JOINT APPLICATION FORM FOR ILLINOIS

ITEMS 1 AND 2 FOR AGENCY USE

1. Application Number	2. Date Received

3. and 4. (SEE SPECIAL INSTRUCTIONS) NAME, MAILING ADDRESS AND TELEPHONE NUMBERS

3a. Applicant's Name	3b. Co-Applicant/Property Owner Name (if needed or if different from applicant)	4. Authorized Agent (an agent is not required)
Illinois Department of Natural Resources Company Name (if any) Illinois Department of Natural Resources Address Email Address	Company Name (if any) Address Email Address	Christopher Devick Company Name (if any) SmithGroup, Inc. Address 44 East Mifflin St. Suite 500, Madison, WI. Email Address Chris.Devick@smithgroup.com
Applicant's Phone Nos. w/area code Business: Residence: Cell: Fax:	Applicant's Phone Nos. w/area code Business: Residence: Cell: Fax:	Agent's Phone Nos. w/area code Business: (608) 421 7321 Residence: Cell: Fax:

STATEMENT OF AUTHORIZATION

I hereby authorize, _____ to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

_____ Applicant's Signature

_____ Date

5. ADJOINING PROPERTY OWNERS (Upstream and Downstream of the water body and within Visual Reach of Project)

Name	Mailing Address	Phone No. w/area code
a.Illinois Department of Conservation.	0 Oakshore Dr Winthrop Harbor, 60096	
b. Lake County Public Water District	0 17th St. Zion, 60099	
c. Exelon Generation Company LLC	101 Shiloh Blvd. Zion, 60099	
d. Delaware Johns-Manville Corporation	1831 N Pershing Rd., Waukeegan, Il.	

6. PROJECT TITLE:
Illinois Beach State Park Shoreline Stabilization

7. PROJECT LOCATION

LATITUDE: 42.466° LONGITUDE: -87.810°	UTMs Northing: 4697200.77 Easting: 433774.31				
STREET, ROAD, OR OTHER DESCRIPTIVE LOCATION 300 Lake Front Drive, Zion, Il	LEGAL DESCRIPT	QUARTER NW 1/4	SECTION 11	TOWNSHIP NO. 46	RANGE 12
☒ IN OR ☐ NEAR CITY OF TOWN (check appropriate box) Municipality Name Zion, Illinois	WATERWAY Lake Michigan			RIVER MILE (if applicable)	

COUNTY	STATE	ZIP CODE		
Lake	Illinois	60099		

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☐ Corps of Engineers ☐ IL Dept of Natural Resources ☐ IL Environmental Protection Agency ☐ Applicant's Copy

8. PROJECT DESCRIPTION (Include all features): The project consists of a new shoreline protection and stabilization system that includes shore attached and offshore breakwaters, sand nourishment and habitat structures to protect critical infrastructure and reduce natural shoreline transitory processes. See attachement for Block 8 Project Description.

9. PURPOSE AND NEED OF PROJECT: The Illinois Beach State Park represents the final remaining natural, undeveloped lakefront in Illinois and has long experienced erosion of its shoreline. Because of the geologic origin of the park, the shoreline is transient by nature, and if left unprotected, would naturally erode completely over time. The purpose of the project is to build structures that were designed to address the shoreline erosion and stabilize the shoreline protecting critical infrastructure and habitat for dozens of endangered species that live in the park.

COMPLETE THE FOLLOWING FOUR BLOCKS IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

10. REASON(S) FOR DISCHARGE: To maintain the character of the park's natural shoreline, a beach nourishment with sand similar to the native sand will be performed. Additionally, rock breakwaters will be placed offshore to reduce the incoming wave energy and stabilize the shoreline.

11. TYPE(S) OF MATERIAL BEING DISCHARGED AND THE AMOUNT OF EACH TYPE IN CUBIC YARDS FOR WATERWAYS:

TYPE: Rock and sand

AMOUNT IN CUBIC YARDS: 64,920 and 112,600 respectively.

12. SURFACE AREA IN ACRES OF WETLANDS OR OTHER WATERS FILLED (See Instructions)

4.7 acres of open water to be filled with rock for the breakwater structures. Material will be placed by barge mounted construction equipment (cranes, excavators, front end loaders, etc.). 16.8 acreas of the shoreline and near shore area to be filled with sand for the sand nourishment. Material will be placed by pumping from an off shore barge and truck fromm the landside, grading of placed sand will be carried out by earthmoving construction equipment (loaders, graders, bulldozers, etc.)

