DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DIVISION, GREAT LAKES AND OHIO RIVER
CORPS OF ENGINEERS
550 MAIN STREET
CINCINNATI, OH 45202-3222

CELRD-PD-G

21 FEB 2013

MEMORANDUM FOR Commander, U.S. Army Engineer District, Chicago (Susanne Davis/CELRC-PM-PL), 111 N. Canal, Suite 600, Chicago, IL, 60606-7206

SUBJECT: Decision Document Review Plan for Illinois Shoreline Erosion, Interim III (Chicago Shoreline), Wilmette to Illinois/Indiana State Line

1. The attached Review Plan (RP) for Illinois Shoreline Erosion (Chicago Shoreline) was presented to the Great Lakes and Ohio River Division for approval in accordance with EC 1165-2-214 "Civil Works Review" dated 15 Dec 2012.

2. This Review Plan defines the scope and level of peer review for the Chicago Shoreline Post Authorization Change Report (PACR) intended to document changes in the project since authorization, reevaluate the economics of the project, and update the total project cost estimate. Development of the PACR is needed to seek reauthorization due to estimated total project cost reaching the authorized 902 limit.

3. The construction of the Illinois Shoreline Erosion, Interim III Wilmette to Illinois/Indiana State Line Project began in 1997 and design and construction responsibility was divided between the Corps and the Local Sponsor (LS) under the terms of the Local Cooperation Agreements. A current list of project segments in construction, in design, or completed is provided in the review plan.

4. The RP defines the scope and level of peer review for the activities to be performed for the subject project. The USACE LRD Review Management Organization (RMO) has reviewed the attached RP and concurs that it describes the scope of review for work phases and addresses all appropriate levels of review consistent with the requirements described in EC 1165-2-214.

5. I concur with the recommendations of the RMO and approve the enclosed RP for the Illinois Shoreline Erosion (Chicago Shoreline) project.

6. The District is requested to post the RP to its website. Prior to posting, the names of all individuals identified in the RP and the dollar values of all project costs should be removed.

7. If you have any questions please contact Dr. Hank Jarboe, CELRD-PDP, at (513) 684-6050.

ROBERT D. PETERSON
Colonel, USA
Acting Commander

Encl
Review Plan

REVIEW PLAN

ILLINOIS SHORELINE EROSION, INTERIM III
WILMETTE TO ILLINOIS/INDIANA STATE LINE

Chicago District

MSC Approval Date: Pending
Last Revision Date: 07 Feb 2013

US Army Corps
of Engineers ®

REVIEW PLAN

ILLINOIS SHORELINE EROSION, INTERIM III
WILMETTE TO ILLINOIS/INDIANA STATE LINE

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1. PURPOSE AND REQUIREMENTS

Purpose. This Review Plan defines the scope and level of peer review for the Illinois Shoreline Erosion, Interim III Wilmette to Illinois/Indiana State Line Project design and construction activities and Post Authorization Change Report (PACR).

a. References

(1) Engineering Circular (EC) 1165-2-209, Civil Works Review Policy, 31 Jan 2010
(2) EC 1105-2-412, Assuring Quality of Planning Models, 31 Mar 2011
(3) Engineering Regulation (ER) 1110-1-12, Quality Management, 30 Sep 2006
(4) ER 1105-2-100, Planning Guidance Notebook, Appendix H, Policy Compliance Review and Approval of Decision Documents, Amendment #1, 20 Nov 2007
(5) Chicago Shoreline Project Management Plan, March 2011

b. Requirements. This review plan was developed in accordance with EC 1165-2-209, which establishes an accountable, comprehensive, life-cycle review strategy for Civil Works products by providing a seamless process for review of all Civil Works projects from initial planning through design, construction, and operation, maintenance, repair, replacement and rehabilitation (OMRR&R). The EC outlines four general levels of review: District Quality Control/Quality Assurance (DQC), Agency Technical Review (ATR), Independent External Peer Review (IEPR), and Policy and Legal Compliance Review. In addition to these levels of review, decision documents are subject to cost engineering review and certification (per EC 1165-2-209) and planning model certification/approval (per EC 1105-2-412).

2. REVIEW MANAGEMENT ORGANIZATION (RMO) COORDINATION

The RMO is responsible for managing the overall peer review effort described in this Review Plan. The RMO for decision documents is typically either a Planning Center of Expertise (PCX) or the Risk Management Center (RMC), depending on the primary purpose of the decision document. The RMO for the peer review effort described in this Review Plan is Planning Center of Expertise for Coastal Storm Damage Reduction (PCX-CSDR). The PCX-CSDR point of contact is Mr. Larry Cocchieri, North Atlantic Division. The MSC will serve as the RMO for ATR reviews of the design and construction activities.

The RMO will coordinate with the Cost Engineering Directory of Expertise (DX) to ensure the appropriate expertise is included on the review teams to assess the adequacy of cost estimates, construction schedules and contingencies.

3. STUDY INFORMATION

a. Decision Document. This Review Plan defines the scope and level of peer review for the Chicago Shoreline Post Authorization Change Report (PACR) intended to document changes in the project since authorization, reevaluate the economics of the project, and update the total project cost estimate. Development of the PACR is needed to seek reauthorization due to estimated total project cost reaching the authorized 902 limit. Approval should be obtained from MSC, HQUSACE, and the ASA(CW) and will require Congressional reauthorization.

b. Study/Project Description. Chicago's shoreline is largely man-made and constructed on landfill an average of 1,500 feet wide. This landfill is a key-contributing factor to the creation of an extensive series of lakeshore parks that began in the mid to late 1800's and continued through the 1940's. During the turn of the last century and into the 1930's, wooden cribs structures were constructed primarily to contain the stone fill material in order to provide a base upon which 4 to 8 ton cut limestone blocks would be placed in step-stone fashion to construct the existing revetment structure. This project provides storm damage protection to the Lake Michigan shoreline and, in particular, to Lake Shore Drive, a major transportation artery in the City of Chicago. The previous shoreline structures, built in the early 1900s, had deteriorated and no longer functioned to protect against storms, flooding and erosion.

