C., 2013; ESRI 2012;
 Microsoft Corporation 2010.

© 2013 Ecology and Environment Engineering, P.C.

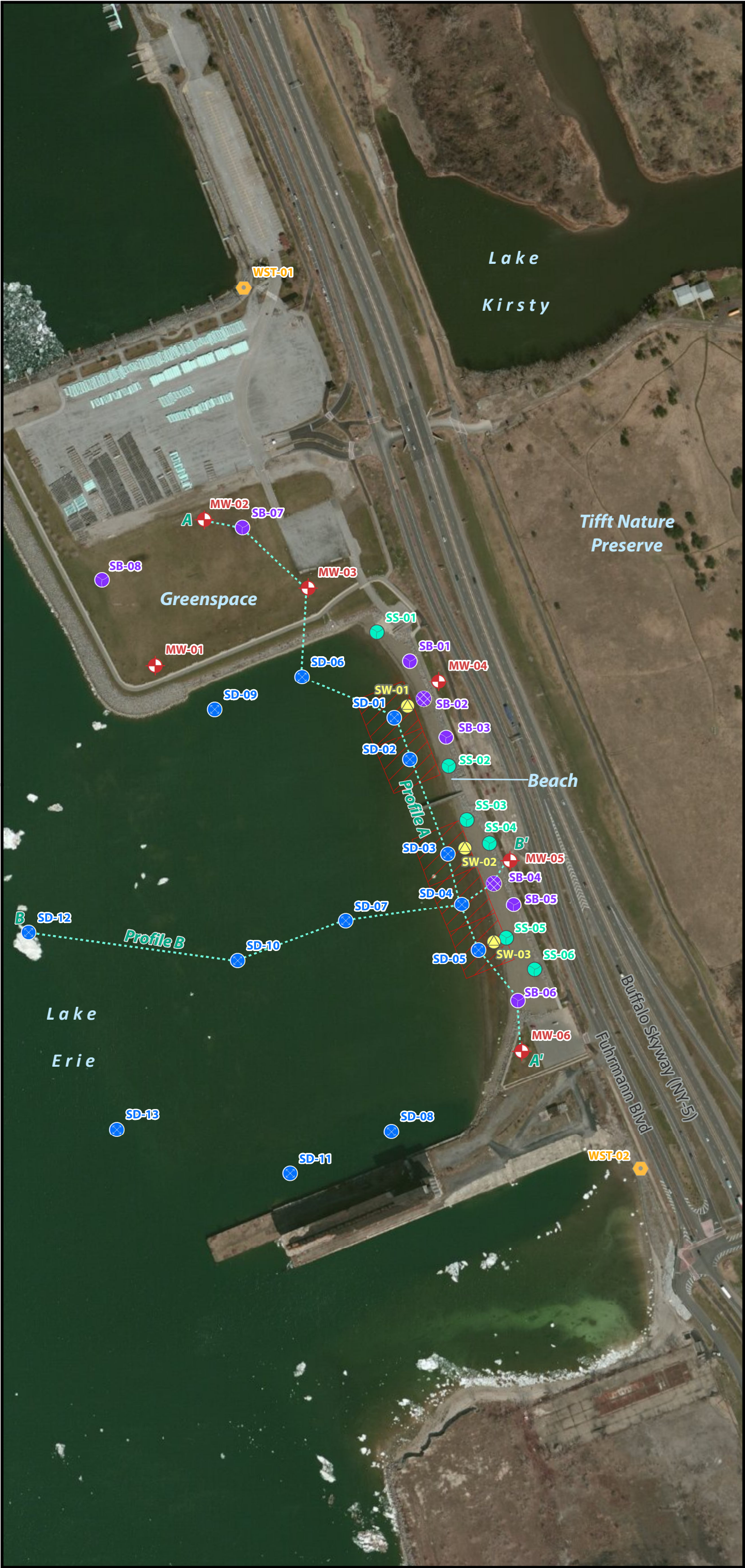
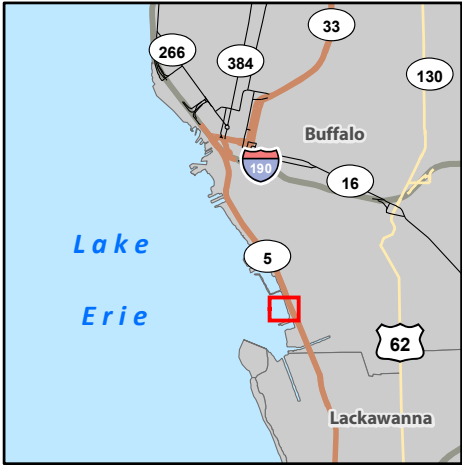