13. DESCRIPTION OF AVOIDANCE, MINIMIZATION AND COMPENSATION (See instructions)

See attachment for Block 13 Description of Avoidance, Minimization and Compensation

14. Date activity is proposed to commence 10/2021			Date activity is expected to be completed 10/2023		
15. Is any portion of the activity for which authorization is sought now complete? Month and Year the activity was completed	Yes	☐	No	☒	NOTE: If answer is "YES" give reasons in the Project Description and Remarks section. Indicate the existing work on drawings.

16. List all approvals or certification and denials received from other Federal, interstate, state, or local agencies for structures, construction, discharges or other activities described in this application.

Issuing Agency	Type of Approval	Identification No.	Date of Application	Date of Approval	Date of Denial

17. CONSENT TO ENTER PROPERTY LISTED IN PART 7 ABOVE IS HEREBY GRANTED.	Yes	No

18. APPLICATION VERIFICATION (SEE SPECIAL INSTRUCTIONS)

Application is hereby made for the activities described herein. I certify that I am familiar with the information contained in the application, and that to the best of my knowledge and belief, such information is true, complete, and accurate. I further certify that I possess the authority to undertake the proposed activities.

Signature of Applicant or Authorized Agent — Date

Signature of Applicant or Authorized Agent — Date

Signature of Applicant or Authorized Agent

Date

☐ Corps of Engineers ☐ IL Dept of Natural Resources ☐ IL Environmental Protection Agency ☐ Applicant's Copy

Revised 2011

SEE INSTRUCTIONS FOR ADDRESS

LOCATION MAP

SEE ATTACHED PLAN SET

Revised 2011

☐ Corps of Engineers ☐ IL Dept of Natural Resources ☐ IL Environmental Protection Agency ☐ Applicant's Copy

PLAN VIEW

SEE ATTACHED PLAN SET

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Revised 2011

☐ Corps of Engineers ☐ IL Dept of Natural Resources ☐ IL Environmental Protection Agency ☐ Applicant's Copy

SMITHGROUP

MEMORANDUM
www.smithgroup.com

PROJECT	Illinois Beach State Park shoreline Stabilization	DATE	4/29/2021
PROJECT NO.	12324		
PROJECT LOCATION	Zion, IL		
SUBJECT	Joint Permit Application Supplementary Information		
PREPARED BY	Chris Devick		

DISTRIBUTION

NAME	COMPANY	EMAIL	PHONE

Block 8 Project Description (include all features)
The project consists of a new shoreline protection and stabilization system that includes offshore breakwaters, shore attached breakwaters, sand nourishment and habitat structures to protect critical infrastructure and reduce natural shoreline transitory processes. The breakwaters consist of a combination of 10 emergent and partially submerged rock structures. The breakwaters are proposed to be placed on existing lakebed without excavation of the existing grades. Each breakwater consists of a either a 2-layer stone design, consisting of a filter and armor layer, or a 3-layer stone design, consisting of a core, filter and armor stone layer. Core, filter and Armor stone sizes are provided in the attached plans.

The dimensions of the breakwaters vary based on existing lakebed grades and breakwater type. In general the breakwaters range in length from 150 feet to 460 feet with crest elevations of the breakwaters varying between 580 feet IGLD 85 and 587 feet IGLD85. Partially submerged breakwaters have a lower crest elevation reducing visual impacts, but require a wider footprint to provide the same level of protection as the taller fully emergent breakwaters. Breakwaters range in overall width from 45 feet to 103 feet and crest width from 14 feet to 28 feet.

Sand nourishment consists of beach quality sand whose gradation considers native material gradation, wave environment, recreational and habitat goals. Sand nourishment extends from the existing shoreline at an elevation of 580 feet IGLD 85 lakeward by a width of up to 180 feet, then sloping to existing lake bed at a slope of 15:1 (horizontal:vertical). Sand nourishment is proposed to occur along 0.62 miles of shoreline to create a stable shoreline over the design life of the project.