The Chicago Shoreline project was authorized under the Water Resources Development Act of 1996 (P.L. 104–303) Section 101(12) which stipulated:

> *The project for storm damage reduction and shoreline erosion protection, Lake Michigan, Illinois, from Wilmette, Illinois, to the Illinois-Indiana State line: Report of the Chief of Engineers, dated April 14, 1994, at a total cost of $204,000,000, with an estimated Federal cost of $110,000,000 and an estimated non-Federal cost of $94,000,000. The project shall include the breakwater near the South Water Filtration Plant described in the report as a separate element of the project, at a total cost of $11,470,000, with an estimated Federal cost of $7,460,000 and an estimated non-Federal cost of $4,010,000. The Secretary shall reimburse the non-Federal interest for the Federal share of any costs incurred by the non-Federal interest— (A) in reconstructing the revetment structures protecting Solidarity Drive in Chicago, Illinois, if such work is determined by the Secretary to be a component of the project; and (B) in constructing the breakwater near the South Water Filtration Plant in Chicago, Illinois.*

Additional authorization was provided under Water Resources Development Act of 1999 (P.L. 106–53) Section 318 which stipulated:

> *The project for storm damage reduction and shore protection, Lake Michigan, Illinois, from Wilmette, Illinois, to the Illinois-Indiana State line, authorized by section 101(a)(12) of the Water Resources Development Act of 1996 (110 Stat. 3664), is modified to provide for reimbursement for additional project work undertaken by the non-Federal interest. The Secretary shall credit or reimburse the non-Federal interest for the Federal share of project costs incurred by the non-Federal interest in designing, constructing, or reconstructing reach 2F (700 feet south of Fullerton Avenue and 500 feet north of Fullerton Avenue), reach 3M (Meigs Field), and segments 7 and 8 of reach 4 (43rd Street to 57th Street), if the non-Federal interest carries out the work in accordance with plans approved by the Secretary, at an estimated total cost of $83,300,000. The Secretary shall reimburse the non- Federal interest for the Federal share of project costs incurred by the non-Federal interest in reconstructing the revetment structures protecting Solidarity Drive in Chicago, Illinois, before the signing of the project cooperation agreement, at an estimated total cost of $7,600,000.*

The construction of the Illinois Shoreline Erosion, Interim III Wilmette to Illinois/Indiana State Line Project began in 1997 and design and construction responsibility was divided between the Corps and the Local Sponsor (LS) under the terms of the Local Cooperation Agreements. A

current list of project segments in construction, in design, or completed is provided below. The list also shows the project segments completed by the District or by the Local Sponsor; City of Chicago, Department of Transportation (DOT) and Chicago Park District (CPD).

Active Projects – In Construction

The **43rd to 45th Street** project consists of the reconstruction of 2,040 linear feet of shoreline. Improvements will include steel sheet pile and concrete revetment, realignment of the lakefront trail, use of IHPA-approved concrete texture formliners, and fish habitat reefs. Optimization from the planning charrette process will be incorporated into this design. The estimated cost of this project is $18.4 million. Contracts on this project are administered by the DOT and CPD. This project is currently in construction.

Active Projects – In Design

The **Montrose to Irving Park Road** project consists of the reconstruction of 2,050 linear feet of shoreline. Improvements will include the construction a rubble mound revetment, and rehabilitation of the pier. Improvements of the design are currently under evaluation as part of the planning charrette process. The Aldermanic and community public process will occur after the 50% design is complete. The estimated cost of this project is $13-15 million. Contracts on this project will be administered by USACE. Construction is scheduled to begin in 2013.

The **Fullerton/Theater on the Lake** project consists of the reconstruction of 1,200 linear feet of shoreline. Improvements will include the construction of steel sheet pile and concrete revetment, land expansion, realignment of the lakefront trail, and landscaping and drainage improvements. Design is currently between 25 and 50%, with the intent to go to the Alderman and community for a public meeting prior to completion of the 50% design. Optimization from the planning charrette process will be incorporated into this design. The estimated cost of this project is $17.2 million. Contracts on this project will be administered by the DOT and CPD. Construction is scheduled to begin in 2013.

The **45th to 51st Street** project consists of the reconstruction of 4,460 linear feet of shoreline. This segment is currently in design (25% to 50% stage) and will include the construction of dune and swale, wetlands, and land expansion into the Lake in addition to steel sheet pile and concrete revetment, and realignment of the lakefront trail. Optimization from the planning charrette process will be incorporated into this design. The estimated cost of this project is $50 million. Contracts on this project are administered by the DOT and CPD. This segment will be constructed in two phases, and is scheduled to begin in 2014 and 2015.

The **54th to 56th Street** project consists of the reconstruction of 4,200 linear feet of shoreline. Construction at Promontory Point is on hold pending resolution of design issues with the community and the Illinois Historic Preservation Agency. The estimated cost of this project is $30 million. Contracts on this project are administered by the DOT and CPD, with estimated start for construction in 2015.

