Milwaukee South Shore Beach Improvements

Basis of Design

FINAL

Prepared For:

Milwaukee County Department of
Administrative Services
633 West Wisconsin Avenue, Suite 1006
Milwaukee, WI 53203

Prepared By:

SmithGroupJJR

44 East Mifflin Street, Suite 500

Madison, WI 53703

SmithGroupJJR Project Number: 10451.000

Revision Date: June 11, 2018

EPA Grant Number: GL00E01206_MKE1603_SouthShore

WISCONSIN DEPT. OF NATURAL RESOURCES

Great Lakes RESTORATION

MILWAUKEE COUNTY PARKS

Table of Contents

Appendices

List of Tables

1. Executive Summary

A beach relocation study was completed for the beach at the South Shore Park in Milwaukee, WI. The work consisted of the following:

1) Reviewing and analyzing the existing metocean conditions (water levels, wind, wave, and currents) that impact the project site.
2) Preparation of the base map, for which a field survey of the project site that includes the existing beach, upland area, the stone revetment, and the potential beach relocation area, was completed. Bathymetric contours from previously completed studies and from LiDAR data were also incorporated into the final base map.
3) Deployment of an *Acoustic Doppler Current Profiler* (ADCP) to measure wave and currents near the project site.
4) Numerical modeling of the wind, waves and currents at the site. For this, a model calibration was carried out using the data collected by the ADCP.
5) Development of four improved beach alternatives for the park.

2. Project Background

South Shore Park is a Milwaukee County Department of Parks, Recreation and Culture (DPRC) facility located in the city of Milwaukee, the state's most populous urban area. It is one of only three improved public access points along the Lake Michigan shoreline in the southern half of Milwaukee County. As such, it provides Lake Michigan recreational access to thousands of Southeast Wisconsin residents annually, including significant numbers of individuals with low-moderate incomes. Within the recreational amenities of the park is the South Shore Beach, which unfortunately ranks amongst the worst in the nation in recreational water quality. Consequently, the beach, and specifically the water quality at the beach has been the subject of numerous studies over the years. These studies identified the probable causes of the poor water quality, which include stormwater runoff, waterfowl excrement, CSO discharges, the sailboat mooring field and restricted water circulation. In late 2014, DPRC in partnership with key stakeholders, including SmithGroupJJR, approved a masterplan for the shoreline area of South Shore Park.

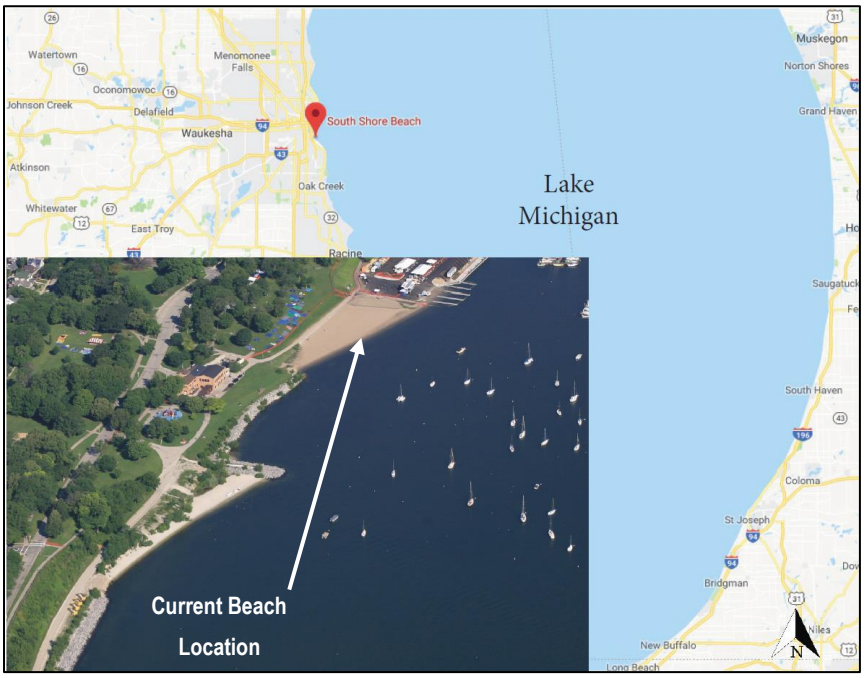


Figure 1: Location of the South Shore Park along the Lake Michigan shoreline

Now that funding has been secured, Milwaukee County wishes to move forward with a process that focuses on the nearshore influences on the water quality issue. The landside features, which are equally important, were addressed in previous planning exercises. These will also be integrated and enhanced during the nearshore development. Some of the alternatives explored include relocation of the recreational beach to the south, which is in an area outside the original master plan. Addressing existing sources of water quality degradation and evaluating the possible relocation of the beach are the focus of this project. The goal is to improve water quality adjacent to the beach and reduce to the greatest extent possible the ongoing beach closures.

2.1. Previous Studies

The McLellan lab from the School of Freshwater Sciences, UWM has carried out extensive field surveys and molecular testing methods to determine the causes of poor water quality at South Shore beach.

The *E. coli* bacteria is used as an indicator for fecal pollution. The monitoring of South Shore Beach showed that this indicator was above the EPA recommended limit nearly 60% of the days tested.

There are multiple sources of potential contamination that impact South Shore Beach. The majority of the fecal pollution originates from bird waste, where gulls, ducks and geese deposit *E. coli* into the sand and water. Human waste has also been intermittently detected at low levels. Additionally, large-scale regional sources of fecal pollution during heavy rain impact South Shore and the adjacent areas.

A summary of the McLellan lab investigation can be found below:

2.1.1. From McLellan and Salmore, 2003

- The beach closings from 1999-2001 were caused mainly by avian contamination.
- Water quality samples were taken during the summer of 2002 at South Shore Park. E. coli levels were highest at the Beach site 88% of the days sampled.
- *E. coli* levels were much higher within the first 10m from the shoreline. *E. coli* counts approximately10m away from the shoreline were similar to the levels measured 150m away, which indicates that the source of contamination is from the shoreline.
- The concentration of *E. coli* at the breakwater opening were found to be significantly less than the levels found in the swimming area.

2.1.2. From McLellan and Jensen, 2005

- Overall, the *E. coli* counts were consistently higher after a precipitation event, indicating transport via stormwater runoff.
- *E. coli* concentrations increased six-fold after a precipitation event.
- 33 of the 34 beach water samples tested positive for Bacteroids, however, none tested positive for human specific Bacteroids. Therefore, it was deducted that much of the contamination is not from human sewage since there were no Combined Sewer Overflow (CSO) events during the sampling time.

2.1.3. Scopel, Harris and Mc.Lellan 2006

- Water quality sampling indicated that the existing beach had much higher levels than the TBM beach (the location of SGJJR alternative 1). The primary cause of contamination was pollutants from the adjacent shoreline.
- A fluorescein dye study demonstrated that wind could move the water away from the beach, but only during strong wind conditions.
- During calm winds, the longshore current was determined to be the main dispersion factor at the existing beach.
- The dye moved twice as fast during calm wind conditions at the TBM beach location.
- During high wind conditions, at the existing beach, the dye moved away from the shore; however, at the TBM location, the dye continued to move along the shore, only at a faster rate.
- Under NNW wind conditions, the residence times for 90% replacement of the dye were similar for both locations.
- The primary mechanism for *E. coli* dispersion appeared to be surface currents, while mixing was a minor factor.

2.1.4. McLellan, et. Al., 2007

- The study concluded that *E. coli* levels were notably higher during CSO and storm sewer overflow events. Unfortunately, it is difficult to determine if the pollution originated from the CSO events, or from the large volume of urban stormwater that was released directly into the receiving waters.
- *E. coli* levels dramatically decreased outside the breakwater.
- Beaches at least one kilometer from the harbor were not affected by overflow events.

2.2. Bacteria in beach sands

Aside from the nearshore water, *E. coli* bacteria can also be found in the beach sand. Sands and sediments can provide habitat where fecal bacterial populations may persist, and in some cases grow in the coastal zone. Some of the ways that fecal indicator bacteria can be deposited in the sand are via stormwater runoff, fecal contamination from sewage malfunction or overflow, direct introduction of fecal matter by animals (birds, dogs, wildlife, humans), and periodic water level rewetting within the swash zone[1].

To address this issue, all three alternatives feature a steep beach face with a coarse sediment to minimize the area that's in contact with the water.

[1] The swash zone is defined as the part of the beach extending from a nearshore shallow depth to the limit of maximum inundation.

3. Existing Environmental Conditions

3.1. Water Levels

South Shore Park is subjected to the varying water levels of Lake Michigan. On a yearly basis, the water levels vary by approximately one foot, with the highs occurring in mid-July and the lows in mid-February. Long term water levels fluctuate by approximately 6.3 feet with the record high occurring in 1986-1987 and the record lows occurring in 1964, 2012 and 2013 depending on the month. Lake levels drop during periods of drought and dry or cold weather and rise during periods of heavy rainfall and runoff of snowmelt. Individual storm events and pressure systems also affect water levels on a short-term basis.

Lake Michigan water levels are well documented and historical information of over a century is available through the *National Oceanic and Atmospheric Administration*'s website, where the water levels are reported in the International Great Lakes Datum 1985 (IGLD85). The closest water measurement station from NOAA is station 9087057, located in Milwaukee (43° 0.1' N 87° 53.2' W), less than a mile Northwest from the project site. This gauge collects hourly data and has been recording information since January of 1970.

Figure 2: Location of NOAA's water level gauge ST 9087057.

Water level measurements from January of 1919 to March of 2018 are shown in Figure 3. It can be observed that the minimum average water level was recorded in March of 1964, whereas the maximum average level was recorded in

October of 1986 with a total average variation of 6.3 ft. It is also observed that highest levels are registered during the summer months and the lowest during the winter months.

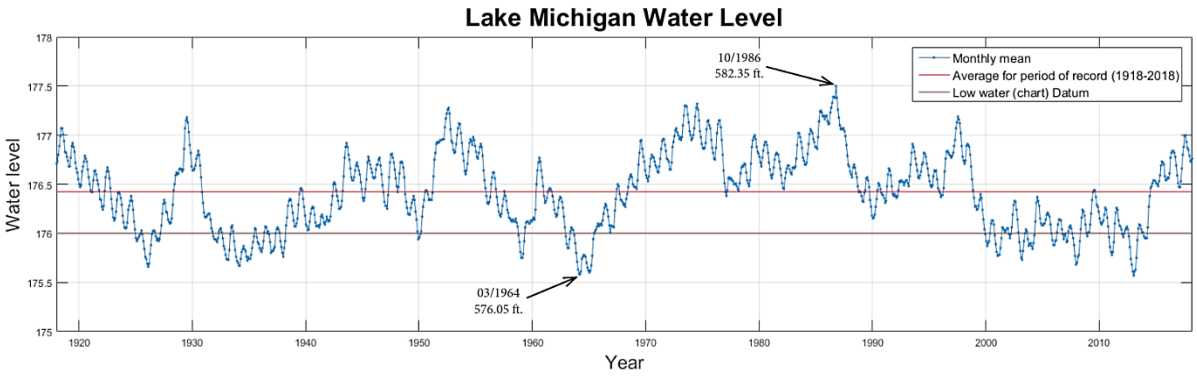


Figure 3: Lake Michigan measured Water Levels (1918-2018)

The reported low water datum (LWD) and mean water level (MWL) for this station are shown in both IGLD85 and in NGVD29 in Table 1. The Low Water Datum was used as a zero level for the numerical model grid generation.

Table 1: Lake Michigan Low and Mean water levels from January 1918 to March 2018[2].

WATER LEVEL	IGLD85 (ft.)	NGVD29 (ft.)
Low Water Datum LWD	577.50	578.27
Mean Water Level MWL	578.80	579.65

[2] https://www.glerl.noaa.gov//data/dashboard/GLWLD.html

3.2. Over Water Wind Data

Wind measurements were extracted from the MLWW3 meteorological station. This station is operated by NOAA's Great Lakes Environmental Research Laboratory and has approximately 12.7 years of data. Station MLWW3 has an anemometer located 12.2m above the site elevation (~617 ft. above mean sea level). The unit is set to sample an averaging interval of 5 minutes. For each 5-minute interval, a mean and maximum (gust) wind speed are reported.

Figure 4: Location of Milwaukee meteorological station (MLWW3).

Figure 5 shows the wind rose for all year. It can be inferred from this rose that the dominant winds are from the W and WNW sectors, whereas the strongest winds come from the NNE and NE, almost perpendicular to the shore. Figure 6 shows the summer wind rose, where the dominant winds come from the NNE and N sectors and the strongest from the SW and the NNE sectors.

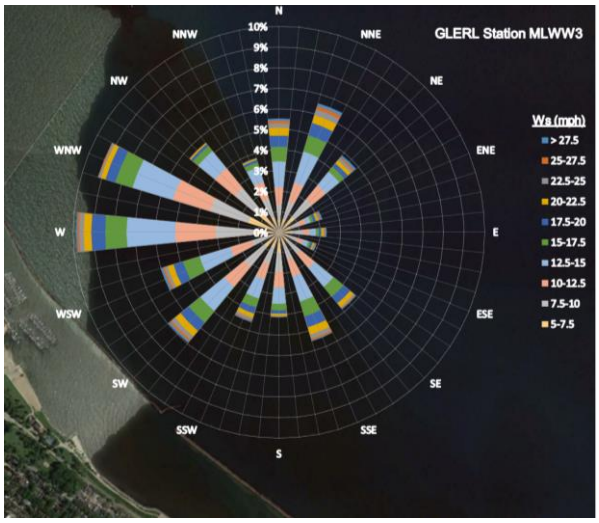


Figure 5: Wind rose for the Milwaukee meteorological station, all year.

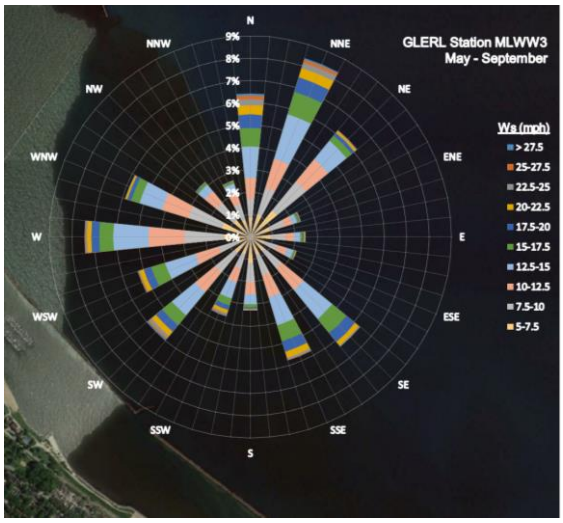


Figure 6: Wind rose for the Milwaukee meteorological station, summer.

An extreme analysis using the highest winds per 22.5° directional bin from MLWW3 was also completed. Recorded winds were available from 2005-2017. These winds were then fitted to a Weibull distribution to obtain the different return period storms shown in Table 2. These winds were used as additional energy input into the large-scale wave model through wave generation.

Table 2: Extreme Wind speeds in miles per hour for different return periods per 22.5° directional bin. From GLERL MLWW3

Return Periods	All Direction	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
1 yr	37.41	29.99	32.89	32.32	31.46	29.67	28.34	30.87	30.07	29.44	31.49	32.40	32.31	31.44	29.37	27.33	26.55
10 yr	43.70	32.72	34.57	38.87	33.85	36.26	34.76	33.52	33.76	32.75	37.91	39.98	42.05	38.33	33.50	30.47	31.84
25 yr	45.83	33.07	36.78	42.50	37.10	37.88	35.74	34.26	34.87	34.08	40.26	44.71	46.22	41.40	34.94	31.89	33.50
50 yr	47.38	33.29	39.22	45.48	40.76	39.01	36.38	34.79	35.66	35.09	42.02	48.73	49.43	43.78	36.00	32.99	34.69
100 yr	48.91	33.48	42.41	48.62	45.59	40.06	36.96	35.29	36.41	36.10	43.75	53.09	52.68	46.20	37.04	34.12	35.85

No overland – over water wind transformation was done since the GLERL MLWW3 is located at the lake, and only 3.6 miles from the project site.

3.3. Offshore Wave Conditions

Wave measurements were extracted from the US Army Corps of Engineers (USACE) *Wave Information Studies* (WIS) Station 94050 which is located 5 miles offshore of the project site. The water depth at this station is approximately 98 feet. This station has 35 years of wave data (from 1979-2014).

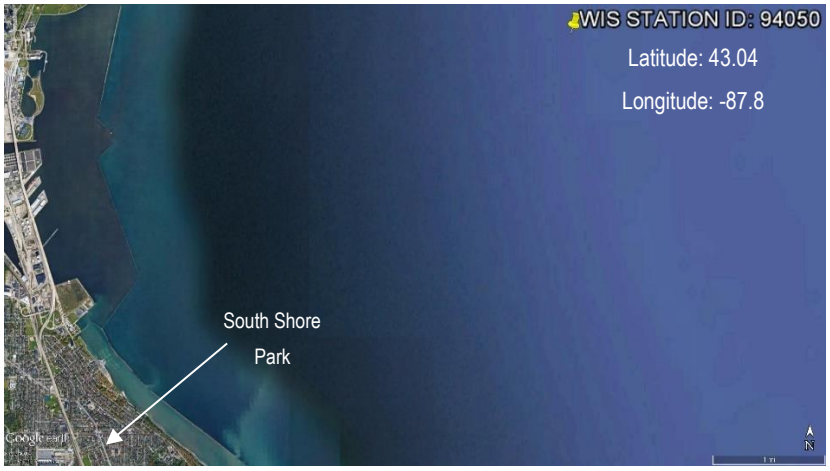


Figure 7: Location of the WIS station 94050 in front of the project site.

The all-year wave rose for station 94050 shown in Figure 8, indicates that the most frequent and highest waves come from the NNE direction.

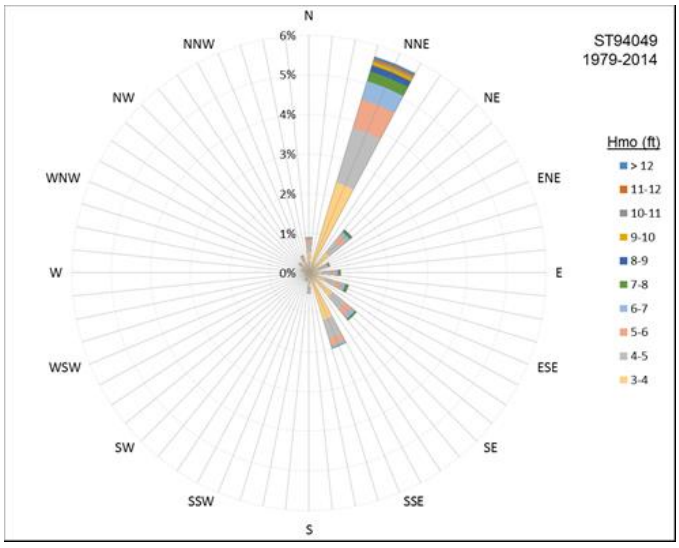


Figure 8: All season deep water wave rose from ST 94050 (1979-2014)

Using the 35 years of available information, the offshore wave conditions were analyzed by obtaining the yearly wave occurrences per direction. The results are shown in Table 3. These values will be used as boundary conditions for the numerical wave modeling efforts.

Table 3: Extreme significant wave heights for different return periods per 22.5° directional bin. From WIS ST 94050.

Return Periods	All Direction	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
1 yr	10.95	6.21	10.21	8.18	5.87	6.65	7.19	7.11	6.55	5.49	4.98	4.61	4.08	4.18	4.11	4.48	4.93
10 yr	16.25	9.59	16.08	10.98	9.98	11.64	11.10	9.65	8.11	7.27	6.72	6.55	6.26	6.10	6.40	6.58	6.85
25 yr	18.08	11.02	17.87	13.38	10.97	13.47	12.26	10.50	8.50	8.19	7.85	7.31	6.76	6.69	6.99	7.06	7.21
50 yr	19.42	12.11	19.16	15.64	11.65	14.84	13.09	11.11	8.76	8.93	8.82	7.89	7.10	7.12	7.41	7.38	7.45
100 yr	20.74	13.22	20.39	18.27	12.30	16.18	13.89	11.71	9.01	9.71	9.88	8.46	7.42	7.54	7.80	7.69	7.67

4. ADCP Deployment

An Acoustic Doppler Current Profiler (ADCP) was deployed in the nearshore area of South Shore Beach to collect wave and current data from November 11th to December 22nd of 2017. This data was used to calibrate the numerical model (See section 6.2).

The ADCP was programmed using TELEDYNE's suite of tools which are used to set up the ADCP for data collection. A thorough check of the ADCP's battery, compass, time stamp, current, and pressure sensors was done before delivering the instrument to *Pirates Cove Diving Inc.*, a professional diving team that attached the ADCP to a secure housing, and deployed it to the established location shown in Figure 9 at a depth of 11.5 ft.

Figure 9: Position of the deployed ADCP behind the breakwater entrance.

After retrieval, the collected data was post-processed using the manufacturer's software to eliminate any erroneous information based on the instrument's thresholds.

5. Beach Alternatives

Based on the specific goals and objectives of this project, and the comments received during the public input process, SmithGroupJJR prepared four initial plan alternatives to illustrate upland, beach, and nearshore area improvements. The main objectives were:

- Provide a recreational beach with a footprint of similar area to the existing beach.
- Provide infrastructure that supports public access to the park.
- Provide accommodations to improve user recreational needs.
- Full integration of stormwater BMP's.
- Beach water circulation improvements with the goal of decreasing the amount of beach closures.
- Implement deterrents to reduce wildlife presence.
- Adherence to ADA guidelines.

These initial alternatives can be found in Appendix A. The alternatives were developed with an understanding the water circulation improved the closer the beach was to the breakwater opening. Furthermore, the beach slope at the water's edge was steepened to reduce the beach surface regularly wetted by wave activity. To lessen moisture retention time within the sands, it is recommended that the beach sediment be coarse and narrowly-graded sandy material which will promote drainage. The alternatives were presented to the Milwaukee County and WDNR staff at a meeting on January 9th, 2018. Based on comments received, four final alternatives were developed for the site. These final alternatives were developed in conjunction with the numerical modeling task to ensure that they perform as required (See section 6.2.4).

Based on the findings of previous studies listed in section 2.1 and the numerical modeling results, the water circulation is higher along the southern beach location then at its current location next to the marina. Understanding that without removal of contributing sources of pollutants which are not within the project boundary, the best method for improving water quality along the nearshore is to increase water circulation. Therefore, the location of the three alternatives was strategically located in front of the breakwater entrance where wave penetration, and therefore wave generated water circulation, would be greatest.

Alternative 1

This alternative provides a beach closer to the breakwater opening, where wave energy and water circulation is highest. (see Section 6.3).

Figure 10: Alternative 1

The proposed jetties were sized to provide a beach area that would match the existing dry beach area (~1 acre), which was one of the main constrains that informed the design.

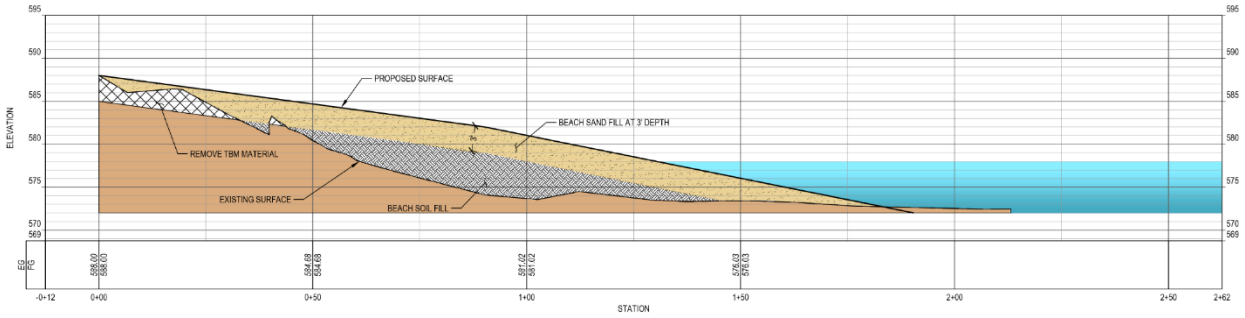


Figure 11: Alternative 1 Generic Beach Cross-Section

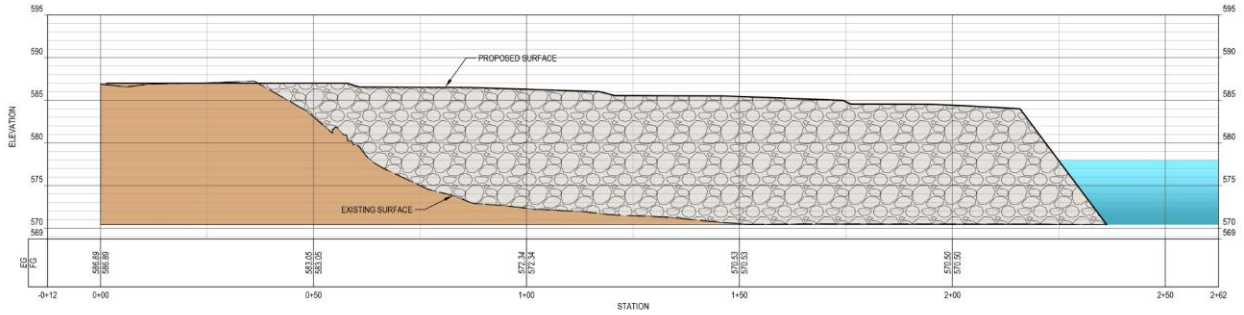


Figure 12: Alternative 1 North Breakwater Section

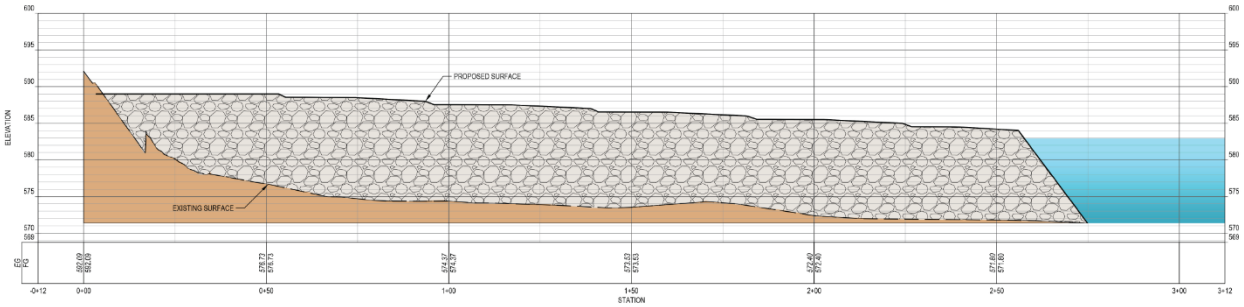


Figure 13: Alternative 1 South Breakwater Section

Alternative 2

This alternative features a beach closer to the existing amenities (restrooms, beer garden), and adjacent to a Terraced Lawn more central to park and pavillion users.

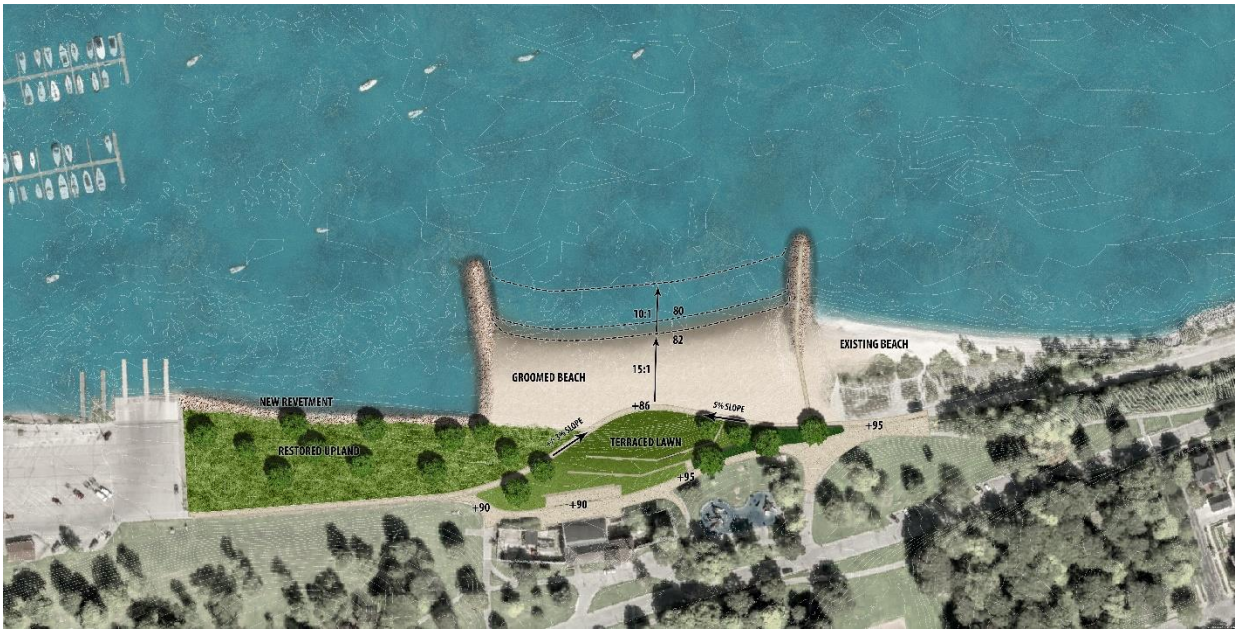


Figure 14: Alternative 2 Planview

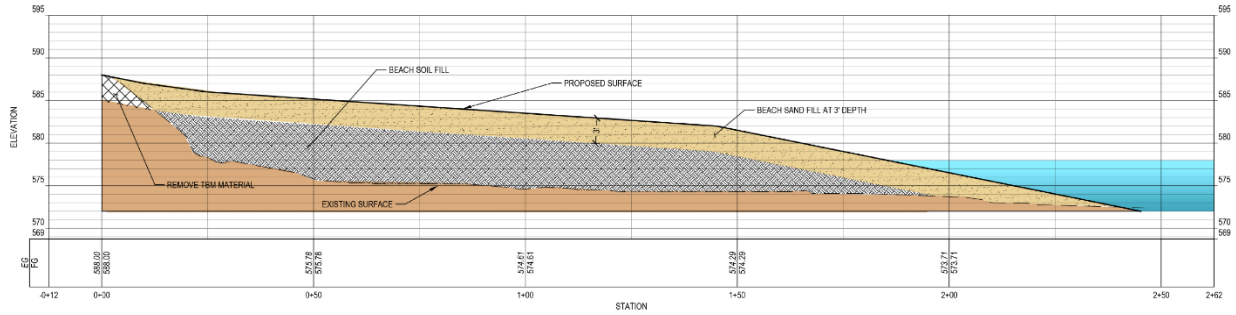


Figure 15: Alternative 2 Generic beach Cross-section

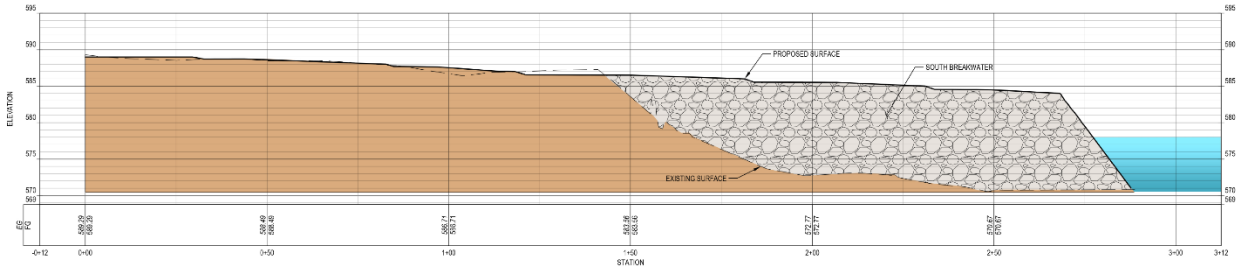


Figure 16: Alternative 2 South Breakwater Cross-section.