Habitat structures will consist of a mix of habitat types including aquatic habitat for Perch and mud puppy) and Avian habitat for the Caspian and Common Tern. Habitat features will be used to increase the diversity of a habitat within the project area. To offer maximum benefit from a habitat perspective, the breakwater shapes are curvilinear to increase the total length of “edges” A few localized pockets of more exaggerated features such as long fingers, forming semi enclosed habitat

"fish streets" were included. The cross sections of the breakwaters are allowed and encouraged to be variable in height and width to emulate a more natural formed feature. Breakwaters have emergent crest surfaces conducive to attracting and nesting of targeted avian species and provide lee side sheltered pool areas and may have shallow benches, ledges and overhanging slabs.

Block 13 Description of Avoidance, Minimization and Compensation
Design of the breakwaters and sand nourishment evaluated a series of alternatives to minimize the impacts to Lake Michigan while still meeting project goals for shoreline stabilization, protection of critical infrastructure and habitat. Alternatives analysis used numerical and physical modeling of the littoral transport and breakwater performance to identify design changes to reduce the overall size and dimensions of the breakwaters and sand placement to the minimum required. Alternative evaluation and physical model testing of structures and sand are detailed in Attachments A and B.

Sand nourishment is designed to work with the native sediments and provide environmental benefits as opposed to recreational value. Each area does have recreational access and use but the areas take into account environmental benefits. Project goals for the sand nourishment relate to limiting the erosion of the shoreline over the design life but not hold the shoreline in a static position. Littoral transport and project goals for the project are described in Attachment A-D. Based on the littoral analysis conducted a proposed mitigation of pre-fill of sand material for impacts to alongshore littoral transport is approximately 4,375 CY, including a 25% increase above the impact to the littoral transport.

During construction discharge of sand via barge and pumping will incorporate appropriate measures such as training berms at the landside discharge location to limit the turbidity of water re-entering the lake, it is not anticipated that turbidity curtains will be needed as standard placement practices for beach nourishment and grain sizes should limit the turbidity of water re-entering Lake Michigan. If at the time of construction turbidity levels re-entering Lake Michigan are considered potentially detrimental then other management measures such as turbidity curtains will be required.

Habitat structures will be included in the project to increase habitat types within the lake as well as along the shoreline. These structures may include various types as described in Attachment C.

Attachments:
Attachment A: Illinois Beach State Park Shoreline Morphology Analysis & Stabilization Options September 2019.
Attachment B: Illinois Beach State Park Shoreline Stabilization Physical Modeling Summary (including Lake Michigan Beach protection 2D Physical Modeling final report and Lake Michigan Beach Protection 3D Physical Model final report)
Attachment C: Basis of Design February 2021
Attachment D: Littoral Drift Study April 2021

(ATTACHMENTS ARE NOT INCLUDED WITH THE PERMIT APPLICATION AS THEY ARE A PART OF THE CONTRACT DOCUMENTS)

JOINT APPLICATION FORM FOR ILLINOIS

ITEMS 1 AND 2 FOR AGENCY USE

1. Application Number	2. Date Received

3. and 4. (SEE SPECIAL INSTRUCTIONS) NAME, MAILING ADDRESS AND TELEPHONE NUMBERS

3a. Applicant's Name	3b. Co-Applicant/Property Owner Name (if needed or if different from applicant)	4. Authorized Agent (an agent is not required)
Illinois Department of Natural Resources Company Name (if any) Address Email Address	Company Name (if any) Address Email Address	Christopher Devick Company Name (if any) SmithGroup, Inc. Address 44 East Mifflin St. Suite 500, Madison, WI. Email Address Chris.Devick@smithgroup.com
Applicant's Phone Nos. w/area code Business: Residence: Cell: Fax:	Applicant's Phone Nos. w/area code Business: Residence: Cell: Fax:	Agent's Phone Nos. w/area code Business: (608) 421 7321 Residence: Cell: Fax:

STATEMENT OF AUTHORIZATION

I hereby authorize, _____ to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

_____ Applicant's Signature

_____ Date

5. ADJOINING PROPERTY OWNERS (Upstream and Downstream of the water body and within Visual Reach of Project)

Name	Mailing Address	Phone No. w/area code
a.Illinois Department of Conservation.	0 Oakshore Dr Winthrop Harbor, 60096	
b. Lake County Public Water District	0 17th St. Zion, 60099	
c. Exelon Generation Company LLC	101 Shiloh Blvd. Zion, 60099	
d. Delaware Johns-Manville Corporation	1831 N Pershing Rd., Waukeegan, Il.	