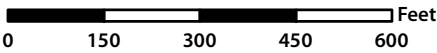
Figure 2
Sample Location and Profile Map
Buffalo Harbor State Park
Buffalo, New York

Legend

- Cross-Section Profile
- Near-Shore Surface Water Sample Location
- ⬡ Stormwater Outfall Sample Location
- Surface and Subsurface Soil Sample Location
- ⊗ Surface and Subsurface Soil and Near-Shore Groundwater Sample Location
- Surface Soil Sample Location
- ⊕ Monitoring Well Location
- ⊗ Sediment Core
- ▨ Potential Swimming Area

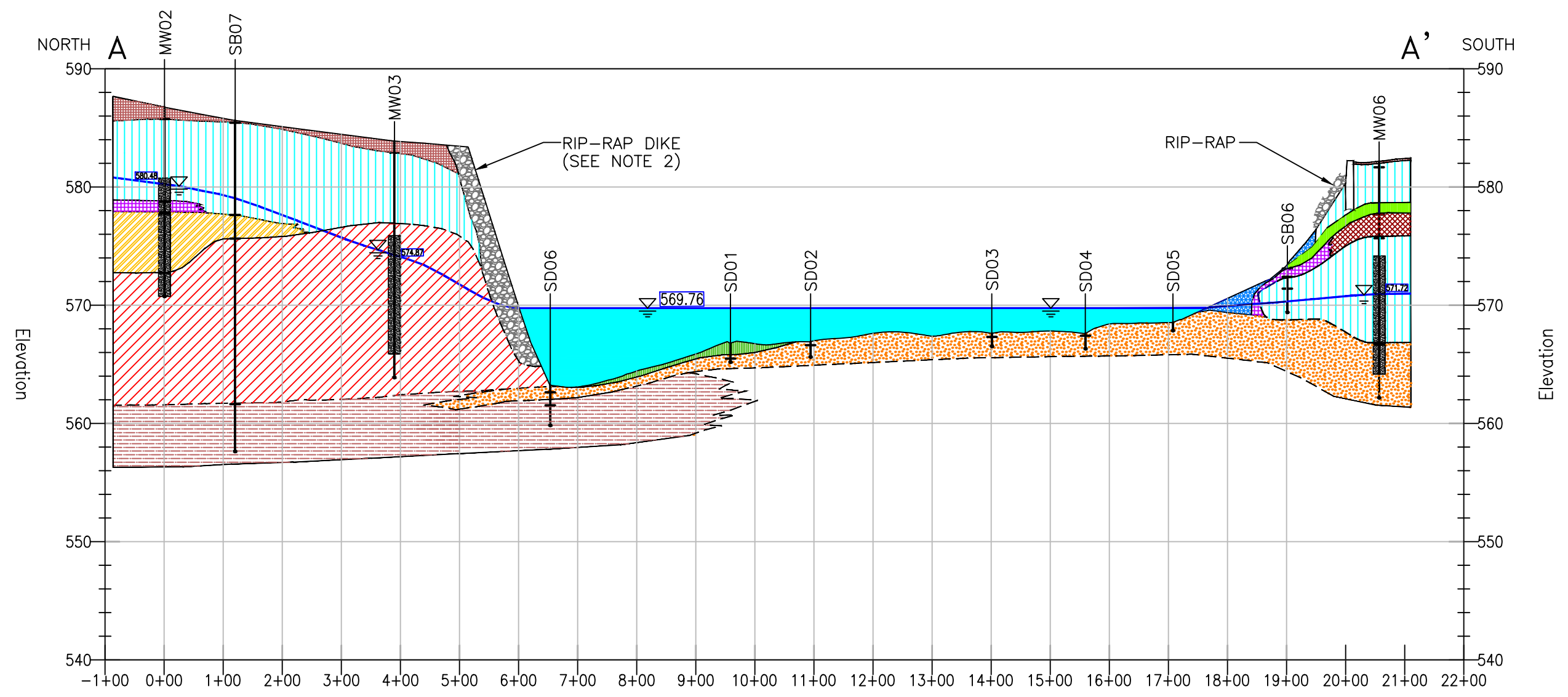


SCALE



1" = 300'

