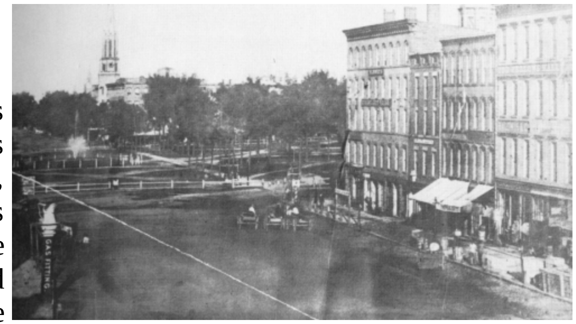
Lakeview Beach—Sanitary Survey Report

Fall 2011

Cuyahoga County Board of Health • 5550 Venture Drive • Parma, Ohio 44130 • (216) 201-2000 • www.ccbh.net • estaff@ccbh.net

Background



It is no secret that the Great Lakes are one of the nation's most precious natural resources. Local economies have flourished around these bodies of water since the time of the Civil War. Manufacturing and shipping, staples of the Cleveland area, have provided employment opportunities and growth in the region for well over a century. In turn, homes were built and families were raised, creating a demand for fresh water and waste removal systems. In addition to Lake Erie's role as a key resource for industry and infrastructure, it continues to thrive as a recreation destination. Anyone who has experienced a Northeast Ohio winter knows how to enjoy every last bit of summertime. From Toledo to Ashtabula, the shoreline is dotted with boat launches, marinas, bathing beaches, and parks just inviting you to the water and the beautiful views exclusive to Lake Erie.

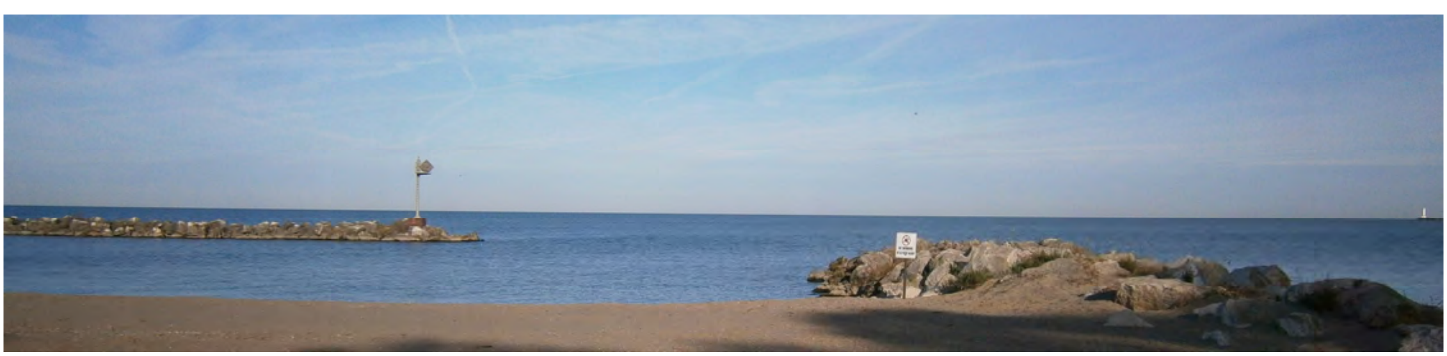
As the demand on Lake Erie and the other Great Lakes increased, managing the water quality became imperative. The health and well-being of humans and wildlife are dependent on good water quality. Realizing this fact, then-President Nixon and the federal government decided to take action in 1970 with the creation of the Environmental Protection Agency (EPA), which drafted the Clean Water Act in 1972 to protect surface waters from contamination.

To augment the efforts of the EPA, Congress amended the Clean Water Act with the passage of the Beaches Environmental Assessment and Coastal Health (BEACH) Act in 2000. The Act established uniform criteria for testing, monitoring, and notifying public users of possible coastal recreational water problems. For almost two decades, the Cuyahoga County Board of Health has maintained a beach monitoring program involving sampling and analysis for potential bacterial contamination in near shore waters.

In addition to routine beach monitoring, the Cuyahoga County Board of Health was awarded a grant to conduct Annual Sanitary Surveys at beaches along the Lake Erie coast. A sanitary survey is a method of identifying and investigating the sources of contamination in a body of water and assessing the magnitude of pollution through water sample analysis.

Beach sanitary surveys involve collecting information at the beach, as well as in the surrounding watershed. Information collected at the beach may include: number of birds at the beach, slope of the beach, location and condition of bathrooms, and amount of algae on the beach. Information collected in the watershed may include: land use, location of storm water outfalls, surface water quality, and residential septic tank information.

The following report contains all of the information obtained while conducting the sanitary survey, including the Annual Sanitary Survey field form, photos and GPS coordinates of sampling locations (if applicable), and sample results. Please contact Barry Grisez at (216) 201-2001 ext. 1232 or bgrisez@ccbh.net with any questions or concerns about this project.



Sample Results

As a result of the sanitary survey, three outfalls were identified as potential sources of water pollution. An "outfall" is defined as the point where a storm water conveyance system discharges into a natural body of water such as a lake, river, stream, or wetland. The photos below show the outfalls. As part of this project, water samples were taken during both dry weather and after rain events. They were then analyzed for bacterial contamination. This analysis was used as an indication of whether these outfalls were contributing to the higher bacteria counts occasionally observed in the Lake. Sampling was conducted weekly, beginning August 17th and concluding on October 12th. The table below provides the *E.coli* concentrations found as a result of sample analysis.