6. PROJECT TITLE:
Illinois Beach State Park Shoreline Stabilization

7. PROJECT LOCATION

LATITUDE: 42.466° LONGITUDE: -87.810°	UTMs Northing: 4697200.77 Easting: 433774.31				
STREET, ROAD, OR OTHER DESCRIPTIVE LOCATION 300 Lake Front Drive, Zion, Il	LEGAL DESCRIPT	QUARTER NW 1/4	SECTION 11	TOWNSHIP NO. 46	RANGE 12
☒ IN OR ☐ NEAR CITY OF TOWN (check appropriate box) Municipality Name Zion, Illinois	WATERWAY Lake Michigan				RIVER MILE (if applicable)

COUNTY	STATE	ZIP CODE		
Lake	Illinois	60099		

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☐ Corps of Engineers ☐ IL Dept of Natural Resources ☐ IL Environmental Protection Agency ☐ Applicant's Copy

8. PROJECT DESCRIPTION (Include all features): The project consists of a new shoreline protection and stabilization system that includes offshore breakwaters, sand nourishment and habitat structures to protect critical infrastructure and reduce natural shoreline transitory processes. See attachement for Block 8 Project Description.

9. PURPOSE AND NEED OF PROJECT: The Illinois Beach State Park represents the final remaining natural, undeveloped lakefront in Illinois and has long experienced erosion of its shoreline. Because of the geologic origin of the park, the shoreline is transient by nature, and if left unprotected, would naturally erode completely over time. The purpose of the project is to build structures that were designed to address the shoreline erosion and stabilize the shoreline protecting critical infrastructure and habitat for dozens of endangered species that live in the park.

COMPLETE THE FOLLOWING FOUR BLOCKS IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

10. REASON(S) FOR DISCHARGE: To maintain the character of the park's natural shoreline, a beach nourishment with sand similar to the native sand will be performed. Additionally, rock breakwaters will be placed offshore to reduce the incoming wave energy and stabilize the shoreline.

11. TYPE(S) OF MATERIAL BEING DISCHARGED AND THE AMOUNT OF EACH TYPE IN CUBIC YARDS FOR WATERWAYS:

TYPE: Rock and sand

AMOUNT IN CUBIC YARDS: 45,100 and 88,600 respectively.

12. SURFACE AREA IN ACRES OF WETLANDS OR OTHER WATERS FILLED (See Instructions)

3.7 acres of open water to be filled with rock for the breakwater structures. Material will be placed by barge mounted construction equipment (cranes, excavators, front end loaders, etc.). 15.2 acreas of the shoreline and near shore area to be filled with sand for the sand nourishment. Material will be placed by pumping from an off shore barge and truck fromm the landside, grading of placed sand will be carried out by earthmoving construction equipment (loaders, graders, bulldozers, etc.)

13. DESCRIPTION OF AVOIDANCE, MINIMIZATION AND COMPENSATION (See instructions)

See attachment for Block 13 Description of Avoidance, Minimization and Compensation

14. Date activity is proposed to commence: 10/2021

Date activity is expected to be completed: 10/2023

15. Is any portion of the activity for which authorization is sought now complete? Yes ☐ No ☒

NOTE: If answer is "YES" give reasons in the Project Description and Remarks section.

Month and Year the activity was completed

Indicate the existing work on drawings.

16. List all approvals or certification and denials received from other Federal, interstate, state, or local agencies for structures, construction, discharges or other activities described in this application.

Issuing Agency	Type of Approval	Identification No.	Date of Application	Date of Approval	Date of Denial

17. CONSENT TO ENTER PROPERTY LISTED IN PART 7 ABOVE IS HEREBY GRANTED. Yes No

18. APPLICATION VERIFICATION (SEE SPECIAL INSTRUCTIONS)

Application is hereby made for the activities described herein. I certify that I am familiar with the information contained in the application, and that to the best of my knowledge and belief, such information is true, complete, and accurate. I further certify that I possess the authority to undertake the proposed activities.