Completed Projects

The **Diversey Revetment** project was originally the southern-most part of the Belmont to Diversey segment, but following concerns raised by the local boating community, this segment was separated out. The design effort will preserve the inner harbor revetment and complete the remaining revetment piece. The actual construction cost of this project is $10.7 million. Contracts on this project were administered by USACE. Independent Technical Review (ITR) was completed on 31 July 2008 and construction was completed in 2010.

The **40th to 41st Street** project consists of the reconstruction of 1,500 linear feet of shoreline. Improvements will include the construction of steel sheet pile and concrete revetment, a new beach, a parking lot and a bioswale for treating overland flow from the parking lot, realignment of the lakefront trail, and landscaping and drainage improvements. The construction cost of this project was $17.2 million. Contracts on this project were administered by USACE. Construction was completed in 2008.

The **Belmont to Diversey South** project consists of the reconstruction of 1,100 linear feet of shoreline. Improvements will include the construction of steel sheet pile and concrete revetment, use of IHPA-approved concrete texture formliners, drainage and landscaping improvements, and a raised toe berm. Reuse of the community dubbed “art-stone” as a landscaping/architectural detail is under evaluation. The construction cost of this project was $11.1 million. Contracts on this project were administered by USACE. . The ITR was completed on 23 April 2002 and construction was completed in 2008.

The **Montrose (North)** project consists of the reconstruction of 3,760 linear feet of shoreline. Improvements included the construction of steel sheet pile and concrete revetment. Contracts on this project were administered by the USACE. The construction cost of this project was $30.5 million. The west half of the project (2,400 feet) was completed in summer 2003. The east half of the project (1,360 feet) was completed in fall 2005. Presently, 4 acres of native grasses and flowers were planted on the site. Construction was completed in 2005.

The **Irving Park Road to Belmont Avenue** project consisted of the reconstruction of 4,000 linear feet of shoreline. Improvements include the construction of steel sheet pile and concrete revetment. Contracts on this project were administered by USACE. The construction cost of the project was $15.6 million and was completed in summer 2002. The ITR was completed on 4 August 1999 and construction was completed in 2001.

The **Belmont Harbor Peninsula** project consisted of the reconstruction of 1,000 linear feet of shoreline. Improvements included the construction of steel sheet pile and concrete revetment. The construction cost of this project was $5 million. Contracts on this project were administered by the DOT and CPD. The project was completed in 1999.

The **Belmont to Diversey North** project consists of the reconstruction of 1,700 linear feet of shoreline. The contract on this project was administered by USACE. The construction cost of the project was $10.5 million and was completed in summer 2004.

The **Diversey to Fullerton** project consisted of the reconstruction of 2,300 linear feet of shoreline. Improvements included the construction of steel sheet pile and concrete revetment, new park creation by land expansion into the Lake, a new lakefront trail, and landscaping and drainage

improvements. The construction cost of this project was $17.2 million. The contract on this project was administered by USACE. Construction was completed in July 2005.

The **Solidarity Drive** project consisted of the reconstruction of 2,800 linear feet of shoreline. Improvements included the construction of steel sheet pile and concrete revetment. The construction cost of this project was $10.4 million. Contracts on this project were administered by the DOT and CPD. The project was completed in 1998.

The **I-55 to 30th Street** project consisted of the reconstruction and rehabilitation of a total of 3,400 linear feet of shoreline. Improvements included the construction of steel sheet pile and concrete revetment. The construction cost of this project was $14 million. Contracts on this project were administered by USACE. The project was completed in 2000.

The **31st Street Beach** project consisted of the reconstruction of 800 linear feet of shoreline. Improvements included beach enhancement and the construction of steel sheet pile and concrete revetment, a submerged breakwater, a new pier, and an extension of the existing pier. The construction cost of this project was $6.3 million. Contracts on this project were administered by the DOT and CPD. The project was completed in 2000.

The **31st to 33rd Street** project consisted of the reconstruction of 1,400 linear feet of shoreline. Improvements included the construction of steel sheet pile and concrete revetment. The construction cost of this project was $5.2 million. Contracts on this project were administered by USACE. The project was completed in 1999.

The **33rd to 37th Street** project consisted of the reconstruction of 2,050 linear feet of shoreline. Improvements included the construction of steel sheet pile and concrete revetment. The construction cost of this project was $13 million. Contracts on this project were administered by USACE. The project was completed in 2001.

The **37th to 40th Street** project consisted of the reconstruction of 3,200 linear feet of shoreline. Improvements included the construction of steel sheet pile and concrete revetment, new park creation by land expansion into the Lake, realignment and new lakefront trail, and landscaping and drainage improvements. The construction cost of this project was $22.7 million. Contracts on this project were administered by USACE. Construction was completed in fall 2004.

The **41st to 43rd Street** project consisted of the reconstruction of 1,350 linear feet of shoreline. Improvements included the construction of steel sheet pile and concrete revetment. The construction cost of this project was $7million. Contracts on this project are administered by USACE. The project was completed in 2003.

The **51st to 54th Street** project consisted of the reconstruction of 1,600 linear feet of shoreline. Improvements included the construction of steel sheet pile and concrete revetment and land expansion up to 100 feet from the existing shoreline. The construction cost of this project was $9.2 million. Contracts on this project were administered by the DOT and CPD. The project was completed in 2001.