Lakeview—West

Lakeview—East

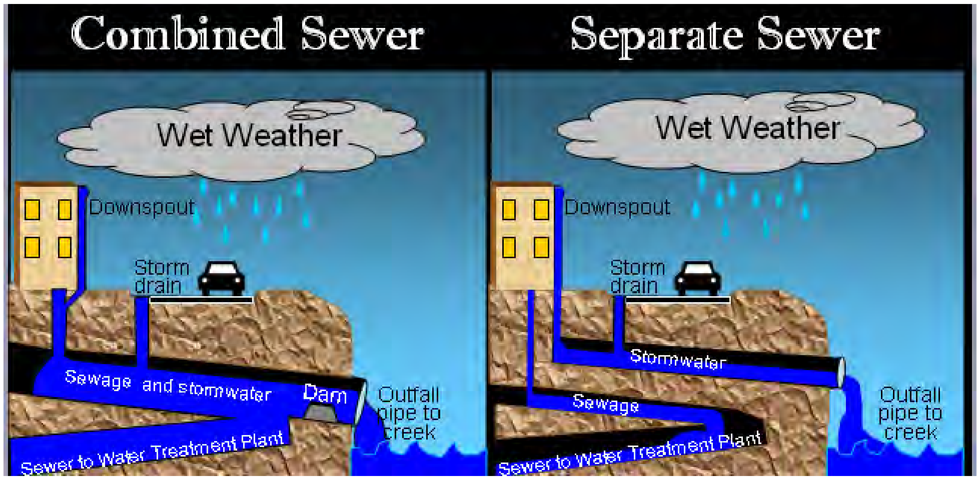
Black River

BEACH NAME	OUTFALL LOCATION	GPS (N)	GPS (W)	COLLECTION DATE	E COLI CFU/100mL	RECENT RAINFALL	RAINFALL AMOUNT (INCHES)
Lakeview	West of Beach	41.46244	-82.19797	8/17/2011	47	<72 hours	0.35
Lakeview	West of Beach	41.46244	-82.19797	8/24/2011	16800	<24 hours	0.46
Lakeview	West of Beach	41.46244	-82.19797	8/31/2011	150	>72 hours	0.22
Lakeview	West of Beach	41.46244	-82.19797	9/6/2011	1120	<72 hours	1.75
Lakeview	West of Beach	41.46244	-82.19797	9/13/2011	2909	<72 hours	0.28
Lakeview	West of Beach	41.46244	-82.19797	9/20/2011	5200	<48 hours	1.06
Lakeview	West of Beach	41.46244	-82.19797	9/26/2011	5000	<24 hours	1.48
Lakeview	West of Beach	41.46244	-82.19797	10/3/2011	9200	<24 hours	0.36
Lakeview	West of Beach	41.46244	-82.19797	10/12/2011	37000	<24 hours	0.38
Lakeview	East of Beach	41.46470	-82.19339	8/17/2011	1933	<72 hours	0.35
Lakeview	East of Beach	41.46470	-82.19339	8/24/2011	2633	<24 hours	0.46
Lakeview	East of Beach	41.46470	-82.19339	8/31/2011	47	>72 hours	0.22
Lakeview	East of Beach	41.46470	-82.19339	9/6/2011	184	<72 hours	1.75
Lakeview	East of Beach	41.46470	-82.19339	9/13/2011	1636	<72 hours	0.28
Lakeview	East of Beach	41.46470	-82.19339	9/20/2011	520	<48 hours	1.06
Lakeview	East of Beach	41.46470	-82.19339	9/26/2011	72	<24 hours	1.48
Lakeview	East of Beach	41.46470	-82.19339	10/3/2011	1450	<24 hours	0.36
Lakeview	East of Beach	41.46470	-82.19339	10/12/2011	1775	<24 hours	0.38
Lakeview	Black River	41.47112	-81.18453	8/31/2011	225	>72 hours	0.22
Lakeview	Black River	41.47112	-81.18453	9/6/2011	330	<72 hours	1.75
Lakeview	Black River	41.47112	-81.18453	9/13/2011	460	<72 hours	0.28
Lakeview	Black River	41.47112	-81.18453	9/20/2011	1250	<48 hours	1.06
Lakeview	Black River	41.47112	-81.18453	9/26/2011	21200	<24 hours	1.48
Lakeview	Black River	41.47112	-81.18453	10/3/2011	16600	<24 hours	0.36
Lakeview	Black River	41.47112	-81.18453	10/12/2011	168	<24 hours	0.38

Discussion of Sample Results

To interpret the results, the *E.coli* concentration listed in the previous table is compared to a water quality standard of 576 CFU/100 mL. The threshold of 576 was created by the USEPA for storm water analysis. Results exceeding 576 are an indication of a high bacteria load and will most likely affect the water quality at the beach. In general, beach water quality is affected by two factors; local wildlife and rainfall. The Cuyahoga County Board of Health is working with the United States Geological Survey (USGS) to determine how much of an impact wildlife has on Lakeview. The results of this project show that the outfalls located near the beach are heavily influenced by rain. This is common among beaches in a region where older infrastructure is still present. There are a number of options available to help effectively reduce the amount of pathogenic bacteria such as *E. coli* flowing into Lake Erie from these outfalls, including:

Modifying the existing sewer system and separating sanitary waste lines from storm water lines. On average, this is the most expensive and time-consuming solution. However, completely separate conveyance systems ensure that only storm water runoff enters the outfalls and eventually Lake Erie. Keep in mind that storm water runoff can still contain bacteria from other sources; local wildlife (geese), pet waste, agricultural waste, and discharge from impervious surfaces like streets and parking lots.



Creating an overflow tank to capture excess storm water - As opposed to revamping the entire sewer system, these tanks or "tunnels" act as a retention basin by capturing the excess flow and slowly return the water back to the wastewater treatment plant. The Northeast Ohio Regional Sewer District has completed projects such as these throughout the area. Currently, they are working on the Euclid Creek Tunnel Project. When completed, it will have the capacity to hold 70 million gallons of combined storm water and wastewater which would otherwise have ended up in Lake Erie.

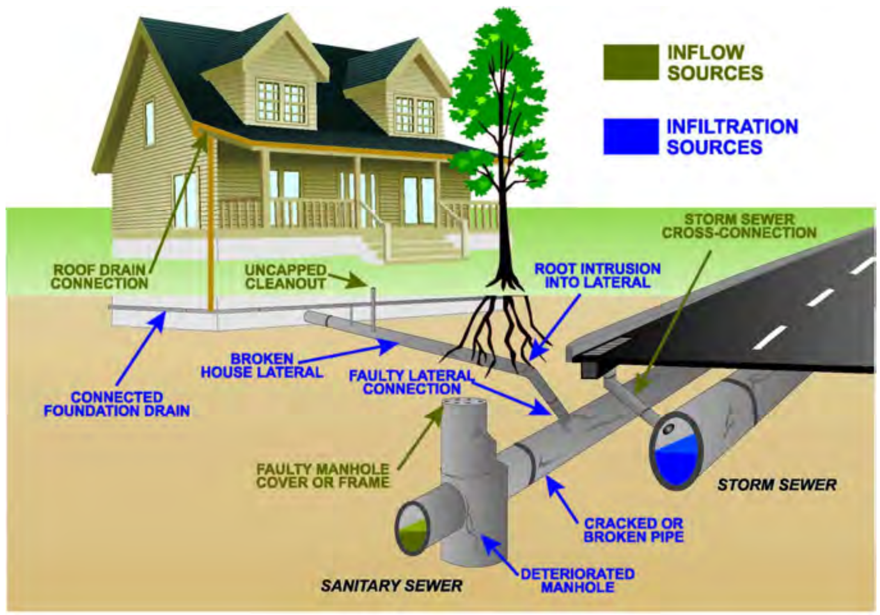
Green Infrastructure – A relatively new concept, green infrastructure involves creating wetlands, large rain gardens, and other natural "speed bumps" that help slow down the flow of water to Lake Erie by diverting it and allowing for treatment. Similar to the "tunnels" mentioned above, these types of projects create a holding area for excess storm water runoff. The only difference is that these green solutions call for natural treatment of the water through soil absorption as opposed to piping the water back to a treatment plant.

All of these solutions are viable ways to deal with bacteria-laden storm water. By conducting sanitary survey projects such as this, information is obtained on where the bacteria concentrations are of greatest concern allowing for a strategic approach to eliminating these problem areas.