Signature of Applicant or Authorized Agent

Date

Signature of Applicant or Authorized Agent	Date
Signature of Applicant or Authorized Agent	Date

☐ Corps of Engineers Revised 2011 ☐ IL Dept of Natural Resources ☐ IL Environmental Protection Agency ☐ Applicant's Copy

SEE INSTRUCTIONS FOR ADDRESS

LOCATION MAP

SEE ATTACHED PLAN SET

Revised 2011

☐ Corps of Engineers ☐ IL Dept of Natural Resources ☐ IL Environmental Protection Agency ☐ Applicant's Copy

PLAN VIEW

SEE ATTACHED PLAN SET

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SMITHGROUP

MEMORANDUM
www.smithgroup.com

PROJECT	Illinois Beach State Park Shoreline Stabilization	DATE	4/29/2021
PROJECT NO.	12324		
PROJECT LOCATION	Zion, IL		
SUBJECT	Joint Permit Application Supplementary Information		
PREPARED BY	Chris Devick		

DISTRIBUTION

NAME	COMPANY	EMAIL	PHONE

Block 8 Project Description (include all features)
The project consists of a new shoreline protection and stabilization system that includes offshore breakwaters, shore attached breakwaters, sand nourishment, habitat structures and the Kellog creek outlet control structure to protect critical infrastructure and reduce natural shoreline transitory processes. The breakwaters consist of a combination of 7 emergent and partially submerged rock structures. The breakwaters are proposed to be placed on existing lakebed without excavation of the existing grades. Each breakwater consists of a either a 2-layer stone design, consisting of a filter and armor layer, or a 3-layer stone design, consisting of a core, filter and armor stone layer. Core, filter and Armor stone sizes are provided in the attached plans.

The dimensions of the breakwaters vary based on existing lakebed grades and breakwater type. In general the breakwaters range in length from 275 feet to 540 feet with crest elevations of the breakwaters varies between 580 feet IGLD 85 and 587 feet IGLD 85. Partially submerged breakwaters have a lower crest elevation reducing visual impacts, but require a wider footprint to provide the same level of protection as the taller fully emergent breakwaters. Breakwaters range in overall width from 52 feet to 76 feet and crest width from 12 feet to 28 feet.

Sand nourishment consists of beach quality sand whose gradation considers native material gradation, wave environment, recreational and habitat goals. Sand nourishment extends from the existing shoreline at an elevation of 585 feet IGLD 95 lakeward by a width of up to 125 feet, then sloping to existing lake bed at a slope of 15:1 (horizontal:vertical). Sand nourishment is proposed to occur along 0.67 miles of shoreline to create a stable shoreline over the design life of the project.

Habitat structures will consist of a mix of habitat types including aquatic habitat for Perch and mud pupp) and Avain habitat for the Caspian and Common Tern. Habitat features will be used to increase the diversity of a habitat within the project area. To offer maximum benefit from a habitat perspective, the breakwater shapes are curvilinear to increase the total length of “edges” A few localized pockets of more exaggerated features such as long fingers, forming semi enclosed habitat “fish streets”

were included. The cross sections of the breakwaters are allowed and encouraged to be variable in height and width to emulate a more natural formed feature. Breakwaters have emergent crest surfaces conducive to attracting and nesting of targeted avian species and provide lee side sheltered pool areas and may have shallow benches, ledges and overhanging slabs.

The Kellog Creek Outlet Control structure will be constructed of rock, concrete or steel sheet pile. The structure will extend offshore a total of 310 feet in a hooked shape and have a top of groin elevation of 585 feet IGLD85.

Block 13 Description of Avoidance, Minimization and Compensation
Design of the breakwaters and sand nourishment evaluated a series of alternatives to minimize the impacts to Lake Michigan while still meeting project goals for shoreline stabilization, protection of critical infrastructure and habitat. Alternatives analysis used numerical and physical modeling of the littoral transport and breakwater performance to identify design changes to reduce the overall size and dimensions of the breakwaters and sand placement to the minimum required. Alternative evaluation and physical model testing of structures and sand are detailed in Attachments A and B. Additionally alternatives analysis for the Kellog Creek Groin structure was conducted to minimize impact to alongshore littoral transport. Numerical and physical modeling of the structure were conducted to understand wave induced current patterns around the proposed structure. The selected design redirects along shore currents around the structure and at a higher velocity near the creek mouth which will result in a reduction of sediment deposition. While this shape results in less sediment capture against the structure it has a higher rate of bypassing which is better for the downdrift shoreline. See attachment X for a discussion of alternatives evaluated and modeling results for the Kellog Creek Structure.