The **56th to 57th Street** project consisted of the reconstruction of 800 linear feet of shoreline. Major features of this project included steel sheet pile and concrete revetment, significant reuse of

salvaged stone from the old failed revetment, and landscaping and drainage improvements. The revetment from 56th to 57th Street was constructed by the Chicago Department of Transportation (CDOT) as part of the 57th Street underpass construction. The construction cost of this project is $6.2 million. Contracts on this project were administered by DOT and CPD. Construction was completed in July 2005.

The **South Water Purification Plant** project consisted of the reconstruction of 800 linear feet of on-shore revetment and 2,600 linear feet of breakwater. The construction cost of this project was $9.5 million. Contracts on this project were administered by the DOE and CPD. The project was completed in 1998.

c. Factors Affecting the Scope and Level of Review. Upon the completion of the Montrose to Irving Park project the Federal portion of this project will be complete. Projects in design will be constructed as the local sponsor can access necessary funds to complete projects and the

submission of required documentation for reimbursement. There are no anticipated challenges for the Limited Reevaluation Report for Chicago Shoreline. There report is not expected to:

(1) contain influential scientific information or be a highly influential scientific assessment;
(2) have significant economic, environmental, and/or social effects to the Nation because it is already 90% complete;
(3) have significant interagency interest;
(4) have any additional human life/safety issue beyond the inherent life/safety issues factored into the coastal revetment design, and;
(5) be highly controversial due to the fact the project is almost 90% complete.

d. In-Kind Contributions. The local sponsor will provide design and cost estimates for those projects that have yet to be constructed.

4. DISTRICT QUALITY CONTROL (DQC)

All design and decision documents (including supporting data, analyses, environmental compliance documents, etc.) shall undergo DQC. DQC was performed on the completed projects and will be performed on all the remaining work to be performed by the District and LS. DQC is an internal review process of basic science and engineering work products focused on fulfilling the project quality requirements defined in the Project Management Plan (PMP). The home district shall manage DQC. Documentation of DQC activities is required and should be in accordance with the Quality Manual of the District and the home MSC.

a. Documentation of DQC. In accordance with the approved project Quality Control Plan (QCP), design documents (plans, specification and design analyses) and the PACR will undergo appropriate PDT and Chief's review as well as Planning and Policy Compliance and Legal Certifications. The PDT review involves a comprehensive review of each product by the PDT prior to routing for Chief's Review. Chief's review will involves a review of the design documents and Draft PACR by all appropriate functional chiefs of sections, branches and divisions with a PDT member involved in the development of the product. Edits will be incorporated into the document and rerouted for final approval requiring sign-off from the functional chiefs. This review, in conjunction with the PDT review is completed to ensure consistency of the document prior to ATR. DrChecks is not utilized to document the PDT or Chief's review.

5. AGENCY TECHNICAL REVIEW (ATR)

ATR is mandatory for all decision documents (including supporting data, analyses, environmental compliance documents, etc.). ATR will also be performed on the remaining project segments to be performed by the Chicago District. The objective of ATR is to ensure consistency with established criteria, guidance, procedures, and policy. The ATR will assess whether the analyses presented are technically correct and comply with published USACE guidance, and that the document explains the analyses and results in a reasonably clear manner for the public and decision makers. ATR is managed within USACE by the designated RMO and is conducted by a qualified team from outside the home district that is not involved in the day-to-day production of the project/product. ATR teams will be comprised of senior USACE personnel and may be supplemented by outside experts as appropriate. The ATR team lead will be from outside the home MSC. The Chicago Shoreline project has spanned over 15 years and technical review requirements and policies have changed over the years. The required technical reviews were completed for the products during the design phase. Prior to the ATR policy

released in January 2010, ITRs were performed on some of the project segments and the certification dates are documented above.

In lieu of an ATR, ITR will be completed on the remaining project segments to be performed by the LS. The LS utilizes A/Es for the design of the project segments. The A/Es are required to perform quality control and an independent review on the design. The ITRs will be performed by senior engineers and will not be part of the design team to ensure an independent review.

a. Products to Undergo ATR. Agency Technical Review (ATR) will be performed for the Draft PACR and for implementation products for the Montrose to Irving Park project segment.

b. Required ATR Team Expertise.

ATR Team Members/Disciplines	Expertise Required
ATR Lead	The ATR lead should be a senior professional with extensive experience in preparing Civil Works decision documents and conducting ATR. The lead should also have the necessary skills and experience to lead a virtual team through the ATR process. The ATR lead may also serve as a reviewer for a specific discipline (such as planning, economics, environmental resources, etc).
Planning	The Planning reviewer should be a senior water resources planner with experience and will have strong knowledge of current planning policies and guidance and extensive experience with weighing costs and benefits, screening measures, and plan formulation (same as ATR Lead).
Economics	The Economics reviewer should be knowledgeable in the basics of Coastal Storm Damage Reduction studies. Specifically for this study the reviewer should be knowledgeable in the specifics of revealed preference methods of Unit Day Value, applicable EGMs, and ER1105-2-100.
Cost Engineering	Team member will have a strong knowledge of cost estimating practices for coastal storm damage reduction projects and civil design procedures. A member from the Cost Engineering Directory of Expertise should be selected.
Environmental	Team member will have a strong knowledge of environmental engineering practices for coastal storm damage reduction projects and civil design procedures.
Geotechnical Engineering	The Geotechnical Engineer shall be a senior engineer, an expert in the field of engineering, and have knowledge of advance engineering concepts, principles and practices of geotechnical engineering.The reviewer shall have thorough understanding of soil mechanics, subsurface investigation, groundwater hydrology and seepage, slope stability analyses, erosion protection design, earthwork construction and other geotechnical applications. The geotechnical engineer shall be a licensed Professional Engineer.
Structural Engineering	The structural engineer shall be a senior engineer, an expert in the field of structural engineering, and proficient in stability analyses

	and structural design of sheet pile and concrete revetment structures and pier structures. The structural engineer shall be familiar with current design software. The structural engineer shall be a licensed Professional Engineer and/or Structural Engineer.
Coastal Engineering	Team member will have a strong knowledge of coastal storm damage reduction projects and civil design procedures. The reviewer shall have thorough understanding of wave analyses and toe protection design. The coastal engineer shall be a licensed Professional Engineer.