Alternative 3

This alternative was developed to create a narrower groomed beach that extends further south closer to the breakwater entrance while still providing beach area in front of the pavilion.

Figure 17: Alternative 3 Planview

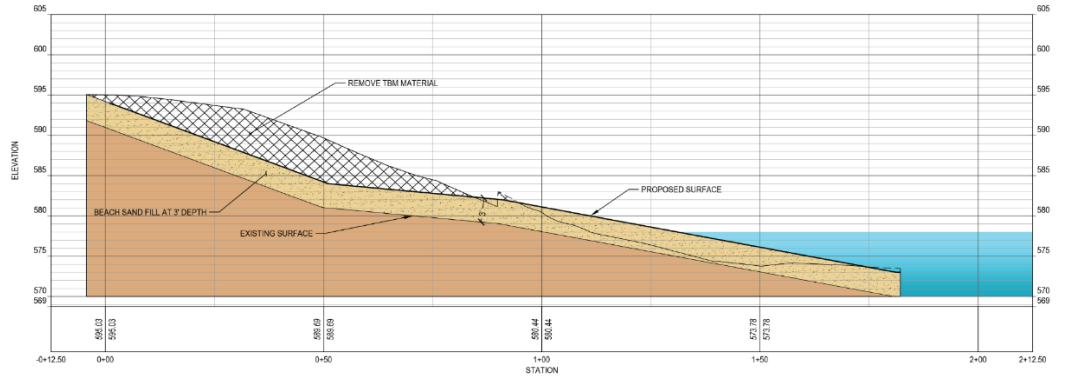


Figure 18: Alternative 3 Generic Beach Cross-section

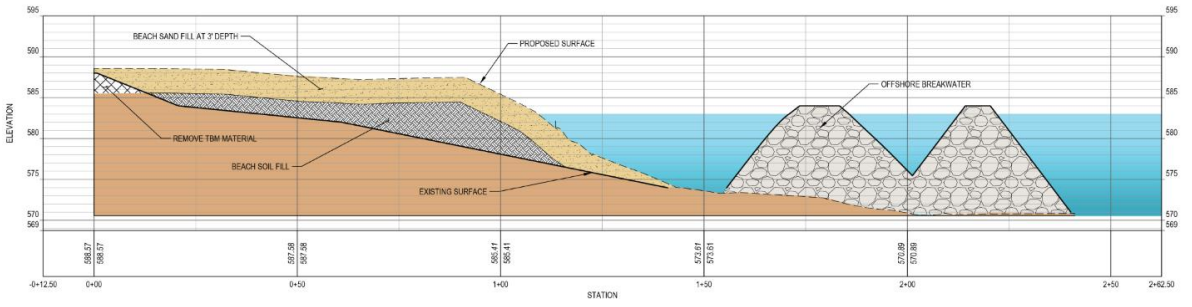


Figure 19: Alternative 3 Beach and Detached Breakwater Cross-section

Alternative 4

Based on comments from WDNR following review of a draft of this report, alternative 4 was included. It is located in the same area as Alternative 1 where the water circulation is better, although it features smaller structures.

Alternative 4 was developed in order to reduce impacts to the lakebed and reduce construction costs. This alternative resulted in a recreational beach area reduced by approximately 40% when compared to Alternative 1.

Figure 20: Alternative 4 Planview

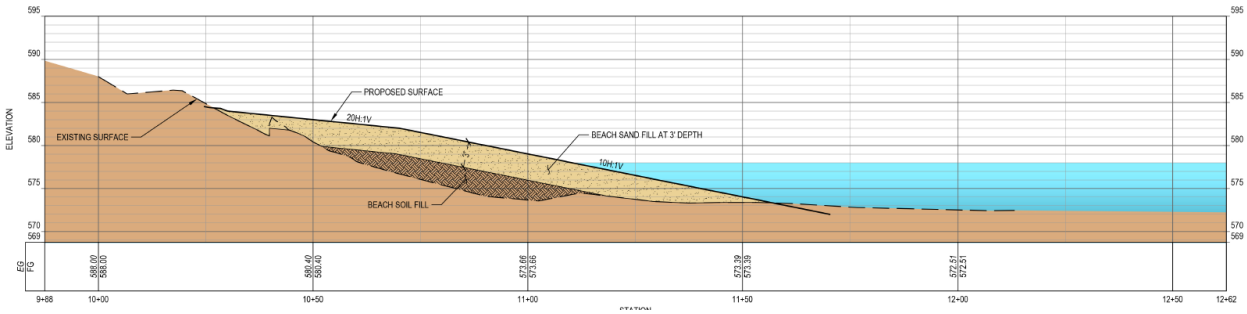


Figure 21: Alternative 4 Generic Beach Cross-Section

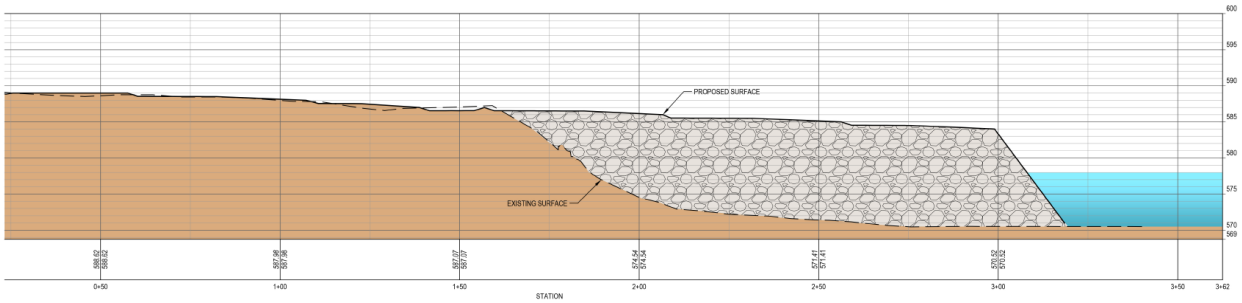


Figure 22: Alternative 4 North Breakwater Section

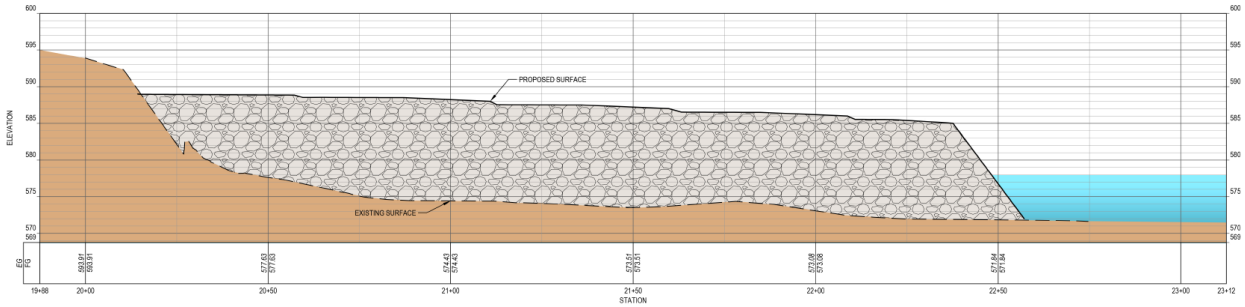


Figure 23: Alternative 4 South Breakwater Section

5.1. Opinion of Probable Construction Cost

A preliminary opinion of probable construction cost (OPCC) with key elements broken out separately was prepared for the beach alternatives and is included in Appendix B. Table 4 indicates the total cost for each.

Table 4: OPCC for each beach alternative.

Project Total (Construction, design, contingency and permitting)	Alternative 1	Alternative 2	Alternative 3	Alternative 4
	$ 3,530,039	$ 3,605,804	$ 4,332,361	$ 2,956,979

6. Numerical Modeling

All numerical modeling was completed using the MIKE 21 software package, a state of the art model developed by DHI, capable of simulating physical nearshore processes. This software has a proven 25-year track record of successful applications. This software package is a modular product that includes simulation engines for different applications, such as wave modeling, hydrodynamics, sediment dynamics, etc.

For this application, the MIKE 21 Spectral Wave model (SW), and the MIKE 21 Flow Model (FM), were used. The MIKE 21 SW simulates the growth, decay, and transformation of wind-generated waves and swells, both in offshore and coastal areas. The hydrodynamic (HD) module, is the basic module in MIKE 21 FM, and provides the hydrodynamic basis to simulate water level variations and flows in response to a variety of forcing functions in lakes and other coastal regions.

Both the SW and FM modules were dynamically coupled to simulate the mutual interaction between the waves and the currents, i.e. the two modules feed information to one another iteratively until an equilibrium is reached. This way, a full feedback of the changes on the waves and flow calculation was included.

After the initial model setup, calibration and verification of the model was completed using waves and currents measured by the ADCP deployed for this purpose (See page 24).

6.1. Model Setup

To set up the model, the collected data was converted into a format which can be understood by the numerical model. This was completed by creating a computational domain (mesh and bathymetry) and preparing the input for the boundary conditions for the model. A summary of this setup is presented in this section.

6.1.1. Mesh and Bathymetry

Bathymetry information for the numerical model was compiled from several sources:

1) A selected grid from NOAA's Great Lakes Bathymetry database at 3 arc-second resolution (~295 ft.) for the large-scale bathymetry.
2) NOAA's more detailed nearshore bathymetry from LiDAR 2012[3].
3) Topographic survey performed by KSingh Engineers on November 14 of 2017.
4) Bathymetry information from Himalayan Consultants, who completed a survey on August of 2012.

With the above information, a digital terrain model was created for the numerical model (Figure 24). The boundary outline defining the model domain extends approximately 4.6 miles North, 3 miles South and 4.4 miles offshore of the project site.

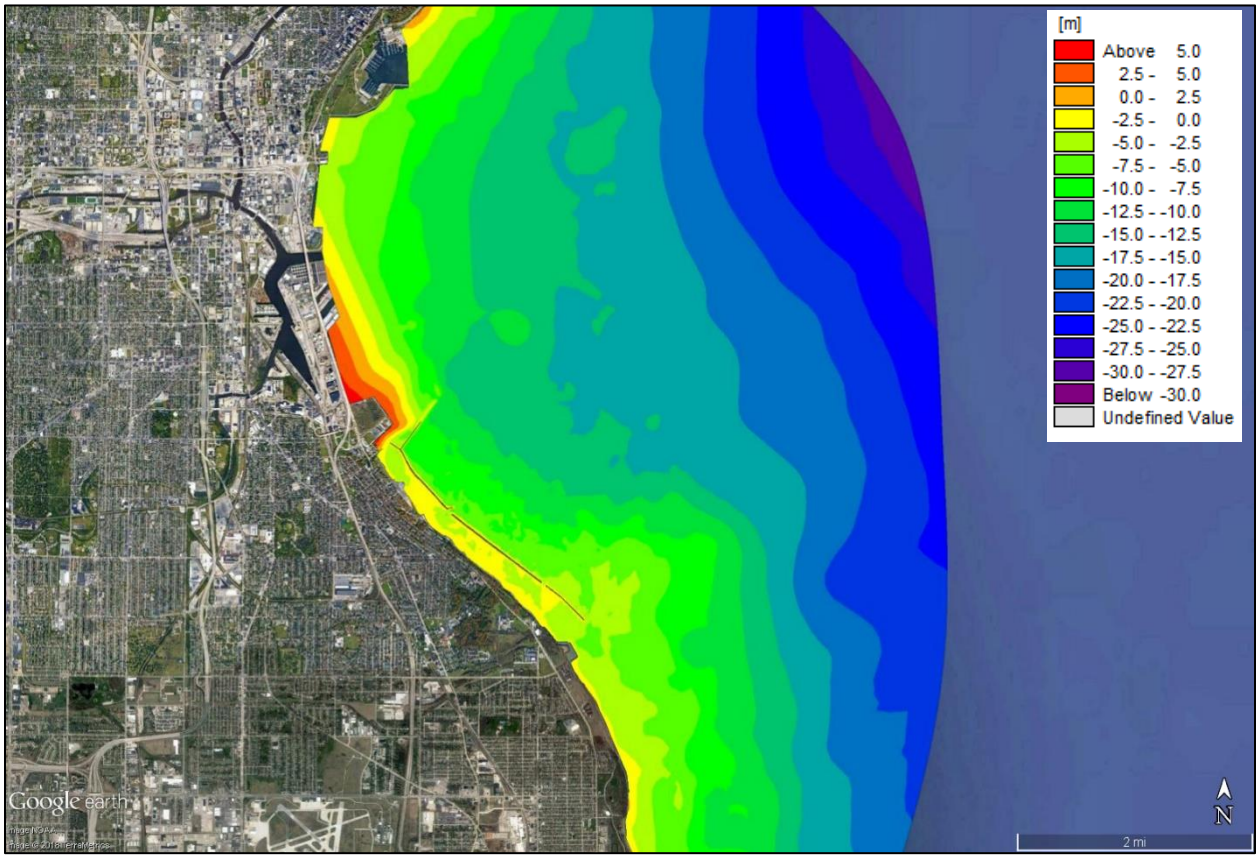


Figure 24: Large scale Bathymetry for the study area.

[3] https://coast.noaa.gov/dataviewer/#/lidar/

An unstructured mesh (varying in grid size) was created using the MIKE *Mesh Generator* tool (Figure 25). This unstructured mesh provides a good degree of flexibility in the representation of complex geometries since small elements can be used in areas where more resolution is required, and larger elements used where less resolution is required. The mesh resolution influences greatly the accuracy and duration of the numerical simulation. For this study the mesh sizes ranged from 8m (~26 ft.) close to the project site (Figure 26), to 130m (~426 ft.) in the offshore deep-water areas.

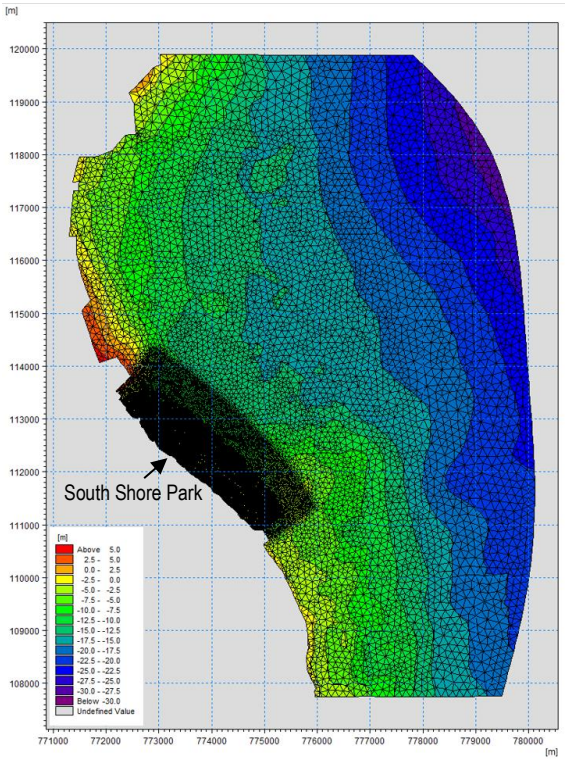


Figure 25: Unstructured mesh for the model domain with varying mesh resolutions.

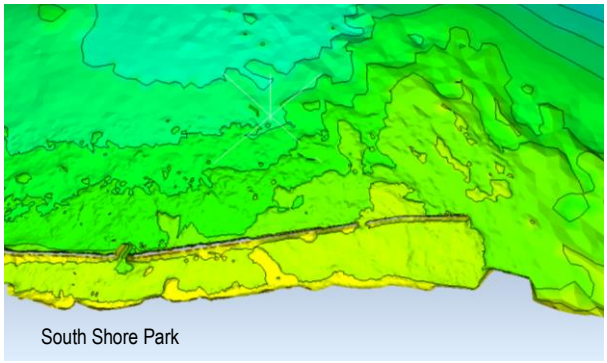


Figure 26: Bathymetry with higher resolution in the nearshore area.

6.2. Calibration of the numerical model

The purpose of the calibration is to tune the numerical model to reproduce known/measured conditions for a particular situation. In this case, the wave and current data recorded by the ADCP was used to calibrate the numerical model for the period of time from November 11th, 2017 to December 22nd, 2017 (calibration period).

The most important factor when calibrating a model is the accuracy of the measured data. As mentioned in section 4, the measurements were processed to eliminate erroneous information based on the instrument's thresholds.

6.2.1. Offshore Wave Boundary Conditions for calibration

Since the ADCP wave measurements were taken inside the harbor (Figure 9), offshore wave conditions for the same period of time were required. This information was downloaded from the Nowcast of the Great Lakes Coastal Forecasting System[4] at a Latitude of 43.0400° and a Longitude of -87.8°, as shown in Figure 27.

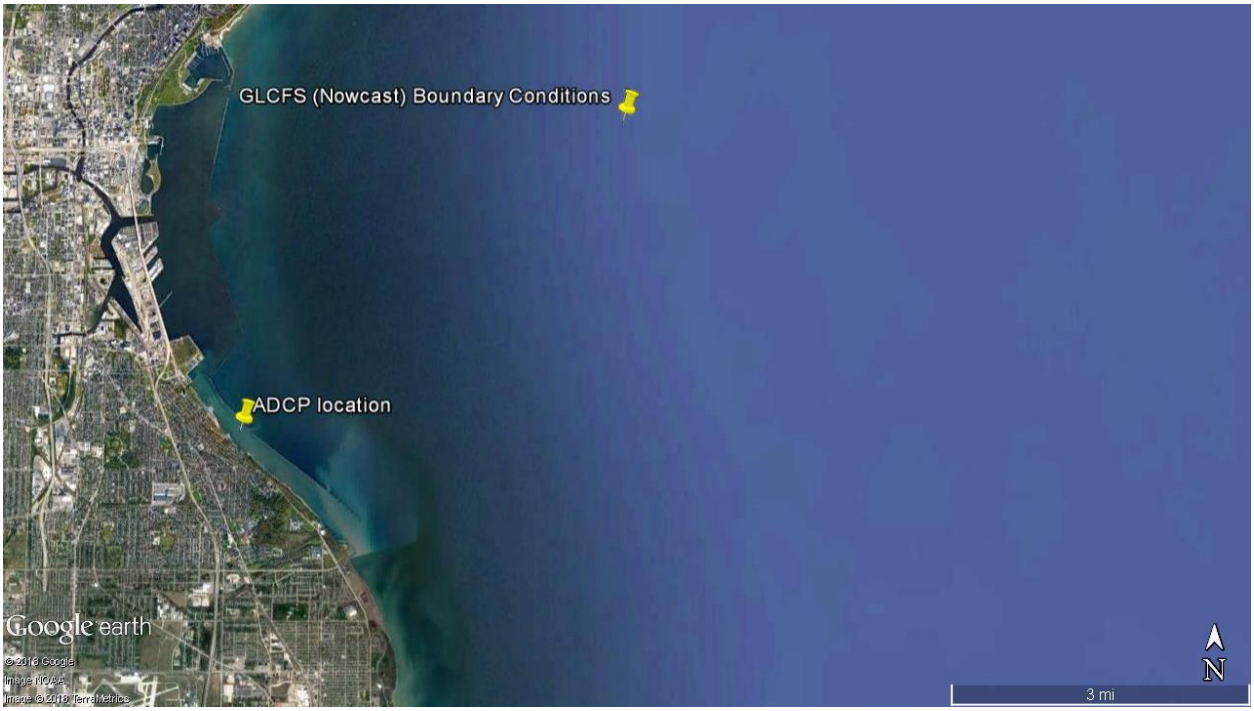


Figure 27: Comparison between the offshore wave data vs the ADCP location.

[4] http://data.glos.us/glcfs/

Wave roses for the two different locations are shown in Figures 28 and 29. The change in magnitude and in direction is evident. This is because as offshore waves enter shallower water, they become depth-limited and start to shoal and refract because of the varying water depths. Furthermore, when waves encounter an obstacle, such as the breakwaters at the project site, diffraction occurs and the wave crest will curve into the shadow area behind the breakwater.

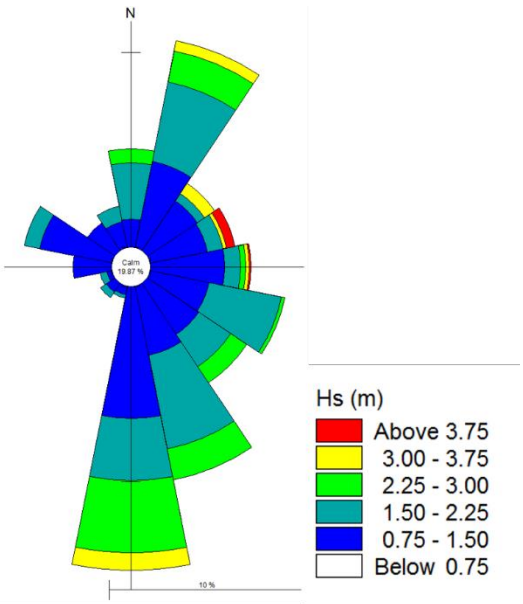


Figure 28: Offshore wave rose from 11/06/2017 to 12/22/2017

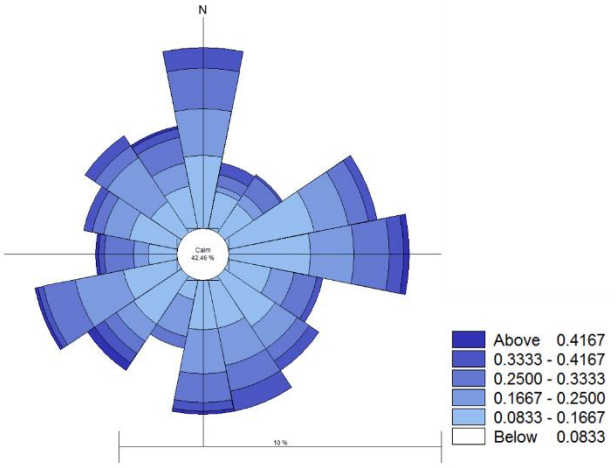


Figure 29: Nearshore wave rose from 11/06/2017 to 12/22/2017

6.2.2. Wind Boundary Conditions for calibration

The wind data for the model calibration was downloaded from the NDBC MLWW3 station. The wind rose generated with this data shows that the dominant winds are coming from the WNW and the SW sectors, whereas the strongest winds are from the West and WSW.

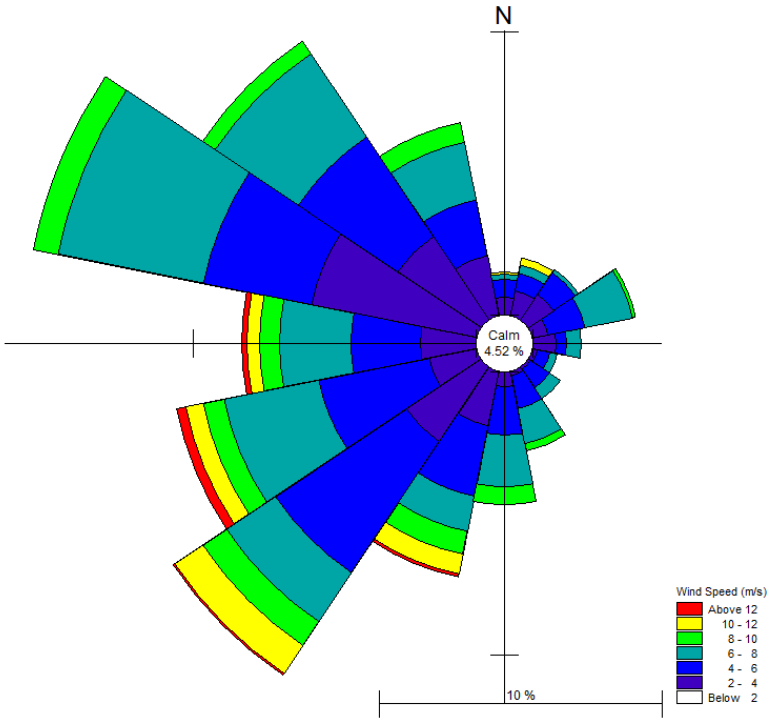


Figure 30: Wind rose from 11/06/2017 to 12/22/2017

6.2.3. Model calibration

The wind and wave offshore data mentioned in sections 6.2.1 and 6.2.2 were used as boundary conditions to force the model during the calibration period.

The initial run was completed using the software's default parameters. The results show an underestimation of the wave heights in the model simulations (Figure 31).

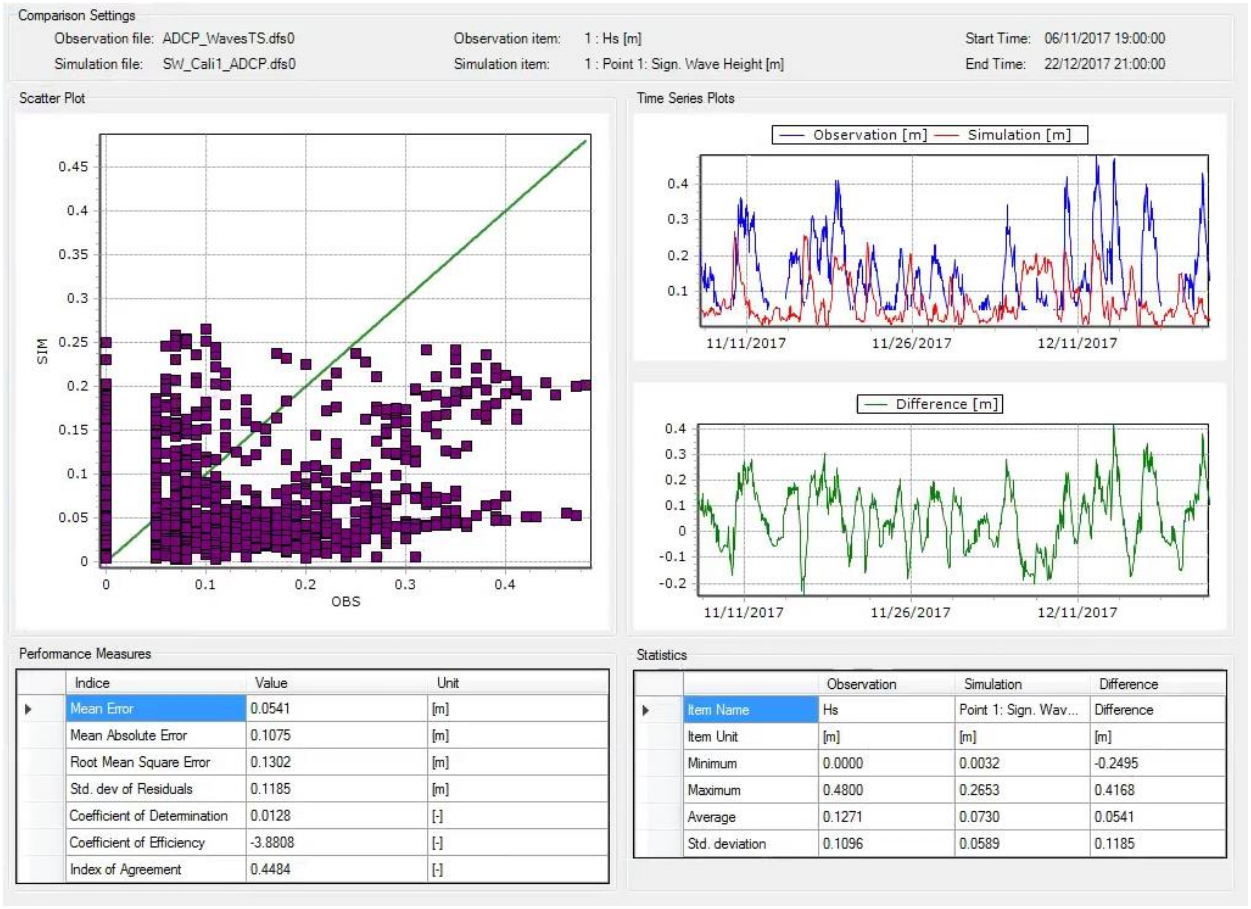


Figure 31: Comparison between the ADCP measured wave heights and the model simulation using the default parameters.

To reduce the differences between the model results and the in-situ measurements, different formulations, solution techniques, and the following parameters were changed:

- Resolution of the mesh grid.
- Bottom friction coefficient for shallow water depths.
- Wave breaking parameters.
- Accuracy of the wind data.

Various model runs were completed modifying the tuning parameters until an acceptable difference was reached (calibrated) (Figure 32).