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, **SOURCE:** ESRI 2012; Microsoft Corporation 2010; Ecology and Environment Engineering, P.C., 2013.
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LEGEND

	FILL (DREDGE SPOILS)		CLAY
	FILL (SAND, SILT)		SAND
	FILL (MIX)		RECENT SOFT SEDIMENT
	FILL (GRAVEL)		SILTY CLAY
	FILL (CLAY)		FILL (GRAVELLY SAND)
	FILL (SILT)		BOTTOM OF BORING
	RIP-RAP		SCREEN INTERVAL
	WATER		569.76 WATER LEVEL (FEET ABOVE SEA LEVEL)

HORIZONTAL
SCALE IN FEET

0 200 400 600

VERTICAL
SCALE IN FEET

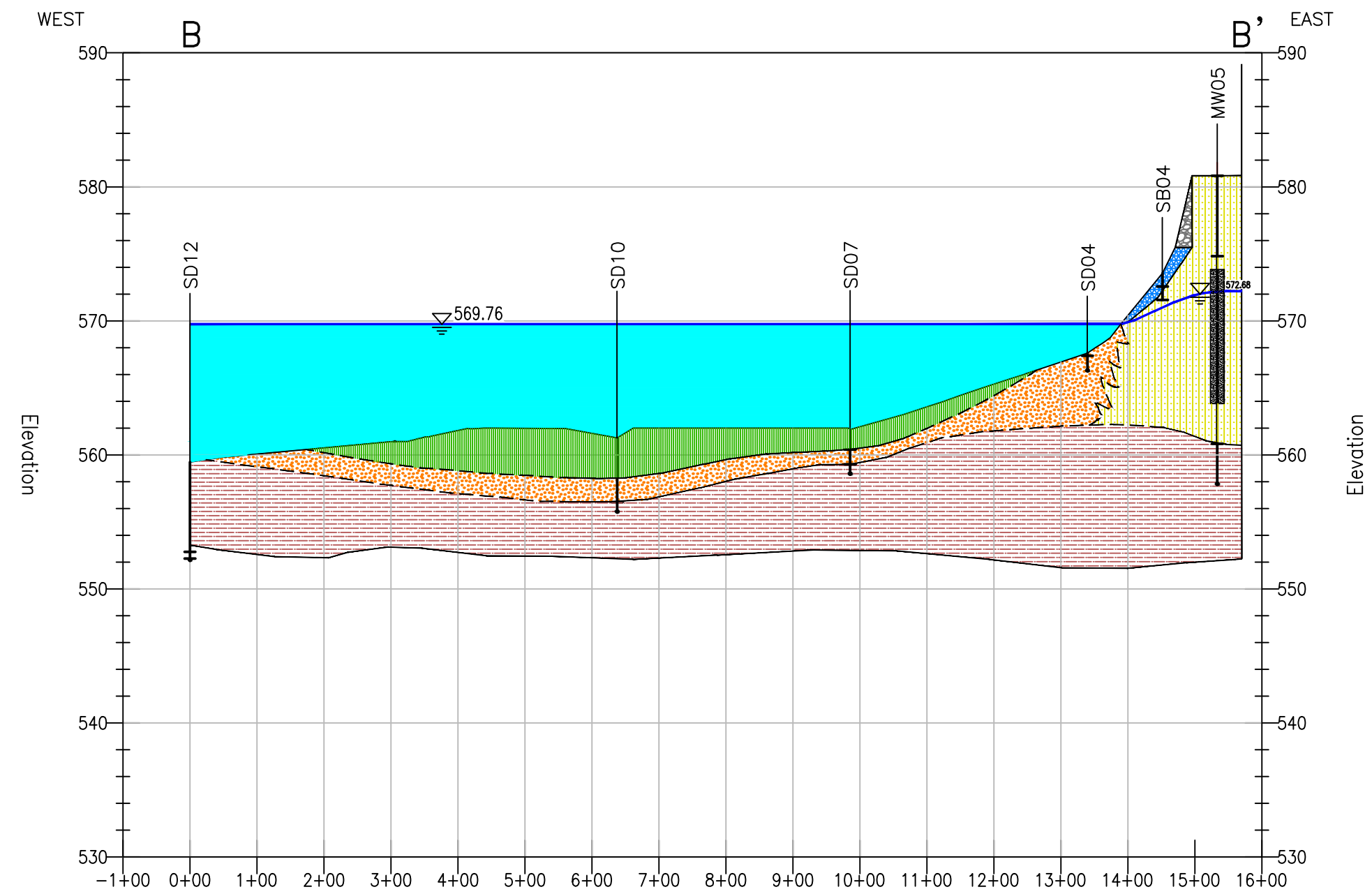
0 10 20 30

NOTES

1. DASHED LINES REPRESENT INFERRED DATA.
2. DIKE DESIGN IS DESCRIBED AS 'PREPARED LIMESTONE RIP-RAP ON EARTHEN AND SLAG CORE' PER USACE GREAT LAKES CONFINED DISPOSAL FACILITIES BUFFALO HARBOR - SMALL BOAT HARBOR CDF FACT SHEET.

FIGURE 3

GEOLOGIC CROSS SECTION, PROFILE LINE A-A'
BUFFALO HARBOR STATE PARK
BUFFALO, NEW YORK



LEGEND

	SAND		BOTTOM OF BORING
	RECENT SOFT SEDIMENT		SCREEN INTERVAL
	SILTY CLAY		WATER LEVEL (FEET ABOVE SEA LEVEL)
	FILL		
	FILL (GRAVELLY SAND)		
	RIP-RAP		
	WATER		

HORIZONTAL
SCALE IN FEET

0 200 400 600

VERTICAL
SCALE IN FEET

0 10 20 30

NOTES

1. DASHED LINES REPRESENT INFERRED DATA.

FIGURE 4

