



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

1 May 13

CELRD-PD-G

MEMORANDUM FOR Commander, U.S. Army Engineer District, Detroit, (Attn: Jim Galloway, CELRE-PL), 477 Michigan Avenue, Detroit, MI 48226-2550

SUBJECT: Review Plan St. Clair Compensating Works, St. Clair River (Michigan and Canada), General Reevaluation Report (GRR)

1. The attached decision document Review Plan (RP) for St. Clair Compensating Works 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. The history regarding the development of compensating works to restore the lost water on Lakes Michigan-Huron dates back to 1925. Since that time, there have been numerous other reports and documents developed regarding the magnitude of impacts due to compensation structures in the River. However, the Corps' St Clair River Compensating Works decision document and subsequent recommendation in the Chief of Engineers Report of July 19, 1955 is the basis for justifying the need to develop a GRR as opposed to another original "General Investigation". The enactment of the 1955 Chief's Report recommended compensating works is then authorized in Chapter 90 of Public Law 434 of March 21, 1956.
3. The original legislation for dredging the St. Clair River authorized the construction of compensating works in the St. Clair River to raise the level of Lake Michigan-Huron back to pre-dredging levels. Design studies were completed in the early 1970s and required the approval of the U.S. and Canadian governments. No record of any approvals has been found, and the project was never constructed. Water levels set record highs in the mid 1970s and again in the mid 1980s and discussion of compensating works again ceased until recently, when lakes Michigan-Huron set record lows in January 2013. Because of the wide publicity the record-lows gained, there has been significant grass-roots and shipping industry pressure to again look at compensating works.
4. Since the original Corps Decision Document approval in 1954, there have been significant changes in estimated costs, new engineering and design efficiencies, additional benefit considerations and significantly changed environmental conditions. Therefore it is expected the appropriate document for this effort will be a GRR.
5. 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.


CELRD-PD-G

SUBJECT: Review Plan St. Clair Compensating Works, St. Clair River (Michigan and Canada),  
General Reevaluation Report (GRR)

6. I concur with the recommendations of the RMO and approve the enclosed RP for the St. Clair  
Compensating Works GRR.

7. 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.

8. If you have any questions please contact Dr. Hank Jarboe, CELRD-PDP, at (513) 684-6050,  
or Ms. Pauline Thorndike, CELRD-PDG, at (513) 684-6212.

  
MARGARET W. BURCHAM  
Brigadier General, USA  
Commanding

Encl

1. Review Plan
2. Memo from Wes Walker (PCX-IN), 13 Mar 2013



REPLY TO  
ATTENTION OF

**DEPARTMENT OF THE ARMY**  
HUNTINGTON DISTRICT, CORPS OF ENGINEERS  
502 EIGHT STREET  
HUNTINGTON, WEST VIRGINIA 25701-2035

CELRH-NC

13 March 2013

MEMORANDUM FOR Commander, Detroit District

SUBJECT: Review Plan for St. Clair River Compensating Works, St. Clair River (Michigan and Canada) General Reevaluation Report, Michigan and Canada

1. The enclosed Review Plan (RP) has been presented to the Planning Center of Expertise for Inland Navigation (PCXIN) for its review and endorsement in accordance with EC1165-2-214 "Civil Works Review Policy" dated, 15 Dec 2012
2. The St. Claire River Compensating Works General Reevaluation Report (GRR) will identify a recommended alternative plan for the addition of compensating works in the St. Claire River. An EIS is being prepared concurrently with the study.
3. PCXIN staff has reviewed the plan for technical sufficient and policy compliance. Preliminary cost estimates suggest that the total project cost could range from \$30,000,000 to \$170,000,000. Therefore a Type I IEPR is being undertaken for the study. The IWR Planning Suite (model certified) will be used during the study. Additionally, the ERDC AdH Model (certified) will also be used.
4. I concur with the findings of the PCXIN technical staff and endorse the enclosed review plan for the St. Claire Compensating Works GRR. Following approval by Great Lakes and Ohio River Division, the District is requested to post the RP to its web site and provide the link to the PCXIN for their use. Prior to posting, the names of the individuals in the RP should be removed.
5. If you have any questions or need additional information, please contact Jami Buchanan at 304.399.5347.