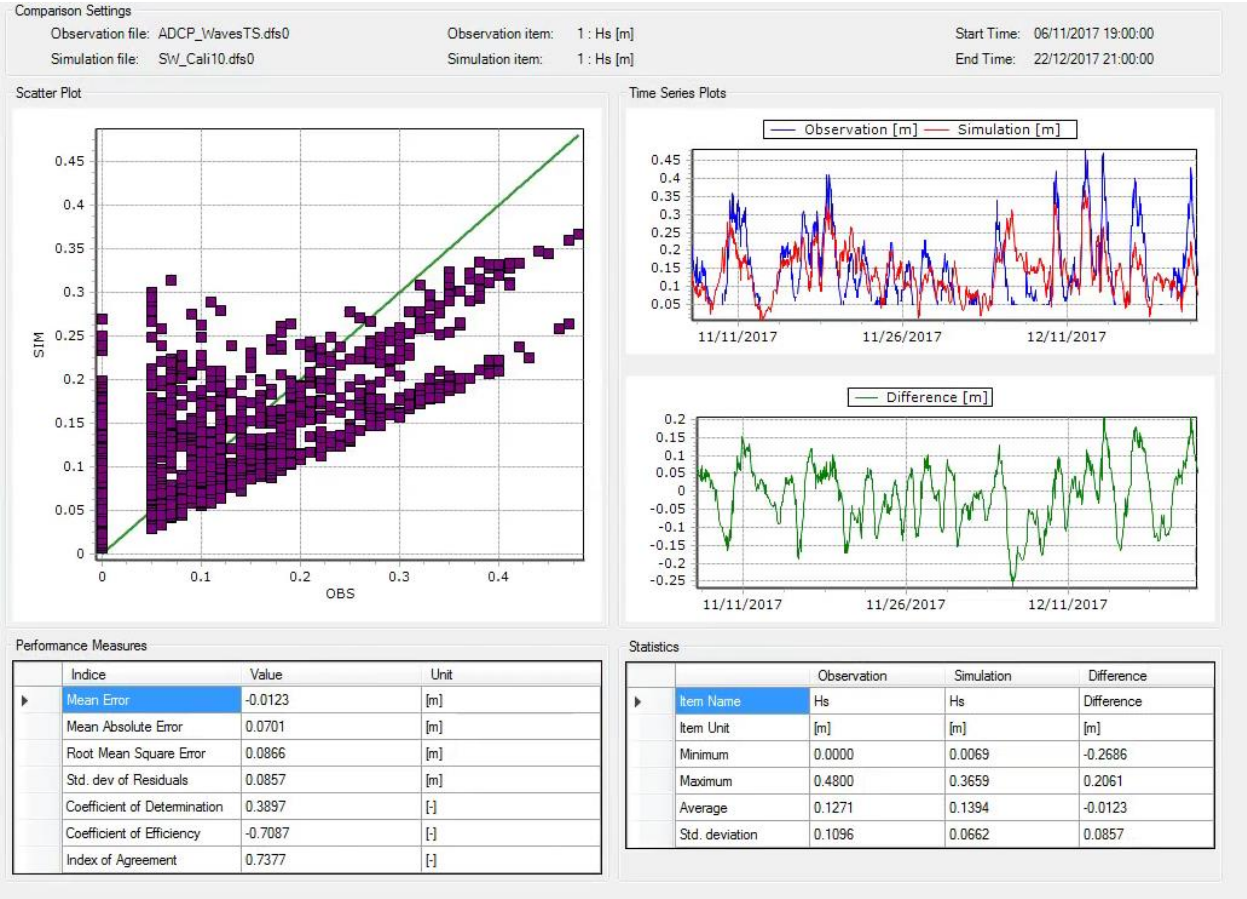


Figure 32: Comparison between the ADCP measured wave heights and the model simulation after the tuning parameters were changed.

6.2.4. Model Simulation for the different alternatives

Once the model was calibrated, a digital terrain for each of the beach alternatives shown in Section 5 was created (Figures 33-36).

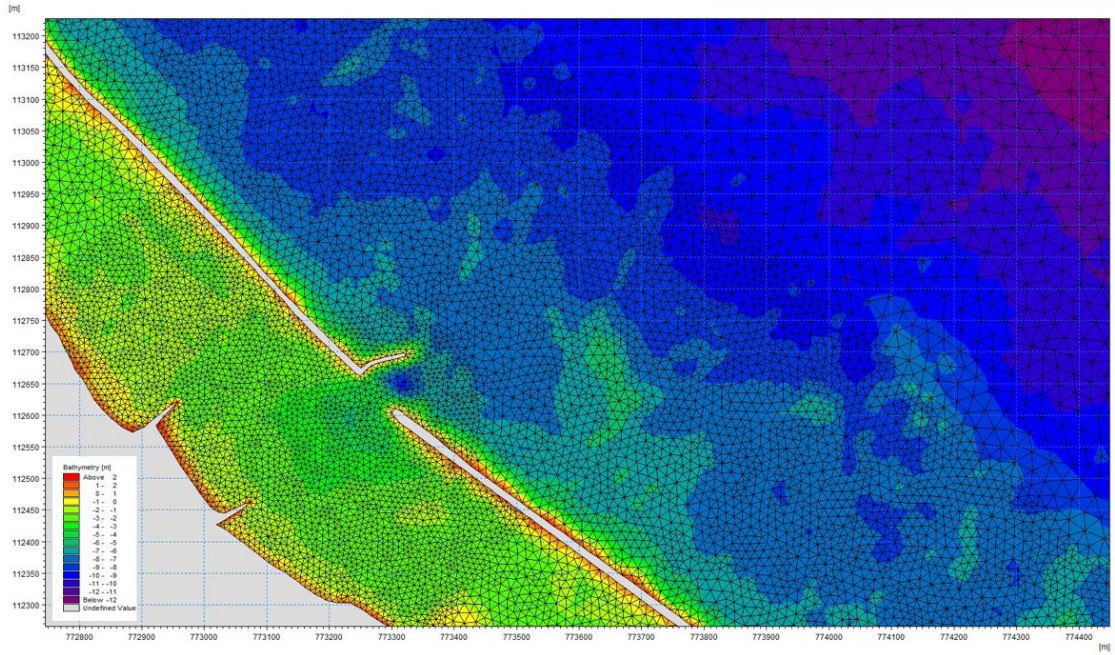


Figure 33: Digital domain for alternative 1.

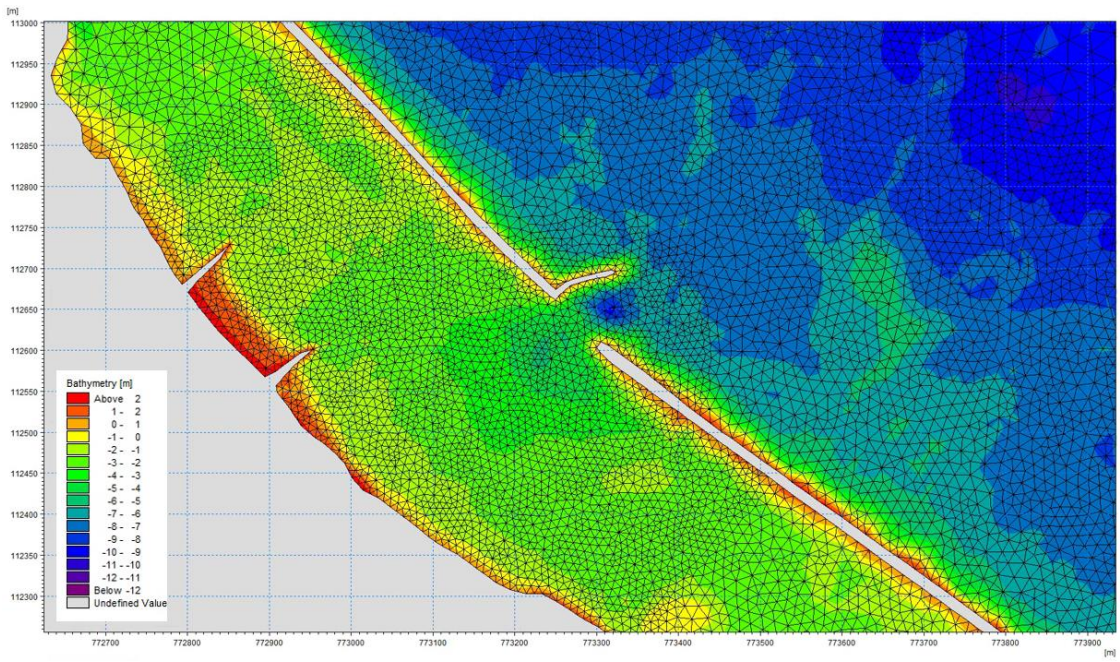


Figure 34: Digital domain for alternative 2.

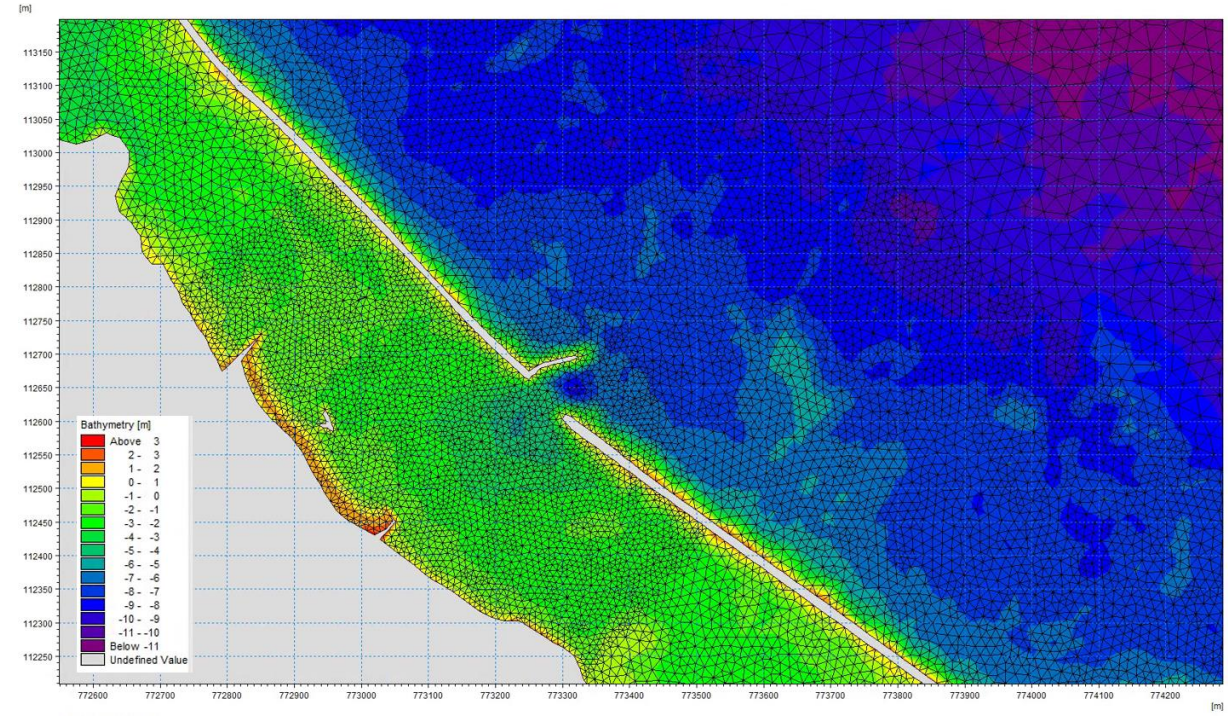


Figure 35: Digital domain for alternative 3.

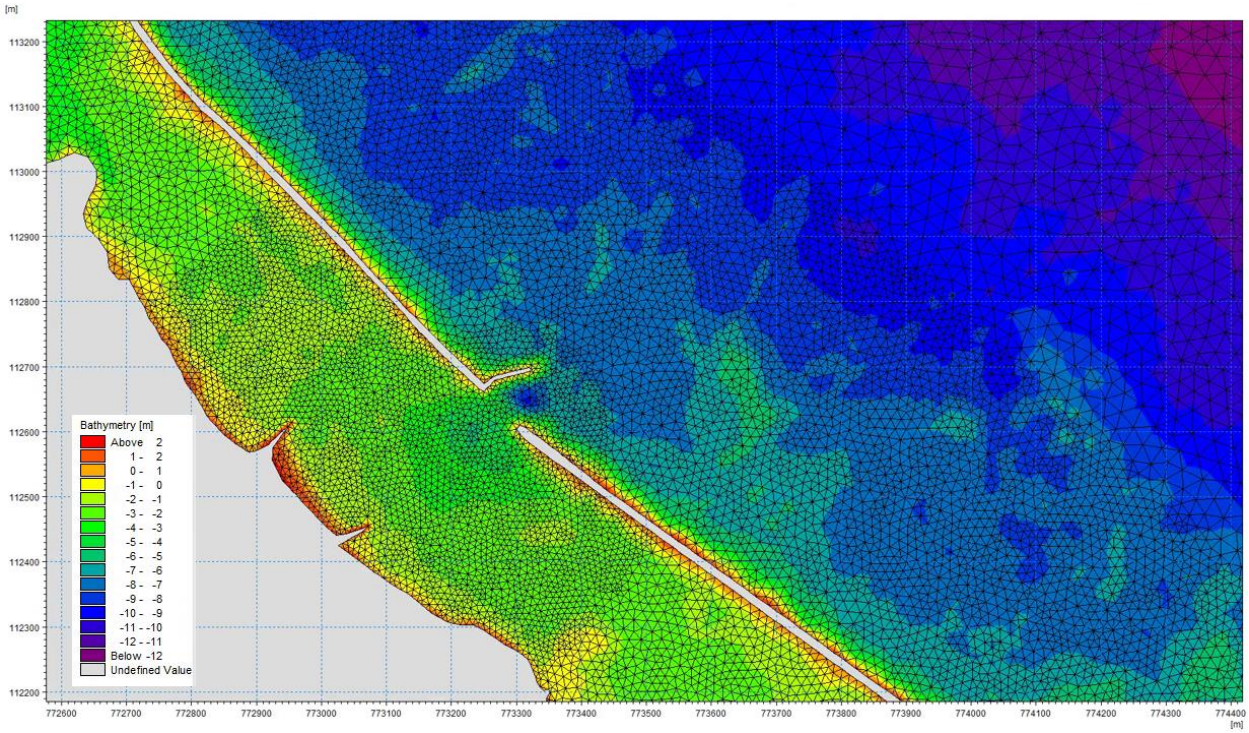


Figure 36: Digital domain for alternative 4.

The existing conditions of South Shore Park and the four beach alternatives were modeled under different return period events per directional bin, as discussed in Section 3.2 and Section 3.3 . The purpose of these simulations was to assess the difference in the nearshore currents at each of the location during different wind/waves conditions. The wind and waves used to force the model are shown in Table 5, for a total of 48 simulations.

Table 5: Model simulation Boundary Conditions

Direction and Return Period Event	Hs (m)	Tp (s)	Wind Speed (m/s)	Direction (°)
NNE_1yr	3.11	7.5	13.8	22.5
NNE_50yr	5.48	9.75	17.11	22.5
NE_1yr	2.49	7	12.67	45
NE_50yr	4.77	8.75	16.87	45
E_1yr	2.03	6.25	12.71	90
E_50yr	4.52	8.75	16.49	90
SE_1yr	2.17	6.5	12.18	135
SE_50yr	3.20	7.5	14.42	135
SW_1yr	--	--	14.27	225
SW_50yr	--	--	19.45	225
W_1yr	--	--	14.09	270
W_50yr	--	--	17.15	270

After the simulations were completed, current speed information near the shore was extracted for each of the alternatives for comparison purposes. Figures 37-41 show the location of the extraction points.

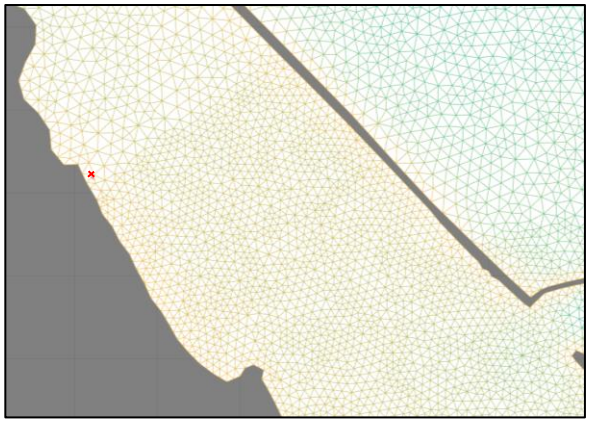


Figure 37: Extraction Point at the Existing Beach Location

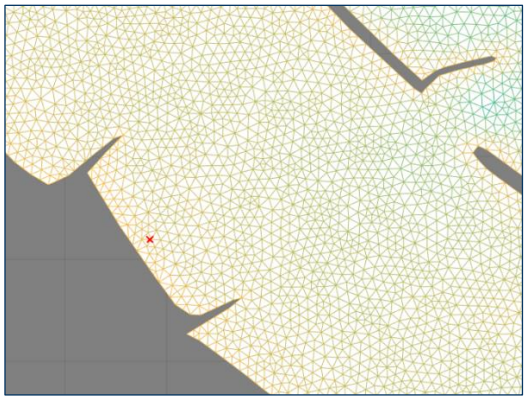


Figure 38: Extraction Point for Alternative 1

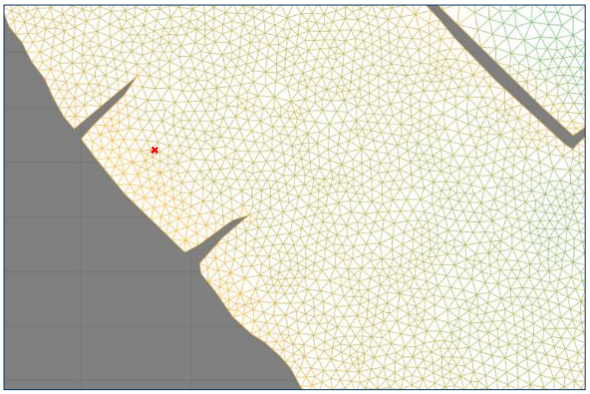


Figure 39: Extraction Point for Alternative 2

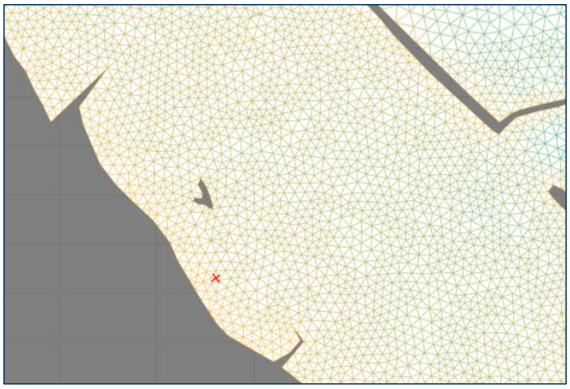


Figure 40: Extraction Point for Alternative 3

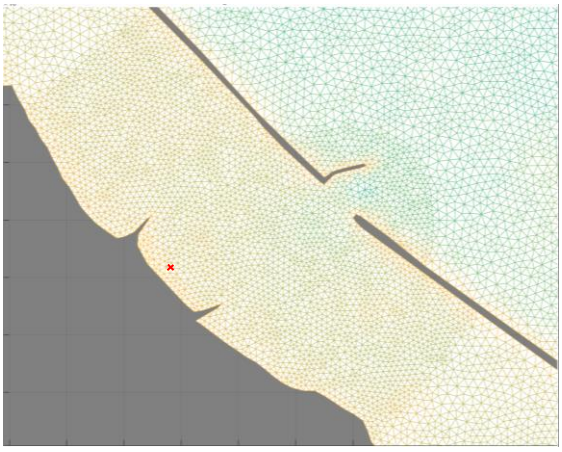


Figure 41: Extraction Point for Alternative 4

6.3. Results

A quantitative comparison of the nearshore currents was completed for each beach alternative and for the existing location of the beach. The results for the one-year return period events per directional bin are shown in Table 6.

Table 6: Nearshore current speed values for the 4 proposed alternatives

Direction and Return Period Event	Current Speed (m/s)								
	Existing Beach	Alternative 1		Alternative 2		Alternative 3		Alternative 4	
		Before Structures	After Structures	Before Structures	After Structures	Before Structures	After Structures	Before Structures	After Structures
NNE_1yr	0.06	0.28	0.25	0.07	0.08	0.28	0.22	0.28	0.24
NE_1yr	0.18	0.36	0.33	0.11	0.16	0.36	0.32	0.36	0.3
E_1yr	0.11	0.22	0.2	0.12	0.16	0.22	0.26	0.22	0.17
SE_1yr	0.12	0.17	0.12	0.09	0.11	0.12	0.14	0.12	0.11
SW_1yr	0.05	0.06	0.09	0.05	0.05	0.06	0.08	0.06	0.05
W_1yr	0.11	0.09	0.13	0.06	0.07	0.07	0.2	0.07	0.08

As requested by DNR, a comparison of the existing circulation in the locations of the proposed alternatives was added to Table 6. It is worth nothing that in many of the locations, adding the jetties has slightly decreased circulation velocities. However, the jetties are necessary to contain the recreational beach and prevent sand migration. In the case of alternative 2, the circulation is slightly greater after adding the new jetties and regrading the area, this is due to the beach being extended lakeward.

As stated previously, the dominant wind direction in the summer is NNE. When winds are from the NNE, the water currents head towards the NW parallel to the shore. As shown in Table 6, the nearshore current velocities are significantly higher in alternatives one and three than the velocities at the existing location.

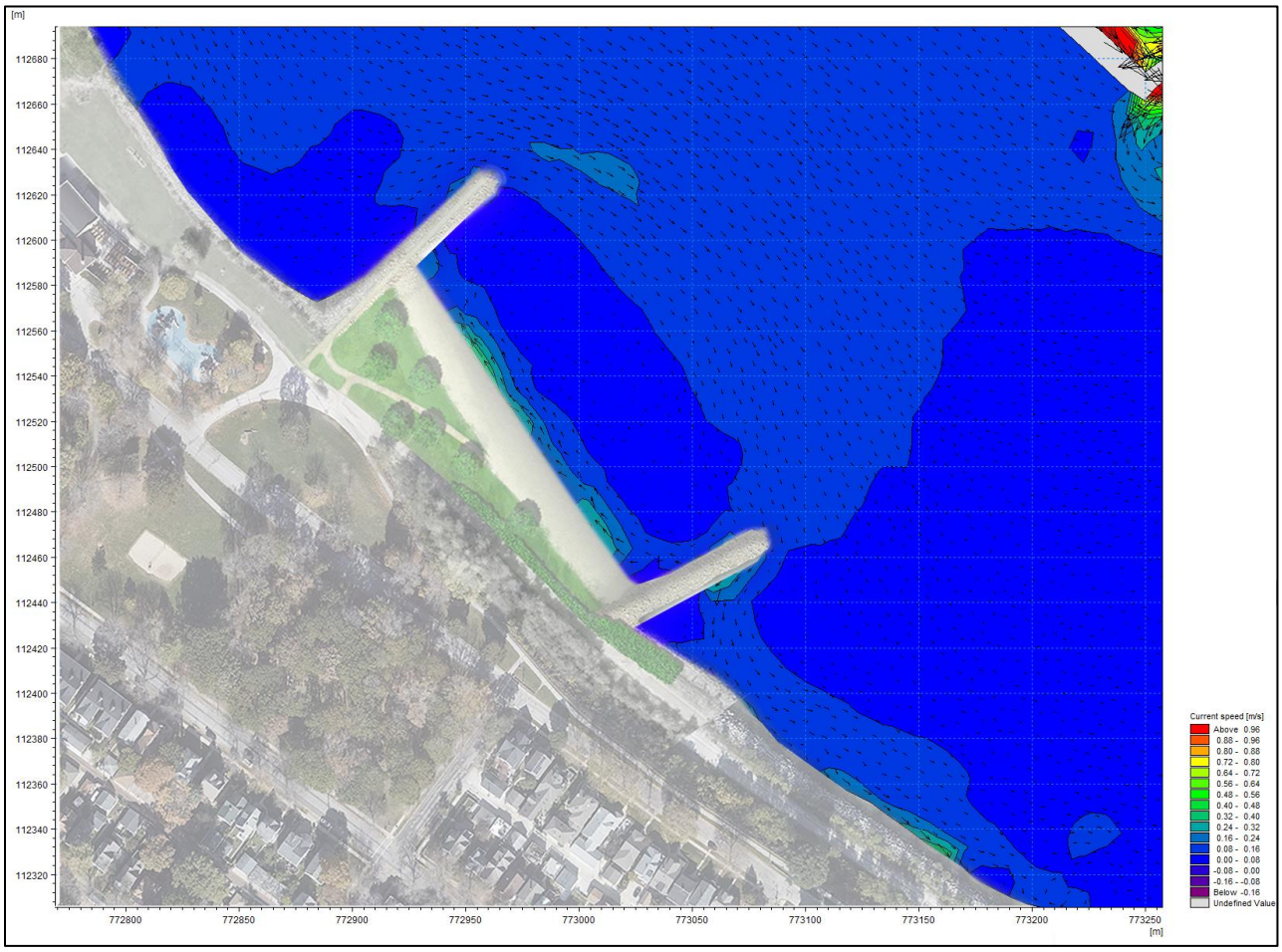


Figure 42: Current Speeds caused by winds from the NNE 1year return period event (Alternative 1).

Figure 43: Current Speeds caused by winds from the NNE 1year return period event (Alternative 2).

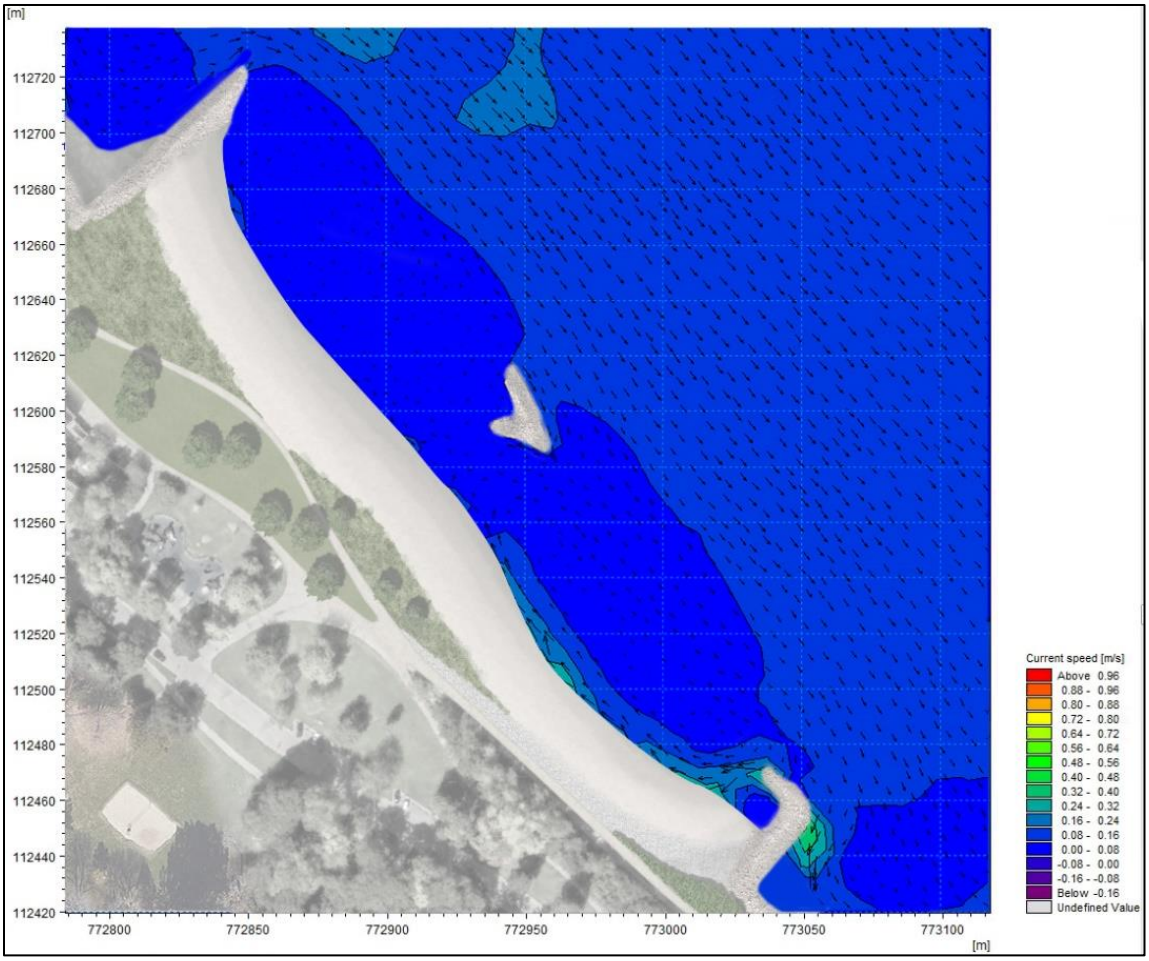


Figure 44: Current Speeds caused by winds from the NNE 1year return period event (Alternative 3).

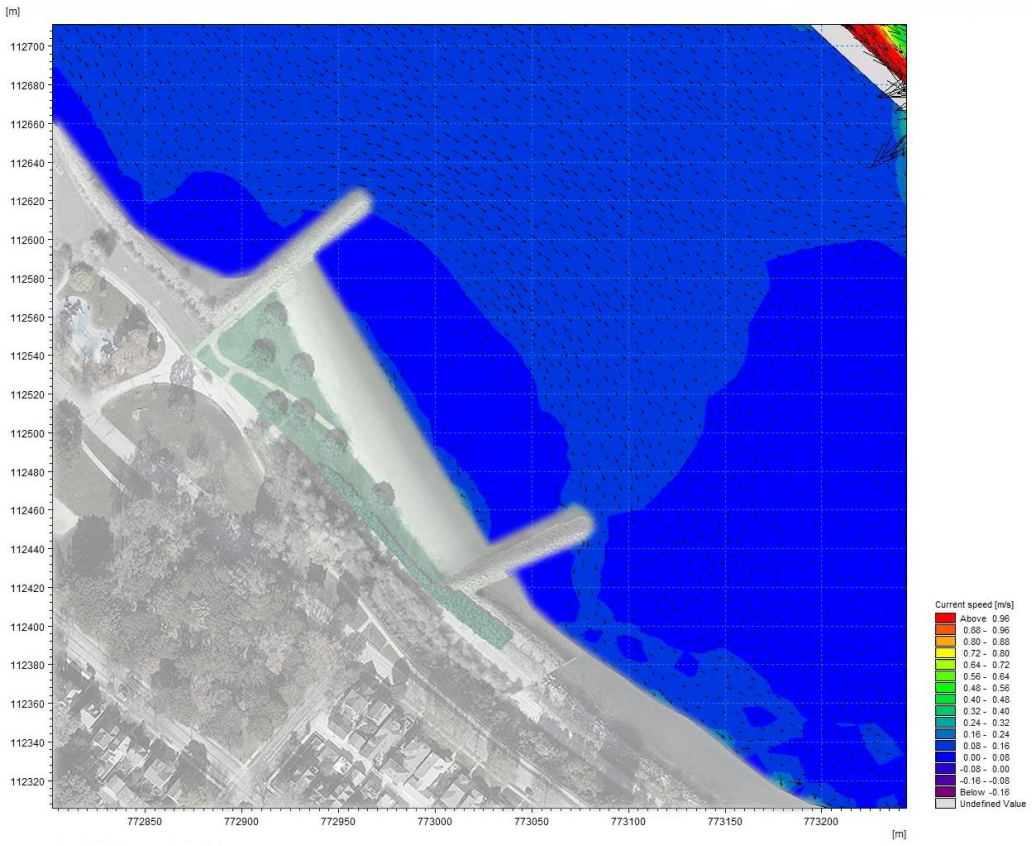


Figure 45: Current Speeds caused by winds from the NNE 1year return period event (Alternative 4).

The second most dominant wind direction during the summer is the West (Figure 6). Alternatives one, four and three still show better water circulation than the existing beach although the difference is not as significant. It is worth noting that water circulation varies the most in Alternative three, the water circulation South of the beach is higher than at the North, further to the breakwater entrance.