c. Documentation of ATR. DrChecks review software will be used to document all ATR comments, responses and associated resolutions accomplished throughout the review process. Comments should be limited to those that are required to ensure adequacy of the product. The four key parts of a quality review comment will normally include:

(1) The review concern – identify the product's information deficiency or incorrect application of policy, guidance, or procedures;
(2) The basis for the concern – cite the appropriate law, policy, guidance, or procedure that has not be properly followed;
(3) The significance of the concern – indicate the importance of the concern with regard to its potential impact on the plan selection, recommended plan components, efficiency (cost), effectiveness (function/outputs), implementation responsibilities, safety, Federal interest, or public acceptability; and
(4) The probable specific action needed to resolve the concern – identify the action(s) that the reporting officers must take to resolve the concern.

In some situations, especially addressing incomplete or unclear information, comments may seek clarification in order to then assess whether further specific concerns may exist.

The ATR documentation in DrChecks will include the text of each ATR concern, the PDT response, a brief summary of the pertinent points in any discussion, including any vertical team coordination (the vertical team includes the district, RMO, MSC, and HQUSACE), and the agreed upon resolution. If an ATR concern cannot be satisfactorily resolved between the ATR team and the PDT, it will be elevated to the vertical team for further resolution in accordance with the policy issue resolution process described in either ER 1110-1-12 or ER 1105-2-100, Appendix H, as appropriate. Unresolved concerns can be closed in DrChecks with a notation that the concern has been elevated to the vertical team for resolution.

At the conclusion of each ATR effort, the ATR team will prepare a Review Report summarizing the review. Review Reports will be considered an integral part of the ATR documentation and shall:

- Identify the document(s) reviewed and the purpose of the review;
- Disclose the names of the reviewers, their organizational affiliations, and include a short paragraph on both the credentials and relevant experiences of each reviewer;
- Include the charge to the reviewers;
- Describe the nature of their review and their findings and conclusions;
- Identify and summarize each unresolved issue (if any); and

- Include a verbatim copy of each reviewer's comments (either with or without specific attributions), or represent the views of the group as a whole, including any disparate and dissenting views.

ATR may be certified when all ATR concerns are either resolved or referred to the vertical team for resolution and the ATR documentation is complete. The ATR Lead will prepare a Statement of Technical Review certifying that the issues raised by the ATR team have been resolved (or elevated to the vertical team). A Statement of Technical Review should be completed, based on work reviewed to date, for the AFB, draft report, and final report. A sample Statement of Technical Review is included in Attachment 2.

6. INDEPENDENT EXTERNAL PEER REVIEW (IEPR)

IEPR may be required for decision documents and design and construction activities under certain circumstances. IEPR is the most independent level of review, and is applied in cases that meet certain criteria where the risk and magnitude of the proposed project are such that a critical examination by a qualified team outside of USACE is warranted. A risk-informed decision, as described in EC 1165-2-209, is made as to whether IEPR is appropriate. IEPR panels will consist of independent, recognized experts from outside of the USACE in the appropriate disciplines, representing a balance of areas of expertise suitable for the review being conducted. There are two types of IEPR:

- Type I IEPR. Type I IEPR reviews are managed outside the USACE and are conducted on project studies. Type I IEPR panels assess the adequacy and acceptability of the economic and environmental assumptions and projections, project evaluation data, economic analysis, environmental analyses, engineering analyses, formulation of alternative plans, methods for integrating risk and uncertainty, models used in the evaluation of environmental impacts of proposed projects, and biological opinions of the project study. Type I IEPR will cover the entire decision document or action and will address all underlying engineering, economics, and environmental work, not just one aspect of the study. For decision documents where a Type II IEPR (Safety Assurance Review) is anticipated during project implementation, safety assurance shall also be addressed during the Type I IEPR per EC 1165-2-209.

- Type II IEPR. Type II IEPR, or Safety Assurance Review (SAR), are managed outside the USACE and are conducted on design and construction activities for hurricane, storm risk management and flood risk management projects or other projects where potential hazards pose a significant threat to human life. Type II IEPR panels will conduct reviews of the design and construction activities prior to initiation of physical construction and, until construction activities are completed, periodically thereafter on a regular schedule. The reviews shall consider the adequacy, appropriateness, and acceptability of the design and construction activities in assuring public health safety and welfare.

a. Decision on Type I IEPR. A Type I IEPR will be conducted for the 2013 Post Authorization Change Report. The IEPR will focus on reviewing the updated Total Project Cost Estimate and Economic justification of the project.