Encl

WESLEY W. WALKER  
Technical Director  
PCX for Inland Navigation

# **DECISION DOCUMENT REVIEW PLAN**

**St. Clair River Compensating Works, St. Clair River (Michigan and Canada)  
General Reevaluation Report**

**Detroit District**

**MSC Approval Date: 1 May 2013**

**Last Revision Date: None**



**US Army Corps  
of Engineers ®**

**DECISION DOCUMENT REVIEW PLAN**

**St. Clair River Compensating Works, St. Clair River (Michigan and Canada)  
General Reevaluation Report**

**TABLE OF CONTENTS**

1. PURPOSE AND REQUIREMENTS..... 1

2. REVIEW MANAGEMENT ORGANIZATION (RMO) COORDINATION..... 1

3. STUDY INFORMATION..... 1

4. DISTRICT QUALITY CONTROL (DQC)..... 6

5. AGENCY TECHNICAL REVIEW (ATR) ..... 7

6. INDEPENDENT EXTERNAL PEER REVIEW (IEPR) ..... 10

7. POLICY AND LEGAL COMPLIANCE REVIEW ..... 12

8. COST ENGINEERING DIRECTORY OF EXPERTISE (DX) REVIEW AND CERTIFICATION ..... 12

9. MODEL CERTIFICATION AND APPROVAL ..... 12

10. REVIEW SCHEDULES AND COSTS ..... 13

11. PUBLIC PARTICIPATION..... 14

12. REVIEW PLAN APPROVAL AND UPDATES ..... 15

13. REVIEW PLAN POINTS OF CONTACT ..... 15

ATTACHMENT 1: TEAM ROSTERS..... 16

ATTACHMENT 2: SAMPLE STATEMENT OF TECHNICAL REVIEW FOR DECISION DOCUMENTS ..... 18

ATTACHMENT 3: REVIEW PLAN REVISIONS ..... 19

## 1. PURPOSE AND REQUIREMENTS

**Purpose.** This Review Plan defines the scope and level of peer review for the St. Clair River Compensating Works, St. Clair River (Michigan and Ontario) General Reevaluation Report

### a. References

- (1) Engineering Circular (EC) 1165-2-214, Civil Works Review Policy, 15 Dec 2012
- (2) Engineer Circular 1105-2-410: Water Resources Policies and Authorities; Review of Decision Documents (2008 Expiration: 30 Sep 2010)
- (3) EC 1105-2-412, Assuring Quality of Planning Models, 31 Mar 2011
- (4) Engineering Regulation (ER) 1110-1-12, Quality Management, 30 Sep 2006
- (5) ER 1105-2-100, Planning Guidance Notebook, Appendix H, Policy Compliance Review and Approval of Decision Documents, Amendment #1, 20 Nov 2007
- (6) Project Management Plan for the St. Clair River Compensating Works, St. Clair River (Michigan and Ontario) (to be developed)
- (7) Quality Control Plan for the St. Clair River Compensating Works, St. Clair River (Michigan and Ontario) General Reevaluation Report
- (8) LRD Regional Business Process Manual

**b. Requirements.** This review plan was developed in accordance with EC 1165-2-214, 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 1165-2-214) 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 the Center of Expertise for Inland Navigation (PCXIN).

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. Assisting the RMO as a co-center of expertise is the Hydrologic Engineering Center (HEC) of Davis, California.

## 3. STUDY INFORMATION

a) Decision Document. The St. Clair River Compensating Works General Reevaluation Report (GRR) will be the title of this work. A GRR may be necessary if a significant period of time has elapsed or conditions have changed significantly since the feasibility study was completed (ER 1105-2-100,

Planning Guidance Notebook, Paragraph 4-1.b.). As stated under *Post Authorization Studies and Reports* – “a (GRR) study may be necessary if a significant period of time has elapsed or conditions have changed significantly since the feasibility study was completed”. This provision of the regulation further requires that all reevaluation studies include the specific information outlined in Appendix G, paragraph G-16. Per subparagraph (1), since the report supporting the authorization for the proposed St Clair River Compensating Works was completed in 1954 and there have been potential changes in Project Costs, Engineering and Design, Benefits, and Environmental Considerations, it is anticipated that a General Reevaluation report will be necessary.