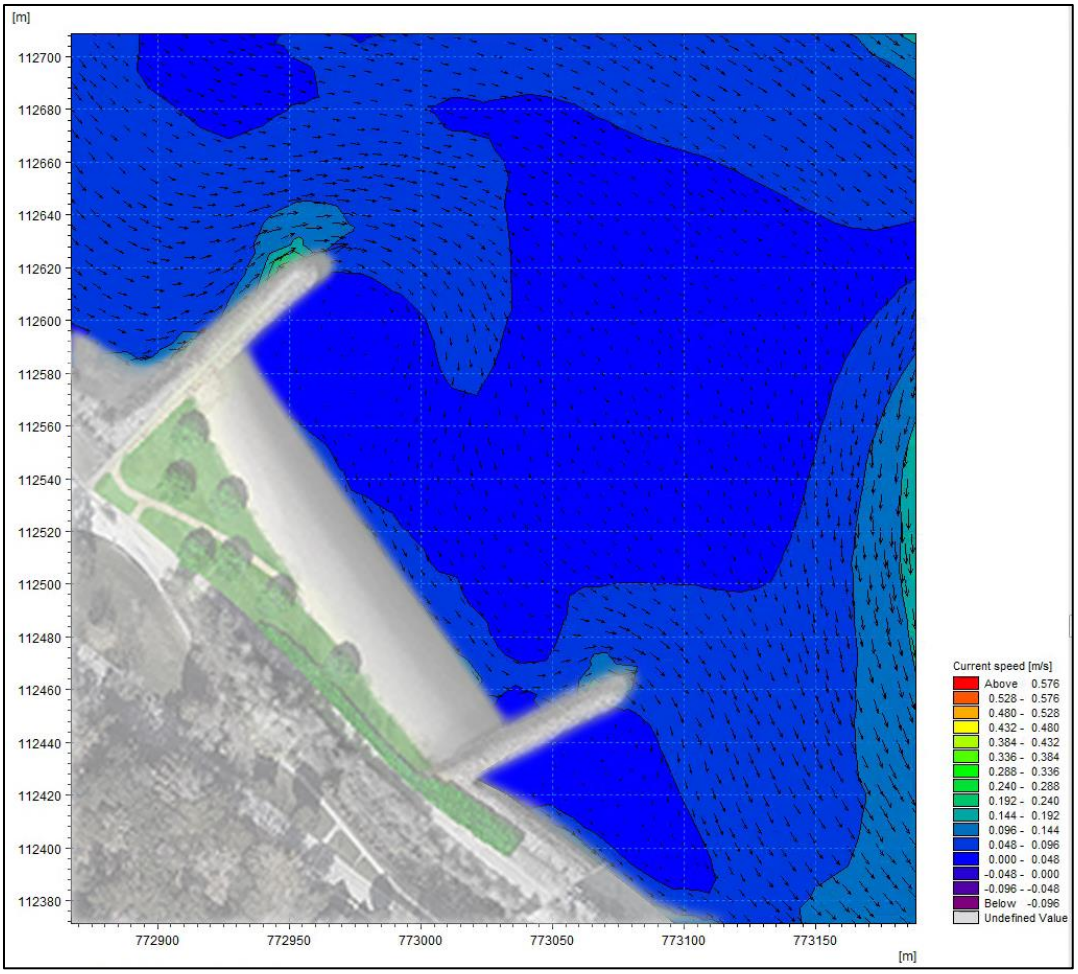


Figure 46: Current Speeds caused by winds from the W 1year return period event (Alternative 1).

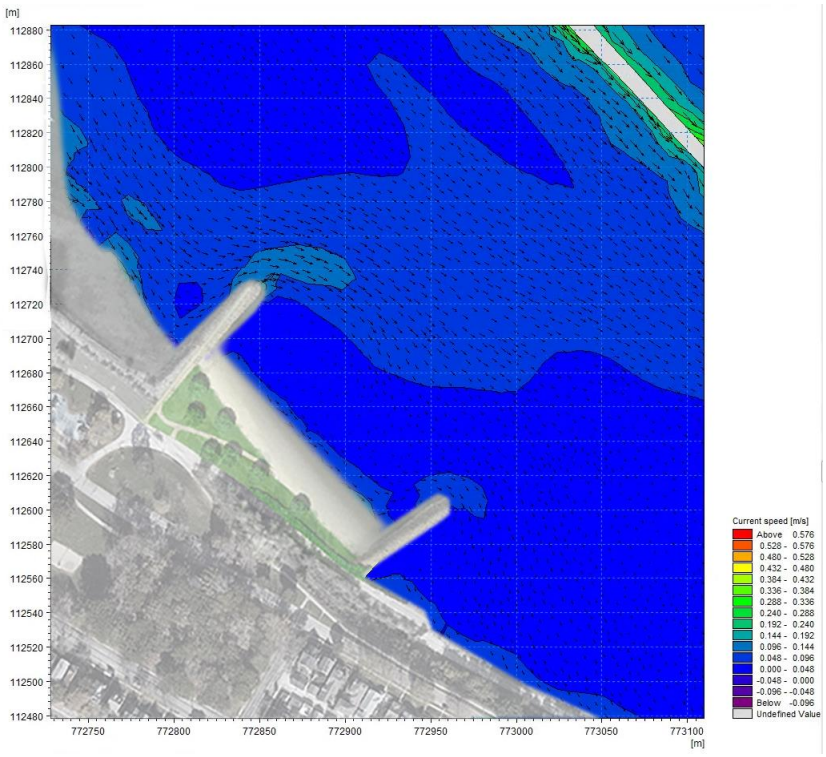


Figure 47: Current Speeds caused by winds from the W 1year return period event (Alternative 2).

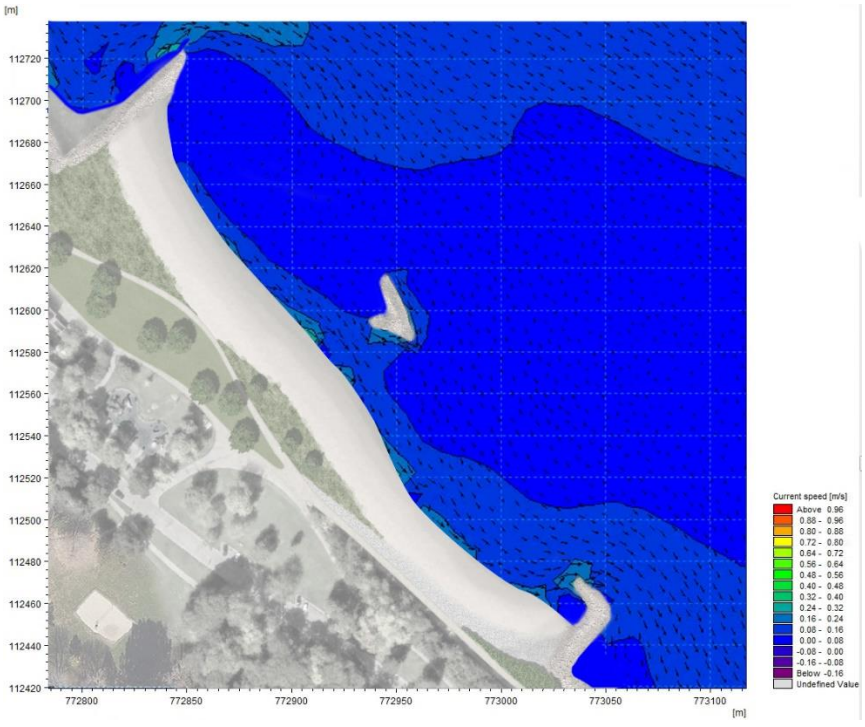


Figure 48: Current Speeds caused by winds from the W 1year return period event (Alternative 3).

7. Conclusions

- South Shore Park is located inside two breakwaters that shelter it from Lake Michigan's waves. This results in less energy from the waves breaking near the shore and therefore low current velocities along the shoreline.
- The NNE is the dominant wind direction during the summer, occurring approximately 8.5% of the time.
- Winds from the NNE and NE directions generate higher current velocities and increased water circulation is observed in the nearshore area. The nearshore water in alternative one, three, and four experience higher current velocities than the velocities at the existing beach location. Current velocities in the nearshore area of alternative two are similar to the existing beach location.
- Winds from the West are the second most dominant direction during the summer. The currents generated from the westerly winds have a SE direction. The differences between alternative 1, 4 and the existing beach are not significant (~0.02m/s).
- Alternative three shows higher current velocities at the southern part of the beach given the shape of the breakwaters that promote better water circulation, the same was not observed for the northern part of the beach.

8. Recommendations

The goal of this study was to develop alternatives to the existing beach layout and configuration that improved water circulation adjacent to the beach and reduce to the greatest extent possible the ongoing beach closures at South Shore Beach. Based on the results of the modeling which indicates increased nearshore water velocities and circulation during winds from the NNE (prominent summer wind direction), we recommend alternatives #1 and #4. The advantage of alternative #4 is that it has the least cost, however, the recreational beach area is ~40% less than alternative #1.

Alternative #3, also has increased water circulation, but only at the southern most limits of the beach, whereas alternatives #1 and #4, showed increased water circulation across the full width of the beach.

Milwaukee County Department of Administrative Services

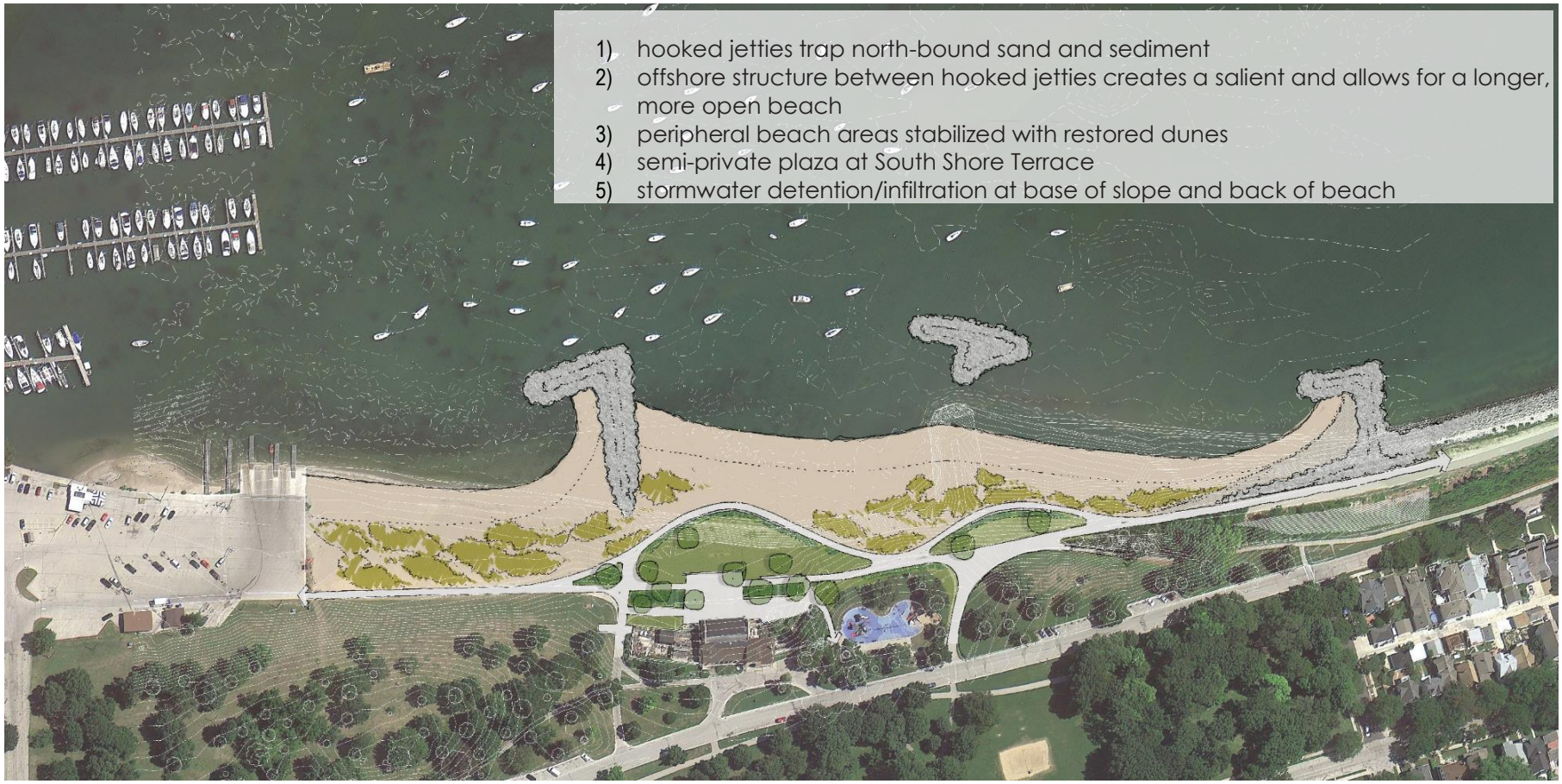
South Shore Beach Improvements

Coastal Report

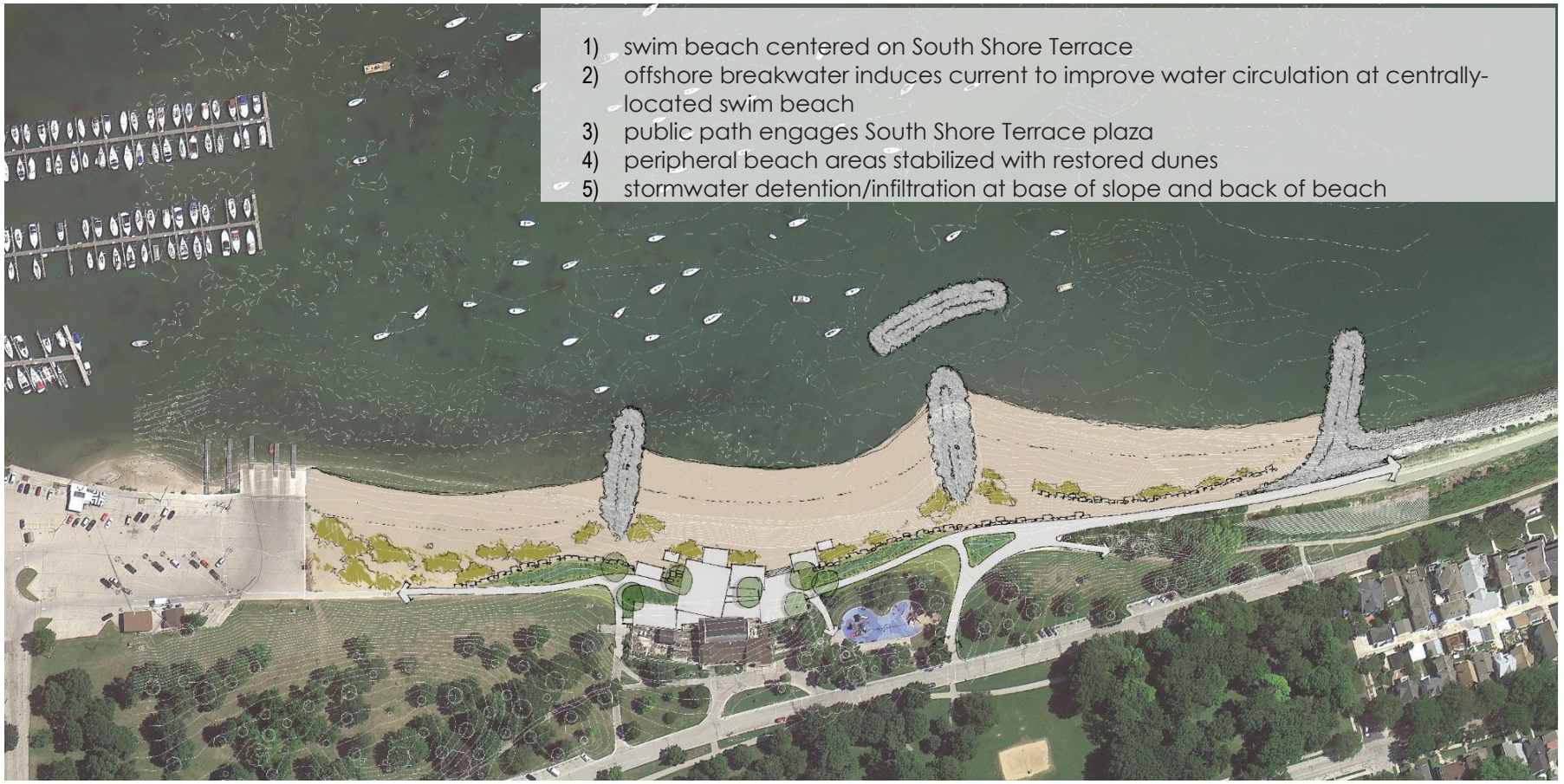
APPENDIX A

Initial Beach Alternatives

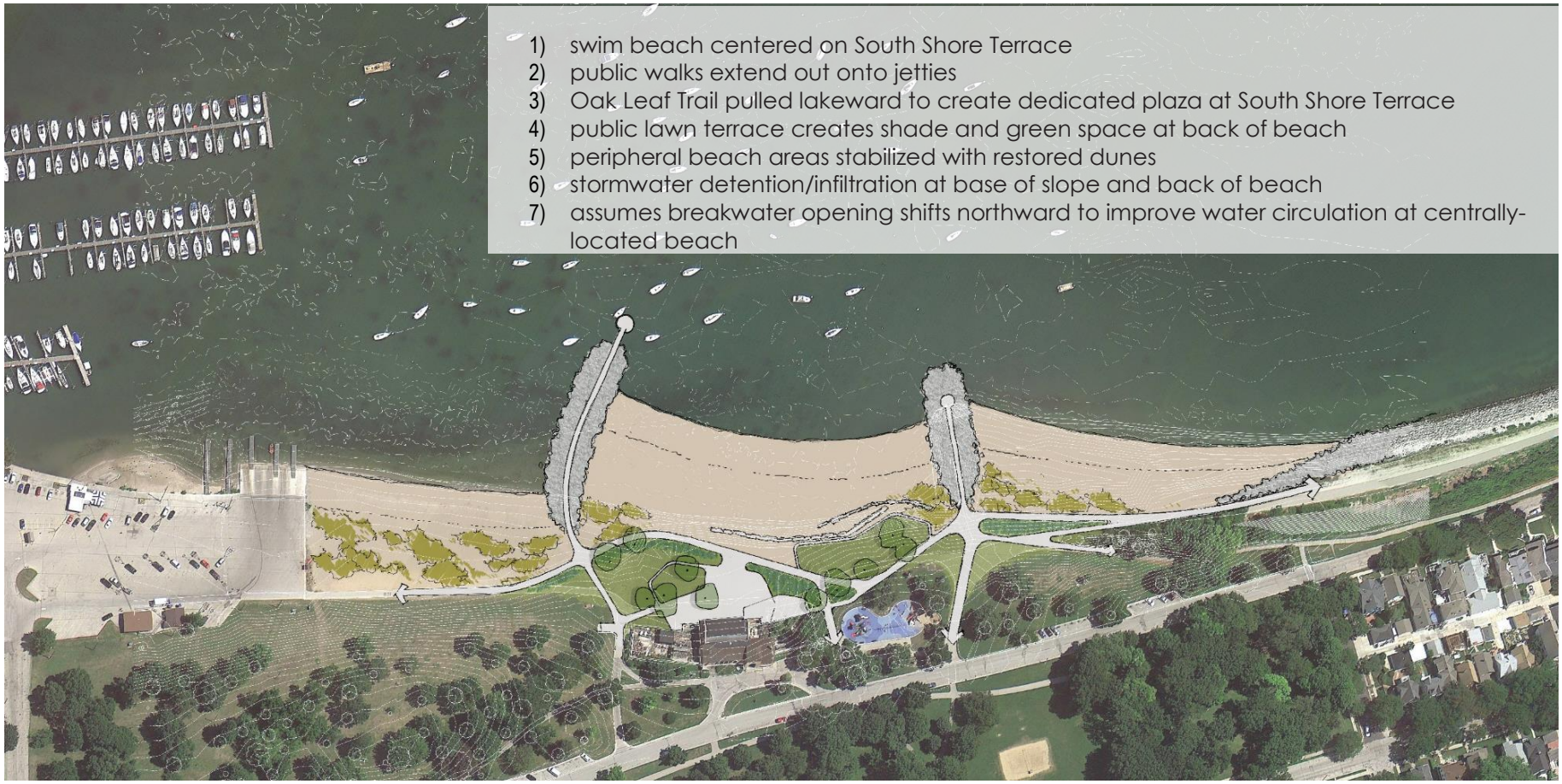
Initial Alternatives – Alt A



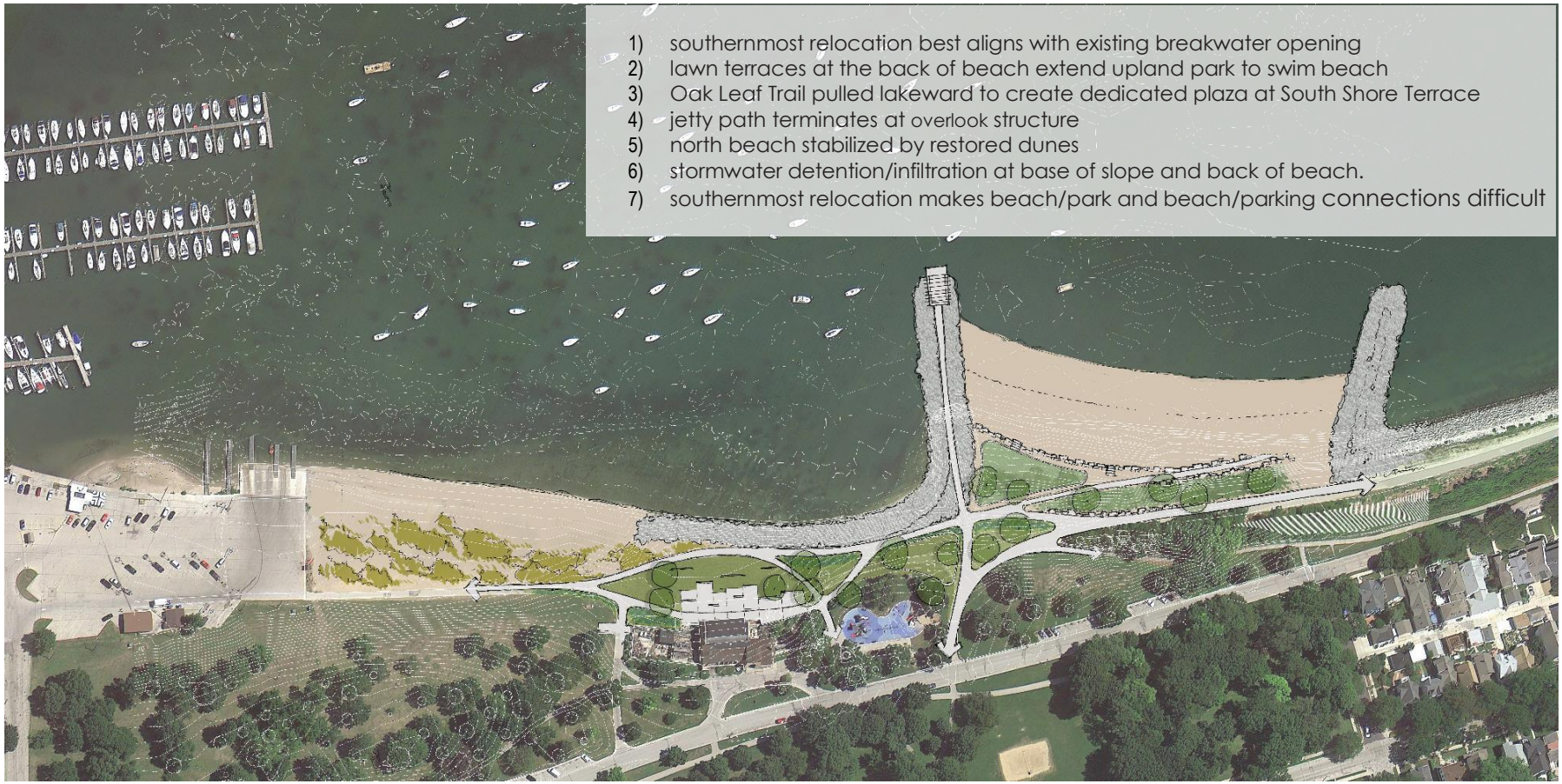
Initial Alternatives – Alt B



Initial Alternatives – Alt C



Initial Alternatives – Alt D



Milwaukee County Department
of Administrative Services

South Shore Beach Improvements

Basis of Design

APPENDIX B

Opinion of Probable Construction Cost for the Beach Alternatives

SMITHGROUP JJR

www.smithgroupjjr.com

Client	Milwaukee County
Project	South Shore Park - Beach Masterplan
Project #	10451
Detail	prelimnary cost opinions on beach alternative
Date	4/16/2018

Alternative 1

Item	Division	Item	Quantity	Unit	Unit Cost	Item Total	Subtotal
	01	**General Requirements**					**$ 210,500.00**
1.	01 21	Allowances - testing	1	LS	$ 5,000.00	$ 5,000	
2.	01 54 36	Mobilization	1	LS	$ 200,000.00	$ 200,000	
3.	01 58 13	Temporary Project Signage	1	LS	$ 500.00	$ 500	
4.	01 71 23	Construction Layout	1	LS	$ 5,000.00	$ 5,000	
	02	**Existing conditions**					**$ 225,000.00**
1.	02 41 13	Remove existing TBM Material	15,000	CY	$ 15.00	$ 225,000	
	03	**Concrete**					**$ -**
1.	03 30 53	Miscellaneous Cast-In-Place Concrete	0	SF	$ -	$ -	
	10	**Specialties**					**$ 3,000.00**
1.	10 14	Signage	1	LS	$ 3,000.00	$ 3,000	
	31	**Earthwork**					**$ 124,888.89**
1.	31 11 10	Clearing and Grubbing of Land	1	LS	$ 6,000.00	$ 6,000	
2.	31 22 13	Rough Grading Sites	1	LS	$ 25,000.00	$ 25,000	
3.	31 22 16	Fine Grading	1	LS	$ 25,000.00	$ 25,000	
4.	31 23 23.17	General Fill - at existing Beach	2,778	CY	$ 14.00	$ 38,889	
5.	31 25	Erosion and Sedimentation Controls	1	LS	$ 30,000.00	$ 30,000	
6.	31 41 16	Sheet Piling	0	FF	$ 35.00	$ -	
	32	**Exterior Improvements**					**$ 404,131.50**
1.	32 12 16	Hardscape	2,500	sf	$ 7.00	$ 17,500	
2.	32 32 53	Stone Retaining Walls	0	LF	$ 150.00	$ -	
3.	32 91 13.26	Planting Beds/Stormwater	8,150	SF	$ 10.00	$ 81,500	
4.	32 92 23	Seeded Lawn	4,136	SY	$ 4.50	$ 18,614	
5.	32 92 23	Seeded Prairie Restoration	63,400	SY	$ 6.00	$ 24,818	
6.	32 93 13.40	Beach Grasses	0	SF	$ 2.00	$ 126,800	
7.	32 93 23.10	Perennials	900	Each	$ 20.00	$ 18,000	
8.	32 93 33	Shrubs	40	Each	$ 110.00	$ 4,400	
9.	32 93 43	Trees	17	Each	$ 500.00	$ 8,500	
10.	32 06 10.20	Stairs	10	Treads	$ 600.00	$ 6,000	
11.	32 16 00	Concrete Path on Breakwater	2,800	SF	$ 35.00	$ 98,000	
	33	**Utilities**					**$ 6,000.00**
1.	33 46 16	Subdrainage Piping	1	LS	$ 6,000.00	$ 6,000	
	35	**Waterways and Marine Construction**					**$ 1,642,918.28**
1.	35 31 19	Armor Stone	6,324	Ton	$ 80.00	$ 505,920	
2.	35 31 19	Filter Stone & Core Stone	5,394	Ton	$ 70.00	$ 377,580	
3.		Beach Sand Fill	10,556	CY	$ 50.00	$ 527,778	
4.		Beach Soil Fill	3,938	CY	$ 10.00	$ 39,380	
5.		Revetment	1,871	Ton	$ 55.00	$ 102,911	
6.		Dunes	0	CY	$ 20.00	$ -	
7.		Cobble Beach	0	Ton	$ 40.00	$ -	
8.	35 31 19	Salvaged Existing Revetment	0	Ton	$ 18.00	$ -	
9.	35 31 19	Salvaged Existing Breakwater (Armor Stone)	2,142	Ton	$ 25.00	$ 53,550	
10.	35 31 19	Salvaged Existing Breakwater (Core Stone)	1,790	Ton	$ 20.00	$ 35,800	
		Construction Subtotal					**$ 2,616,439**
		Bonds and Insurance	1%				$ 26,200
		Contractor Fee	0%				$ -
		Phasing	0%				$ -
		Escalator	2.0%		1 years		$ 52,000
		Construction Total					**$ 2,694,639**
		Design/Engineering/Permits	6%				$ 161,700
		Construction Contingency & Remaining Elements	25%				$ 673,700
		Project Total (Construction, design, contingency and permitting)					**$ 3,530,039**

SMITHGROUP JJR

www.smithgroupjjr.com

Client	Milwaukee County
Project	South Shore Park - Beach Masterplan
Project #	10451
Detail	prelimnary cost opinions on beach alternative
Date	4/16/2018

Alternative 2

Item	Division	Item	Quantity	Unit	Unit Cost	Item Total	Subtotal
	01	General Requirements					$ 210,500.00
1.	01 21	Allowances - testing	1	LS	$ 5,000.00	$ 5,000.00	
2.	01 54 36	Mobilization	1	LS	$ 200,000.00	$ 200,000.00	
3.	01 58 13	Temporary Project Signage	1	LS	$ 500.00	$ 500.00	
4.	01 71 23	Construction Layout	1	LS	$ 5,000.00	$ 5,000.00	
	02	Existing conditions					$ -
1.	02 41 13	Remove existing TBM Material	0	CY	$ 15.00	$ -	
	03	Concrete					$ -
1.	03 30 53	Miscellaneous Cast-In-Place Concrete	0	SF	$ -	$ -	
	10	Specialties					$ 3,000.00
1.	10 14	Signage	1	LS	$ 3,000.00	$ 3,000	
	31	Earthwork					$ 124,888.89
1.	31 11 10	Clearing and Grubbing of Land	1	LS	$ 6,000.00	$ 6,000.00	
2.	31 22 13	Rough Grading Sites	1	LS	$ 25,000.00	$ 25,000.00	
3.	31 22 16	Fine Grading	1	LS	$ 25,000.00	$ 25,000.00	
4.	31 23 23.17	General Fill - at existing Beach	2,778	CY	$ 14.00	$ 38,888.89	
5.	31 25	Erosion and Sedimentation Controls	1	LS	$ 30,000.00	$ 30,000.00	
6.	31 41 16	Sheet Piling	0	FF	$ 35.00	$ -	
	32	Exterior Improvements					$ 341,591.67
1.	32 12 16	Hardscape	7,000	sf	$ 7.00	$ 49,000	
2.	32 32 53	Stone Retaining Walls	690	LF	$ 150.00	$ 103,500	
3.	32 91 13.26	Planting Beds/Stormwater	7,268	SF	$ 10.00	$ 72,680	
4.	32 92 23	Seeded Lawn	3,488	SY	$ 4.50	$ 15,695	
5.	32 92 23	Seeded Prairie Restoration	7,044	SY	$ 6.00	$ 42,267	
6.	32 93 13.40	Beach Grasses	0	SF	$ 2.00	$ -	
7.	32 93 23.10	Perennials	1,400	Each	$ 20.00	$ 28,000	
8.	32 93 33	Shrubs	75	Each	$ 110.00	$ 8,250	
9.	32 93 43	Trees	18	Each	$ 500.00	$ 9,000	
10.	32 06 10.20	Stairs	22	Treads	$ 600.00	$ 13,200	
11.	32 16 00	Concrete Path on Breakwater	0	SF	$ 35.00	$ -	
	33	Utilities					$ 6,000.00
1.	33 46 16	Subdrainage Piping	1	LS	$ 6,000.00	$ 6,000	
	35	Waterways and Marine Construction					$ 1,986,823.87
1.		Armor Stone	6,486	Ton	$ 80.00	$ 518,880	
2.		Filter Stone & Core Stone	5,507	Ton	$ 70.00	$ 385,490	
3.		Beach Sand Fill	16,111	CY	$ 50.00	$ 805,556	
4.		Beach Soil Fill	13,206	CY	$ 10.00	$ 132,060	
5.		Revetment	300	Ton	$ 55.00	$ 16,500	
6.		Dunes	0	CY	$ 50.00	$ -	
7.		Cobble Beach	0	Ton	$ 40.00	$ -	
8.		Salvaged Existing Revetment	2,166	Ton	$ 18.00	$ 38,988	
9.		Salvaged Existing Breakwater (Armor Stone)	2,142	Ton	$ 25.00	$ 53,550	
10.		Salvaged Existing Breakwater (Core Stone)	1,790	Ton	$ 20.00	$ 35,800	
		Construction Subtotal					$ 2,672,804
		Bonds and Insurance	1%				$ 26,700
		Contractor Fee	0%				$ -
		Phasing	0%				$ -
		Escalator	2.0%		1 years		$ 53,000
		Construction Total					$ 2,752,504
		Design/Engineering/Permits	6%				$ 165,200
		Construction Contingency & Remaining Elements	25%				$ 688,100
		Project Total (Construction, design, contingency and permitting)					$ 3,605,804