Tips for Homeowners

The management of large quantities of excess rainwater discussed above is rather complex and normally taken on by municipal or regional entities, such as streets/sewer departments and regional sewer districts. However, homeowners can also take a few small steps to help keep Lake Erie clean. Here are a few tips for around the home:

Prevent rain water from infiltrating sanitary sewers. Just like any other structural component of a house, storm water drain lines periodically need to be repaired or replaced. Rain water from gutters, downspouts, footer drains and lateral lines can infiltrate the sanitary sewer system if cracks or leaks are present. Too much rainwater in sanitary sewers often results in overflows at the sewage treatment plants which spill into area waterways and eventually Lake Erie. Homeowners interested in an evaluation of their drainage system can contact local storm water consulting/engineering firms or their municipal sewer department.



Make sure all household waste goes to the right place. Some houses, especially older homes, were built or remodeled without much consideration given to waste water management. Over the years, homeowners added plumbing fixtures (bathrooms, laundry/utility sinks, etc.) to their basements or garages. The waste water from these fixtures was connected to the storm water drains since those lines are generally much more accessible than sanitary lines. As a result, untreated sanitary waste ends up in Lake Erie contributing to the buildup of bacterial contamination.

On that note, another consideration for homeowners is the storage and disposal of hazardous household waste. Items such as cooking oil, automobile fluids, lawn products, and unused medications are just a few of the hazardous materials that require special attention when handling.

Maintain septic systems as needed. Believe it or not, there are still approximately 10,000 households in Cuyahoga County that require an individual household sewage treatment system in place of sanitary sewers. Routine maintenance of these systems will not only ensure that the resulting waste water is properly treated but will also extend the life of the system and allow for optimal operation.

Discover your green thumb. If the yard could use a little attention, consider creating rain gardens to help buffer runoff from storm water. Rain gardens are very attractive beds of native vegetation that also serve as a way to prevent excess water from entering the drainage system. Also, though native wildflowers, plants, and shrubs are hardy and drought –resistant, adding a rain barrel to your downspout is a great way to keep your flower beds watered during those dry spells. For those looking to take their projects to the extreme, there are ways to replace a standard, shingled roof with a thatched or vegetative green plants designed to retain a significant amount of rainfall. Other small projects, such as replacing impervious concrete surfaces with pavers or decorative stone, can also reduce the amount of rainwater entering the sewers.

Clean up after pets. It seems like common sense, but cleaning up pet waste is the simplest way to prevent bacterial contamination of storm water runoff.

Summary

This Sanitary Survey Project was made possible through grant funding obtained by the Ohio Department of Health from the USEPA Great Lakes Restoration Initiative (GLRI). As a result of the survey, it was concluded that rainfall plays a significant role in determining water quality. The sewer systems installed years ago were designed to overflow into Lake Erie during periods of heavy rain. Although this was a great way to help out homeowners and prevent basement floods, these types of systems created a pollution problem in Lake Erie that has been a challenge to resolve. The Clean Water Act, implemented by the USEPA, requires that municipalities correct these sewer overflows within a specified timeframe and there are a number of possible solutions to address this issue that range in cost and effectiveness. A copy of this report will be shared with municipal sewer departments and other interested parties to discuss the results of this project and begin exploring ways to address the sources of pollution.

Useful Links

Cuyahoga County Board of Health 5550 Venture Drive Parma, OH 44130 Phone: (216) 201-2000 Fax: (216) 676-1317 E-mail: estaff@ccbh.net Website: www.ccbh.net	Northeast Ohio Regional Sewer District 3900 Euclid Ave. Cleveland, OH 44115 Phone: 216-881-6600 Website: www.neorsd.org	Cuyahoga County Solid Waste District 4750 East 131 Street Garfield Heights, OH 44105 Phone: (216) 443-3749 Fax: (216) 478-0014 E-mail: swdinfo@cuyahogacounty.us Website: www.cuyahogaswd.org

United States Department of Agriculture Natural Resources Conservation Service - State Office 200 North High Street, Room 522 Columbus, OH 43215 Phone: (614) 255-2472 Website: www.nrcs.usda.gov	United States Environmental Protection Agency (USEPA) Region 5 (IL, IN, MI, MN, OH, WI) 77 West Jackson Boulevard Chicago, IL 60604-3507 Phone: (312) 353-2000 Fax: (312) 353-4135 Toll free within Region 5: (800) 621-8431 Website: www.epa.gov

GREAT LAKES BEACH ANNUAL SANITARY SURVEY

1. BASIC INFORMATION

Name of Beach: LAKEVIEW BEACH	Date(s) of Survey: 8/15/2011
Beach ID:	Name of Waterbody: LAKE ERIE
Town/City/County/State: LORAIN, OH	Number of Routine Surveys Used: 97
Sampling Station(s)/ID:	Name(s) of Surveyor(s): HEATHER GRISEZ, TIM GOURLEY
STORET Organizational ID:	Surveyor Affiliation: C.C.B.H.

2. DESCRIPTION OF LAND USE IN WATERSHED

Current Land Use in Watershed

Type	Residential	Industrial	Commercial	Agricultural	Other (specify): PARK
Percentage	80	5	10		5

Development	Describe
% undeveloped	5
% developed	95

How was land use measured:

Waterbody Uses: ☒ Boating ☒ Fishing ☐ Surfing ☒ Windsurfing ☐ Diving ☐ Other (specify)

Are maps of the beach area attached? ☒ yes ☐ no Are maps of the watershed attached? ☒ yes ☐ no

List maps and their sources:

Does the detailed map include locations of:

	yes	no	explain
Sample Points	☒ yes	☐ no	(explain):
Hydrometric Network	☐ yes	☒ no	(explain): N/A
Pollutant Sources	☒ yes	☐ no	(explain):
Boat Traffic	☒ yes	☐ no	(explain):
Marinas	☒ yes	☐ no	(explain):
Boat dockage	☒ yes	☐ no	(explain):
Fishing	☒ yes	☐ no	(explain): FISHING PIER NEAR MOUTH OF BLACK RIVER
Bathing/Swimming	☒ yes	☐ no	(explain):
Bounding Structures:			
Jetty	☐ yes	☒ no	(explain): N/A
Groin	☒ yes	☐ no	(explain):
Seawall	☒ yes	☐ no	(explain):
Other	☐ yes	☒ no	(explain):
Sanitary Facilities	☐ yes	☒ no	(explain): NOT VISIBLE ON MAP
Restaurants/Bars	☐ yes	☒ no	(explain): " " " "
Playground	☐ yes	☒ no	(explain): " " " "
Parking Lot(s)	☒ yes	☐ no	(explain):
Other	☐ yes	☐ no	(explain):

Erosion/Accretion Measurements

High Watermark Location Identification	Fixed Object Description (e.g., tree, building)	Distance from Fixed Object to High Watermark	Feet or Meters?	Distance between High Watermark Locations	Feet or Meters?
A	PLAY GROUND	220	FT	A↔B: 189	FT.
B	CONCRETE STAIRS	213	FT	B↔C:	
C				C↔D:	
D (optional)				D↔E:	
E (optional)					