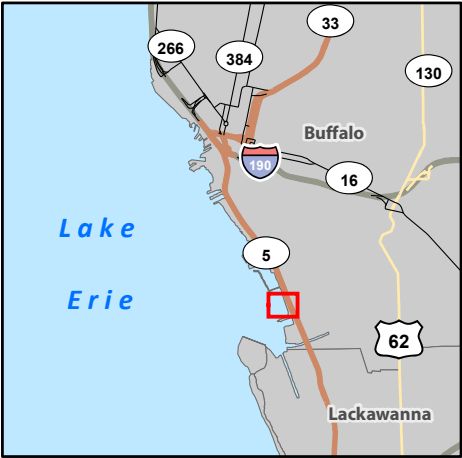
GEOLOGIC CROSS SECTION, PROFILE LINE B-B'
BUFFALO HARBOR STATE PARK
BUFFALO, NEW YORK



Figure 5
Groundwater Contour Map
October 29, 2013
Buffalo Harbor State Park
Buffalo, New York

Legend

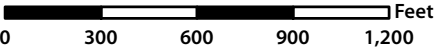
- Monitoring Well Location
- Tift Farm Monitoring Well Location *N/A = Not Available*
- Surface Water Elevation Measurement Point
- Staff Gauge
- Groundwater Contour Line (elevation in feet above mean sea level)
- Inferred Groundwater Contour Line (elevation in feet above mean sea level)
- Groundwater Flow Direction



Vertical Datum:
North American Vertical Datum of 1988 (NAVD88)



SCALE



1" = 600'

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, **SOURCE:** ESRI 2012; Microsoft Corporation 2010; Ecology and Environment Engineering, P.C., 2013.
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Figure 6
Approximate Locations and Densities
of the Different Submerged Aquatic
Vegetation Species Observed
at Gallagher Beach
Buffalo Harbor State Park
Buffalo, New York

Legend

Submerged Aquatic Vegetation Sections

Section 1: 100% Eurasian Watermilfoil

Section 2: 60%-80% Wild Celery
10%-30% Eurasian Watermilfoil
10%-20% American Waterweed