SMITHGROUP JJR

www.smithgroupjjr.com

Client	Milwaukee County
Project	South Shore Park - Beach Masterplan
Project #	10451
Detail	prelimnary cost opinions on beach alternative
Date	3/9/2018

Alternative 3

Item	Division	Item	Quantity	Unit	Unit Cost	Item Total	Subtotal
	01	General Requirements					$ 270,500.00
1.	01 21	Allowances - testing	1	LS	$ 5,000.00	$ 5,000	
2.	01 54 36	Mobilization	1	LS	$ 260,000.00	$ 260,000	
3.	01 58 13	Temporary Project Signage	1	LS	$ 500.00	$ 500	
4.	01 71 23	Construction Layout	1	LS	$ 5,000.00	$ 5,000	
	02	Existing conditions					$ 225,000.00
1.	02 41 13	Remove existing TBM Material	15,000	CY	$ 15.00	$ 225,000	
	03	Concrete					$ -
1.	03 30 53	Miscellaneous Cast-In-Place Concrete	0	SF	$ -	$ -	
	10	Specialties					$ 3,000.00
1.	10 14	Signage	1	LS	$ 3,000.00	$ 3,000	
	31	Earthwork					$ 164,888.89
1.	31 11 10	Clearing and Grubbing of Land	1	LS	$ 6,000.00	$ 6,000	
2.	31 22 13	Rough Grading Sites	1	LS	$ 45,000.00	$ 45,000	
3.	31 22 16	Fine Grading	1	LS	$ 45,000.00	$ 45,000	
4.	31 23 23.17	General Fill - at existing Beach	2,778	CY	$ 14.00	$ 38,889	
5.	31 25	Erosion and Sedimentation Controls	1	LS	$ 30,000.00	$ 30,000	
6.	31 41 16	Sheet Piling	0	FF	$ -	$ -	
	32	Exterior Improvements					$ 373,566.67
1.	32 12 16	Hardscape	7,000	SF	$ 7.00	$ 49,000	
2.	32 32 53	Stone Retaining Walls	0	LF	$ 150.00	$ -	
3.	32 91 13.26	Planting Beds/Stormwater	8,650	SF	$ 10.00	$ 86,500	
4.	32 92 23	Seeded Lawn	4,400	SY	$ 4.50	$ 19,800	
5.	32 92 23	Seeded Prairie Restoration	7,044	SY	$ 6.00	$ 42,267	
6.	32 93 13.40	Beach Grasses	18,000	SF	$ 2.00	$ 36,000	
7.	32 93 23.10	Perennials	1,200	Each	$ 20.00	$ 24,000	
8.	32 93 33	Shrubs	50	Each	$ 110.00	$ 5,500	
9.	32 93 43	Trees	25	Each	$ 500.00	$ 12,500	
10.	32 06 10.20	Stairs	0	Treads	$ 600.00	$ -	
11.	32 16 00	Concrete Path on Breakwater	2,800	SF	$ 35.00	$ 98,000	
	33	Utilities					$ 6,000.00
1.	33 46 16	Subdrainage Piping	1	LS	$ 6,000.00	$ 6,000	
	35	Waterways and Marine Construction					$ 2,168,105.78
1.		Armor Stone	7,600	Ton	$ 80.00	$ 608,000	
2.		Filter Stone & Core Stone	6,039	Ton	$ 70.00	$ 422,730	
3.		Beach Sand Fill	17,589	CY	$ 50.00	$ 879,444	
4.		Beach Soil Fill	3,024	CY	$ 10.00	$ 30,240	
5.		Revetment	300	Ton	$ 55.00	$ 16,500	
6.		Dunes	2,081	CY	$ 20.00	$ 41,613	
7.		Cobble Beach	1,031	Ton	$ 40.00	$ 41,240	
8.		Salvaged Existing Revetment	2,166	Ton	$ 18.00	$ 38,988	
9.		Salvaged Existing Breakwater (Armor Stone)	2,142	Ton	$ 25.00	$ 53,550	
10.		Salvaged Existing Breakwater (Core Stone)	1,790	Ton	$ 20.00	$ 35,800	
		Construction Subtotal					**$ 3,211,061**
		Bonds and Insurance	1%				$ 32,100
		Contractor Fee	0%				$ -
		Phasing	0%				$ -
		Escalator	2.0%		1 years		$ 64,000
		Construction Total					**$ 3,307,161**
		Design/Engineering/Permits	6%				$ 198,400
		Construction Contingency & Remaining Elements	25%				$ 826,800
		Project Total (Construction, design, contingency and permitting)					**$ 4,332,361**

SMITHGROUP JJR

www.smithgroupjjr.com

Client	Milwaukee County
Project	South Shore Park - Beach Masterplan
Project #	10451
Detail	preliminary cost opinion on beach alternatives
Date	6/7/2018

Alternative 4

Item	Division	Item	Quantity	Unit	Unit Cost	Item Total	Subtotal
	01	General Requirements					$ 210,500.00
1.	01 21	Allowances - testing	1	LS	$ 5,000.00	$ 5,000	
2.	01 54 36	Mobilization	1	LS	$ 200,000.00	$ 200,000	
3.	01 58 13	Temporary Project Signage	1	LS	$ 500.00	$ 500	
4.	01 71 23	Construction Layout	1	LS	$ 5,000.00	$ 5,000	
	02	Existing conditions					$ 225,000.00
1.	02 41 13	Remove existing TBM Material	15,000	CY	$ 15.00	$ 225,000	
	03	Concrete					$ -
1.	03 30 53	Miscellaneous Cast-In-Place Concrete	0	SF	$ -	$ -	
	10	Specialties					$ 3,000.00
1.	10 14	Signage	1	LS	$ 3,000.00	$ 3,000	
	31	Earthwork					$ 80,000.00
1.	31 11 10	Clearing and Grubbing of Lanc	1	LS	$ 6,000.00	$ 6,000	
2.	31 22 13	Rough Grading Sites	1	LS	$ 22,000.00	$ 22,000	
3.	31 22 16	Fine Grading	1	LS	$ 22,000.00	$ 22,000	
4.	31 23 23.17	General Fill - at existing Beach	2,778	CY	$ -	$ -	
5.	31 25	Erosion and Sedimentation Controls	1	LS	$ 30,000.00	$ 30,000	
6.	31 41 16	Sheet Piling	0	FF	$ 35.00	$ -	
	32	Exterior Improvements					$ 306,131.50
1.	32 12 16	Hardscape	2,500	sf	$ 7.00	$ 17,500	
2.	32 32 53	Stone Retaining Walls	0	LF	$ 150.00	$ -	
3.	32 91 13.26	Planting Beds/Stormwater	8,150	SF	$ 10.00	$ 81,500	
4.	32 92 23	Seeded Lawn	4,136	SY	$ 4.50	$ 18,614	
5.	32 92 23	Seeded Prairie Restoration	63,400	SY	$ 6.00	$ 24,818	
6.	32 93 13.40	Beach Grasses	0	SF	$ 2.00	$ 126,800	
7.	32 93 23.10	Perennials	900	Each	$ 20.00	$ 18,000	
8.	32 93 33	Shrubs	40	Each	$ 110.00	$ 4,400	
9.	32 93 43	Trees	17	Each	$ 500.00	$ 8,500	
10.	32 06 10.20	Stairs	10	Treads	$ 600.00	$ 6,000	
11.	32 16 00	Concrete Path on Breakwater	0	SF	$ 35.00	$ -	
	33	Utilities					$ 6,000.00
1.	33 46 16	Sub-drainage Piping	1	LS	$ 6,000.00	$ 6,000	
	35	Waterways and Marine Construction					$ 1,360,747.17
1.	35 31 19	Armor Stone	3,537	Ton	$ 80.00	$ 282,960	
2.	35 31 19	Filter Stone & Core Stone	7,564	Ton	$ 70.00	$ 529,480	
3.		Beach Sand Fill	6,333	CY	$ 50.00	$ 316,667	
4.		Beach Soil Fill	3,938	CY	$ 10.00	$ 39,380	
5.		Revetment	1,871	Ton	$ 55.00	$ 102,911	
6.		Dunes	0	CY	$ 20.00	$ -	
7.		Cobble Beach	0	Ton	$ 40.00	$ -	
8.	35 31 19	Salvaged Existing Revetment	0	Ton	$ 18.00	$ -	
9.	35 31 19	Salvaged Existing Breakwater (Armor Stone)	2,142	Ton	$ 25.00	$ 53,550	
10.	35 31 19	Salvaged Existing Breakwater (Core Stone)	1,790	Ton	$ 20.00	$ 35,800	
		Construction Subtotal					$ 2,191,379
		Bonds and Insurance	1%				$ 21,900
		Contractor Fee	0%				$ -
		Phasing	0%				$ -
		Escalator	2.0%		1 years		$ 44,000
		Construction Total					$ 2,257,279
		Design/Engineering/Permits	6%				$ 135,400
		Construction Contingency & Remaining Elements	25%				$ 564,300
		Project Total (Construction, design, contingency and permitting)					$ 2,956,979