Bounding Structures

Bounding Structure	Number	Description or Comment
Jetty		
Groin	3	
Seawall	3	
Natural formation		
Other (specify):		
Other (specify):		

Beach Materials/Sediments:

☒ Sandy ☐ Mucky ☐ Rocky ☒ Other: PEA GRAVEL

Or, Beach Materials/Sediments Lab Analysis (attach diagram or photographs of plot locations) N/A

Name of Lab Used:			
Date of Sample Collection:			
Plot ID	Mean Grain Size Diameter	Uniformity Coefficient	Description of Plot Location:
Average			

Describe the results and conclusion of the sediment analysis and potential effects of the sediment distribution at this beach:

Photos Taken in the Beach Area or Surrounding Watershed (SEE ATTACHED)

Image Number	Date/Time	File Name	Description of Photo (Include Pictures of High Watermark Locations and Corresponding Fixed Objects)

Habitat around beach:

☐ Dunes ☐ Wetlands ☐ River/stream ☐ Forest ☒ Park ☐ Protected Habitat or Reserve

☐ Other:

3. WEATHER CONDITIONS N/A - NO DATA FROM 2010

Examine the weather data collected over the prior beach season(s) along with bacteria sampling results.
Do the bacteria concentrations at this beach appear to correlate with any of the following?

Rainfall	☐ yes	☐ no	(explain):
Air Temperature	☐ yes	☐ no	(explain):
Water Temperature	☐ yes	☐ no	(explain):
Cloud Cover	☐ yes	☐ no	(explain):
Wind Speed	☐ yes	☐ no	(explain):
Wind Direction	☐ yes	☐ no	(explain):
Longshore Current	☐ yes	☐ no	(explain):
Wave Height or Intensity	☐ yes	☐ no	(explain):
Other Weather	☐ yes	☐ no	(explain):

Have any statistical analyses been done to calculate the degree of correlation? ☐ yes ☒ no

Describe any analyses done, and any trends or correlations found (add lines if needed to describe in detail):

N/A

Average air temperature during beach season: 67.5 °C or (°F)	Average water temperature during beach season: 73.8 °C or (°F)

Average wind speed and direction during beach season (e.g., E or 90° at 15 mph): S at 6 mph

Typical weather conditions: ☒ Sunny ☐ Mostly Sunny ☒ Partly Cloudy ☐ Mostly Cloudy ☐ Overcast ☐ Rainy

Rainfall total for the beach season (in): 20.46	Average rainfall for all beach seasons (in): 12.68

Does rainfall intensity correlate with bacteria sample results? ☒ yes ☐ no Describe:

Number of significant rain events: 8	What constitutes "significant?" (e.g., 1 inch or more rain) 0.75 (per CSO/SSO DATA)

Additional Comments/Observations:

4. PHYSICAL BEACH CONDITIONS

Beach length or dimensions (indicate Z1, Z2, and Z3 on a map)

Length (m): 504	Width (average, in m): 66	
Width Z1 (m): 67	Width Z2 (m): 65	Width Z3 (m):
Local water level variation: 3 feet 2 inches	Hydrographic influences (e.g., seiches):	

Characterize any longshore or nearshore currents and their potential effects based on bacteria sampling results

N/A

Approximate beach slope at swim area: 3 %

Description and date of last beach rehabilitation (example: new sand, nourishment, dredging, etc., physical structures will be described in Sections 12 and 13):

(SEE ATTACHED)

Comments/Observations:

5. BATHER LOAD (# OF BEACH USERS)

Is bather load measured? ☒ yes ☐ no

If yes, describe how beachgoer numbers are calculated (i.e., turnstile, counting at noon, photographs):

DURING PERIODS of HEAVIEST USE

Beach Use

Beachgoer Category	Number of People Per Day Using the Beach: Peak Use for the Season (Daily Use)	Seasonal Average (Daily Use)	Holiday Average (Daily Use)	Weekend Average (Daily Use)	Weekday Average (Daily Use)	Off-Season Average if applicable (Daily Use)
Total people in the water		1				
Total people out of the water		9				
Total people at the beach		10				
Breakdown of Activities (if activities were broken down on the Routine-Onsite Sanitary Survey, summarize them here)						
Activity 1:						
Activity 2:						
Activity 3:						
Activity 4:						
Activity 5:						
Activity 6:						
Frequency of measurements (e.g., daily, weekly, monthly)	DAILY IN A.M. - NUMEROUS EVENTS HELD THROUGHOUT THE SUMMER W/ HUNDREDS OF PEOPLE IN ATTENDANCE ON WEEKENDS.					

Examine bather load data along with sampling results for the past beach season(s). Look at each sampling point. Does bather load appear to correlate with bacteria concentrations at any of these sampling points? Does the amount of people in the water or out of the water correlate with bacteria concentrations? Has a statistical analysis been done? Describe:

NO CORRELATION, NO STATISTICAL ANALYSIS.

Comments/Observations:

6. BEACH CLEANING

Beach cleaning frequency during season: 3x/WEEK W/ MACHINE RAKE, DAILY BY HAND

Description of cleanup activities

	Leveling of Sand	Trimming or Removing Vegetation	Removing Debris	Removing Trash	Construction and Maintenance of a Temporary Pathway Directly to Open Water	Other (specify):
Check activities that were done	3x/wk	FALL	DAILY	DAILY	AS NEEDED	
Equipment used (if applicable)						

How often are floatables found at the beach? ☐ Never ☒ Sometimes ☐ Frequently ☐ Very frequently

Known sources of floatables:

Types of floatables found ☐ Street litter ☒ Food-related litter ☐ Medical items ☐ Sewage-related ☐ Building materials ☐ Fishing related ☒ Household waste ☐ Other:

How often is beach debris/litter found on the beach? ☐ Never ☐ Sometimes ☒ Frequently ☐ Very frequently

Known sources of debris:

GREAT LAKES BEACH ANNUAL SANITARY SURVEY (continued)

Type of Debris/Litter Found

☒ Street litter ☒ Food-related litter ☐ Medical items ☐ Sewage-related ☐ Building materials
☐ Fishing related ☒ Household waste ☐ Tar ☐ Oil/ Grease ☐ Other:

Comments/Observations:

7. INFORMATION ON SAMPLING LOCATION

Description of Sample Points (include beach water and potential pollution sources)

Sample Point Name/ID	Location	Description	Sample Frequency	Time of Day of Sample Collection
LAKEVIEW - C	(SEE SUMMARY)	ROUTINE MONITORING PT.	DAILY	AM
LAKEVIEW - E	"	" " "	DAILY	"
OUTFALL - E	"	EAST OF BEACH	WEEKLY 8/17-10/12	"
OUTFALL - W	"	WEST OF BEACH	" " "	"
BLACK RIVER	"	MOUTH OF RIVER	" 8/31-10/12	"

Description of hydrometric network [note that this is a network of monitoring stations that collect data such as rainfall and stream flow]

HOPKINS AIRPORT / NWS. FOR 2012, THE NWS DATA FROM LORAIN REGIONAL AIRPORT WILL BE USED.

Comments/Observations:

8. WATER QUALITY SAMPLING

Name of laboratory: N.E.O.R.S.D. Distance to laboratory: 33 miles

Is there a sampling and analysis plan? ☒ yes ☐ no Is it adequate? ☒ yes ☐ no (explain):

Are the sampling staff properly trained on sampling techniques, equipment maintenance, and calibration procedures? ☒ yes ☐ no

Biological Survey Results:

Were invasive/nonnative species present? ☐ yes ☒ no (describe):

Have algae blooms been observed during the beach season? (If so, specify duration and algae species) YES, INFREQUENTLY THROUGHOUT THE SUMMER

Percent of beach season where algae was present in significant amounts in the nearshore water: ☐ None ☒ Low (1–20%) ☐ Moderate (21–50%) ☐ High (> 50%)

Percent of beach season where algae was present in significant amounts on the beach: ☐ None ☒ Low (1–20%) ☐ Moderate (21–50%) ☐ High (> 50%)

List types of algae found: PERIPHYTON, GLOBULAR

Colors of algae most commonly found: DARK GREEN

List any infectious snails that were found: NONE

List any dangerous aquatic organisms that were found: NONE

Presence of Wildlife and Domestic Animals

Type	Degree of Presence (Low, Mod, High)	Does the Presence Appear to Correlate with Bacteria Results? (Yes, No, Don't Know)	Describe Further (include whether fecal droppings are seen and are a problem)
Geese	MOD	NO	
Gulls	HIGH	YES	FECAL DROPPINGS SEEN ON BEACH & IN WATER
Dogs	NONE	NO	
Other (specify):			
Other (specify):			
Other (specify):			

Was a significant number of dead birds found on the beach during beach season? ☐ yes ☒ no
Describe types and numbers found and possible causes:

Was a significant number of dead fish found on the beach during the beach season? ☐ yes ☒ no
Describe numbers found and possible causes:

Bacteria Samples Collected

Do you test for *Escherichia coli*? ☒ yes ☐ no Analytical Method Used: MTEC
Do you test for *Enterococcus*? ☐ yes ☒ no Analytical Method Used:
Do you test for fecal coliform? ☐ yes ☒ no Analytical Method Used:
List any additional bacteria tested and associated analytical methods:
Do you composite any bacteria samples? ☐ yes ☒ no If yes, explain:

How do this past season's bacteria results compare to that of previous years'? N/A - FIRST YEAR OF DATA FROM LAKEVIEW FOR C.C.B.H.

Do the bacteria results correlate to other parameters, such as water quality, weather, flow, bather load, algae, or wildlife? ☒ yes
☐ no Describe in detail analyses that were performed on the data (add additional lines as needed).
WATER QUALITY / RAINFALL & GULLS. NO STATISTICAL ANALYSIS PERFORMED ON DATA TO DETERMINE CORRELATION.

Water Quality (check all that are measured regularly)

Temperature	pH	Rainfall	Turbidity	Conductivity	Other
X		X	X		X BIRD COUNT

How does the water quality data compare to data from previous years? N/A

Do any data correlate with bacteria sample results? ☒ yes ☐ no If yes, explain: RAINFALL, BIRD COUNT. DURING DRY SPELLS, BACTERIA COUNTS EXCEEDING 235 CAN BE ATTRIBUTED TO HUNDREDS OF GULLS ON THE BEACH.

GREAT LAKES BEACH ANNUAL SANITARY SURVEY (continued)

Were there any unusual results, such as extremely high or low values detected, or unusual trends? ☒ yes ☐ no If yes, explain what was found and any potential causes: HIGH BACTERIA COUNTS DURING DRY WEATHER - GULLS

Are water quality annual trend data attached? ☐ yes ☒ no

Comments/Observations:

9. MODELING

Are models being used? ☐ yes ☒ no

If yes, list types of models being used and a brief description of the models:

Comments/Observations:

C.C.B.H. IS WORKING WITH THE USGS TO DEVELOP A NOWCAST MODEL FOR LAKEVIEW BEACH.

10. ADVISORIES/CLOSINGS

List any advisories and closings that occurred, whether bacteria levels were high, and any possible reasons for advisory or closing or high bacteria level, such as stormwater runoff, sewage spill, or wildlife on the beach.

Advisory or Closing (specify one)	Start and End Dates	Length of Advisory or Closing (Days)	Did Bacteria Concentrations Exceed GM or SSM Criteria?	Reason for Advisory or Closing or Possible Contributing Factors
ADVISORY	6/3 - 6/4	1	SSM	RAINFALL, BIRD COUNT
"	6/10 - 6/11	1	"	"
"	6/12 - 6/14	2	"	"
"	6/18 - 6/19	1	"	"
"	6/21 - 6/22	1	"	"
"	6/23 - 6/27	4	"	"
"	6/29 - 7/2	3	"	"
"	7/3 - 7/5	2	"	"
"	7/8 - 7/9	1	"	"
"	7/12 - 7/15	3	"	"
"	7/20 - 7/21	1	"	"
"	7/22 - 7/23	1	"	"

Total number of closings issued: 0

Total number of advisories issued:

Total number of days under an advisory: 55

Total number of days beach was closed: 0

Comments/Observations:

7/24 - 7/26 - 2 DAYS
7/27 - 7/28 - 1 DAY
7/29 - 7/31 - 2 DAYS
8/1 - 8/2 - 1 DAY
8/4 - 8/7 - 3 DAYS
8/8 - 8/9 - 1 DAY
8/10 - 8/28 - 18 DAYS
8/29 - 8/30 - 1 DAY
8/31 - 9/5 - 5 DAYS

11. POTENTIAL POLLUTION SOURCES

Type of Source	Level of Concern (H, M, L, or NA)	Latitude*	Longitude*	Describe how this source might contribute to beach pollution and frequency of contribution
Wastewater discharges	H			TREATMENT PLANT - 2/3 mi E
Sewage overflows	H			AGING INFRASTRUCTURE
Septic systems	L			SEWERS AROUND BEACH AREA
Subsurface sewage disposal	N/A			
Stormwater outfalls	H			RUNOFF, CROSS-CONNECTIONS
Natural outfalls	N/A			
CAFOs or AFOs	N/A			
Wildlife	H			GULLS ON BEACH - HIGH FREQUENCY
Agriculture runoff	N/A			
Urban runoff, industrial waste	N/A			
Marinas, harbors	L			MARINA @ MOUTH OF BLACK RIVER
Mooring boats	L			" " " " "
Domestic animals	N/A			
Unsewered areas	N/A			
Erosion-prone areas	N/A			
Landfills, open dumps	N/A			
Groundwater seepage	N/A			
Bathhouse leakage	N/A			
Drains and pipes nearby	L			
Stream or wetland drainage	N/A			
Vacant areas	N/A			
Other (specify):				
Other (specify):				
Other (specify):				

*If latitude and longitude are unknown, show the location on the detailed map and describe in the Comments/Observations section below.

Have potential pollution sources identified above been included on the detailed map? ☒ yes ☐ no (explain):

Did you collect bacteria samples from any potential pollution sources, such as streams or outfalls? ☒ yes ☐ no (explain):

If yes, describe any analyses performed and a summary of the results: ALL SAMPLING PTS. ARE HEAVILY INFLUENCED BY RAINFALL. HOWEVER, BACTERIAL CONCENTRATIONS SUBSIDE AFTER 48 HRS.

Are there any discharge reports available for dischargers in the watershed? ☐ yes ☒ no If yes, attach report or pertinent sections and summarize here:

Have any sources been remediated, or have steps been taken to remediate sources? ☐ yes ☒ no (explain):

SOURCES NEED TO BE IDENTIFIED. THIS REPORT PROVIDES A STARTING POINT.

Comments/Observations:

12. DESCRIPTION OF SANITARY FACILITIES

Bathhouses: Total number of bathhouses at the beach: 1

Number or ID	Location	Condition (Good, Fair, or Poor)	Distance from Waterline (feet)	Frequency of Cleaning (Daily, Weekly, Monthly)
1	IN COMMUNITY CTR.	GOOD	300	DAILY

Describe further. Include number of toilets, showers, sinks, etc., and whether these facilities are adequate to support beach use.

Litterbins: Total number of litterbins at the beach: 9

Number or ID	Location	Condition (Good, Fair, or Poor)	Distance from Waterline (feet)	Frequency of Emptying (Daily, Weekly, Monthly)
9	THROUGOUT PARK/ BEACH AREA	GOOD	30' & BEYOND	DAILY

Describe further. Include whether number and location of litterbins is adequate to support beach use.

13. DESCRIPTION OF OTHER FACILITIES

List facilities in the beach area, such as restaurants, bars, playgrounds, parking lots, and dog parks.

Facility Name/Type	Location	Condition (Good, Fair, or Poor)	Distance from Beach (feet)	How might this facility contribute to water quality problems?
RESTAURANT	IN COMM. CTR.	GOOD	300	N/A
PLAYGROUND	ON BEACH - EAST	GOOD	-	N/A
PARKING LOT		GOOD	300	RUNOFF

Comments/Observations:

Lakeview

Beach Attendance

From Bryan Goldthorpe - Park Manager

Date	# of people on the beach	# of swimmers	Comments
5/21	0-25	0-25	Kayak Symposium, beach not open to the public
5/28	0-25	0-25	
5/29	0-25	0-25	
5/30	26-50	0-25	
6/4	26-50	0-25	
6/5	26-50	0-25	
6/10	0-25	0-25	
6/11	0-25	0-25	
6/12	0-25	0-25	
6/13	26-50	0-25	
6/14	0-25	0-25	
6/15	0-25	0-25	
6/16	0-25	0-25	
6/17	26-50	0-25	
6/18	51-100	0-25	
6/19	0-25	0-25	
6/20	0-25	0-25	
6/21	0-25	0-25	
6/22	0-25	0-25	
6/23			Not reported
6/24	0-25	0-25	
6/25	201-300	0-25	Water closed due to wave height
6/26	0-25	51-100	
6/27	0-25	0-25	
6/28	26-50	0-25	
6/29	26-50	0-25	
6/30	26-50	0-25	
7/1	0-25	0-25	
7/2	26-50	0-25	
7/3	0-25	0-25	
7/4	51-100	0-25	
7/5	0-25	0-25	
7/6	0-25	0-25	

Beach Attendance

Date	# of people on the beach	# of swimmers	Comments
7/7	0-25	0-25	
7/8	0-25	0-25	
7/9	51-100	0-25	
7/10	26-50	0-25	
7/11	51-100	0-25	
7/12	0-25	0-25	
7/13	26-50	0-25	
7/14	0-25	0-25	
7/15	0-25	0-25	
7/16	26-50	0-25	
7/17	0-25	0-25	
7/18	0-25	0-25	
7/19	0-25	0-25	
7/20	26-50	0-25	
7/21	26-50	0-25	
7/22	0-25	26-50	
7/23	26-50	0-25	
7/24	0-25	0-25	
7/25	0-25	0-25	
7/26	0-25	0-25	
7/27			Not reported
7/28	0-25	0-25	
7/29	0-25	0-25	
7/30	0-25	0-25	
7/31			Not reported
8/1	0-25	0-25	
8/2	0-25	0-25	
8/3	0-25	0-25	
8/4	0-25	0-25	
8/5	0-25	0-25	
8/6	0-25	0-25	
8/7	0-25	0-25	
8/8	0-25	0-25	

Beach Attendance

Date	# of people on the beach	# of swimmers	Comments
8/9	0-25	0-25	
8/10	0-25	0-25	Water closed due to wave height
8/11	0-25	0-25	
8/12	0-25	0-25	
8/13	0-25	0-25	
8/14	0-25	0-25	
8/15	0-25	0-25	Water closed due to wave height

I - INTRODUCTION

1. Project Authorization.

The Cooperative Beach Erosion Control Project for Lakeview Park, Lorain, OH, was authorized by the River and Harbor Act approved 3 September 1954 (Section 101, Public Law 780, 83rd Congress, 1st Session), in accordance with the plans and conditions contained in Appendix VIII of House Document No. 229, 83rd Congress, 1st Session.

2. Location.

The project site is located in Lakeview Park in the city of Lorain, Lorain County, OH, on the southern shore of Lake Erie. Lakeview Park is a 43-acre city-owned recreational facility situated 1,500 feet to 3,000 feet west of the west breakwater of Lorain Harbor.

3. Description.

The project shown in Appendix C, sheets 1 through 10, includes: three 250-foot long detached rubblemound breakwaters; a 170-foot long rubblemound extension to the east groin; rehabilitation of a 50-foot long portion of the existing west groin; and initially, 168,000 tons of beach fill. The project also includes an asphalt concrete access road to the beach. The city of Lorain, as the local cooperator, relocated or extended three storm sewer works within the project area and partially removed the stone of three groins from the beach fill area.

4. Protection Provided.

The project was designed to protect the preproject shore at Lakeview Park and to provide and protect a recreational beach. The beach fill protects the preproject shore. The detached breakwaters and groins protect the beach fill. The structural components of the beach system were designed for a lake level elevation of 574.1 (IGLD) (5.5 feet above Low Water Datum) which was predicted as having a 20-year recurrence interval and for a 10-foot high wave with a 7-second period whose recurrence interval was predicted at 25-50 years.

5. Construction History.

Construction was initiated by contract on 15 June 1977, and was essentially completed by 8 October 1977. The prime Contractor was Luedtke Engineering Company of Frankfort, MI. The project was given its final inspection before acceptance by local interests on 29 March 1978. The constructed project is shown in Appendix C, Sheets 1

III - PROJECT FEATURES

14. General.

The survey stationing is indicated on sheet 4 of Appendix C. The protective works consist of a beach fill which in turn is protected by three offshore breakwaters and two groins. The "as constructed" drawings, sheets 1 to 10, in Appendix C depict these items.

15. Offshore Breakwaters.

The breakwater layout and construction details are shown in Appendix C. Three detached rubblemound breakwaters, 250 feet long each, are arrayed along a flat-arc alignment, convex lakeward. The breakwaters are spaced 160 feet apart. The west end of the west breakwater is 400 feet and the east end of the west breakwater is 500 feet offof the preproject shore. Both are within the projected centerlines of the two groins protecting 1,250 lineal feet of shoreline. The breakwaters have a crest width of 14 feet at an elevation 8 feet above LWD. Selection of this elevation was primarily based on wave overtopping considerations. A small degree of wave overtopping is desirable to maintain beach-face slopes and to induce water circulation; however, excessive overtopping during storm waves with associated wind setup could cause large losses of the sand fill. A composite sloped breakwater was constructed. The stones on the cap are on side slopes of 1:1.5. Armor stone was placed in a two-stone layer thickness. The armor layer on the seaward slope extends from the crest to an elevation 1 foot below LWD. From 1 foot below LWD to the bottom, the slope flattens to 1:2.5 and the armor stone weight is reduced. Navigation lights are on the west end of the west breakwater and on the east end of the east breakwater. The lights are battery-operated and were installed by the U.S. Coast Guard on concrete foundations poured in the head sections of the respective breakwaters. A metal frame anchored to the concrete block supports each light.

16. Groin Extensions.

a. East Groin - The east concrete-capped groin was extended to a total length of 300 feet from the existing shore. This length was established by the width of beach required in the project plan. The preproject groin extended only 130 feet from shore and had a crest elevation of 6 feet above LWD. The constructed crest elevation of the modified groin is 8 feet above LWD to retain a beach fill at the same elevation. The concrete cap of the existing groin was raised two feet. Quarry run stone was placed along its east side to an elevation of 4.5 above LWD. The 170-foot groin extension is of rubblemound construction with a 13-foot crest width. The armor layer is comprised of quarry stone, two stones thick, placed on a side slope of 1:1.5. The head-section slope is flattened to 1:2 for greater stability. A graded core supports the armor and provides an impermeable littoral barrier from the lake bottom to LWD. A two-foot thick bedding layer consisting of quarry stone with a 5-foot toe, is provided to support the structure on the existing bottom and to provide protection against toe scour. A vertical sheet pile diaphragm is provided along the centerline of the groin extension for the first 96.5 feet to render the groin sand-tight. The diaphragm extends lakeward far enough to retain the beach above LWD.

b. West Groin - The crest of the existing west concrete-capped groin was raised two feet for the first 52 feet from shore to retain the beach berm at its design elevation. Rubblemound was placed for 50 feet along the west face of the preconstruction groin to provide protection from toe scour and to support the structure.

17. Beach Fill.

The quantity of medium-size sand required for the initial beach fill was 168,000 tons. This figure included a 15 percent contingency for initial losses during construction. The design +8 foot LWD berm elevation is based on storm-wave runup considerations. The shoreline is expected to develop a cuspate configuration sculptured by the diffraction pattern of waves passing around the breakwater ends and through the gaps. Natural forces will tend to move the finer material into the protected areas on a flatter slope and the coarser material will remain in the more exposed areas. The beach fill is truncated at each end by groins. The width of beach at the average annual water level is predicted to range from 90 feet at the existing west groin to 250 feet at the spit in the center of the park. The beach spans 1,250 feet of park frontage. Additional beach area will be provided on the flanks in the fillets formed by the wave shadows of the groins and breakwaters. The storm-sewer outlet structures will tend to stabilize these small fillets against longshore transport away from the project site.

18. Storm Sewers.

Three storm sewer outfalls which were located within the project boundaries required extension or relocation. The city of Lorain made these necessary modifications.

An 18-inch line which discharged into the lake at the center of the project site was capped and rerouted to join the east 60-inch line. The outlet chamber of the east 60-inch line was extended 50 feet farther into the lake to reduce the probability of sand plugging the line. Like the existing outlet, this extension has a reinforced concrete box section but is angled toward the east to be perpendicular to the predicted new beach profile. The invert elevation of the east storm sewer outlet extension is designed to be 568± feet (IGLD) at the outer end. The lower 150 feet of the 36-inch west storm sewer was rerouted to the west side of the existing stone-block T-groin at the west end of the park. Its outlet was extended from the shore bluff an additional 30 feet into the lake. The corrugated metal pipe used in this extension was protected with a mound of quarry-run stone with the larger stones placed in the outer layer.

19. Groin Removal.

Three stone-block groins within the project area were partially removed by the city of Lorain as shown in Appendix C, Sheet 4. The remains of these groins were covered by the initially placed beach fill.

20. Access Road.

An approximately 200-foot long asphalt concrete access road was constructed between the existing west parking area and the existing seawall as shown in Appendix C, Sheets 4 and 6. Construction of the access road conformed to the "State of Ohio, Department of Transportation Construction and Materials Specifications, 1 January 1975." This access road was used as a haul route for the initial beach fill placement, and is intended to serve as the access for any future replenishment programs.

21. Stone Specifications.

Stone material for the groin extension and the offshore breakwaters was specified as being sound, durable, and free from fractures, spalls, deleterious material and overburden spoil. The stone has a specific gravity between 2.40 and 2.80 (150 to 175 pounds per cubic foot, respectively).

The gradation of the underlayer and armor stone for the offshore breakwaters is as follows:

Stone placement limits are indicated in Sheets 4-8 of Appendix C.

22. Beach Fill Specifications.

The beach fill sand consists of medium grained, reasonably well-graded, sound, hard, durable, natural sand particles or crushed conglomerate. The sand is clean and free of organics, clay, deleterious or other foreign or objectionable material. Sand contains no more than 20 percent flat or elongated particles.

The gradation for beach fill is as shown in Figure 2.