Sand nourishment is designed to work with the native sediments and provide environmental benefits as opposed to recreational value. Each area does have recreational access and use but the areas take into account environmental benefits. Project goals for the sand nourishment relate to limiting the erosion of the shoreline over the design life but not hold the shoreline in a static position. Littoral transport and project goals for the project are described in Attachment A-D. Based on the littoral analysis conducted a proposed mitigation of pre-fill of sand material for impacts to alongshore littoral transport is approximately 4,375 CY, including a 25% increase above the impact to the littoral transport.

During construction discharge of sand via barge and pumping will incorporate appropriate measures such as training berms at the landside discharge location to limit the turbidity of water re-entering the lake, it is not anticipated that turbidity curtains will be needed as standard placement practices for beach nourishment and grain sizes should limit the turbidity of water re-entering Lake Michigan. If at the time of construction turbidity levels re-entering Lake Michigan are considered potentially detrimental then other management measures such as turbidity curtains will be required.

Habitat structures will be included in the project to increase habitat types within the lake as well as along the shoreline. These structures may include various types as described in Attachment C.

Attachments:
Attachment A: Illinois Beach State Park Shoreline Morphology Analysis & Stabilization Options September 2019.
Attachment B: Illinois Beach State Park Shoreline Stabilization Physical Modeling Summary (including Lake Michigan Beach protection 2D Physical Modeling final report and Lake Michigan Beach Protection 3D Physical Model final report)

Attachment C: Basis of Design February 2021
Attachment D: Littoral Drift Study April 2021

(ATTACHMENTS ARE NOT INCLUDED WITH THE PERMIT APPLICATION AS THEY ARE A PART OF THE CONTRACT DOCUMENTS)

JOINT APPLICATION FORM FOR ILLINOIS

ITEMS 1 AND 2 FOR AGENCY USE

1. Application Number	2. Date Received

3. and 4. (SEE SPECIAL INSTRUCTIONS) NAME, MAILING ADDRESS AND TELEPHONE NUMBERS

3a. Applicant's Name	3b. Co-Applicant/Property Owner Name (if needed or if different from applicant)	4. Authorized Agent (an agent is not required)
Illinois Department of Natural Resources Company Name (if any) Address Email Address	Company Name (if any) Address Email Address	Christopher Devick Company Name (if any) SmithGroup, Inc. Address 44 East Mifflin St. Suite 500, Madison, WI. Email Address Chris.Devick@smithgroup.com
Applicant's Phone Nos. w/area code Business: Residence: Cell: Fax:	Applicant's Phone Nos. w/area code Business: Residence: Cell: Fax:	Agent's Phone Nos. w/area code Business: (608) 421 7321 Residence: Cell: Fax:

STATEMENT OF AUTHORIZATION

I hereby authorize, _____ to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

_____ Applicant's Signature

_____ Date

5. ADJOINING PROPERTY OWNERS (Upstream and Downstream of the water body and within Visual Reach of Project)

Name	Mailing Address	Phone No. w/area code
a.Illinois Department of Conservation.	0 Oakshore Dr Winthrop Harbor, 60096	
b. Lake County Public Water District	0 17th St. Zion, 60099	
c. Exelon Generation Company LLC	101 Shiloh Blvd. Zion, 60099	
d. Delaware Johns-Manville Corporation	1831 N Pershing Rd., Waukeegan, Il.	

6. PROJECT TITLE:
Illinois Beach State Park Shoreline Stabilization

7. PROJECT LOCATION

LATITUDE: 42.466° LONGITUDE: -87.810°	UTMs Northing: 4697200.77 Easting: 433774.31				
STREET, ROAD, OR OTHER DESCRIPTIVE LOCATION 300 Lake Front Drive, Zion, Il	LEGAL DESCRIPT	QUARTER NW 1/4	SECTION 11	TOWNSHIP NO. 46	RANGE 12
☒ IN OR ☐ NEAR CITY OF TOWN (check appropriate box) Municipality Name Zion, Illinois	WATERWAY Lake Michigan				RIVER MILE (if applicable)

COUNTY	STATE	ZIP CODE		
Lake	Illinois	60099		

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8. PROJECT DESCRIPTION (Include all features): The project consists of a new shoreline protection and stabilization system that includes offshore breakwaters, sand nourishment and habitat structures to protect critical infrastructure and reduce natural shoreline transitory processes. See attachement for Block 8 Project Description.