Decision on Type II IEPR. As recommended by the District Chief of Technical Services Division, a Type II IEPR is not applicable and will not be completed for the Chicago Shoreline project. Failure of the structure is not a significant threat to human life. Mr. Snorteland, Director of Risk Management Center, also clarified that failure of the shoreline structure is not life threatening, unlike a levee or

dam. Therefore, a Type II IEPR is not warranted for this project. The District Chief of Technical Services Division memo for the decision of Type II IEPR is included in Attachment 7.

b. Products to Undergo Type I or II IEPR. N/A

c. Required Type I or II IEPR Panel Expertise. N/A

d. Documentation of Type I or II IEPR. N/A

7. REVIEW SCHEDULES AND COSTS

a. DQC Schedule and Cost. The cost for DQC is included in the costs for PDT activities and is not broken out separately. DQC will occur seamless during throughout the P&S. Quality checks and reviews occur during the development process and are carried out as a routine management practice. The schedule of the PDT review of the design products for the remaining project segments will be determined during the development of the product Quality Control Plans.

b. ATR Schedule and Cost. The cost for the ATR review of the Montrose to Irving project is $16,000. The ATR cost for the PACR is estimated to be $20,000.

ATR Schedule	
PACR ATR	August 2012
Montrose to Irving 50% plans, specs, and DA	April 2012
Montrose to Irving 100% plans, specs, and DA	July 2012

c. IEPR Schedule and Cost. N/A

d. Model Certification/Approval Schedule and Cost. N/A

8. POLICY AND LEGAL COMPLIANCE REVIEW

All decision documents will be reviewed throughout the study process for their compliance with law and policy. Guidance for policy and legal compliance reviews is addressed in Appendix H, ER 1105-2-100. These reviews culminate in determinations that the recommendations in the reports and the supporting analyses and coordination comply with law and policy, and warrant approval or further recommendation to higher authority by the home MSC Commander. DQC and ATR augment and complement the policy review processes by addressing compliance with pertinent published Army policies, particularly policies on analytical methods and the presentation of findings in decision documents.

9. COST ENGINEERING DIRECTORY OF EXPERTISE (DX) REVIEW AND CERTIFICATION

All decision documents shall be coordinated with the Cost Engineering DX, located in the Walla Walla District. The Cost-DX will assist in determining the expertise needed on the ATR team and Type I IEPR team (if required) and in the development of the review charge(s). The Cost-DX will also provide cost certification. The RMO is responsible for coordination with the Cost Engineering DX.

10. MODEL CERTIFICATION AND APPROVAL

EC 1105-2-412 mandates the use of certified or approved models for all planning activities to ensure the models are technically and theoretically sound, compliant with USACE policy, computationally accurate, and based on reasonable assumptions. Planning models, for the purposes of the EC, are defined as any models and analytical tools that planners use to define water resources management problems and opportunities, to formulate potential alternatives to address the problems and take advantage of the opportunities, to evaluate potential effects of alternatives and to support decision making. The use of a certified/approved planning model does not constitute technical review of the planning product. The selection and application of the model and the input and output data is still the responsibility of the users and is subject to DQC, ATR, and IEPR (if required).

EC 1105-2-412 does not cover engineering models used in planning. The responsible use of well-known and proven USACE developed and commercial engineering software will continue and the professional practice of documenting the application of the software and modeling results will be followed. As part of the USACE Scientific and Engineering Technology (SET) Initiative, many engineering models have been identified as preferred or acceptable for use on Corps studies and these models should be used whenever appropriate. The selection and application of the model and the input and output data is still the responsibility of the users and is subject to DQC, ATR, and IEPR (if required).

a. Planning Models. No planning models are expected to be used for this study.

b. Engineering Models. No engineering models are expected to be used for this study.

11. PUBLIC PARTICIPATION

Throughout the life of the project there has been ample opportunity for public participation. Every reach of the Chicago Shoreline has produced an associated Environmental Assessment that allowed for public comment. Likewise, the remaining project segments (Fullerton-Theater-on-the-Lake, 56th to 57st Street and Montrose to Irving) will all produce EAs associated with their work. A NEPA document is not required to be completed in association with the PACR. The PACR itself will not be available for public review. With coordination with the LS, public meetings have been held for the project segments to discuss the project designs and provided opportunity for the public to provide comments on the design. Future public meetings will be held as appropriate.

12. REVIEW PLAN APPROVAL AND UPDATES

The Great Lakes and Ohio River Division Commander is responsible for approving this Review Plan. The Commander's approval reflects vertical team input (involving district, MSC, RMO, and HQUSACE members) as to the appropriate scope and level of review for the decision document. Like the PMP, the Review Plan is a living document and may change as the study progresses. The home district is responsible for keeping the Review Plan up to date. Minor changes to the review plan since the last MSC Commander approval are documented in Attachment 3. Significant changes to the Review Plan (such as changes to the scope and/or level of review) should be re-approved by the MSC Commander

following the process used for initially approving the plan. The latest version of the Review Plan, along with the Commanders' approval memorandum, should be posted on the Home District's webpage. The latest Review Plan should also be provided to the RMO and home MSC.

13. REVIEW PLAN POINTS OF CONTACT

Public questions and/or comments on this review plan can be directed to the following points of contact:

Chicago District (CELRC):
Mike Nguyen, PM-PM, Project Manager, 312-846-5555, mike.nguyen@usace.army.mil
Kendall Zaborowski, PM-PL-F, Lead Planner, 312-846-5590, nicholas.k.zaborowski@usace.army.mil

Great Lakes and Ohio River Division (CELRD):
Pauline Thorndike, PDS-GL, District Liaison, 513-684-6212, pauline.d.thorndike@usace.army.mil
Hank Jarboe, PDS-P, Planning and Policy, 513-684-6050, hank.jarboe@usace.army.mil

Planning Center of Expertise for Coastal Storm Damage Reduction (PCX-CSDR):
Larry Cocchieri, CENAD-PD-X, National Program Manager, 347-370-4571,
lawrence.j.cocchieri@usace.army.mil