Milwaukee County Department
of Administrative Services

South Shore Beach Improvements

Basis of Design

APPENDIX C

Model Graphics

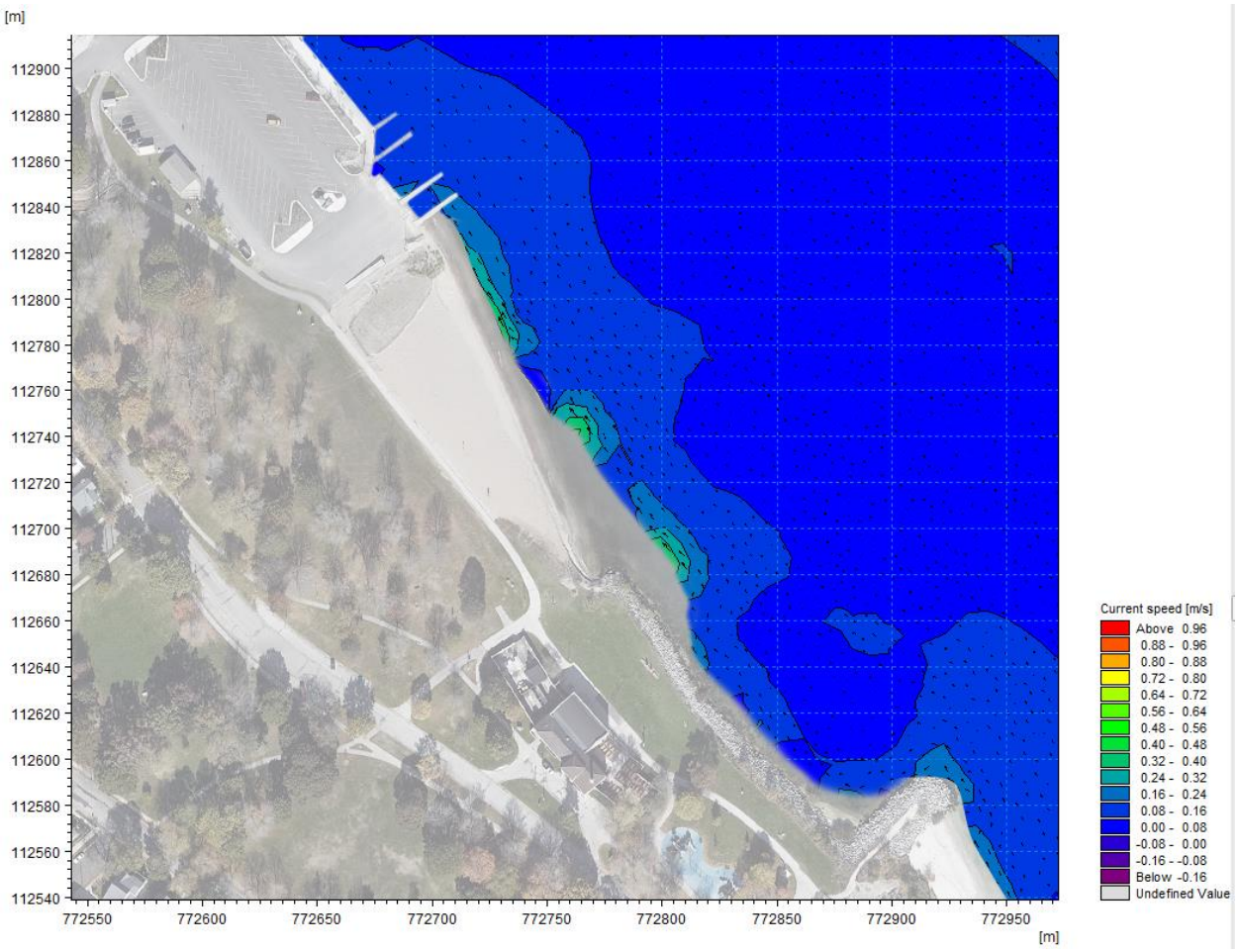


Figure 49: E_1yr

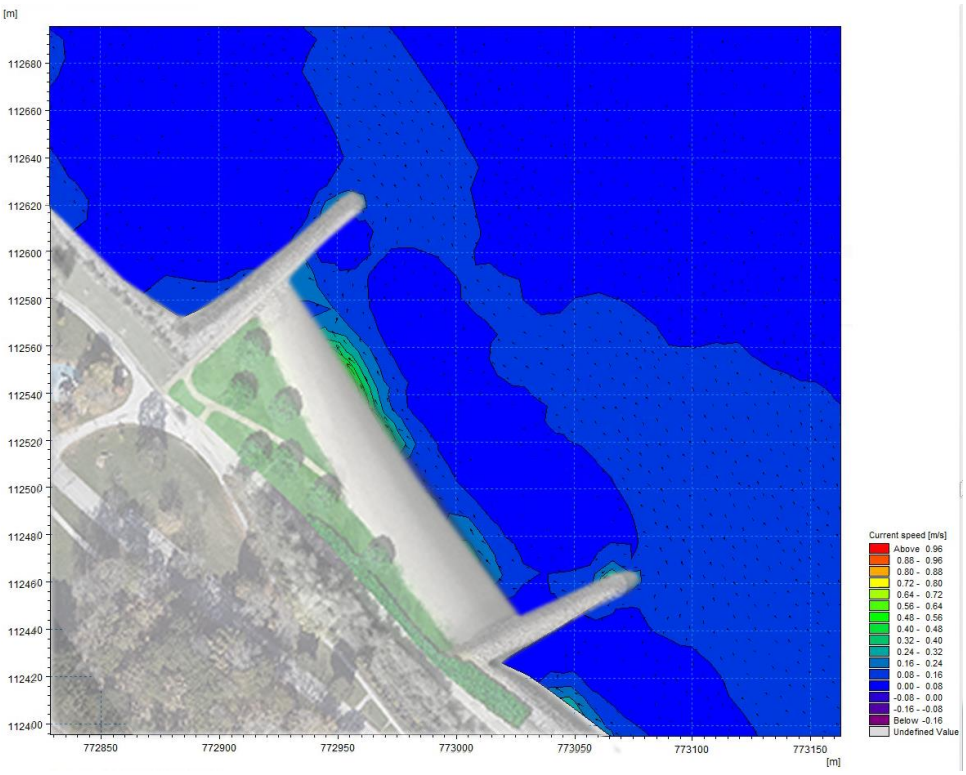


Figure 50: E_1yr Alternative 1

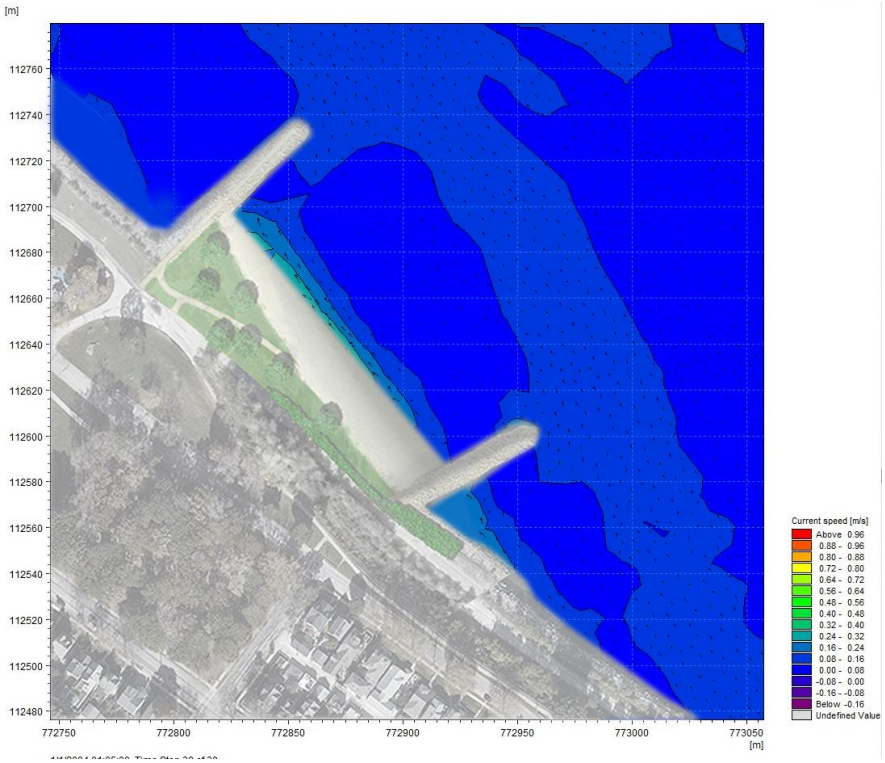


Figure 51: E_1yr Alternative 2

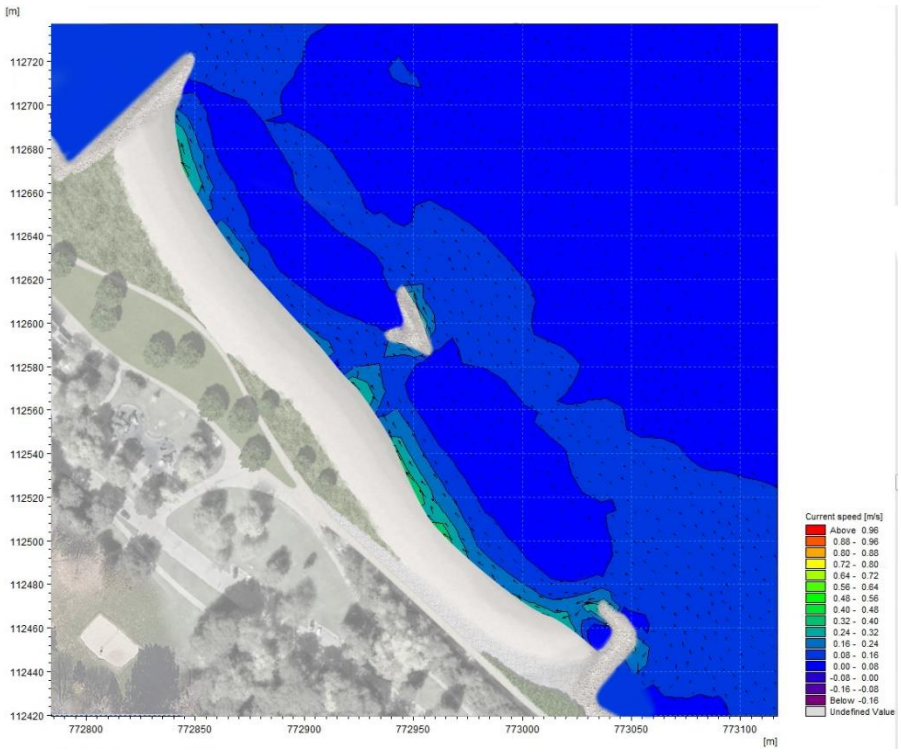


Figure 52: E_1yr Alternative 3

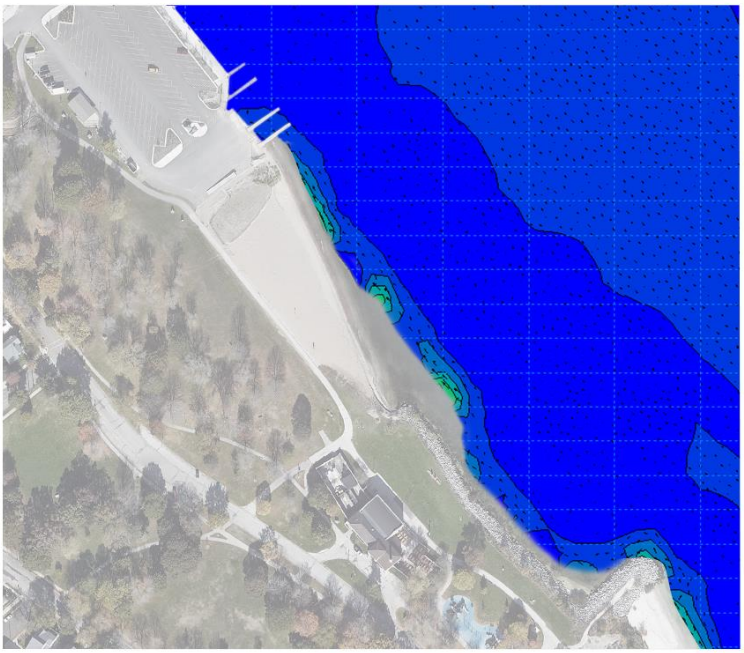


Figure 53: NE_1yr

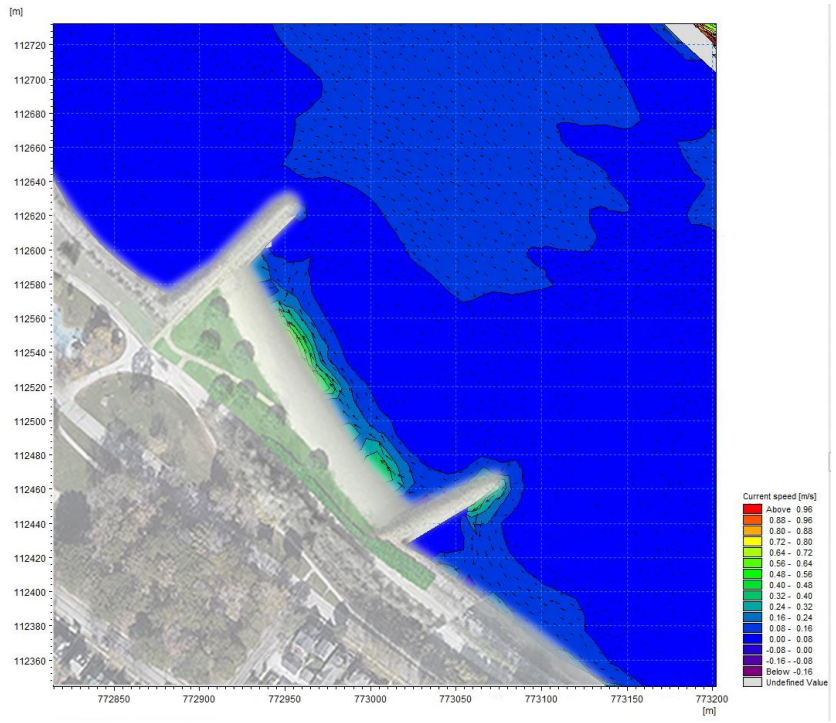


Figure 54: NE_1yr Alternative 1

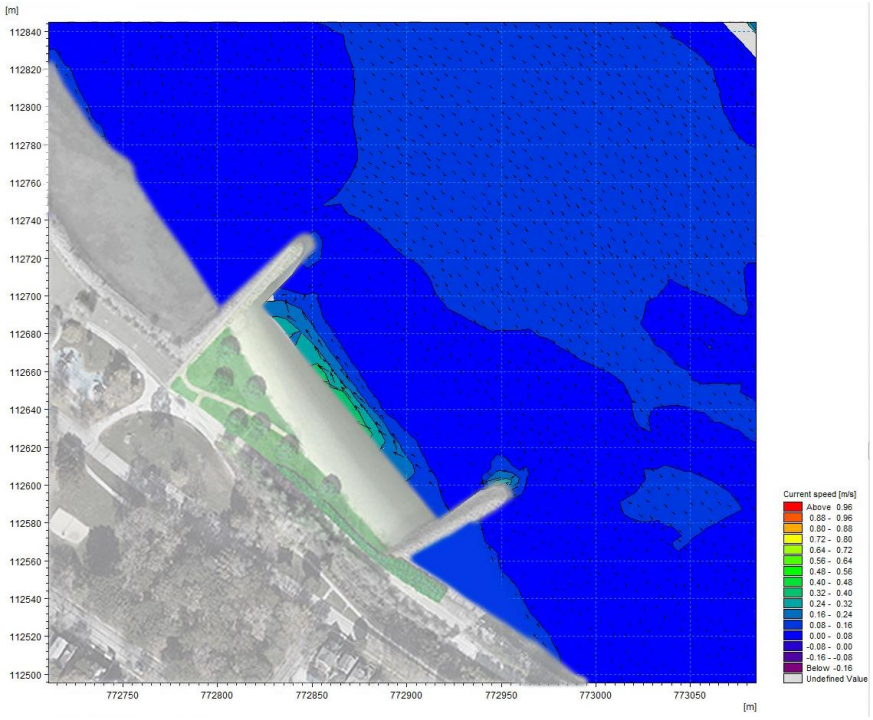


Figure 55: NE_1yr Alternative 2

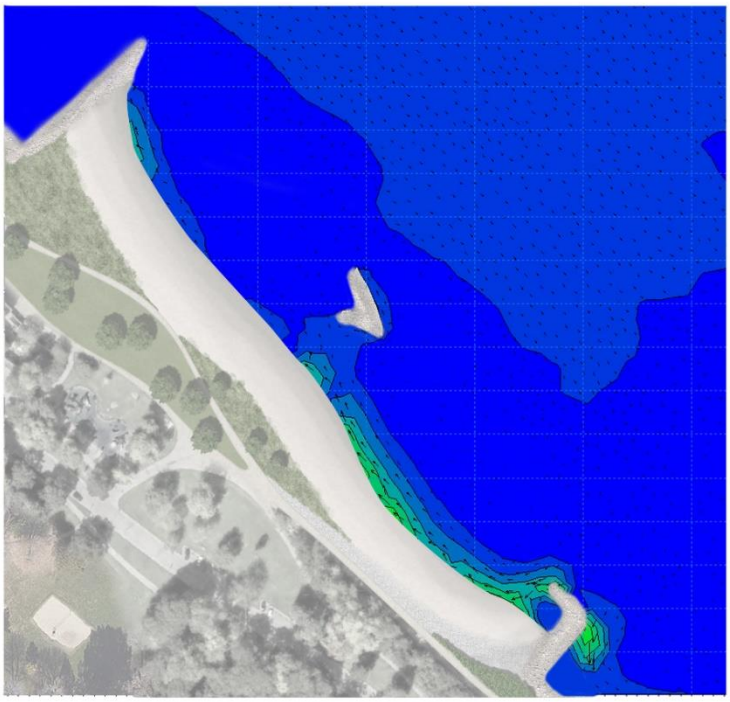


Figure 56: NE_1yr Alternative 3

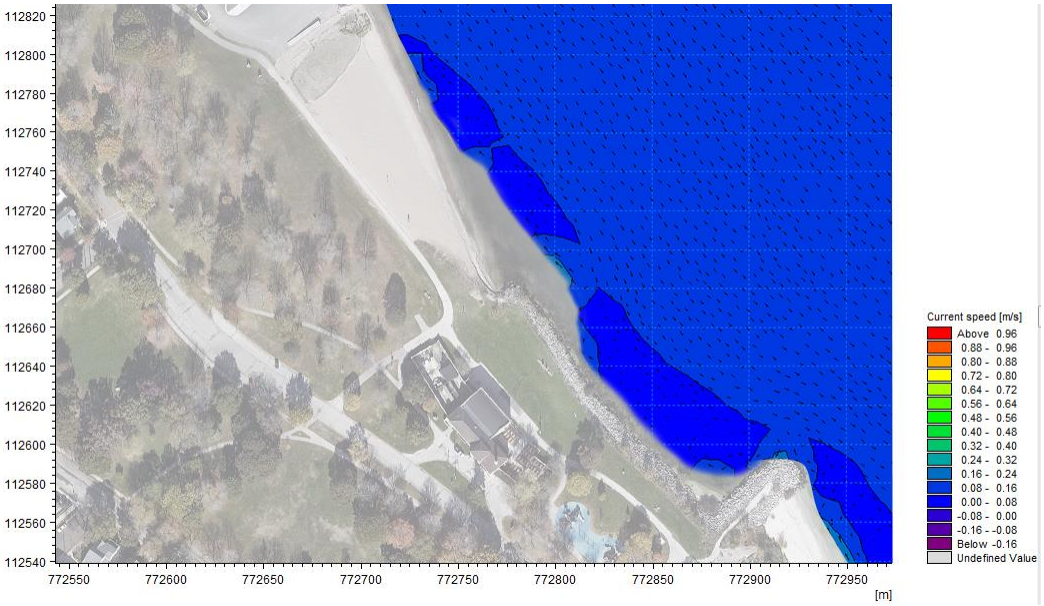


Figure 57: NNE_1yr

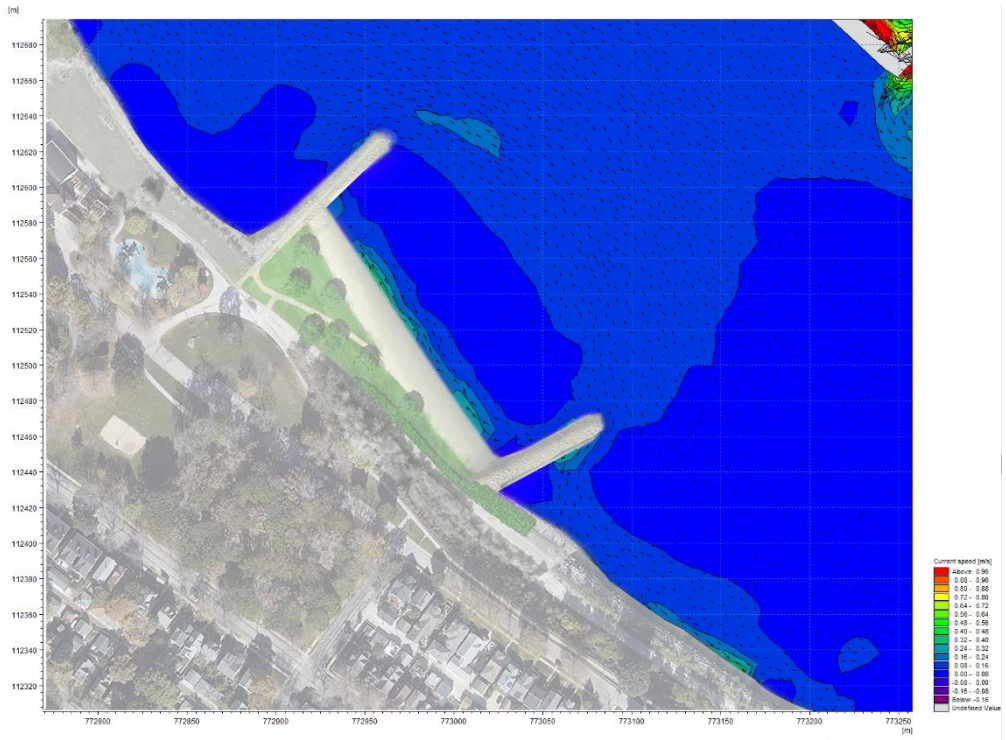


Figure 58: NNE_1yr Alternative 1

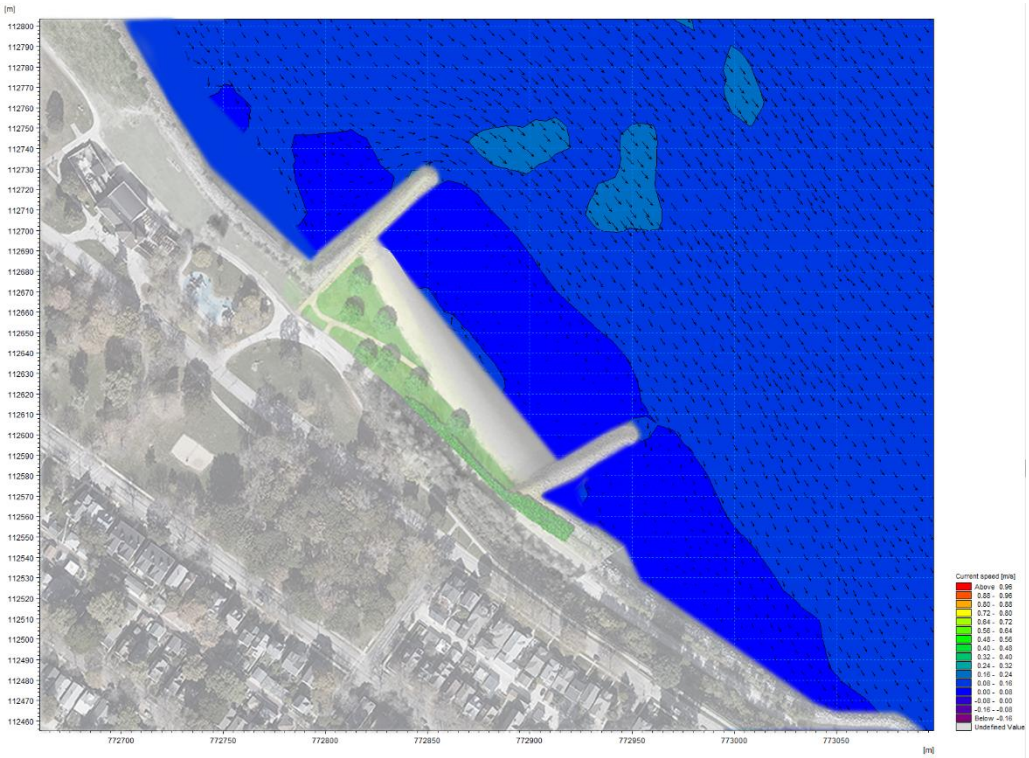


Figure 59: NNE_1yr Alternative 2

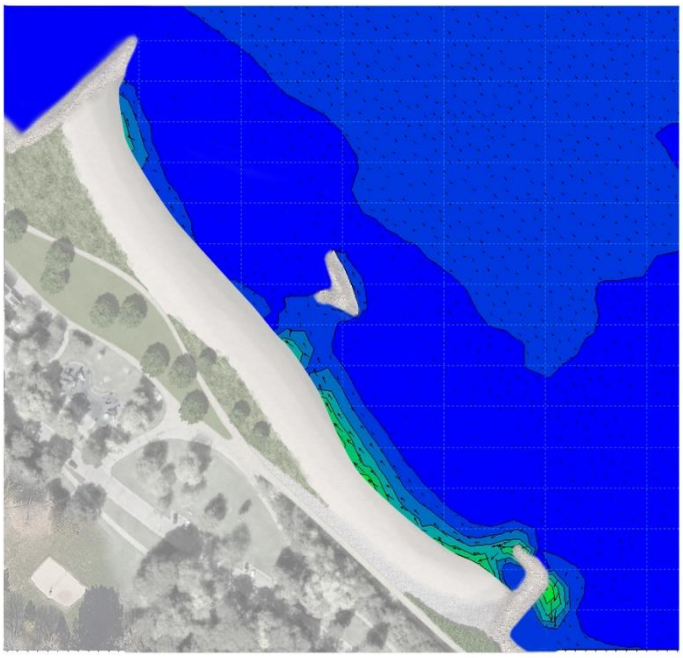


Figure 60: NNE_1yr Alternative 3

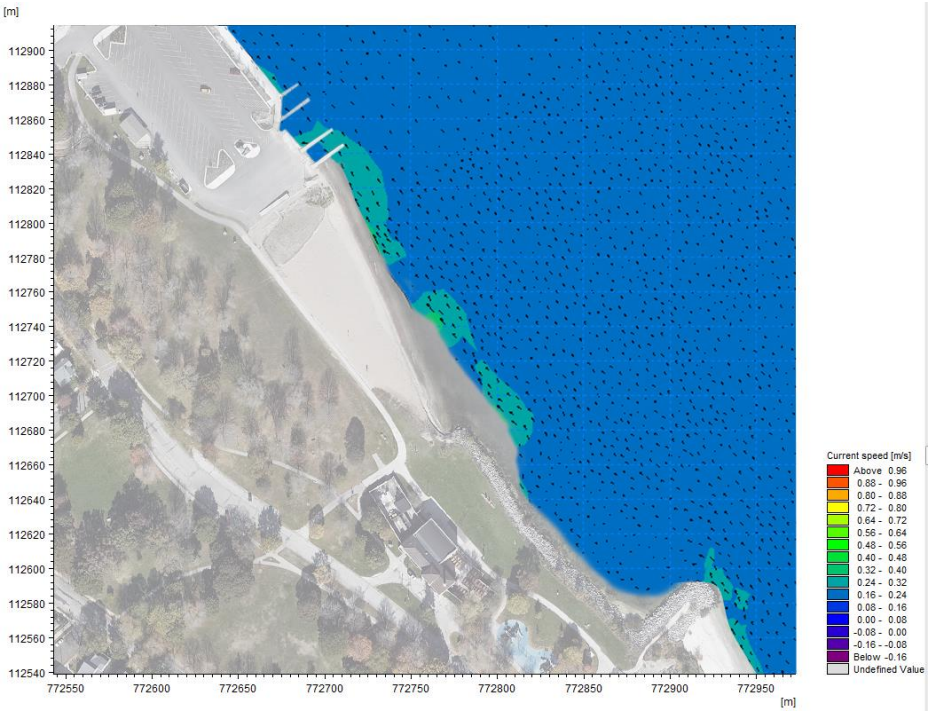


Figure 61: SE_1yr

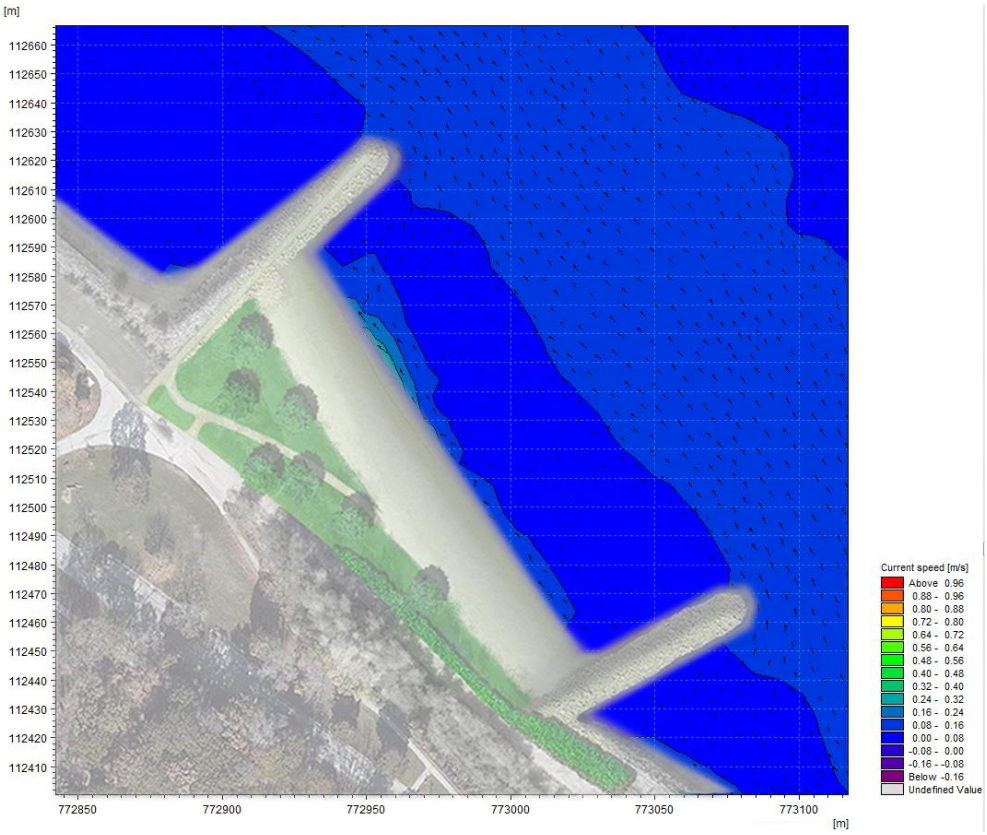


Figure 62: SE_1yr Alternative 1

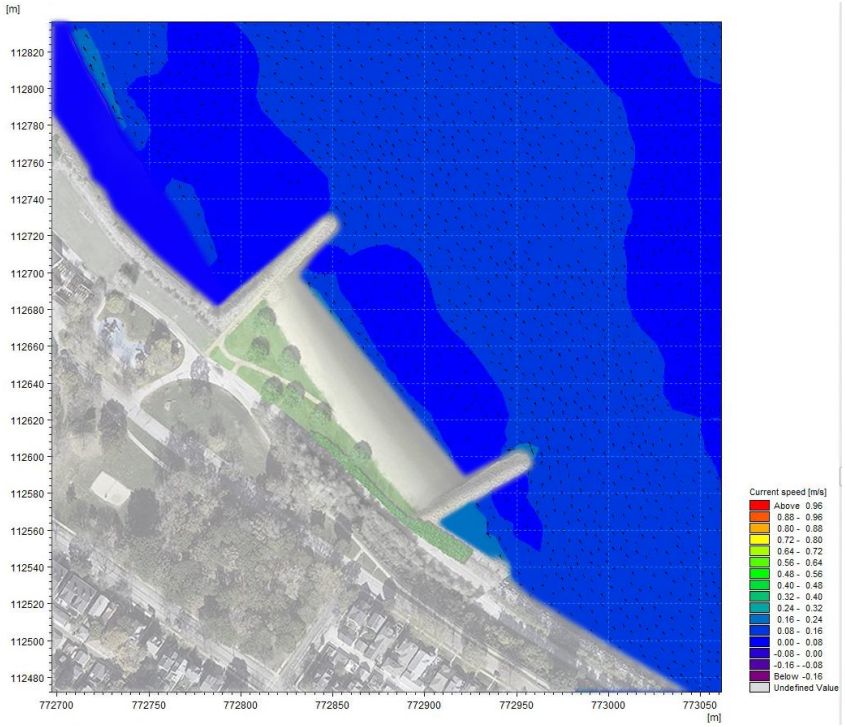


Figure 63: SE_1yr Alternative 2

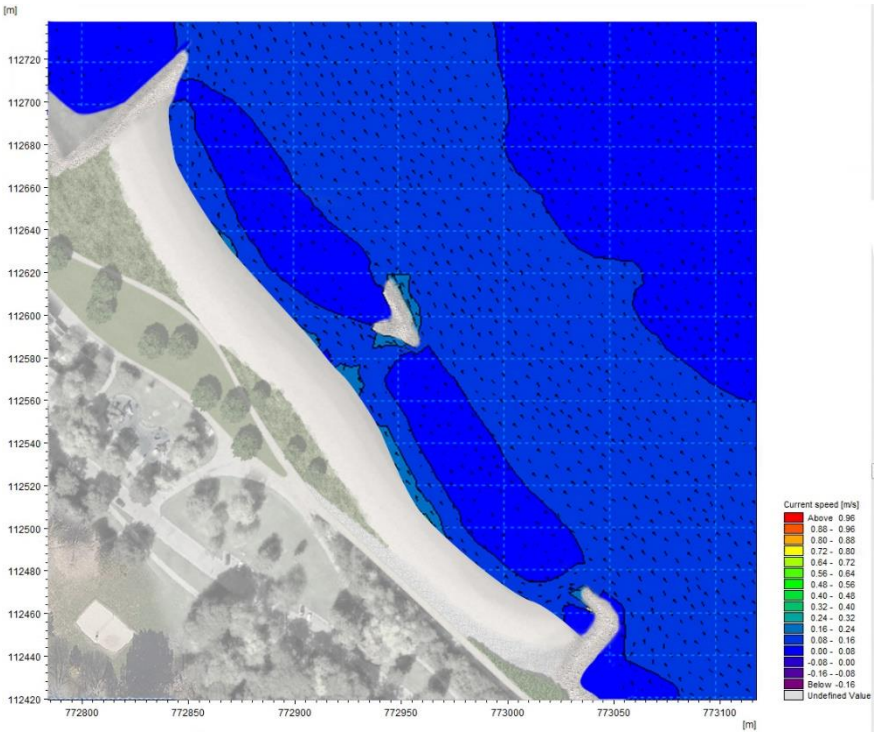


Figure 64: SE_1yr Alternative 3

Milwaukee County Department
of Administrative Services

South Shore Beach Improvements

Coastal Report

APPENDIX D

Stormwater Report

8.1. Sediment Loading Analysis

Pollutant loading for existing conditions was estimated using both the WinSLAMM and STEPL computer programs.

8.1.1. WinSLAMM Modeling Methodology

WinSLAMM is commonly used in Wisconsin to evaluate the relationships between sources of urban nonpoint source pollutants and the discharge of pollutants downstream. The model also evaluates the pollutant trapping capabilities of stormwater BMP's, such as the biofiltration basins located in the yacht club parking lot.

8.1.2. WinSLAMM Parameter Files

WinSLAMM requires a series of parameters to simulate pollutant probability distribution, source area runoff coefficients, particle size distributions, and pollutant delivery characteristics. Parameter files used for the analysis were selected based on DNR requirements, as summarized below:

- Pollutant Probability Distribution File - WI_GEO01.ppd
- Runoff Coefficient File - WI_SL06 Dec06.rsv
- Particulate Solids Concentration File - WI_avg01.psc
- Particulate Residue Delivery File - WI_dlv01.prr
- Street Delivery Files:
- Residential/Other - WI_Res and Other Urban Dec06.std
- Institutional/Commercial/Industrial - WI_Com Inst Indust Dec06.std
- Freeway - Freeway Dec06.std
- Rain Files - WisReg - Milwaukee WI 1969.RAN

STEPL Modelling Methodology

Spreadsheet Tool for Estimating Pollutant Load (STEPL) is a model developed for the EPA which uses simple algorithms to calculate nutrient and sediment loads from different land uses and the load reductions that would result from the implementation of various best management practices (BMPs). It computes watershed surface runoff; nutrient loads, including nitrogen, phosphorus, and BOD5; and sediment delivery based on various land uses and management practices. The sediment and pollutant load reductions that result from the implementation of BMPs are computed using the known BMP efficiencies.

STEPL Parameters and Assumptions

- Milwaukee Mitchell AP Weather Station, 32 total inches of rain in 124 storm events annually
- All tributary area is considered "Urban", as no crop or pasture land is present onsite.
- Septic system leakage was not included
- Hydrologic soil group: C
- Existing Bioretention BMP's were included assuming 63% Nitrogen reduction, 80% Phosphorous reduction, and 80% TSS reduction for all runoff draining to the engineered soil.

8.2. Existing Land Use

Approximately 34 acres were included in the WinSLAMM model. The South Shore site was divided into 5 sub-basins (Figure1) The Sub-basins include: (1) the existing beach area, (2) an area draining directly to the lake via storm sewer, (3) a portion of the yacht club discharging directly to the lake, (4) the area draining to the yacht club parking lot biofiltration basins, (5) the area southwest of the spur. Other adjacent areas drain directly to a combined sewer owned by MMSD. For each sub-basin, specific pollutant source areas (such as parking lots, roadways, and other impervious areas) were quantified using shapefiles and aerial photos available from Milwaukee County. The models also include the biofiltration basins. The cross-section of the biofiltration basins was not known, but it was assumed that the minimal DNR requirements in Tech Standard 1004 were met, and 80% TSS removal was achieved for runoff flowing through the engineered media.

Table 1. Assumed Urban land use distribution

Watershed	Urban Area (ac.)	Industrial %	Institutional %	Transportation %	Single-Family %	Open Space %
1	6.2	0	40	0	0	60
2	8.6	0	9	13	0	78
3	4.82	63	0	0	0	37
4	7.77	42	0	7	29	22
5	6.78	0	35	0	0	65

Table 2. Pollutant Source Areas

Subbasin #	1	2	3	4	5
Location	Ex. Beach	Inland ST.	NW-Shore	NW-Yacht Club	SE of Spur
Source Area	(ac)	(ac)	(ac)	(ac)	(ac)
Roof-Sloped	0.38	-	0.08	0.54	-
Parking	-	0.24	1.82	2.91	0.00
Driveway	-	-	-	0.34	-
Sidewalk	0.64	0.42	0.64	0.24	0.98
Street	0.00	1.11	-	0.56	0.00
Small Landscape	3.73	6.74	1.80	3.03	4.42
Other Pervious	0.85	0.09	0.33	-	0.44
Other Impervious	0.60	-	0.15	0.15	0.94

8.3. Results

As indicated in Table 3, the WinSLAMM model estimates that 8,065 pounds of TSS would be generated from the 34-acre area. Existing BMP's, including the biofiltration basins capture 2,574 pounds annually. This results in a TSS reduction of 32% for the overall site.

As indicated in **Error! Reference source not found.**le 4, the STEPL model estimates that approximately 6,201 pounds of TSS would be generated from the 34-acre site. The existing BMP's, including the Biofiltration Basins capture 1,768 pounds annually. This results in a TSS reduction of 80% for the area treated and approximately 25% for the overall site.

For each sub-basin, the annual pollutant loading is calculated based on the runoff volume and the pollutant concentrations in the runoff water. Each of the two models has unique empirical coefficients used to calculate pollutant runoff so it's not unexpected that the models would have somewhat different results.

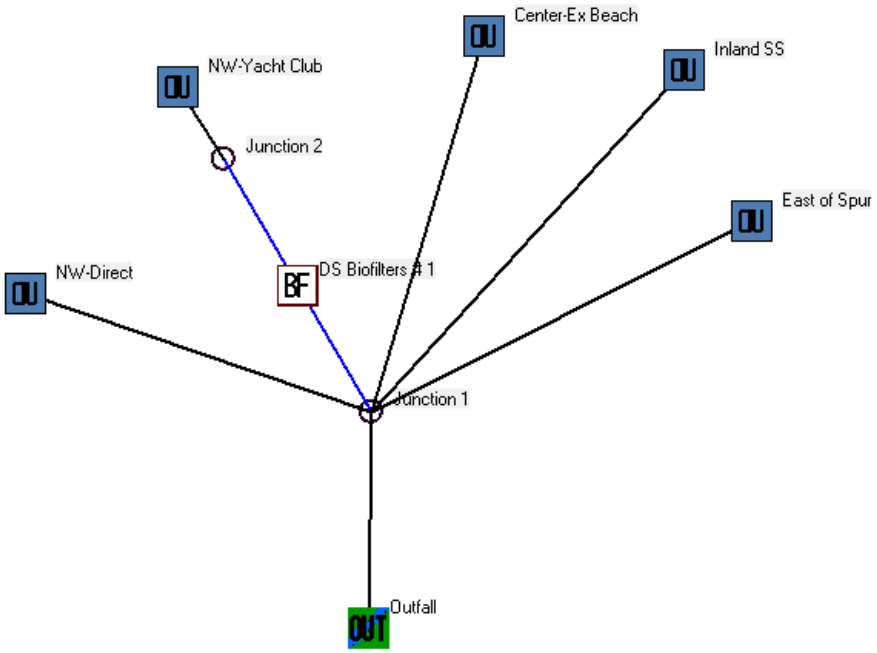
Table 3. SLAMM TSS Loading

Watershed	TSS Load (no BMP)	TSS Load (with BMP)	TSS Reduction
	lb/year	lb/year	lb/year
1	649.4	649.4	0.0
2	1964.5	1964.5	0.0
3	1570.3	1570.3	0.0
4	3130.0	3130.0	2574.0
5	750.6	750.40	0.0
Total Urban	8064.8	5897.7	2574.0

Table 4. STEPL TSS Loading

Watershed	TSS Load (no BMP)	TSS Load (with BMP)	TSS Reduction
	lb/year	lb/year	lb/year
1	781.6	781.6	0.0
2	1565.9	1565.9	0.0
3	1120.2	1120.2	0.0
4	1906.5	384.8	1521.8
5	826.9	826.9	0.0
Total Urban	6201.1	4679.4	1521.8

WinSLAMM Model Input



WinSLAMM Model Results

File Name:

P:\10451.000\ADMIN\Disciplines\Civil\Stormwater\SLAMM\2017-1108-Cal-SLAMM.mdb

Outfall Output Summary

	Runoff Volume (cu. ft.)	Percent Runoff Reduction	Runoff Coefficient (Rv)	Particulate Solids Conc. (mg/L)	Particulate Solids Yield (lbs)	Percent Particulate Solids Reduction
Total of All Land Uses without Controls	1.018E+06		0.25	126.9	8065	
Outfall Total with Controls	846839	16.81 %	0.21	103.9	5490	31.93 %

Current File Output: Annualized Total After Outfall Controls: 858600 Years in Model Run: 0.99 5567

Pollutant	Concentration - No Controls	Concentration - With Controls	Concentration Units	Pollutant Yield - No Controls	Pollutant Yield - With Controls	Pollutant Yield Units	Percent Yield Reduction
Particulate Solids	126.9	103.9	mg/L	8065	5490	lbs	31.93 %
Filterable Solids	65.92	68.26	mg/L	4188	3609	lbs	13.84 %
Total Solids	192.9	172.1	mg/L	12253	9099	lbs	25.74 %

Print Output Summary to Text File

Print Output Summary to .csv File

Total Area Modeled (ac): 34.170

Total Control Practice Costs

Capital Cost	N/A
Land Cost	N/A
Annual Maintenance Cost	N/A
Present Value of All Costs	N/A
Annualized Value of All Costs	N/A

Perform Outfall Flow Duration Curve Calculations

Receiving Water Impacts Due To Stormwater Runoff

(CWP Impervious Cover Model)

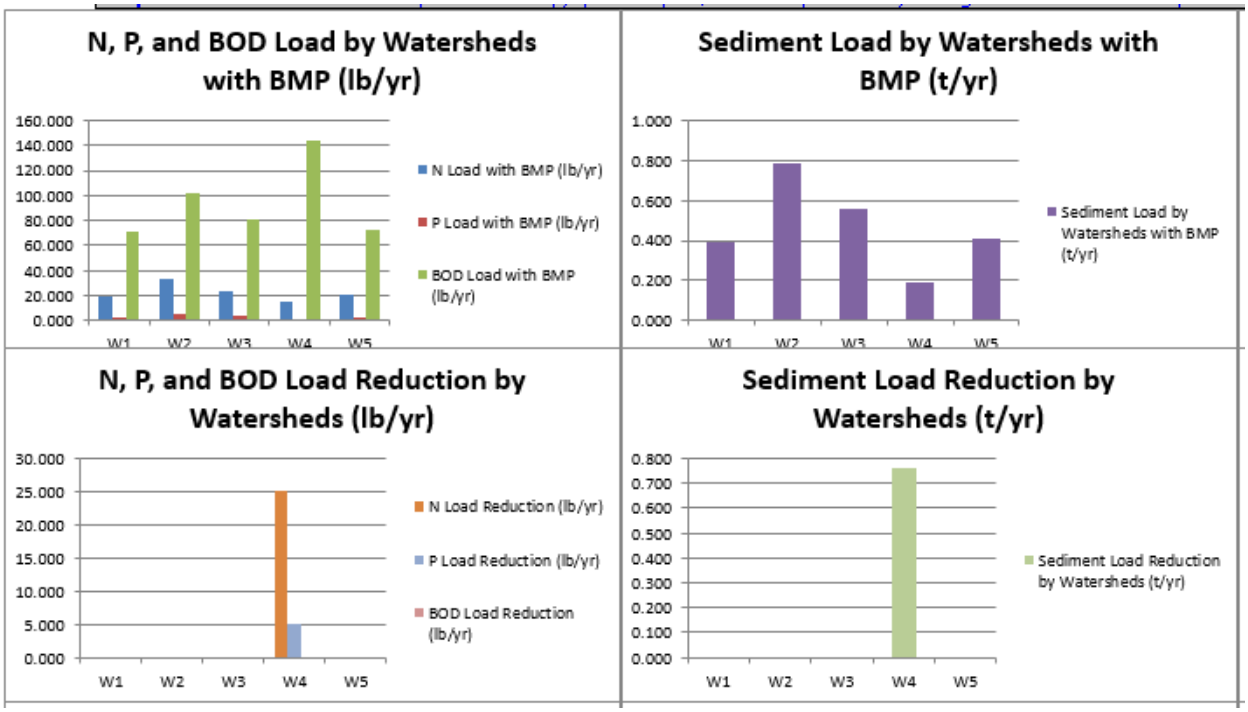
	Calculated Rv	Approximate Urban Stream Classification
Without Controls	0.25	Poor
With Controls	0.21	Poor

STEPL Model input

State: Wisconsin | County: Milwaukee | Weather Station: _WI-Milwaukee_Mean | Calculate Manure Application Months: Manure Application

1. Input watershed land use area (ac) and precipitation (in)									Rain correction factors 0.853	0.399	
Watershed	Urban	Cropland	Pastureland	Forest	User Defined	Feedlots	Feedlot Percent Paved	Total	Annual Rainfall	Rain Days	Avg. Rain/Event
W1	6.2	0	0	0	0	0	0-24%	6.2	32	115	0.590
W2	8.6	0	0	0	0	0	0-24%	8.6	32	115	0.590
W3	4.82	0	0	0	0	0	0-24%	4.82	32	115	0.590
W4	7.77	0	0	0	0	0	0-24%	7.77	32	115	0.590
W5	6.78	0	0	0	0	0	0-24%	6.78	32	115	0.590

STEPL Model Results



Milwaukee County Department
of Administrative Services

South Shore Beach Improvements

Coastal Report

APPENDIX E

Wetland Delineation Report

WETLAND DELINEATION REPORT
South Shore Park Beach Re-location Project

Delineation #16.2017

October 23, 2017

Thompson & Associates
WETLAND SERVICES

Alice Thompson
Carissa Anich
Thompson and Associates Wetland Services, LLC
1514 Menomonee Ave.
South Milwaukee, WI 53172
(414) 571-8383
www.thompsonwetlands.com

SWS PCP
ALICE L. THOMPSON, M.S.
001307
PROFESSIONAL WETLAND SCIENTIST

the professional opinion of Thompson and Associates. These are suggested categories however the WDNR may modify these in their permit review. For example, some of the characteristics of a Highly Susceptible wetland may not be apparent to Thompson due to confidential data or data beyond the scope of this delineation (eg: Rare Species, high quality trout stream etc.).

The wetland line staked in the field by Thompson and Associates Wetland Services is an estimate of the wetland boundary and the opinions presented in this report are best estimates of the conditions at the time the wetlands were delineated.

Alice Thompson, lead delineator, is an Assured Delineator as explained at the Wisconsin Department of Natural Resources' (the "WDNR") web site, at http://www.dnr.state.wi.us/org/water/fhp/wetlands/boundaries.html . The WDNR considers Thompson's wetland delineation work to be "Assured" for purposes of Wisconsin waterway and wetland permits, such that Thompson's clients do not need to wait for concurrence letters from the WDNR before relying on such delineations and may expect that wetland delineation issues should not be the cause of delays in state waterway and wetland permit decisions.

Thompson's work is reviewed annually by the WDNR Wetland ID program and one site a year is field verified as part of Thompson's continued assurance status. A client will be notified if their site is going to be spot-checked, and no additional fees will be required. The Assurance Program has a code of ethics that includes high moral and ethical standards and clear and scientifically accurate reporting to the WDNR. All of Thompson's reports are filed with the WDNR Wetland ID program, unless the client does not want to utilize the report and findings. Any work not filed with the WDNR is not valid.

Wetlands and waterways that are considered waters of the U.S. are subject to regulation under Section 404 of the Clean Water Act (CWA) and the jurisdictional regulatory authority lies with the U.S. Army Corps of Engineers (USACE). Additionally, the Wisconsin Department of Natural Resources (WDNR) has regulatory authority over wetlands, navigable waters, and adjacent lands under Chapters 30 and 281 Wisconsin State Statutes, and Wisconsin Administrative Codes NR 103, 299, 350, and 353. As of 2015, the USACE and WDNR have jurisdictional authority to determine which features are exempt including stormwater ponds and conveyance features. If the client proposes to modify a stormwater feature, the WDNR will need to determine its exemption status. Contact the Wetland Identification Program for assistance, this will involve a fee. Furthermore, municipalities, townships and counties may have local zoning authority over certain areas or types of wetland and waterways. The determination that a wetland or waterway is subject to regulatory jurisdiction is made independently by the agencies. As a result, there may be adjustments to boundaries or jurisdiction based upon review of a regulatory agency.