9. PURPOSE AND NEED OF PROJECT: The Illinois Beach State Park represents the final remaining natural, undeveloped lakefront in Illinois and has long experienced erosion of its shoreline. Because of the geologic origin of the park, the shoreline is transient by nature, and if left unprotected, would naturally erode completely over time. The purpose of the project is to build structures that were designed to address the shoreline erosion and stabilize the shoreline protecting critical infrastructure and habitat for dozens of endangered species that live in the park.

COMPLETE THE FOLLOWING FOUR BLOCKS IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

10. REASON(S) FOR DISCHARGE: To maintain the character of the park's natural shoreline, a beach nourishment with sand similar to the native sand will be performed. Additionally, rock breakwaters will be placed offshore to reduce the incoming wave energy and stabilize the shoreline.

11. TYPE(S) OF MATERIAL BEING DISCHARGED AND THE AMOUNT OF EACH TYPE IN CUBIC YARDS FOR WATERWAYS:

TYPE: Rock and sand

AMOUNT IN CUBIC YARDS: 41,800 and 226,000 respectively.

12. SURFACE AREA IN ACRES OF WETLANDS OR OTHER WATERS FILLED (See Instructions)

3.5 acres of open water to be filled with rock for the breakwater structures. Material will be placed by barge mounted construction equipment (cranes, excavators, front end loaders, etc.). 23 acreas of the shoreline and near shore area to be filled with sand for the sand nourishment. Material will be placed by pumping from an off shore barge and truck fromm the landside, grading of placed sand will be carried out by earthmoving construction equipment (loaders, graders, bulldozers, etc.)

13. DESCRIPTION OF AVOIDANCE, MINIMIZATION AND COMPENSATION (See instructions)

See attachment for Block 13 Description of Avoidance, Minimization and Compensation

14. Date activity is proposed to commence: 10/2021

Date activity is expected to be completed: 10/2023

15. Is any portion of the activity for which authorization is sought now complete? Yes ☐ No ☒

NOTE: If answer is "YES" give reasons in the Project Description and Remarks section.

Month and Year the activity was completed

Indicate the existing work on drawings.

16. List all approvals or certification and denials received from other Federal, interstate, state, or local agencies for structures, construction, discharges or other activities described in this application.

Issuing Agency	Type of Approval	Identification No.	Date of Application	Date of Approval	Date of Denial

17. CONSENT TO ENTER PROPERTY LISTED IN PART 7 ABOVE IS HEREBY GRANTED. Yes No

18. APPLICATION VERIFICATION (SEE SPECIAL INSTRUCTIONS)

Application is hereby made for the activities described herein. I certify that I am familiar with the information contained in the application, and that to the best of my knowledge and belief, such information is true, complete, and accurate. I further certify that I possess the authority to undertake the proposed activities.

Signature of Applicant or Authorized Agent

Date

Signature of Applicant or Authorized Agent	Date
Signature of Applicant or Authorized Agent	Date

☐ Corps of Engineers Revised 2011 ☐ IL Dept of Natural Resources ☐ IL Environmental Protection Agency ☐ Applicant's Copy

SEE INSTRUCTIONS FOR ADDRESS

LOCATION MAP

SEE ATTACHED PLAN SET

PLAN VIEW

SEE ATTACHED PLAN SET

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SMITHGROUP

MEMORANDUM
www.smithgroup.com

PROJECT	Illinois Beach State Park Shoreline Stabilization	DATE	4/29/2021
PROJECT NO.	12324		
PROJECT LOCATION	Zion, IL		
SUBJECT	Joint Permit Application Supplementary Information		
PREPARED BY	Chris Devick		

DISTRIBUTION

NAME	COMPANY	EMAIL	PHONE

Block 8 Project Description (include all features)
The project consists of a new shoreline protection and stabilization system that includes offshore breakwaters, sand nourishment and habitat structures to protect critical infrastructure and reduce natural shoreline transitory processes. The breakwaters consist of a combination of 5 emergent, partially submerged and submerged rock structures. The breakwaters are proposed to be placed on existing lakebed without excavation of the existing grades. Each breakwater consists of a either a 2-layer stone design, consisting of a filter and armor layer, or a 3-layer stone design, consisting of a core, filter and armor stone layer. Core, filter and Armor stone sizes are provided in the attached plans.