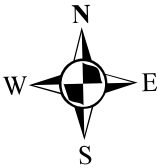
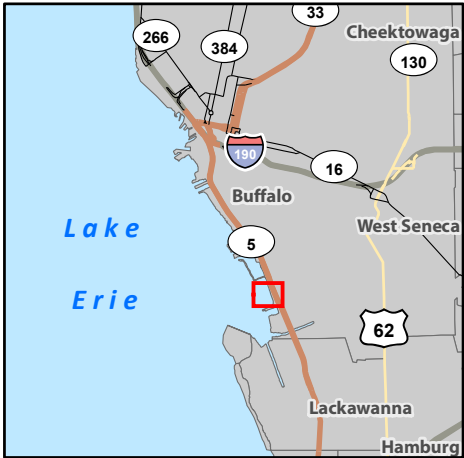
Section 3: 30%-60% Wild Celery
30%-60% American Waterweed
30%-60% Grassleaf Mudplantain
0%-10% Eurasian Watermilfoil

Section 4: 80% Wild Celery
10% Eurasian Watermilfoil
10% Grassleaf Mudplantain

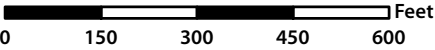
Section 5: 75%-90% Wild Celery
5%-20% Richardson's Pondweed
5% Grassleaf Mudplantain

Section 6: 80% Wild Celery
20% Richardson's Pondweed

Section 7: 25%-50% Wild Celery
50%-75% Bare



SCALE



1 " = 300 '

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP,
SOURCE: ESRI 2012; Microsoft Corporation 2010; Ecology and Environment Engineering, P.C., 2013.
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Service Layer Credits: Image Courtesy of USGS State of Michigan
© Ecology and Environment Engineering, P.C. 2013

0 50 100 150 Feet

Key:

- LimnoTech Water Depth Measurement Location
- ◆ Sediment Core / Surface Water Sample Location
- Top of Sediment Elevation (feet)

Note:
Elevation datum is North American Vertical Datum 1988, feet.

Figure 7
Bathymetric Elevation
Buffalo Harbor State Park

F

Laboratory Results

New York State Department of Health

Wadsworth Center

PO Box 509, Albany, New York 12201-0509

Report No: **EHS1500055340-SR-1**

Page 1 of 1

Report Date: **08/17/2015**

Report retrieved via NYSDOH Health Commerce System by kt475422 on 09/18/2015

REQUESTED BY: DIRECTOR-OPRHP

DIRECTOR'S OFFICE
ENVIRONMENTAL MANAGEMENT BUREAU
NEW YORK STATE PARKS, RECREATION AND HISTORIC
PRESERVATION
ALBANY NY 12238

New York State Parks (OPRHP)

County: ERIE
City (or) Town: BUFFALO
Submitted by: KAREN TERBUSH
Collected by: EVYN IACOVITTI

Grab / Composite Finish: 08/03/15 08:55

Date received: 08/04/15 10:30

Location/Project/Facility Name: DWS-01
Sampling Location Details: GALLAGHER BEACH
1111 FUHRMANN BLVD
BUFFALO NY 14203

FINAL LABORATORY REPORT

Environmental Biology Laboratory
NYS ELAP ID: 10765
Wadsworth Center, Empire State Plaza

LAB DIRECTOR:
Dr. Ellen Braun-Howland 518-473-7925
CONTACT: Christine Minihane 518-474-4192
Debra Fusco 518-473-0649

Sample Id: EHS1500055340-01

Sample Type: Surface Water

Received Temperature (°C): **2.5**
Received State: **Cooling**

Bacteroidales - PCR Method

Start Date: 08/04/15 10:30 Analysis Date: 08/14/15 14:10

Bacteroidales Results: **Positive**

[Note] PCR products typical of Bacteroidales associated with humans were detected using two independent primer sets.

NOTES:

[1] Results were emailed to OPRHP on August 14, 2015 at 2:25pm.

END OF REPORT

The Laboratory Director authorizes the release of this report. The results in this report relate only to the sample submitted to the laboratory.