Any activity in the delineated wetland may require U.S. Army Corps of Engineers permits and State of Wisconsin Department of Natural Resources Water Quality Certification, and local government permits. If the Client proceeds to change, modify or utilize the property in question without obtaining authorization from the appropriate regulatory agency, it will be done at the Client's own risk and Thompson and Associates Wetland Services shall not be responsible or liable for any resulting damages.

This field work and report is not intended to meet the requirements of an SEWRPC Environmental Corridor, WDNR Endangered Species Review, a navigability determination, or the location of either the Ordinary High Water Mark or floodplain.

APPENDICES:

1. Field Photographs
2. Figures
    - Figure 1. Location Map
    - Figure 2. NWS Departure from Mean Precipitation Maps
    - Figure 3. 2-ft Contour Map
    - Figure 4. Soil Map & Hydric Soil List with Minor Soils
    - Figure 5. Wisconsin Wetland Inventory
    - Figure 6. Wetland and Data Point Locations
3. Field Data and Results
    - Table 1. Significantly Disturbed and Problem Areas
    - Data Sheets

ROUTINE METHODOLOGY FOR DELINEATING WETLANDS

This delineation was performed according to guidelines set by the U.S. Army Corps of Engineers 1987 Manual and either the 2012 Regional Supplement to the Corp of Engineers Wetland Delineation Manual: Northcentral and Northeastern Region, or the 2010 Regional Supplement to the Corp of Engineers Wetland Delineation Manual: Midwest Region, depending on which region the site occurs within per US Army Corps of Engineers guidance. Additional DNR requirements and guidance that were presented at wetland delineation training courses offered by UW-Extension have also been incorporated. The most recent of these workshops we attended that provided current guidance was the Critical Methods in Wetland Delineation Workshop in March of 2017.

Maps used during the delineation included site location map, NRCS County soil maps, U.S.G.S. topographic map, Wisconsin Wetland Inventory Map, and aerial photography. NRCS Wetland Inventory Maps are provided when available and pertinent. Soil taxonomy is obtained from the NRCS Official Soil Series Descriptions (OSD). The indicator plant status was taken from the State of Wisconsin 2016 Wetland Plant List authored by Lichvar, R.W., D.L. Banks, W.N.Kirchner, and N.C. Melvin. The National Wetland Plant List: 2016 wetland ratings. U.S. Army Corps of Engineers. When an indicator was not given then the indicator listed in the Plants of the Chicago Region by Floyd Swink and Gerould Wilhelm (1994) was used. *Typha* plants area not identified to species level as recent research by Dr. Pamela Geddes documents the inability to accurately identify to species using current field characteristics. The reference for landform descriptors is: Schoeneberger, P.J., Wysocki and Benham. 2012. Field Book for describing and sampling soils, Version 3.0, NRCS, Lincoln, NE. The NOAA Advanced Hydrologic Prediction Service Departure from Normal Map is used to calculate the 90 day departure from normal on the day of the delineation, and the 90 day percent of mean departure from normal. This NOAA data set uses radar, satellite data, and observed data from the 12 CONUS River Forecast Center. The NOAA "normal" precipitation is derived from PRISM climate data created at Oregon State University. As of 2015 the 30 year PRISM Normals have been updated utilizing the 1981-2010 dataset. The location of the project is geo-referenced on the map.

Data points were set in areas that exhibited obvious wetland and obvious upland characteristics. The location of each data point is in the midpoint of the number on the aerial map "Data Point Locations". At each data point, vegetation was identified, soils described, and hydrology noted. Vegetation was recorded as species and absolute percent cover. Herbaceous vegetation, shrub, and tree cover were estimated in circular plots of approximately 5, 15, and 30 feet in radius, respectively, with the center point being the soil pit. If the entire circular plot was not located within a single plant community, then the plot shape was adjusted accordingly with the total plot area remaining equivalent to the circular plot area. The absolute cover was estimated as precisely as possible with low cover estimated as 1%, 3%, or 5%. Vegetation greater than 5% absolute cover was estimated in additional increments of 5%. The appropriate test (Rapid Assessment, Dominance, Prevalence or Morphological Adaptations test) was used to determine dominant vegetation. All plots with a 50% dominance of hydrophytes were evaluated with the Prevalence Index. The wetland boundary was staked and located between the wetland and upland data points, at a consistent break in vegetation, topography, and soils.

Thompson & Associates
WETLAND SERVICES

BIOGRAPHIES OF FIELD INVESTIGATORS

Alice L. Thompson, Owner, Assured Wetland Delineator
Alice L. Thompson is an independent wetland consultant and is certified by the Society of Wetland Scientists as a Professional Wetland Scientist (PWS). Thompson is a WDNR "assured" wetland delineator since 2006. She obtained a Master's degree in biological sciences at the University of Wisconsin-Milwaukee in 1995. Her professional interests include wetland restoration, mitigation, and the control of invasive plant species, especially reed canary grass. Ms. Thompson has satisfactorily completed the Wetland Delineation course offered by the Wisconsin Department of Administration, Coastal Management Program in 1998; the Advanced Wetland Delineation Training Workshop offered by the University of Wisconsin-La Crosse in 2002, 2008 and again in 2014; Advanced Hydric Soils offered by the Wetland Training Institute in 2004; the Primary Environmental Corridor Delineation Workshop offered by the Southeastern Wisconsin Regional Planning Commission in 2004; Wetland Plant Identification offered by Dr. Mohlenbrock, Biotic Consultants, 2003 and 2004; Ecological Geology Workshop, UWM Field Station, 2006; the Midwest Supplement Training offered by the US Army Corp of Engineers in 2009, Native Mussel Identification Workshop, UWM Field Station, 2012; and the Critical Methods in Wetland Delineation offered annually by the Wisconsin Department of Natural Resources in 2017 and seven previous years since 2006.

Aaron J. Menke, Field Assistant
Aaron J. Menke earned a Bachelor's degree in Applied Environmental Geography from University of Wisconsin-Parkside in 2013. Menke has worked in wetland consulting for Thompson and Associates for the past three years. His specialty includes utility environmental oversight and permitting, and construction environmental monitoring including on the high profile We Energies Germantown-Mequon Gas Main Replacement. Menke also assists on fieldwork including wetland delineation and wetland management. He previously worked as a Natural Resource Specialist at the Hawthorn Hollow Nature Sanctuary and Arboretum (Kenosha) from 2011-2013, and now serves as an advisor to the center. He was a Forestry Specialist for City of Kenosha in 2013, identifying, inventorying and mapping street trees. He has a Certificate in Geographic Information System (GIS) from UW- Parkside (2013). Mr. Menke has inventoried native vegetation, participated in varied wildlife surveys including Blanding's turtles, blue bird nest box monitoring, and removal of the invasive Red Swamp Crayfish in Kenosha. He attended the Wisconsin Wetlands Association Wetland Identification Workshop held in September, 2013 (Racine County). He has successfully completed the Basic Wetland Delineation course offered by the University of Wisconsin-La Crosse in 2014. He attended Critical Methods in Wetland Delineation offered by the Wisconsin Department of Natural Resource (UW-La Crosse) in 2015, 2016 and 2017.

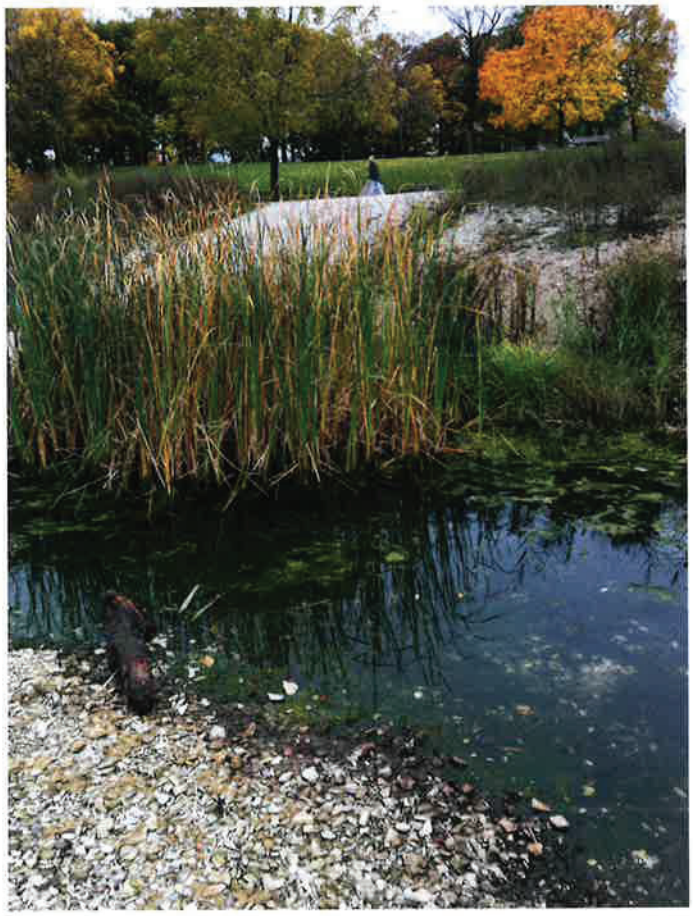
Wetland Delineation Photos taken on October 23, 2017

Upper left– Stormwater swale adjacent parking lot– not a wetland

Middle– Stormwater swale and planted beach dune grass beyond– upland

Below– View from above of Wetland A in swale adjacent rock beach

Wetland Delineation Photos taken on October 23, 2017



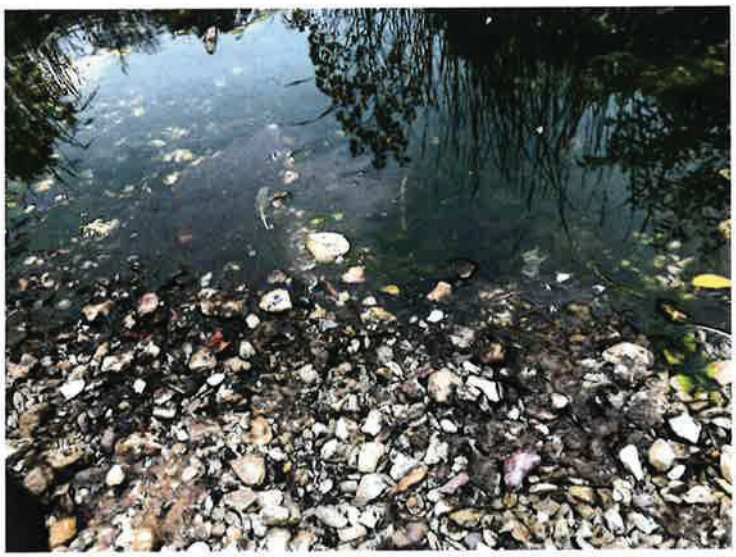
Upper left– Wetland A– three basins within depressions on rocky beach

Upper right– shovel with upland beach rock– no black coating on the left and wetland beach rock with black coating on the right

Right– close up of beach rock with black coatings in wetland ponded basin

Below left– Ponded wetland depression

Below right—Spray painted wetland line



Wetland Delineation Photos taken on October 23, 2017

Upper left– Wetland A with rip rap revetment to the north

Upper right– close up of Wetland A

Middle left– view of beach facing north

Middle right– Spray paint edge of Wetland A

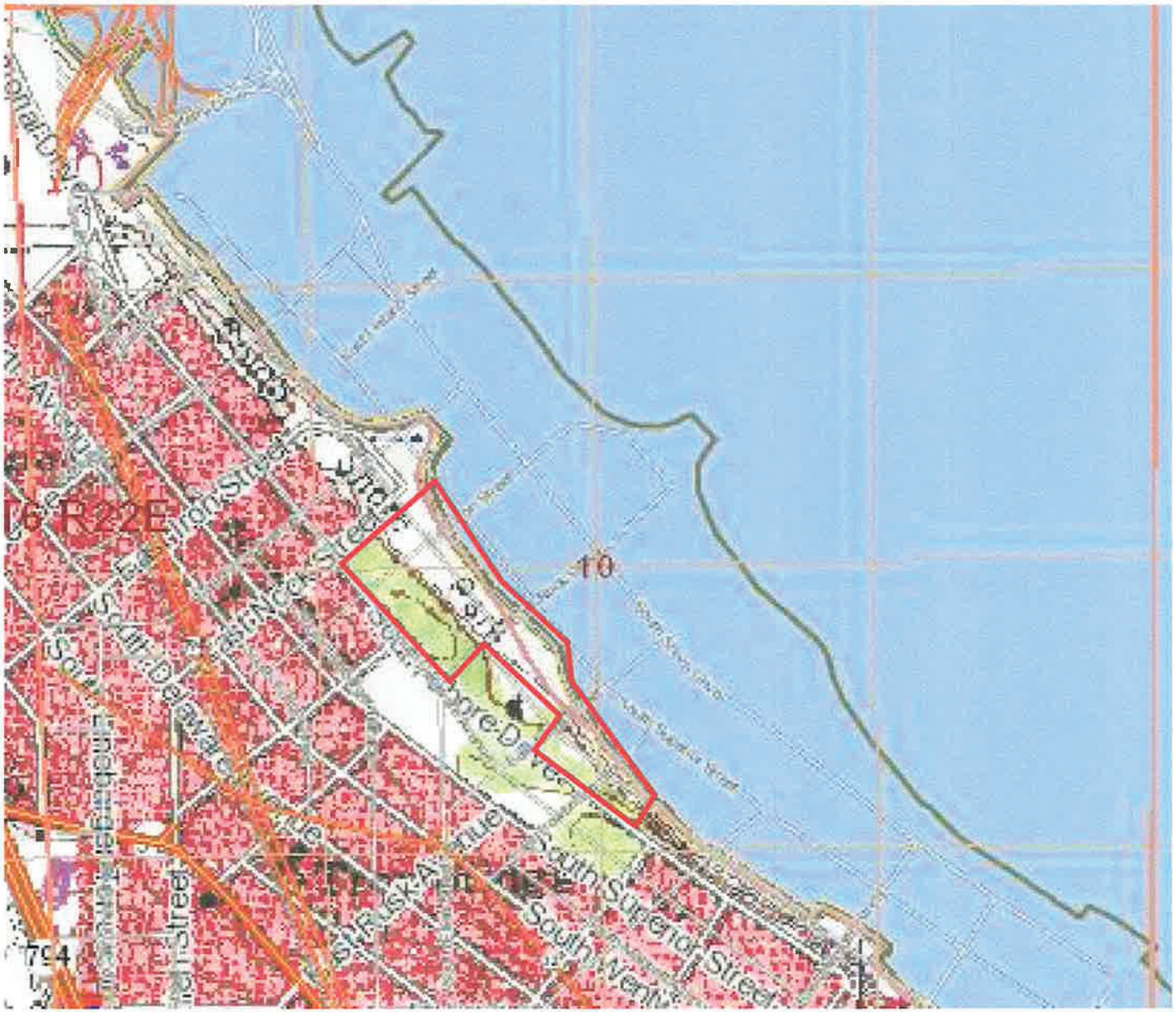
Lower left– Path facing south — uplands in right of photo, on slope, uplands in left of photo dropping down to rocky beach

Wetland Delineation Photos taken on October 23, 2017

Upper left– Uplands on slope above path

Middle– facing north—Upland rocky shoreline in south end of project

Lower left– Upland rocky shoreline facing south at south end of project



Thompson & Associates
Wetland Services

N

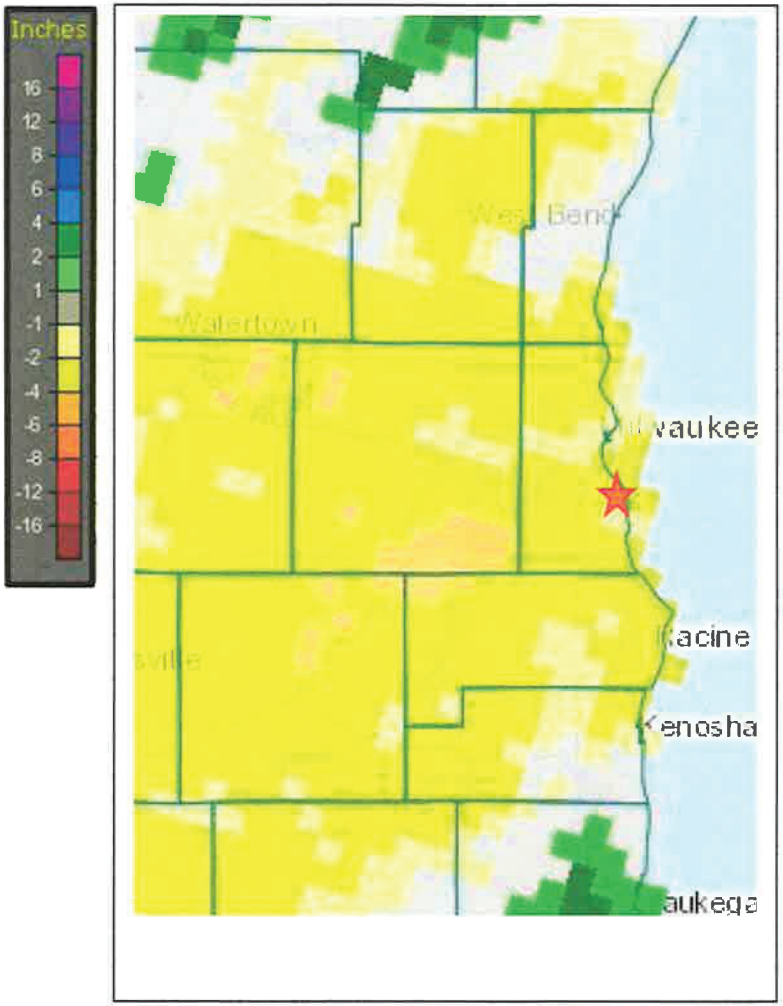
Project Area in red

South Shore Park Beach Re-location

Location and USGS Topographic Map

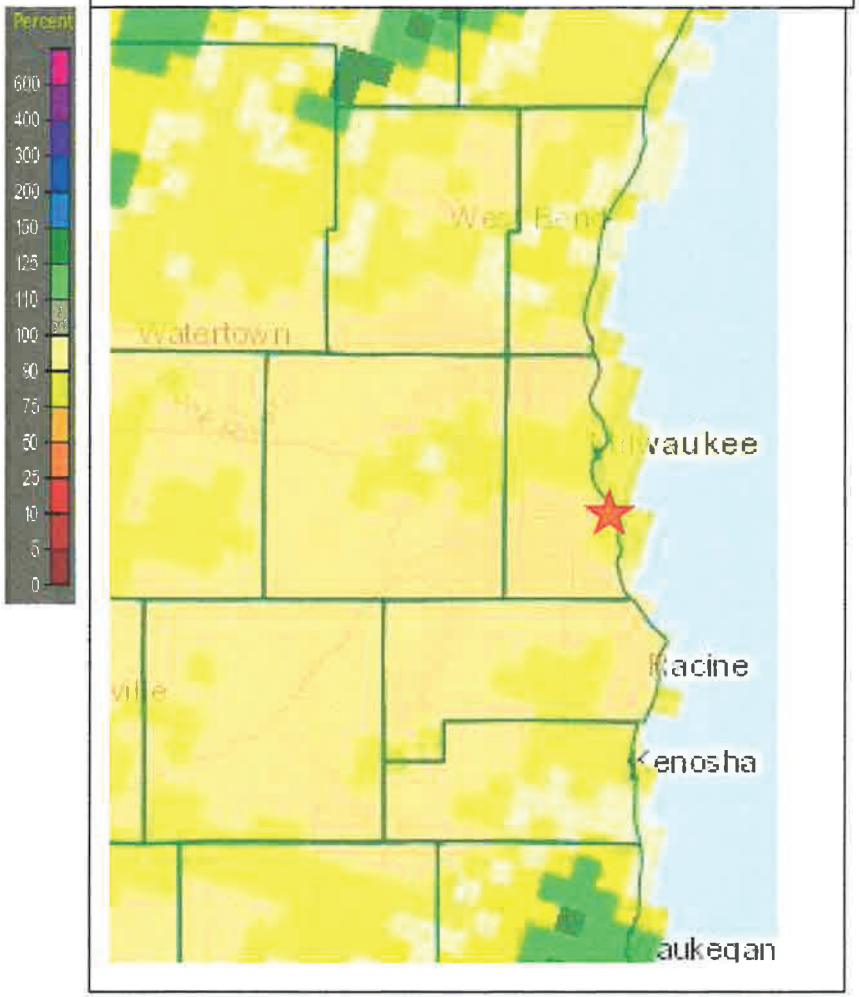
Figure 1

90 Day Departure From Normal Precipitation- inches



90 Day Departure Percent of Normal Precipitation- per cent

0-75=Drier than Normal; 75-125=Normal; 125-600+ =Wetter than Normal



Thompson & Associates
Wetland Services

N

Source: Advanced Hydrologic Precipitation Service Website, National Weather Service

Project Area Starred in Red

South Shore Park Beach Re-location

90- Day Departure from Normal and Percent of Normal Precipitation

Figure 2

Thompson & Associates
Wetland Services

N

Project Area
outlined in red

Source: Milwaukee County
GIS Website

South Shore Park Beach Re-location

Contour Topography

Figure 3 North

Thompson & Associates
Wetland Services

N

Project Area
outlined in red

Source: Milwaukee County
GIS Website

South Shore Park Beach Re-location

Contour Topography

Figure 3 South

Thompson & Associates
Wetland Services

Project Area
outlined in red

Source: NRCS Web Soil Survey, soils descriptions follow

N

South Shore Park Beach Re-location

NRCS Soil Survey

Figure 4

Thompson & Associates
Wetland Services

Project Area outlined in red

Source: WDNR Surface Water Data Viewer

N

South Shore Park Beach Re-location

Wisconsin Wetland Inventory

Figure 5

Thompson & Associates
Wetland Services

Project Area outlined in red

Source: Milwaukee County GIS 2015 aerial

N

South Shore Park Beach Re-location

Data Point Locations and Site Overview

Figure 6 North

Thompson & Associates
Wetland Services

Project Area outlined in red

Source: Milwaukee County
GIS 2015 aerial

N

South Shore Park Beach Re-location

Data Point Locations and Site Overview

Figure 6 South

Table 1. *Summary of "Significantly Disturbed" and "Problem" Areas*

Site: South Shore Park Beach Re-location Project

Significantly Disturbed Areas	Corresponding Data Points	Description	Justification for wetland with less than 3 parameters
☐ Farmed Field			
☑ Managed plant community	*1, 3, 11,*	*mowed lawn in park*	
☐ Soil Removal			
☑ Fill	*1, 3, 4, 5, 6, 9, 10, 14*	*historic fill in established park including fill from the deep tunnel project dug by MMSD, also revetments, rip rap other shoreline stabilization features.*	
☐ Subsurface Plow			
☐ Surface Layer Removed			
☐ Man-Made Structure			
☐ Dam/Levee			
☐ Channelization			
☐ Drainage			
☑ Human-induced wetland	*12*	*recently constructed stormwater swale- did not meet wetland criteria*	
☐ Change in River			

Problem Areas	Corresponding Data Points	Description	Justification for wetland with less than 3 parameters
☐ Highly seasonal wetland			
☐ Vegetated flats			
☐ FACU dominated wetland			
☐ Beaver impoundment			
☐ Problem soils- red parent material, sandy etc.			
☐ Fluvial Soils			
☐ Vernal pools			
☐ Multi-year wet/dry cycle			
☐ White pine swamp			
☑ Other	*6, 7, 8, 13*	*disturbance area- beach erosion, wave action- storm events will move rock and alter the shoreline*	

Significantly disturbed and problem areas are found when one or more of three parameters (vegetation, soils, hydrology) are missing, obscured or misleading. Disturbed areas include human-caused disturbance or disturbance due to a significant, catastrophic natural event. Problem areas are due to natural, normal, seasonal, or annual variability or permanently due to the nature of soils or vegetation on site.

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: South Shore Park Beach Relocation City/County: Milwaukee/Milwaukee Sampling Date: 10/23/2017

Applicant/Owner: Robert Wright, Smith Group State: WI Sampling Point: 1

Investigator(s): TAWS - Alice Thompson, Carissa Anich Section 10 Township 6 N, Range 22 East West

Landform: Summit Shoulder Backslope Footslope Toeslope Urban Modified Other _____ Local relief: concave, convex, linear, other: _____

Soil Map Unit Name: Unmapped WWI classification: _____

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No ___ Reason: Previous 90 day Precipitation WET NORMAL DRY

Are Vegetation X, Soil X, or Hydrology ___ significantly disturbed? fill, mow Are "Normal Circumstances" present? Yes ___ No X

Are Vegetation ___, Soil ___, or Hydrology ___ problematic?

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No X	**Is the Sampled Area within a Wetland?** Yes ___ No X
Hydric Soil Present?	Yes ___	No X	**Wetland Type:** Marsh Fresh Wet Meadow Sedge Meadow Shrub Carr Swamp Forest Riverine Ephemeral Basin Farmed Wetland
Wetland Hydrology Present?	Yes ___	No X	

MIDWEST Remarks: On high rip rap (heavy) wall adjacent Lake Michigan

No beach here ~ 10-12' above lake level - South end of Project

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: equiv to 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: equiv to 15' radius)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Herb Stratum (Plot size: equiv to 5' radius)			
1. Poa compressa	60	Y	FacU
2. Daucus carota	20		FacU
3. Trifolium hybridum	30	Y	FacU
4. Taraxacum officinale	40	Y	FacU
5.			
6.			
7.			
8.			
9.			
10.			
	150 = Total Cover		75/30
Woody Vine Stratum (Plot size: equiv to 30' radius)			
1.			
2.			
3.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

__ Rapid test for hydrophytic vegetation

__ Dominance Test is >50%

__ Prevalence Index is ≤3.0[1]

__ Morphological Adaptations[1] (Provide supporting data in Remarks)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree - Woody plants 3 in. (7.6cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 (1m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines - All woody vines greater than 3.28 ft in height.

Is Hydrophytic Vegetation Present? Yes ___ No X

Remarks:

SOIL

Sampling Point: 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 2/1	100					silty clay loam	
8-12	10YR 5/3	100					sandy clay loam w/ pebbles	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: *(For LRR M)*

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (F22)*
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. * Test Indicator

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Is Hydric Soil Present? Yes ___ No X

Remarks:

@ 12" compacted soil - likely historic fill

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required: check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2) *(~July 15 or later)*
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___ No X	Depth (inches):	
Water Table Present?	Yes ___ No X	Depth (inches):	
Saturation Present? (includes capillary fringe)	Yes ___ No X	Depth (inches):	

Is Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

high on slope

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: South Shore Park Beach Re-location City/County: Milwaukee, Milwaukee Sampling Date: 10/23 /2017
Applicant/Owner: Robert Wright, Smith Group State: WI Sampling Point: 2
Investigator(s): TAWS - Alice Thompson, Carissa Anich Section 10 Township 6 N, Range 22 (East) West
Landform: Summit Shoulder Backslope Footslope Toeslope Urban Modified Other _____ Local relief: concave, convex, linear other: _____
Soil Map Unit Name: unmapped WWI classification: X
Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No ____ Reason: Previous 90 day Precipitation WET NORMAL DRY
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ problematic?

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ____ No X
Hydric Soil Present? Yes ____ No X
Wetland Hydrology Present? Yes ____ No X

Is the Sampled Area within a Wetland? Yes ____ No X
Wetland Type: Marsh Fresh Wet Meadow Sedge Meadow Shrub Carr Swamp Forest Riverine Ephemeral Basin Farmed Wetland

Remarks: would step slope up to west - - data point at lowest point on landscape

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: equiv to 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Fraxinus pennsylvanica	30	Y	FACW
2.			
3.			
4.			
5.			
	30	= Total Cover	15/6
Sapling/Shrub Stratum (Plot size: equiv to 15' radius)			
1. Rhamnus cathartica	30	Y	FAC
2. Lonicera tartarica	30	Y	FACU
3.			
4.			
5.			
6.			
7.			
	60	= Total Cover	30/12
Herb Stratum (Plot size: equiv to 5' radius)			
1. Leonurus cardiaca	50	Y	UPL
2. Arctium minus	40	Y	FACU
3. Solanum dulcamara	40	Y	FACU
4. Lonicera tartarica	20		FACU
5. Vitis riparia	30		FACW
6. Symphytrichum ericoides	20		FACU
7. Alliaria petiolata	30		FAC
8. Taraxacum officinale	20		FACU
9.			
10.			
	250	= Total Cover	125/50
Woody Vine Stratum (Plot size: equiv to 30' radius)			
1.			
2.			
3.			
		= Total Cover	

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 6 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 33 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:		(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:
__ Rapid test for hydrophytic vegetation
__ Dominance Test is >50%
__ Prevalence Index is ≤3.0[1]
__ Morphological Adaptations[1] (Provide supporting data in Remarks)
__ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:
Tree - Woody plants 3 in. (7.6cm) or more in diameter at breast height (DBH), regardless of height.
Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 (1m) tall.
Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
Woody vines - All woody vines greater than 3.28 ft in height.

Is Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

SOIL

Sampling Point: 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/2	100					silt loam	
4-20	10YR 3/2	40						
	5YR 5/3	60					silty clay	
20-23	10YR 3/2	80	10YR 5/6	20	C	M	silty clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: *(For LRR M)*

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (F22)*
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. * Test Indicator

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Is Hydric Soil Present? Yes ___ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required: check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2) *(~July 15 or later)*
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Is Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: South Shore Park Beach Re-location City/County: Milwaukee/Milwaukee Sampling Date: 10/23 /2017
Applicant/Owner: Robert Wright, Smith Group State: WI Sampling Point: 3
Investigator(s): TAWS - Alice Thompson, Carissa Anich Section 10 Township 6 N, Range 22 East West
Landform: Summit Shoulder Backslope Footslope Toeslope Urban Modified Other Local relief: concave, convex, linear, other:
Soil Map Unit Name: unmapped WWI classification: Ø
Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No Reason: Previous 90 day Precipitation WET NORMAL DRY
Are Vegetation X, Soil X, or Hydrology significantly disturbed? mowed fill Are "Normal Circumstances" present? Yes No X
Are Vegetation , Soil , or Hydrology problematic?