The dimensions of the breakwaters vary based on existing lakebed grades and breakwater type. In general the breakwaters range in length from 350 feet to 620 feet with crest elevations of the breakwaters varying between 578 feet IGLD 85 and 578 feet IGLD 85. Partially submerged and submerged breakwaters have a lower crest elevation reducing visual impacts, but require a wider footprint to provide the same level of protection as the taller fully emergent breakwaters. Breakwaters range in overall width from 60 feet to 70 feet and crest width from 12 feet to 35 feet.

Sand nourishment consists of beach quality sand whose gradation considers native material gradation, wave environment, recreational and habitat goals. Sand nourishment extends from the existing shoreline at an elevation of585 feet IGLD 85 lakeward by a width of up to 140 feet, then sloping to existing lake bed at a slope of 15:1 (horizontal:vertical). Sand nourishment is proposed to occur along 0.78 miles of shoreline to create a stable shoreline over the design life of the project.

Habitat structures will consist of a mix of habitat types including aquatic habitat for Perch and mud pupp) and Avain habitat for the Caspian and Common Tern. Habitat features will be used to increase the diversity of a habitat within the project area. To offer maximum benefit from a habitat perspective, the breakwater shapes are curvilinear to increase the total length of “edges” A few localized pockets of more exaggerated features such as long fingers, forming semi enclosed habitat “fish streets”

were included. The cross sections of the breakwaters are allowed and encouraged to be variable in height and width to emulate a more natural formed feature. Breakwaters have emergent crest surfaces conducive to attracting and nesting of targeted avian species and provide lee side sheltered pool areas and may have shallow benches, ledges and overhanging slabs.

Block 13 Description of Avoidance, Minimization and Compensation
Design of the breakwaters and sand nourishment evaluated a series of alternatives to minimize the impacts to Lake Michigan while still meeting project goals for shoreline stabilization, protection of critical infrastructure and habitat. Alternatives analysis used numerical and physical modeling of the littoral transport and breakwater performance to identify design changes to reduce the overall size and dimensions of the breakwaters and sand placement to the minimum required. Alternative evaluation and physical model testing of structures and sand are detailed in Attachments A and B.

Sand nourishment is designed to work with the native sediments and provide environmental benefits as opposed to recreational value. Each area does have recreational access and use but the areas take into account environmental benefits. Project goals for the sand nourishment relate to limiting the erosion of the shoreline over the design life but not hold the shoreline in a static position. Littoral transport and project goals for the project are described in Attachment A-D. Based on the littoral analysis conducted a proposed mitigation of pre-fill of sand material for impacts to alongshore littoral transport is approximately 4,375 CY, including a 25% increase above the impact to the littoral transport.

During construction discharge of sand via barge and pumping will incorporate appropriate measures such as training berms at the landside discharge location to limit the turbidity of water re-entering the lake, it is not anticipated that turbidity curtains will be needed as standard placement practices for beach nourishment and grain sizes should limit the turbidity of water re-entering Lake Michigan. If at the time of construction turbidity levels re-entering Lake Michigan are considered potentially detrimental then other management measures such as turbidity curtains will be required.

Habitat structures will be included in the project to increase habitat types within the lake as well as along the shoreline. These structures may include various types as described in Attachment C.

Attachments:
Attachment A: Illinois Beach State Park Shoreline Morphology Analysis & Stabilization Options September 2019.
Attachment B: Illinois Beach State Park Shoreline Stabilization Physical Modeling Summary (including Lake Michigan Beach protection 2D Physical Modeling final report and Lake Michigan Beach Protection 3D Physical Model final report)
Attachment C: Basis of Design February 2021
Attachment D: Littoral Drift Study April 2021

(ATTACHMENTS ARE NOT INCLUDED WITH THE PERMIT APPLICATION AS THEY ARE A PART OF THE CONTRACT DOCUMENTS)