ATTACHMENT 1: TEAM ROSTERS

Table 1 – Study Project Delivery Team

Discipline	Name	Office
Chicago District		
Project Management		CELRC-PM-PM
Planning		CELRC-PM-PL-F
Economics		CELRC-PM-PL-F
Cost Engineering		CELRC-TS-DC
Structural Engineer		CELRC-TS-DT
Civil Engineer		CELRC-TS-DC
Geotechnical Engineer		CELRC-TS-DG
Environmental Engineer		CELRC-TS-DE
Hydraulic Engineer		CELRC-TS-DH
City of Chicago		
Department of Transportation		
Chicago Park District		

Table 2 – Major Subordinate Command Planning and Policy Team

Discipline	Name	Office
Great Lakes and Ohio River Division		
Chief, Planning & Policy		CELRD-PP
District Liaison		CELRD-GL
Planning & Policy		CELRD-PP
Planning & Policy		CELRD-PP
Regional Engineer		CELRD-RBT

Table 3 – Planning Centers of Expertise Team

Discipline	Name	Office
PCX-CSDR		CENAD-PD-X

Table 4 – Design Agency Technical Review Team

Discipline	Name	Office/Agency
Cost Engineering		CEMVP-EC-D
Structural Engineering (ATR Lead)		CEMVP-EC-D
Geotechnical Engineering		CEMVP-EC-D
Coastal Engineering		CELRB-TS-DC

Table 5 – PACR Agency Technical Review Team

Discipline	Name	Office/Agency
ATR Lead		CENAN-PL-F
Economics		CELRB-PM-PB
Planning & Policy		CENAN-PL-F
Cost Engineering		CENWW-EC-X
Environmental		CELRN-PM-P
Coastal Engineering		CELRB-TS-DC

ATTACHMENT 2: SAMPLE STATEMENT OF TECHNICAL REVIEW FOR DECSION DOCUMENTS

COMPLETION OF AGENCY TECHNICAL REVIEW

The Agency Technical Review (ATR) has been completed for the Chicago Shoreline Limited Reevaluation Report. The ATR was conducted as defined in the project's Review Plan to comply with the requirements of EC 1165-2-209. During the ATR, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of: assumptions, methods, procedures, and material used in analyses, alternatives evaluated, the appropriateness of data used and level obtained, and reasonableness of the results, including whether the product meets the customer's needs consistent with law and existing U.S. Army Corps of Engineers policy. The ATR also assessed the District Quality Control (DQC) documentation and made the determination that the DQC activities employed appear to be appropriate and effective. All comments resulting from the ATR have been resolved and the comments have been closed in DrChecks[sm].

SIGNATURE _____ Date _____
Name
ATR Team Leader
Office Symbol/Company

SIGNATURE _____ Date _____
Mike Nguyen, P.E.
Project Manager
CELRC

SIGNATURE _____ Date _____
Name
Project Lead/Quality Manager
CELRC

SIGNATURE _____ Date _____
Larry Cocchieri, P.E.
Review Management Office Representative
PCX-CSDR

CERTIFICATION OF AGENCY TECHNICAL REVIEW

Significant concerns and the explanation of the resolution are as follows: *Describe the major technical concerns and their resolution.*

As noted above, all concerns resulting from the ATR of the project have been fully resolved.

SIGNATURE _____ Date _____
Susanne J, Davis, P.E.
Chief, Planning Branch
CELRC-PM-PL

SIGNATURE _____ Date _____
Joseph Schmidt, P.E.
Chief, Design Branch
CELRC-TS-D

ATTACHMENT 3: REVIEW PLAN REVISIONS

Revision Date	Description of Change	Page / Paragraph Number

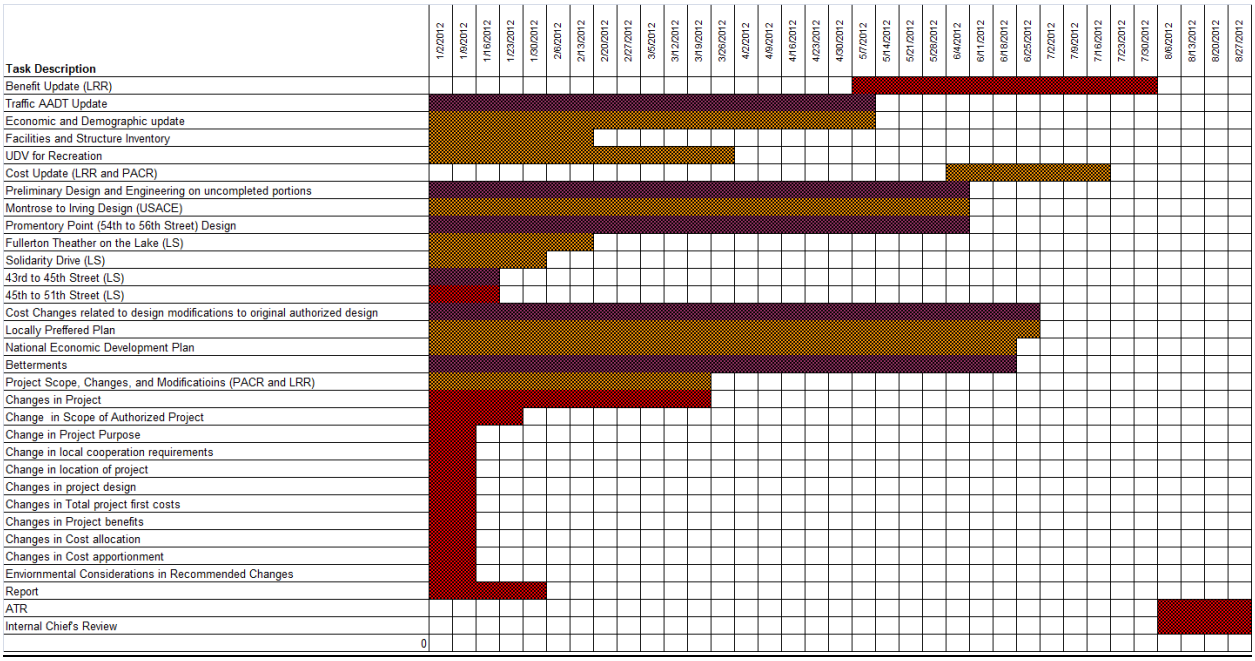
ATTACHMENT 4: ACRONYMS AND ABBREVIATIONS