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes No X
Hydric Soil Present? Yes No X
Wetland Hydrology Present? Yes No X

Is the Sampled Area within a Wetland? Yes No X
Wetland Type: Marsh Fresh Wet Meadow Sedge Meadow Shrub Carr Swamp Forest Riverine Ephemeral Basin Farmed Wetland

Remarks:

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: equiv to 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Ulmus pumila	30	Y	Upl
2. Gleditsia triacanthos	10	Y	FacU
3.			
4.			
5.			
	40	= Total Cover	2/8
Sapling/Shrub Stratum (Plot size: equiv to 15' radius)			
1. Ulmus pumila	30	Y	Upl
2. Salix bebbiana	20	Y	FacW
3.			
4.			
5.			
6.			
7.			
	50	= Total Cover	2.5/10
Herb Stratum (Plot size: equiv to 5' radius)			
1. Poa compressa	60	Y	FacU
2. Taraxacum officinale	30	Y	FacU
3. Chichorium intybus	20		FacU
4. Trifolium hybridum	20		FacU
5.			
6.			
7.			
8.			
9.			
10.			
	130	= Total Cover	65/26
Woody Vine Stratum (Plot size: equiv to 30' radius)			
1.			
2.			
3.			
		= Total Cover	

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 6 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 16 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:
__ Rapid test for hydrophytic vegetation
__ Dominance Test is >50%
__ Prevalence Index is ≤3.0[1]
__ Morphological Adaptations[1] (Provide supporting data in Remarks)
__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree - Woody plants 3 in. (7.6cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 (1m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines - All woody vines greater than 3.28 ft in height.

Is Hydrophytic Vegetation Present? Yes No X

Remarks:

SOIL

Sampling Point: 3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR 2/1	100					clay i	silt loam
2-3	10YR 7/3	100					gravel i	clay

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: *(For LRR M)*

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (F22)*
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. * Test Indicator

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Is Hydric Soil Present? Yes ___ No X

Remarks:

3" compacted gravel - historic fill

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required: check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2) *(~July 15 or later)*
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Is Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: South Shore Park Beach Re-location City/County: Milwaukee/Milwaukee Sampling Date: 10/23/2017
Applicant/Owner: Robert Wright, Smith Group State: WI Sampling Point: 4
Investigator(s): TAWS - Alice Thompson, Carissa Anich Section 10 Township 6 N, Range 22 (East) West
Landform: Summit Shoulder Backslope Footslope Toeslope Urban Modified Other _____ Local relief: concave, convex, linear, other: _____
Soil Map Unit Name: unmapped WWI classification: Ø
Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No ____ Reason: Previous 90 day Precipitation WET NORMAL DRY
Are Vegetation ____, Soil X, or Hydrology ____ significantly disturbed? fill Are "Normal Circumstances" present? Yes ____ No X
Are Vegetation ____, Soil ____, or Hydrology ____ problematic?

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	**Wetland Type:** Marsh Fresh Wet Meadow Sedge Meadow Shrub Carr Swamp Forest Riverine Ephemeral Basin Farmed Wetland
Wetland Hydrology Present?	Yes ____	No X	

Remarks: toe of slope - steep bank to west

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: equiv to 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Fraxinus pennsylvanica	30	M	FacW
2.			
3.			
4.			
5.			
	30 = Total Cover		1/4
Sapling/Shrub Stratum (Plot size: equiv to 15' radius)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Herb Stratum (Plot size: equiv to 5' radius)			
1. Alliaria petiolata	50	M	FacU
2. Parthenocissus quinquefolia	30	M	FacU
3. Solidago canadensis	30	M	FacU
4. Oenothera biennis	10		FacU
5. Phalaris arundinacea	10		FacW
6. Cichorium intybus	10		FacU
7. Melilotus alba	10		FacU
8. Dactylis glomerata	30	M	FacU
9.			
10.			
	180 = Total Cover		90/36
Woody Vine Stratum (Plot size: equiv to 30' radius)			
1.			
2.			
3.			
	= Total Cover		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 5 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 40 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:
__ Rapid test for hydrophytic vegetation
__ Dominance Test is >50%
__ Prevalence Index is ≤3.0[1]
__ Morphological Adaptations[1] (Provide supporting data in Remarks)
__ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:
Tree - Woody plants 3 in. (7.6cm) or more in diameter at breast height (DBH), regardless of height.
Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 (1m) tall.
Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
Woody vines - All woody vines greater than 3.28 ft in height.

Is Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

SOIL

Sampling Point: 4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-2"	10YR 2/1	100					duff + silt loam	
2-3"	10YR 7/3	100					gravel fill	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: *(For LRR M)*

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (F22)*
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. * Test Indicator

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Is Hydric Soil Present? Yes ___ No X

Remarks:

compacted fill

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required: check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2) *(~July 15 or later)*
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Is Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: South Shore Park Beach Re-location City/County: Milwaukee/Milwaukee Sampling Date: 10/23 /2017
Applicant/Owner: Robert Wright, Smith Group State: WI Sampling Point: 5
Investigator(s): TAWS - Alice Thompson, Carissa Anich Section 10 Township 6 N, Range 22 (East) West
Landform: Summit Shoulder Backslope Footslope Toeslope Urban Modified Other _____ Local relief: concave, convex, linear, other: _____
Soil Map Unit Name: unmapped WWI classification: Ø
Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No ____ Reason: Previous 90 day Precipitation WET NORMAL DRY
Are Vegetation ____, Soil X, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No X
Are Vegetation ____, Soil ____, or Hydrology ____ problematic?

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ____ No X
Hydric Soil Present? Yes ____ No X
Wetland Hydrology Present? Yes ____ No X

Is the Sampled Area within a Wetland? Yes ____ No X
Wetland Type: Marsh Fresh Wet Meadow Sedge Meadow Shrub Carr Swamp Forest Riverine Ephemeral Basin Farmed Wetland

MIDWEST Remarks: linear ditch like feature adjacent foot path - sidewalk however upland - not collecting / ponding water

VEGETATION - Use scientific names of plants.

* linear plot

Tree Stratum (Plot size: equiv to 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Juglens nigra	30	Y	FacU
2. Gleditsia triacanthos	30	Y	FacU
3.			
4.			
5.			
	60	= Total Cover	30/12
Sapling/Shrub Stratum (Plot size: equiv to 15' radius)			
1. Rubus idaeus	50	Y	FacU
2.			
3.			
4.			
5.			
6.			
7.			
	50	= Total Cover	25/10
Herb Stratum (Plot size: equiv to 5' radius)			
1. Allium tricoccum	10		FacU
2. Sanicula marilandica	50	Y	FacU
3. Ageratina altissima	30	Y	FacU
4. Nepeta cataria	30	Y	FacU
5. Cichorium intybus	10		FacU
6.			
7.			
8.			
9.			
10.			
	130	= Total Cover	65/26
Woody Vine Stratum (Plot size: equiv to 30' radius)			
1.			
2.			
3.			
		= Total Cover	

Remarks:

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across All Strata: 6 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:
__ Rapid test for hydrophytic vegetation
__ Dominance Test is >50%
__ Prevalence Index is ≤3.0[1]
__ Morphological Adaptations[1] (Provide supporting data in Remarks)
__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree - Woody plants 3 in. (7.6cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 (1m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines - All woody vines greater than 3.28 ft in height.

Is Hydrophytic Vegetation Present? Yes ____ No X

SOIL

Sampling Point: 5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-7	10YR3/2	100					sandy clay loam	
7"	compacted soil							

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: *(For LRR M)*

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (F22)*
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. * Test Indicator

Restrictive Layer (If observed):

Type: _____

Depth (inches): _____

Is Hydric Soil Present? Yes ___ No X

Remarks:

likely on fill (historic)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required: check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2) *(~July 15 or later)*
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): _____

Water Table Present? Yes ___ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): _____

Is Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: South Shore Park Beach Re-location City/County: Milwaukee/Milwaukee Sampling Date: 10/23 /2017
Applicant/Owner: Robert Wright, Smith Group State: WI Sampling Point: 6
Investigator(s): TAWS - Alice Thompson, Carissa Arlich Section 10 Township 6 N, Range 22 (East) West
Landform: Summit Shoulder Backslope Footslope Toeslope Urban Modified Other _____ Local relief: concave, convex, linear, other: _____
Soil Map Unit Name: unmapped WWI classification: Ø
Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No ____ Reason: Previous 90 day Precipitation WET NORMAL DRY
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No X
Are Vegetation ____, Soil X, or Hydrology ____ problematic?

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	Wetland Type: Marsh Fresh Wet Meadow Sedge Meadow Shrub Carr Swamp Forest Riverine Ephemeral Basin Farmed Wetland
Wetland Hydrology Present?	Yes ____	No X	

Remarks: rocky beach - segments lake from wetland - acts like a porous berm - disturbed by wave action - ice etc. - Problematic Area of natural disturbance

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: equiv to 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: equiv to 15' radius)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Herb Stratum (Plot size: equiv to 5' radius)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	= Total Cover		
Woody Vine Stratum (Plot size: equiv to 30' radius)			
1.			
2.			
3.			
	= Total Cover		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)
Total Number of Dominant Species Across All Strata: _____ (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:
__ Rapid test for hydrophytic vegetation
__ Dominance Test is >50%
__ Prevalence Index is ≤3.0[1]
__ Morphological Adaptations[1] (Provide supporting data in Remarks)
__ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:
Tree - Woody plants 3 in. (7.6cm) or more in diameter at breast height (DBH), regardless of height.
Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 (1m) tall.
Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
Woody vines - All woody vines greater than 3.28 ft in height.

Is Hydrophytic Vegetation Present? Yes ____ No X

Remarks: bare rocky beach — no vegetation

SOIL

Sampling Point: 6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 7	10YR 7/3	100					rock & sand	
7"	compacted							

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: *(For LRR M)*

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (F22)*
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. * Test Indicator

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Is Hydric Soil Present? Yes ___ No X

Remarks:

light colored sand mixed with beach stones 1-2" in diameter

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required: check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2) *(~July 15 or later)*
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Is Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

rounded rocky "berm" pushed by waves - higher than data point # 7

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: South Shore Park Beach Re-location City/County: Milwaukee/Milwaukee Sampling Date: 10/23 /2017
Applicant/Owner: Robert Wright, Smith Group State: WI Sampling Point: 7
Investigator(s): TAWS - Alice Thompson, Carissa Anich Section 10 Township 6 N, Range 22 (East) West
Landform: Summit Shoulder Backslope Footslope (Toeslope) Urban Modified Other _____ Local relief: concave, convex, linear, other: _____
Soil Map Unit Name: unmapped WWI classification: Ø
Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No ____ Reason: Previous 90 day Precipitation WET (NORMAL) DRY
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No X
Are Vegetation ____, Soil X, or Hydrology X problematic? natural disturbance in storms

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No ____
Hydric Soil Present? Yes Y No ____
Wetland Hydrology Present? Yes Y No ____

Is the Sampled Area within a Wetland? Yes X No ____ Wetland A
Wetland Type: (Marsh) Fresh Wet Meadow Sedge Meadow Shrub Carr Swamp Forest Riverine Ephemeral Basin Farmed Wetland

Remarks: ponded behind beach berm - powns thus water level similar to lake level - will change shape based on big storms)

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: equiv to 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: equiv to 15' radius)			
1. Salix interior	15	Y	FacW
2.			
3.			
4.			
5.			
6.			
7.			
	15 = Total Cover		8/3
Herb Stratum (Plot size: equiv to 5' radius)			
1. Phragmites australis	50	Y	FacW
2. Typha sp.	40	Y	Obl
3. algae - in water			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	90 = Total Cover		45/18
Woody Vine Stratum (Plot size: equiv to 30' radius)			
1.			
2.			
3.			
	= Total Cover		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:		(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:
__ Rapid test for hydrophytic vegetation
X Dominance Test is >50%
__ Prevalence Index is ≤3.0[1]
__ Morphological Adaptations[1] (Provide supporting data in Remarks)
__ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:
Tree - Woody plants 3 in. (7.6cm) or more in diameter at breast height (DBH), regardless of height.
Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 (1m) tall.
Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
Woody vines - All woody vines greater than 3.28 ft in height.

Is Hydrophytic Vegetation Present? Yes X No ____

Remarks:

SOIL Sampling Point: 7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 2/1	100				black	coating on rock	
rock - rock								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: *(For LRR M)*

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (F22)*
- X Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. * Test Indicator

Restrictive Layer (if observed):
Type: ___
Depth (inches): ___

Prof. Judgment
Is Hydric Soil Present? Yes X No ___

Remarks:
rock similar to beach rock (1-2" flat rock) however with black coatings on rock - organic material laid on rock - coating not present in drier areas

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required: check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2) *(~July 15 or later)*
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ___	Depth (inches):	2'
Water Table Present?	Yes X	No ___	Depth (inches):	surface
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches):	1"

Is Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Ponded depression traps water behind porous rocky beach - probably in equilibrium w/ lake level

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: South Shore Park Beach Re-location City/County: Milwaukee / Milwaukee Sampling Date: 10/23 /2017
Applicant/Owner: Robert Wright, Smith Group State: WI Sampling Point: 8
Investigator(s): TAWS - Alice Thompson, Carissa Arich Section 10 Township 6 N, Range 22 East West
Landform: Summit Shoulder Backslope Footslope Toeslope Urban Modified Other _____ Local relief: concave, convex, linear, other: _____
Soil Map Unit Name: unmapped WWI classification: Ø
Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No ____ Reason: Previous 90 day Precipitation WET NORMAL DRY
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No X
Are Vegetation ____, Soil X, or Hydrology X problematic? natural distribution area

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No ____
Hydric Soil Present? Yes X No ____
Wetland Hydrology Present? Yes X No ____

Is the Sampled Area within a Wetland? Yes X No ____ Wetland A
Wetland Type: Marsh Fresh Wet Meadow Sedge Meadow Shrub Carr Swamp Forest Riverine Ephemeral Basin Farmed Wetland

MIDWEST

Remarks:
water trapped against rip rap - three wetland basins separated by rock

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: equiv to 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix x fragilis	30	y	Fac
2.			
3.			
4.			
5.			
	30 = Total Cover		15/6
Sapling/Shrub Stratum (Plot size: equiv to 15' radius)			
1. Salix interior	10	y	FacW
2.			
3.			
4.			
5.			
6.			
7.			
	10 = Total Cover		5/2
Herb Stratum (Plot size: equiv to 5' radius)			
1. Iris versicolor	20		Obl
2. Lythrum salicaria	10		Obl
3. Phragmites australis	30	y	FacW
4. Typha sp.	50	y	Obl
5. filamentous algae in surface			
6.			
7.			
8.			
9.			
10.			
	110 = Total Cover		55/22
Woody Vine Stratum (Plot size: equiv to 30' radius)			
1.			
2.			
3.			
	____ = Total Cover		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)
Total Number of Dominant Species Across All Strata: 4 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	____	x 1 =	____
FACW species	____	x 2 =	____
FAC species	____	x 3 =	____
FACU species	____	x 4 =	____
UPL species	____	x 5 =	____
Column Totals:	____	(A)	____ (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:
__ Rapid test for hydrophytic vegetation
X Dominance Test is >50%
__ Prevalence Index is ≤3.0[1]
__ Morphological Adaptations[1] (Provide supporting data in Remarks)
__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree - Woody plants 3 in. (7.6cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.26 (1m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines - All woody vines greater than 3.28 ft in height.

Is Hydrophytic Vegetation Present? Yes X No ____

Remarks:

SOIL

Sampling Point: 8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-5"	10YR 2/1	100	(coatings)				rock & gravel	coated w/ black
compacted	rock	5+						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: *(For LRR M)*

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (F22)*
- X Other (Explain in Remarks)

organic coating from ponding

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. * Test Indicator

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Is Hydric Soil Present? Yes X No ___

Remarks:

blacked rock and sand in ponded area - no fines

black coating only in ponded areas - not on rocks on high ground

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required: check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2) *(~July 15 or later)*
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ___ Depth (inches): 18"

Water Table Present? Yes X No ___ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): ___

Is Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: South Shore Park Beach Re-location City/County: Milwaukee/Milwaukee Sampling Date: 10/23 /2017
Applicant/Owner: Robert Wright, Smith Group State: WI Sampling Point: 9
Investigator(s): TAWS - Alice Thompson, Carissa Anich Section 10 Township 6 N, Range 22 (East) West
Landform: Summit Shoulder Backslope Footslope Toeslope Urban Modified Other _____ Local relief: concave, convex, linear, other: _____
Soil Map Unit Name: unmapped WWI classification: Ø
Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No ____ Reason: Previous 90 day Precipitation WET NORMAL DRY
Are Vegetation ____, Soil X, or Hydrology ____ significantly disturbed? historic fill - deep tunnel project Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ problematic? new normal

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ____ No X
Hydric Soil Present? Yes ____ No X
Wetland Hydrology Present? Yes ____ No X

Is the Sampled Area within a Wetland? Yes ____ No X
Wetland Type: Marsh Fresh Wet Meadow Sedge Meadow Shrub Carr Swamp Forest Riverine Ephemeral Basin Farmed Wetland

MIDWEST Remarks:

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: equiv to 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Ulmus pumila	10	Y	UpI
2.			
3.			
4.			
5.			
	10 = Total Cover		5/2
Sapling/Shrub Stratum (Plot size: equiv to 15' radius)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Herb Stratum (Plot size: equiv to 5' radius)			
1. Cichorium intybus	30	Y	FacU
2. Oenothera biennis	30	Y	FacU
3. Symphyotrichum pilosum	20	Y	FacU
4. Xanthium strumarium	20	Y	Fac
5. Taraxacum officinale	10		FacU
6. Daucus carota	10		FacU
7.			
8.			
9.			
10.			
	120 = Total Cover		60/24
Woody Vine Stratum (Plot size: equiv to 30' radius)			
1.			
2.			
3.			
	= Total Cover		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 5 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 20 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:		(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:
__ Rapid test for hydrophytic vegetation
__ Dominance Test is >50%
__ Prevalence Index is ≤3.0[1]
__ Morphological Adaptations[1] (Provide supporting data in Remarks)
__ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:
Tree - Woody plants 3 in. (7.6cm) or more in diameter at breast height (DBH), regardless of height.
Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 (1m) tall.
Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
Woody vines - All woody vines greater than 3.28 ft in height.

Is Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

SOIL

Sampling Point: 9

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-7"	10YR 4/3	50					coarse sandy loam	
	10YR 5/3	50						
7"	competed rock							

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: *(For LRR M)*

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (F22)*
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. * Test Indicator

Restrictive Layer (If observed):

Type: _____

Depth (inches): _____

Is Hydric Soil Present? Yes ___ No X

Remarks:

rock / gravel at 7"

* fill from MMSD deep tunnel project - placed on lakefront

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required: check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2) *(~July 15 or later)*
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___ No X	Depth (inches):	
Water Table Present?	Yes ___ No X	Depth (inches):	
Saturation Present? (includes capillary fringe)	Yes ___ No X	Depth (inches):	

Is Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: South Shore Park Beach Re-location City/County: Milwaukee/Milwaukee Sampling Date: 10/23 /2017
Applicant/Owner: Robert Wright, Smith Group State: WI Sampling Point: 10
Investigator(s): TAWS - Alice Thompson, Carissa Anich Section 10 Township 6 N, Range 22 East West
Landform: Summit Shoulder Backslope Footslope Toeslope Urban Modified Other Local relief: concave, convex, linear, other: slight
Soil Map Unit Name: unmapped WWI classification: Ø
Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No Reason: Previous 90 day Precipitation WET NORMAL DRY
Are Vegetation ____, Soil X, or Hydrology ____ significantly disturbed? FII Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ problematic? normal

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	**Wetland Type:** Marsh Fresh Wet Meadow Sedge Meadow Shrub Carr Swamp Forest Riverine Ephemeral Basin Farmed Wetland
Wetland Hydrology Present?	Yes ____	No X	

Remarks: North end of park structure area (field house etc.) slight low spot on slope

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: equiv to 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Juglens nigra	30	Y	FacU
2.			
3.			
4.			
5.			
	30 = Total Cover		15/6
Sapling/Shrub Stratum (Plot size: equiv to 15' radius)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Herb Stratum (Plot size: equiv to 5' radius)			
1. Solidago canadensis	30	Y	FacU
2. Lolium perrene	50	Y	FacU
3. Festuca arundinacae	50	Y	FacU
4. Glecoma hederacea	30	Y	FacU
5. Arctium minus	20		FacU
6. Xanthorium strmarium	20		Fac
7.			
8.			
9.			
10.			
	200 = Total Cover		100/40
Woody Vine Stratum (Plot size: equiv to 30' radius)			
1.			
2.			
3.			
	= Total Cover		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across All Strata: 5 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	____	x 1 =	____
FACW species	____	x 2 =	____
FAC species	____	x 3 =	____
FACU species	____	x 4 =	____
UPL species	____	x 5 =	____
Column Totals:	____	(A)	____ (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:
__ Rapid test for hydrophytic vegetation
__ Dominance Test is >50%
__ Prevalence Index is ≤3.0[1]
__ Morphological Adaptations[1] (Provide supporting data in Remarks)
__ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:
Tree - Woody plants 3 in. (7.6cm) or more in diameter at breast height (DBH), regardless of height.
Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 (1m) tall.
Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
Woody vines - All woody vines greater than 3.28 ft in height.

Is Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

SOIL

Sampling Point: 10

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of Indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 3/2	100					Sandy loam	
8"	rock							

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: *(For LRR M)*

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (F22)*
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. * Test Indicator

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Is Hydric Soil Present? Yes ___ No X

Remarks: historic fill in park from deep tunnel Project ?
likely other historic fill

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required: check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2) *(~July 15 or later)*
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Is Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: South Shore Park Beach Re-location City/County: Milwaukee, Milwaukee Sampling Date: 10/23 /2017
Applicant/Owner: Robert Wright, Smith Group State: WI Sampling Point: 11
Investigator(s): TAWS - Alice Thompson, Cacissa Anich Section 10 Township 6 N, Range 22 (East) West
Landform: Summit Shoulder Backslope Footslope Toeslope Urban Modified Other _____ Local relief: concave, convex, linear, other: _____
Soil Map Unit Name: unmapped WWI classification: Ø
Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No ____ Reason: Previous 90 day Precipitation WET NORMAL DRY
Are Vegetation X, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ problematic?

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	**Wetland Type:** Marsh Fresh Wet Meadow Sedge Meadow Shrub Carr Swamp Forest Riverine Ephemeral Basin Farmed Wetland
Wetland Hydrology Present?	Yes ____	No X	

MIDWEST Remarks: mowed lawn

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: equiv to 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: equiv to 15' radius)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Herb Stratum (Plot size: equiv to 5' radius)			
1. Poa pratensis	60	Y	FAC
2. Trifolium hybridum	30	Y	FACU
3. Polygonum aviculare	20		FAC
4. Taraxacum officinale	30	Y	FACU
5.			
6.			
7.			
8.			
9.			
10.			
	140 = Total Cover		70/28
Woody Vine Stratum (Plot size: equiv to 30' radius)			
1.			
2.			
3.			
	= Total Cover		

Remarks:

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 33 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:
__ Rapid test for hydrophytic vegetation
__ Dominance Test is >50%
__ Prevalence Index is ≤3.0[1]
__ Morphological Adaptations[1] (Provide supporting data in Remarks)
__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree - Woody plants 3 in. (7.6cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 (1m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines - All woody vines greater than 3.28 ft in height.

Is Hydrophytic Vegetation Present? Yes ____ No X

SOIL

Sampling Point: 11

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 3/2	100					Sandy loam	
10-13	10YR 3/3	100					sandy clay loam	
13"	compacted soil							

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: *(For LRR M)*

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (F22)*
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. * Test Indicator

Restrictive Layer (If observed):

Type: _____

Depth (inches): _____

Is Hydric Soil Present? Yes ___ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required: check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2) *(~July 15 or later)*
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): _____

Water Table Present? Yes ___ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): _____

Is Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: South Shore Park Beach Re-location City/County: Milwaukee / Milwaukee Sampling Date: 10/23 /2017

Applicant/Owner: Robert Wright - Smith Group State: WI Sampling Point: 12

Investigator(s): TAWS - Alice Thompson, Carissa Anich Section 10 Township 6 N, Range 22 (East) West

Landform: Summit Shoulder Backslope Footslope Toeslope Urban Modified Other _____ Local relief: concave, convex, linear, other: _____

Soil Map Unit Name: unmapped WWI classification: Ø

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No ____ Reason: Previous 90 day Precipitation WET NORMAL DRY

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology X problematic? human caused new normal

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?**	Yes ____ No X
Hydric Soil Present?	Yes ____	No X	**Wetland Type:** Marsh Fresh Wet Meadow Sedge Meadow Shrub Carr Swamp Forest Riverine Ephemeral Basin Farmed Wetland	
Wetland Hydrology Present?	Yes ____	No X		

MIDWEST Remarks: Recently constructed storm water swale - not a wetland

Discussed with Tom Nedland (10/23/17) - he agreed - only meets 1 | 3 (and wetland plants were installed) - too recent to agvine any wetland characteristics

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: equiv to 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	____	= Total Cover	
Sapling/Shrub Stratum (Plot size: equiv to 15' radius)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	____	= Total Cover	
Herb Stratum (Plot size: equiv to 5' radius)			
1. Populus tremuloides seedling	40	N	FAC
2. Phragmites australis	5		FACW
3. Schoenoplectus tabernaemontani	10		OBL
4. Xanthium strumarium	10		FAC
5. Iris versicolor	5		OBL
6.			
7.			
8.			
9.			
10.			
	70	= Total Cover	35/14
Woody Vine Stratum (Plot size: equiv to 30' radius)			
1.			
2.			
3.			
	____	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	____	x 1 =	____
FACW species	____	x 2 =	____
FAC species	____	x 3 =	____
FACU species	____	x 4 =	____
UPL species	____	x 5 =	____
Column Totals:	____	(A)	____ (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

__ Rapid test for hydrophytic vegetation

X Dominance Test is >50%

__ Prevalence Index is ≤3.0[1]

__ Morphological Adaptations[1] (Provide supporting data in Remarks)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree - Woody plants 3 in. (7.6cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 (1m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines - All woody vines greater than 3.28 ft in height.

Is Hydrophytic Vegetation Present? Yes X No ____

Remarks:

planted stormwater swale off parking lot

wetland plants installed

SOIL Sampling Point: 12

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4"	10YR 3/2	50					sand	
	10YR 4/2	50						
4"	rock							

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: *(For LRR M)*

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (F22)*
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. * Test Indicator

Restrictive Layer (if observed):
Type: ___
Depth (inches): ___

Is Hydric Soil Present? Yes ___ No X

Remarks:
Sand in recently constructed storm water swale
No change in color from sand on high point - Not clear if it will develop over time if drainage well,

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required: check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2) *(~July 15 or later)*
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- X FAC-Neutral Test (D5)

3 subdominant plants FACW / OBL

Field Observations:

Surface Water Present?	Yes ___ No X	Depth (inches):	___
Water Table Present?	Yes ___ No X	Depth (inches):	___
Saturation Present? (includes capillary fringe)	Yes ___ No X	Depth (inches):	___

Is Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Geomorphic position does not apply in sand per Tom Neiland, WDNR

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: South Shore Park Beach Re-location City/County: Milwaukee/Milwaukee Sampling Date: 10/23 /2017
Applicant/Owner: Robert Wright, Smith Group State: WI Sampling Point: 13
Investigator(s): TAWS - Alice Thompson, Carissa Anich Section 10 Township 6 N, Range 22 (East) West
Landform: Summit Shoulder Backslope (Footslope) Toeslope Urban Modified Other _____ Local relief: concave, convex, linear, other: _____
Soil Map Unit Name: unmapped WWI classification: Ø
Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No ____ Reason: Previous 90 day Precipitation WET/NORMAL/DRY
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil X, or Hydrology X problematic? dune - disturbance community

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?**	Yes ____ No X
Hydric Soil Present?	Yes ____	No X	**Wetland Type:** Marsh Fresh Wet Meadow Sedge Meadow Shrub Carr Swamp Forest Riverine Ephemeral Basin Farmed Wetland	
Wetland Hydrology Present?	Yes ____	No X		

Remarks: beach dune - planted beach grass restoration area

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: equiv to 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: equiv to 15' radius)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Herb Stratum (Plot size: equiv to 5' radius)			
1. Ammophila breviligulata	30	Y	Upl
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	30 = Total Cover		15/6
Woody Vine Stratum (Plot size: equiv to 30' radius)			
1.			
2.			
3.			
	= Total Cover		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:		(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:
__ Rapid test for hydrophytic vegetation
__ Dominance Test is >50%
__ Prevalence Index is ≤3.0[1]
__ Morphological Adaptations[1] (Provide supporting data in Remarks)
__ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:
Tree - Woody plants 3 in. (7.6cm) or more in diameter at breast height (DBH), regardless of height.
Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 (1m) tall.
Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
Woody vines - All woody vines greater than 3.28 ft in height.

Is Hydrophytic Vegetation Present? Yes ____ No X

Remarks: planted beach grass on adjacent sand dune

SOIL

Sampling Point: 13

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-15"	10YR 5/3	50					Coarse Sandy loam - loamy sand	
	10YR 4/2	50						
15"	compacted sand							

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: *(For LRR M)*

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (F22)*
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. * Test Indicator

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Is Hydric Soil Present? Yes ___ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required: check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2) *(~July 15 or later)*
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Is Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: higher on landscape

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: South Shore Park Beach Re-location City/County: Milwaukee/Milwaukee Sampling Date: 10/23 /2017
Applicant/Owner: Robert Wright, Smith Group State: WI Sampling Point: 14
Investigator(s): TAWS - Alice Thompson, Carissa Anich Section 10 Township 10 N, Range 22 East West
Landform: Summit Shoulder Backslope Footslope Toeslope Urban Modified Other Local relief: concave, convex, linear, other:
Soil Map Unit Name: unmapped WWI classification: Ø
Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No Reason: Previous 90 day Precipitation WET NORMAL DRY
Are Vegetation ____, Soil X, or Hydrology ____ significantly disturbed? fill rock Are "Normal Circumstances" present? Yes X No
Are Vegetation ____, Soil ____, or Hydrology ____ problematic? new normal

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	Wetland Type: Marsh Fresh Wet Meadow Sedge Meadow Shrub Carr Swamp Forest Riverine Ephemeral Basin Farmed Wetland
Wetland Hydrology Present?	Yes ____	No X	

MIDWEST Remarks: from here slopes up to much higher ground

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: equiv to 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: equiv to 15' radius)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Herb Stratum (Plot size: equiv to 5' radius)			
1. Poa pratensis	60	M	FAC
2. Plantago major	30		FAC
3. Trifolium hybridum	70	M	FACU
4. Polygonum aviculare	30		FAC
5.			
6.			
7.			
8.			
9.			
10.			
	190 = Total Cover		95/38
Woody Vine Stratum (Plot size: equiv to 30' radius)			
1.			
2.			
3.			
	= Total Cover		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species	120	x 3 =	360
FACU species	70	x 4 =	280
UPL species		x 5 =	
Column Totals:	190	(A)	640 (B)

Prevalence Index = B/A = 3.36

Hydrophytic Vegetation Indicators:
__ Rapid test for hydrophytic vegetation
__ Dominance Test is >50%
__ Prevalence Index is ≤3.0[1]
__ Morphological Adaptations[1] (Provide supporting data in Remarks)
__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:
Tree - Woody plants 3 in. (7.6cm) or more in diameter at breast height (DBH), regardless of height.
Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 (1m) tall.
Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
Woody vines - All woody vines greater than 3.28 ft in height.

Is Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

SOIL

Sampling Point: 14

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-14	10YR3/2						sandy loam + rock (cobble)	
14-16	10YR 4/3						coarse sandy loam	
16"	rock							

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: *(For LRR M)*

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (F22)*
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. * Test Indicator

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Is Hydric Soil Present? Yes ___ No X

Remarks: likely historic fill area

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required: check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2) *(~July 15 or later)*
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Is Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: