

Fact Sheet for Antidegradation Assessment
For North Shore Water Reclamation District
IEPA Log No. C-0209-19
COE Log No. LRC-2014-788
Contact: Angie Sutton 217/558-2012
Public Notice Start Date: November 19, 2019

North Shore Water Reclamation District (“Applicant”) has applied for a 401 Water Quality Certification for impacts associated with the Lakefront Interceptor Protection project in Highland Park, 0.5 miles north of Rosewood Park Beach on Lake Michigan in Highland Park, Lake County, Illinois. The project site is 915 feet of Lake Michigan shoreline in the Southeast quadrant of Section 25, Range 12E, Township 43N. The project site is presently characterized by 60-foot high bluffs fronted by narrow beaches. A ravine tributary also exists near the southern end of the site but is located above the normal water level of the lake with only an ephemeral connection to the lake. Any scour from the ravine tributary has been determined not to significantly impact the sewer pipe. In addition, there are six steel sheet pile groins, a steel sheet pile bulkhead wall at the toe of the bluff and the sanitary sewer present on the site. The sanitary sewer pipe is a buried pipe encased by two parallel steel sheet pile walls and a concrete cap which is currently exposed and susceptible to damage from erosion and scour, downcutting, waves and ice. Pipe rupture as a result of damage would result in the discharge of raw sewage into Lake Michigan in the vicinity of public beaches and water intake locations that ultimately serve potable water needs. There would also be an extended period of time in which sanitary services would be interrupted. The proposed project allows for construction of a design concept to provide protection to the existing sanitary sewer interceptor system buried in the beach running parallel to the shore. Wave attack and lakebed downcutting protection would be provided to the sanitary sewer interceptor system and in turn, limit the risk of failure by expanding and stabilizing the beach cells in front of the interceptor system. The proposed offshore breakwaters would include three T-shaped offshore breakwaters 110-120 feet long, two detached breakwaters 70-80 feet long, and one detached groin 60 feet in length. All structures would consist of armor, filter and core stone. There are currently six steel sheet pile structures (5 groins stabilizing the beach and one wall at the bluff toe) that will be removed or cut off below the beach surface elevation. An existing nearshore rubble mound will be salvaged and incorporated into the design and beach nourishment of 5000 cubic yards of sand fill will be used to create beach cells. The beach fill in combination with 22,590 tons of quarried stone breakwaters and groins, are expected to effectively protect the interceptor system. The area of Lake Michigan beneath the ordinary high-water mark (OHWM) that would be filled for the proposed interceptor protection program is approximately 1.18 acres. Mitigation will be provided by the overall beach improvements from construction as well as construction of habitat enhancements in the form of submerged sill and fish spawning shelves to provide a total of 1.3 acres of enhanced habitat.

Information used in this review was obtained from the draft USACE notice and application documents dated, August 28, 2018, August 15, 2019, August 19, 2019 and August 30, 2019.

Identification and Characterization of the Affected Water Body.

Lake Michigan has 0 cfs of flow during critical 7Q10 low-flow conditions. Lake Michigan is classified as a Lake Michigan Basin Use Water. Lake Michigan is not listed as a biologically significant stream in the 2008 Illinois Department of Natural Resources Publication *Integrating Multiple Taxa in a Biological Stream Rating System*, nor is it given an integrity rating in that document. Rosewood Beach, Waterbody Segment IL_QJ, is listed on the draft 2016 Illinois Integrated Water Quality Report and Section 303(d) List as impaired for fish consumption use with potential causes given as mercury and polychlorinated biphenyls and for primary contact use with potential cause given as E-coli. A Total Maximum Daily Load (TMDL) Report has been prepared and approved by the USEPA for 51 beaches along Illinois’ Lake Michigan shoreline to address Primary Contact Use Recreation impairments due to excess bacteria. The proposed activity occurs within an area identified by the May 15, 2013 report, approved July 31, 2013,

“Shoreline Segments in Suburban Lake County, Illinois” as a Beach Protection Area and is therefore subject to this TMDL.

Identification of Proposed Pollutant Load Increases or Potential Impacts on Uses.

The pollutant load increases that would occur from this project include some possible increases in total suspended solids. These increases are a normal and unavoidable result of the placement of armor stone breakwaters, groin and sand and impact of wave activity on the newly placed sand. The sand would be obtained from a local approved quarry and quarried stone materials will be screened to eliminate fines. There may also be some temporary increases from cutting off the existing steel sheet pile groins below the beach surface. The existing benthic habitat would be temporarily disturbed by beach fill and structure construction activities but impacts to the aquatic life uses of this area are anticipated to be temporary during sand placement and construction and will recover once construction ceases. A small ravine drains to the beach within the project site but drains naturally through the sand with no engineered outfall. Construction is not expected to change loading that comes from the ravine. Gulls were reported as the primary source of bacterial contamination on Rosewood Beach on the TMDL report. Improvements may increase gulls at the site by providing open sand and as a result, favorable foraging and habitat for gulls. Monitoring the gull population and placing signs discouraging feeding may be necessary.

According to the U.S. EPA approved TMDL for *E. coli* within Lake Michigan along shoreline segments in Lake County, bacteria may be harbored at higher levels within embayment structures designed to catch and retain littoral sand. The Highland Park lakefront may exhibit similar characteristics due to its general orientation with respect to lake currents.

Fate and Effect of Parameters Proposed for Increased Loading.

The increase in total suspended solids would be local and temporary. The existing aquatic life use in the shallow, nearshore zone will be temporarily be disturbed, but will recover over time. The structures will also be constructed with marine-based equipment as access from Rosewood Beach will not be allowed, and access from the north is not possible. Beach cells will be filled to their maximum capacity plus 20% to compensate for formation of bypassing shoals. The proposed structures and beach fill will prevent further undermining of the pipe encasement structure by significantly reducing wave heights at the structure, mitigating the risk of pipe failure and associated discharge of sewage. The applicant has proposed compensatory mitigation in the form of construction of habitat enhancements. Submerged sill habitats would span the gap between the offshore breakwaters to provide 0.07 acres of enhanced habitat. The fish spawning shelf would be constructed from 4 to 8-inch stone on the backslope of the offshore breakwaters placed in a three-tiered shelf. The shelf would be constructed over the offshore breakwater so as not to affect the durability of the structure. The fish spawning shelves would provide 0.06 acres of enhanced habitat.

Purpose and Social & Economic Benefits of the Proposed Activity.

Currently the sanitary sewage interceptor system is exposed to wave attack and lakebed downcutting. Continued exposure during periods of high-water levels is expected to decrease the durability and stability of the protection system. This project has created a design concept to protect the system and maintain it through the implementation of monitoring surveys in the future.

Assessments of Alternatives for Less Increase in Loading or Minimal Environmental Degradation.

The Applicant has provided the following alternatives taking into consideration level of protection, lake access, cost, maintenance requirements, project footprint and property owner preference:

Alternative 1-Nearshore Berm :

Alternative 1 consists of a 915-foot long armor stone berm constructed immediately lakeward of the sanitary sewer and the placement of sand fill behind the berm. This berm would consist of approximately 16,600 tons of armor, filter and core stone and would cover approximately 0.66 acres below the Ordinary High-Water Mark (OHWM). Crest elevation would be +9.0 feet LWD. The existing near shore rubblemound would be incorporated into the design and beach nourishment (2500 cubic yards of fill) would create a continuous beach behind the armor stone berm. This alternative ranked last when comparing the 6 evaluation factors.

Alternative 2 – Offshore Breakwaters:

Alternative 2 consists of four detached armor stone breakwaters ranging in length from 80 to 120 feet and constructed from 8430 tons of armor, filter and core stone. The plan also includes one nearshore armor stone revetment 160 feet long constructed of 2875 tons of armor, filter and core stone and one shore tied hooked groin 200 feet long constructed of 4200 tons of armor, filter and core stone. Crest elevation would be +9.0 feet LWD. The detached breakwaters will tie into the existing steel sheet pile groins and the existing nearshore rubblemound will be incorporated into the design. Structures will be founded on the shallow clay subsurface. The toe design would protect the structure from future expected downcutting. The berms and groins would cover approximately 0.95 acres below the Ordinary High-Water Mark (OHWM). Beach nourishment (5000 cubic yards of fill) will be utilized to create the beach cells. This alternative ranked second when comparing the 6 evaluation factors.

Alternative 3 (Preferred Alternative) – Offshore Breakwaters (Refined Concept):

Alternative 3 is a concept that was modified to address comments by landowners to reduce potential impacts on adjacent shorelines. This alternative consists of three T-shaped armor stone breakwaters, 110 to 120 feet in length and constructed from 14,000 tons of armor, filter and core stone. The plan also includes 2 detached breakwaters, 70 to 80 feet in length, constructed of 6300 tons of armor, filter and core stone, and a 60-foot detached groin consisting of approximately 2200 tons of armor, filter and core stone. The existing nearshore rubblemound will be salvaged and incorporated into the design. Breakwater crest elevation will be +9 feet LWD and groin elevation will be +6.5 ft LWD. The breakwaters and groins would cover approximately 1.18 acres below the Ordinary High-Water Mark (OHWM). Beach nourishment (5000 cubic yards of fill) will be utilized to create the beach cells. This alternative ranked first when comparing the 6 evaluation factors, and was the alternative chosen. The design will accomplish the goal of providing wave attack and lakebed downcutting protection to the sanitary sewer interceptor system and limit the risk of failure. This protection is provided by the expansion and stability of the nearshore beach cells in front of the interceptor system.

Alternative 4 – Parallel Sheet Pile Walls with Concrete Cap

Alternative 4 consists of new steel sheet piling driven on both sides of the existing interceptor structure, with a new concrete cap spanning between the two walls. 15-foot lengths of heavy gauge sheet piling on the lakeside face would be utilized to address high abrasion rates and provide lateral stability. On the landside face, 8 feet of a lighter gauge section would be used to prevent undermining in the event of excessive scour, and to assist in restraining the cap. Interlocking concrete blocks would be installed to provide a 1.33-foot thick cap on the structure. The blocks would prevent erosion of fill materials by wave and ice action. The structure would cover 0.23 acres of lakebed.

Summary Comments of the Illinois Department of Natural Resources, Regional Planning Commissions, Zoning Boards or Other Entities.

On August 19, 2019, the IDNR EcoCAT review was initiated for the project area. The review identified protected resources that may be in the vicinity of the project site, but IDNR evaluated the information and determined that adverse effects are unlikely. IDNR terminated the consultation on August 19, 2019. This project was also reviewed for cultural resource impacts and was determined to be in compliance with the Illinois State Historic Resources Preservation Act.

Agency Conclusion.

This preliminary assessment was conducted pursuant to the Illinois Pollution Control Board regulation for Antidegradation found at 35 Ill. Adm. Code 302.105 (antidegradation standard) and was based on the information available to the Agency at the time this assessment was written. We tentatively find that the proposed activity would result in the attainment of water quality standards; that all technically and economically reasonable measures to avoid or minimize the extent of the proposed increase in pollutant loading have been incorporated into the proposed activity, and that this activity would benefit the Highland Park Lakefront by providing protection to the sanitary sewer interceptor system from severe wave attack and lakebed downcutting. Comments received during the 401 Water Quality Certification public notice period will be evaluated before a final decision is made by the Agency.