Term	Definition	Term	Definition
ASA(CW)	Assistant Secretary of the Army for Civil Works	OEO	Outside Eligible Organization
ATR	Agency Technical Review	OSE	Other Social Effects
CSDR	Coastal Storm Damage Reduction	PCX	Planning Center of Expertise
DQC	District Quality Control/Quality Assurance	PDT	Project Delivery Team
DX	Directory of Expertise	PAC	Post Authorization Change
EA	Environmental Assessment	PMP	Project Management Plan
EC	Engineer Circular	PL	Public Law
EO	Executive Order	QMP	Quality Management Plan
Home District/MSC	The District or MSC responsible for the preparation of the decision document	QA	Quality Assurance
HQUSACE	Headquarters, U.S. Army Corps of Engineers	QC	Quality Control
IEPR	Independent External Peer Review	RMC	Risk Management Center
PACR	Post Authorization Change Report	RMO	Review Management Organization
MSC	Major Subordinate Command	RTS	Regional Technical Specialist
NED	National Economic Development	SET	Scientific and Engineering Technology
NEPA	National Environmental Policy Act	SAR	Safety Assurance Review
O&M	Operation and maintenance	USACE	U.S. Army Corps of Engineers
OMB	Office and Management and Budget	WRDA	Water Resources Development Act
OMRR&R	Operation, Maintenance, Repair, Replacement and Rehabilitation		

ATTACHMENT 5: RISK MANAGEMENT ANALYSIS

Risk Factor	Event	Probability of Occurrence	Severity of Risk	Overall Project Risk	Risk Response/Control (Ac)-Accept (Av)-Avoid (M)-Mitigate
HEALTH & SAFETY	Minor injury needing first aid	Seldom	Negligible	Low	(Av) Follow Health & Safety Plan
	Minor injury/accident	Seldom	Marginal	Low	(Av) Follow Health & Safety Plan
	Major accident with permanent partial/temporary total disability >3 months	Unlikely	Critical	Low	(Av) Follow Health & Safety Plan
	Major accident causing death or permanent total disability	Unlikely	Catastrophic	Low	(Av) Follow Health & Safety Plan
COST SHORTAGE/OVERRUN	Insignificant cost increase	Likely	Negligible	Low	(Ac) Update 2101 form monthly
	5-10% cost increase	Seldom	Marginal	Low	(M) Update 2101, reallocate resources
	10-20% cost increase	Unlikely	Critical	Low	(M) Update 2101, reallocate resources
	>20% cost increase	Unlikely	Catastrophic	Low	(Av) Revise Scope of Work
SCHEDULE DELAYS	Insignificant schedule slippage	Likely	Negligible	Low	(Ac) Adjust Milestone date
	5-10% schedule slippage	Likely	Marginal	Low	(M) Adjust Milestone date; Increase progress reporting frequency
	10-20% schedule slippage	Likely	Marginal	Low	(M) Adjust Milestone date; Increase progress reporting frequency
	>20% schedule slippage	Likely	Critical	Medium	(M) Adjust project completion date
SCOPE OF WORK	Scope change barely noticeable	Seldom	Negligible	Low	(M) Update PMP; Follow Communications Plan
	Minor areas of scope are affected	Seldom	Marginal	Low	(M) Update PMP; Follow Communications Plan
	Scope change unacceptable to customer	Unlikely	Critical	Low	(Av) Review SOW w/Stakeholders
	Project end item is effectively useless	Unlikely	Catastrophic	Low	(Av) Review goals & objectives
QUALITY ISSUES	Quality degradation barely noticeable	Seldom	Negligible	Low	(Av) ATR; Follow QCP/QAP and Review Plan (RP)
	Quality reduction requires customer approval	Unlikely	Marginal	Low	(Av) ATR; Follow QCP/QAP and RP
	Quality reduction unacceptable to customer	Unlikely	Critical	Low	(Av) ATR; Follow QCP/QAP and RP
	Project end item is effectively useless	Unlikely	Catastrophic	Low	(Av) ATR; Follow QCP/QAP and RP
PROJECT SPECIFIC	Timely reauthorization of project with a higher 902 Limit	Likely	Critical	Medium	(Av) Schedule to complete PACR reflects the appropriate timing to meet the need of reauthorization. (M) Withhold contract award of Montrose to Irving Reach to avoid overspending the 902 Limit Threshold until reauthorization, at a delay of completion of the project

ATTACHMENT 6: PROJECT SCHEDULE



ATTACHMENT 7: CHICAGO SHORELINE DECISION ON TYPE IEPR II MEMO