Early dredging and deepening to improve navigation on the St. Clair River dates back to 1852. Sand and gravel mining was conducted by private enterprises until 1926. This mainly occurred in the upper portion of the St. Clair River, with some mining occurring in the delta (mouth) area as well. During the 1900’s the Corps carried out 3 major internationally approved deepening projects in the St. Clair River to benefit commercial navigation on the Great Lakes, including: 1910-1923 for a 22-foot-deep channel, 1933-1936 for 25-foot-deep channel, and 1958-1962 for a 27-foot-deep channel. As the cross section of the St. Clair River was made larger, its conveyance increased, and the relationship of Lake Michigan-Huron’s level to Lake Erie’s level changed. The deepening projects and mining operations led to a 10 to 16 inch permanent reduction of water levels on Lakes Michigan-Huron.

The history regarding the development of compensating works to restore the lost water on Lakes Michigan-Huron dates back to 1925. Since that time, there have been numerous other reports and documents developed (1925, 1926(2), 1931, 1933(2), 1934, 1942, 1947, 1956, 1957, 1959(2), 1961, 1962(2), 1964, 1965(11), 1967(3), 1972(2), 1973, 1982, 1988, 2011(2)) regarding the magnitude of impacts due to compensation structures in the River. However, the Corps’ St Clair River Compensating Works decision document and subsequent recommendation in the Chief of Engineers Report of July 19, 1955 is the basis for justifying the need to develop a GRR as opposed to another original “General Investigation”. The enactment of the 1955 Chief’s Report recommended compensating works is then authorized in Chapter 90 of Public Law 434 of March 21, 1956.

The original legislation for dredging the St. Clair River authorized the construction of compensating works in the St. Clair River to raise the level of Lake Michigan-Huron back to pre-dredging levels. Design studies were completed in the early 1970s and required the approval of the U.S. and Canadian governments. No record of any approvals has been found, and the project was never constructed. Water levels set record highs in the mid 1970s and again in the mid 1980s and discussion of compensating works again ceased until recently, when lakes Michigan-Huron set record lows in January 2013. Because of the wide publicity the record-lows gained, there has been significant grass-roots and shipping industry pressure to again look at compensating works.

Since the original Corps Decision Document approval in 1954, there have been significant changes in estimated costs, new engineering and design efficiencies, additional benefit considerations and significantly changed environmental conditions. Therefore it is expected the appropriate document for this effort will be a GRR.

In developing the GRR, it will be necessary to review the previous reports related to the development of alternatives for compensating works in the St Clair River. Concurrent with the development of the GRR, an Environmental Impact Statement (EIS) will also be prepared. The preparation of these documents will also require a review of the existing designs as well as

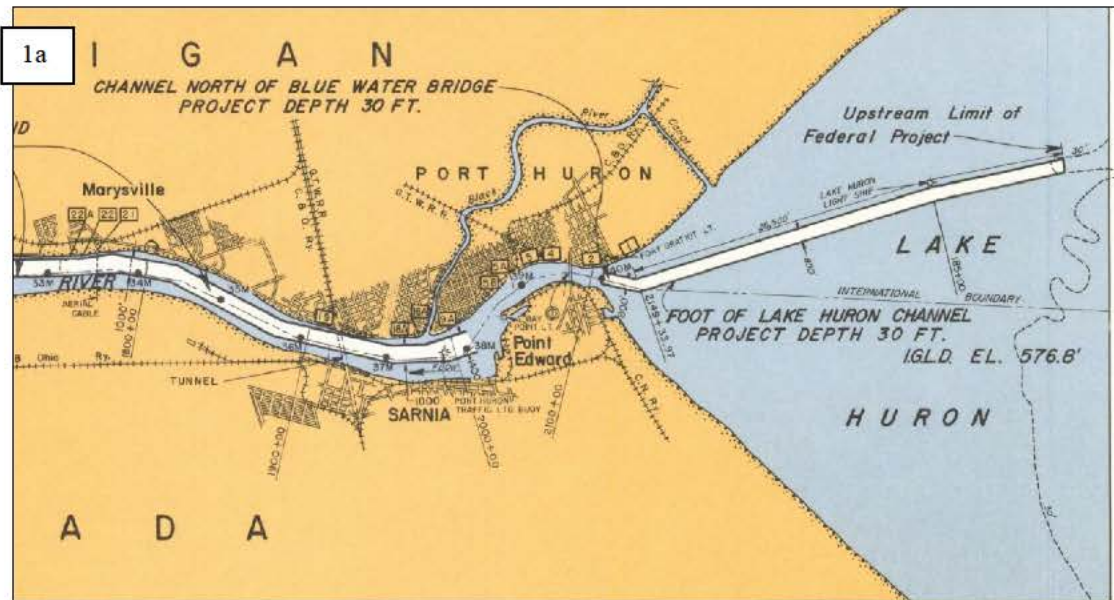


development of additional alternatives not previously identified, a takings analysis as part of the real estate review of the project alternatives, and an economic analysis of the alternatives including development of benefits and costs and applicable benefit-cost ratios (BCR's).