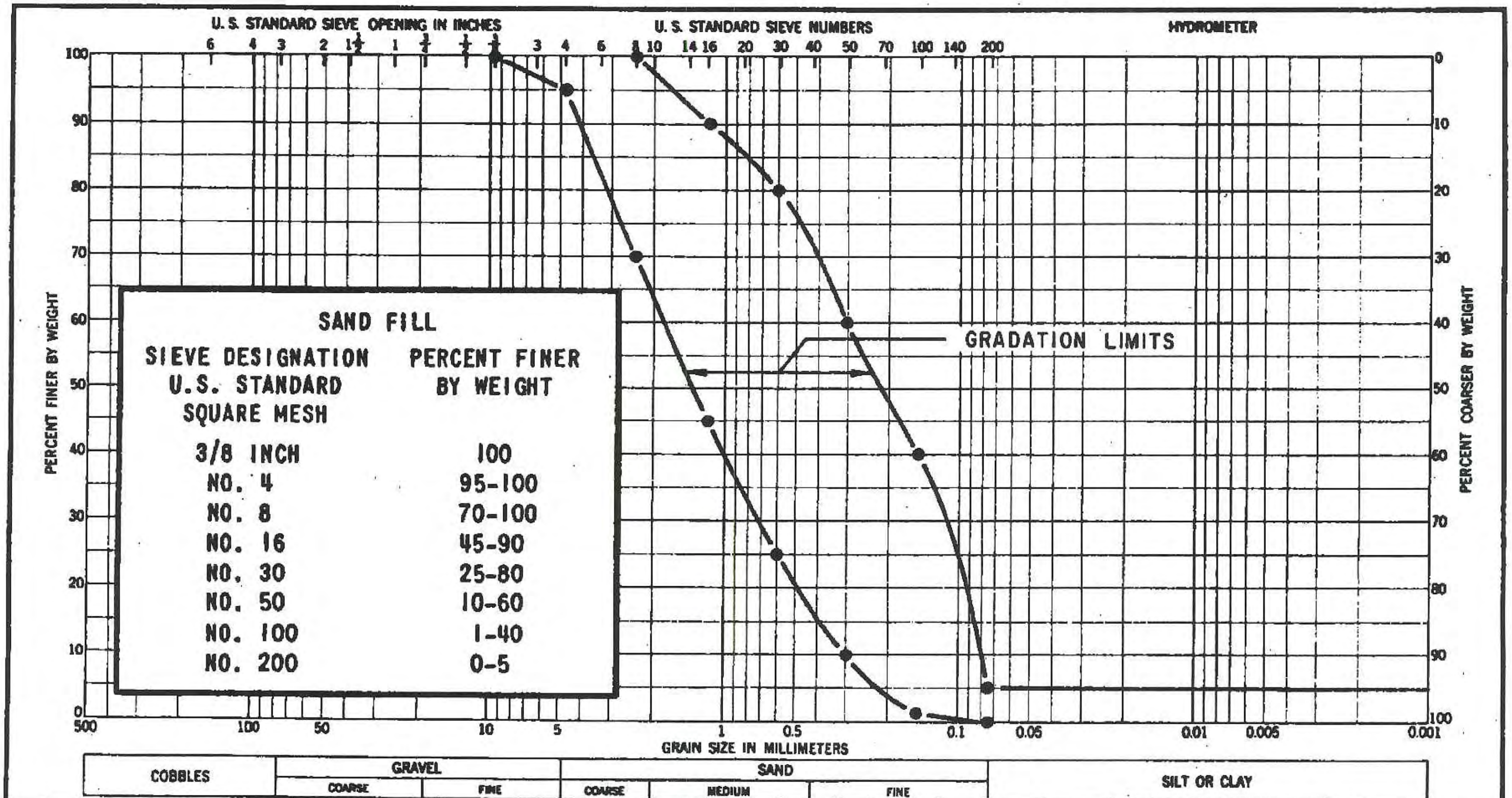
23. Sources of Material.

The types and sizes of stone and beach fill used during the initial construction will be generally required for any repair work. The original sources for these materials, is herein given for possible future interest.

Brough Stone Co.; quarry at West Millgrove, OH; B-1/2 (Breakwater Underlayer)

Erie Sand and Gravel Co.; stockpile at Lorain, OH; (sandfill)

Standard Slag Co.; quarry at Marblehead, OH; A5, A-3.5, A3, A2, A.2, B-1/2, B.1, C. (All stone sizes).



SAND FILL

SIEVE DESIGNATION U.S. STANDARD SQUARE MESH	PERCENT FINER BY WEIGHT
3/8 INCH	100
NO. 4	95-100
NO. 8	70-100
NO. 16	45-90
NO. 30	25-80
NO. 50	10-60
NO. 100	1-40
NO. 200	0-5

Sample No.	Elev or Depth	Classification	Nat w %	LL	PL	PI

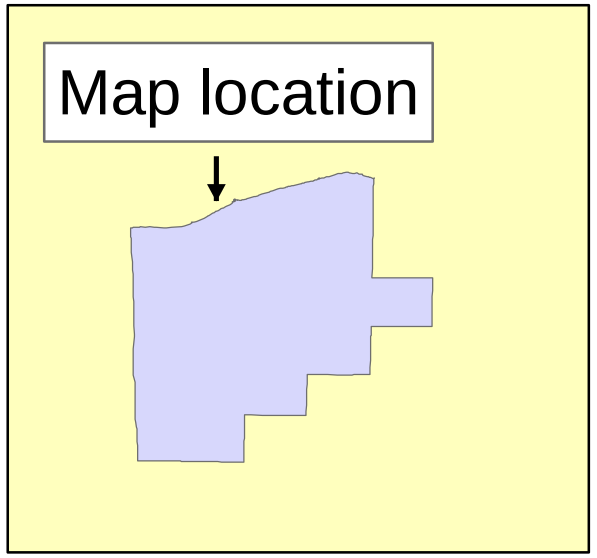
Project LAKEVIEW PARK
LORAIN, OHIO
Area SAND FILL
Boring No.
Date

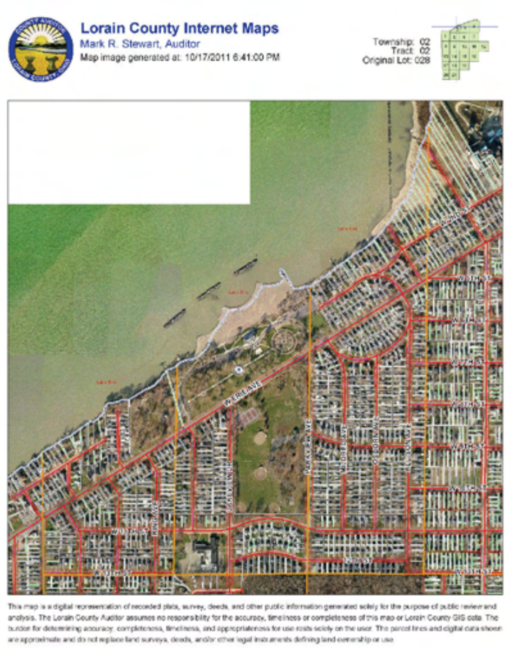
GRADATION CURVES

ENG FORM 1 MAY 63 2087

FIGURE 2

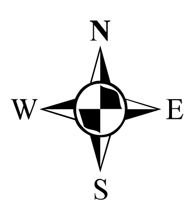
GPO 926-250





Legend

- ▲ CSO SSO Locations
- ● Sampling Locations 2011
- — Stream



Lakeview Beach Area

Public Health
Prevent. Promote. Protect.
Northeast Ohio Public Health Partnership

Cuyahoga County Board of Health
PREVENT • PROMOTE • PROVIDE™

By Timothy A. Gourley, R.S., M.P.H.
Coordinate System: GCS North American 1983
Datum: North American 1983
Units: Degree
Path: C:\Documents and Settings\tgourley\My Documents\beach survey 2011\Lakeview.mxd


WEST BEACH
11/02/2011


WELCOME
TO
LAKEVIEW
BEACH
PARK
HAZARD LEVELS
One Yellow Flag-Medium
One Red Flag-High
Two Red Flags-Water Closed
LIFEGUARD ON DUTY
June 11 thru August 21
12 noon to 6pm
ONLY


11/02/2011