New York State Department of Health
Wadsworth Center

PO Box 509, Albany, New York 12201-0509

Report No: **EHS1500055341-SR-1**

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Report Date: **08/17/2015**

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ENVIRONMENTAL MANAGEMENT BUREAU
NEW YORK STATE PARKS, RECREATION AND HISTORIC
PRESERVATION
ALBANY NY 12238

New York State Parks (OPRHP)

County: ERIE
City (or) Town: BUFFALO
Submitted by: KAREN TERBUSH
Collected by: EVYN IACOVITTI

Grab / Composite Finish: 08/03/15 09:08

Date received: 08/04/15 10:30

Location/Project/Facility Name: DWS-02
Sampling Location Details: GALLAGHER BEACH
1111 FUHRMANN BLVD
BUFFALO NY 14203

FINAL LABORATORY REPORT

Environmental Biology Laboratory
NYS ELAP ID: 10765
Wadsworth Center, Empire State Plaza

LAB DIRECTOR:
Dr. Ellen Braun-Howland 518-473-7925
CONTACT: Christine Minihane 518-474-4192
Debra Fusco 518-473-0649

Sample Id: EHS1500055341-01

Sample Type: Surface Water

Received Temperature (°C): **3.4**
Received State: **Cooling**

Bacteroidales - PCR Method

Start Date: 08/04/15 10:30 Analysis Date: 08/14/15 14:10

Bacteroidales Results: **Positive**

[Note] PCR products typical of Bacteroidales associated with humans were detected using two independent primer sets.

NOTES:

[1] Results were emailed to OPRHP on August 14, 2015 at 2:25pm.

END OF REPORT

The Laboratory Director authorizes the release of this report. The results in this report relate only to the sample submitted to the laboratory.

New York State Department of Health
Wadsworth Center

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Report No: **EHS1500055342-SR-1**

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NEW YORK STATE PARKS, RECREATION AND HISTORIC
PRESERVATION
ALBANY NY 12238

New York State Parks (OPRHP)

County: ERIE
City (or) Town: BUFFALO
Submitted by: KAREN TERBUSH
Collected by: EVYN IACOVITTI

Grab / Composite Finish: 08/03/15 09:15

Date received: 08/04/15 10:30

Location/Project/Facility Name: DWS-03
Sampling Location Details: GALLAGHER BEACH
1111 FUHRMANN BLVD
BUFFALO NY 14203

FINAL LABORATORY REPORT

Environmental Biology Laboratory
NYS ELAP ID: 10765
Wadsworth Center, Empire State Plaza

LAB DIRECTOR:
Dr. Ellen Braun-Howland 518-473-7925
CONTACT: Christine Minihane 518-474-4192
Debra Fusco 518-473-0649

Sample Id: EHS1500055342-01

Sample Type: Surface Water

Received Temperature (°C): **3.1**
Received State: **Cooling**

Bacteroidales - PCR Method

Start Date: 08/04/15 10:30 Analysis Date: 08/14/15 14:10

Bacteroidales Results: **Positive**

[Note] PCR products typical of Bacteroidales associated with humans were detected using two independent primer sets.

NOTES:

[1] Results were emailed to OPRHP on August 14, 2015 at 2:25pm.

END OF REPORT

The Laboratory Director authorizes the release of this report. The results in this report relate only to the sample submitted to the laboratory.

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Wadsworth Center

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Report No: **EHS1500055343-SR-1**

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DIRECTOR'S OFFICE
ENVIRONMENTAL MANAGEMENT BUREAU
NEW YORK STATE PARKS, RECREATION AND HISTORIC
PRESERVATION
ALBANY NY 12238

New York State Parks (OPRHP)

County: ERIE
City (or) Town: BUFFALO
Submitted by: KAREN TERBUSH
Collected by: EVYN IACOVITTI

Grab / Composite Finish: 08/03/15 09:08

Date received: 08/04/15 10:30

Location/Project/Facility Name: FB
Sampling Location Details: GALLAGHER BEACH
1111 FUHRMANN BLVD
BUFFALO NY 14203

FINAL LABORATORY REPORT

Environmental Biology Laboratory
NYS ELAP ID: 10765
Wadsworth Center, Empire State Plaza

LAB DIRECTOR:
Dr. Ellen Braun-Howland 518-473-7925
CONTACT: Christine Minihane 518-474-4192
Debra Fusco 518-473-0649

Sample Id: EHS1500055343-01

Sample Type: Method Blank

Received Temperature (°C): **3.4**
Received State: **Cooling**

Bacteroidales - PCR Method

Start Date: 08/04/15 10:30 Analysis Date: 08/14/15 14:10

Bacteroidales Results: **Negative**

NOTES:

[1] Results were emailed to OPRHP on August 14, 2015 at 2:25pm.

END OF REPORT

The Laboratory Director authorizes the release of this report. The results in this report relate only to the sample submitted to the laboratory.