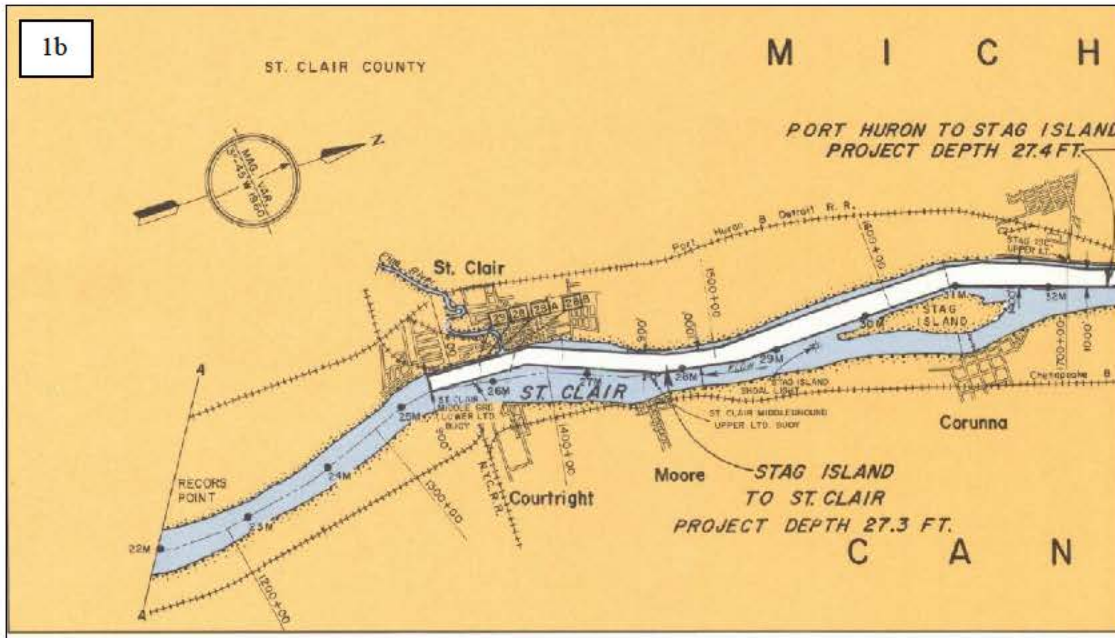
Included in the review of existing alternatives and the development of additional alternatives will be the analysis of fixed, non-adjustable (static) compensating structures versus adjustable (flexible) structures. Static structures would be put in place and permanently left alone, while adjustable structures could be raised or lowered monthly, depending on need. Adjustable structures would require the oversight of a bi-national "Board of Control" to mutually agree on changes to flows from Lake Huron.

Finally, as part of the GRR analysis, full coordination will be required with the International Joint Commission (IJC) and the Canadian Government in the development of any recommended alternatives. Once the recommended alternative is selected, separate authorization and appropriation for construction will be needed from the Congress.

- b. **Study/Project Description.** Early dredging (deepening) to improve navigation on the St. Clair River dates back to 1852. Sand and gravel mining was conducted by private enterprises until 1926. This mainly occurred in the upper portion of the St. Clair River, with some mining occurring in the delta area as well. During the 1900's the Corps carried out 3 major internationally approved deepening projects in the St. Clair River to benefit commercial navigation on the Great Lakes, as discussed in paragraph 3.a. (see charts 1a and 1b below).







As the cross section of the St. Clair River was made larger, its conveyance increased, and the relationship of Lake Michigan-Huron's level to Lake Erie's level changed. The deepening projects and mining operations led to a 10 to 16 inch permanent reduction of water levels on Lake Michigan-Huron.

The system has since reached equilibrium (a relative re-balance in historic differences in levels between Lakes Michigan-Huron and St. Clair because of these changes) and further lowering of the levels due to those projects is not ongoing, however, water levels on Lakes Michigan-Huron have been below average for 13 consecutive years and have broken record lows in December 2012 and January 2013. While hydrologic conditions have driven the recent decline (and setting of record lows) in water levels, there has been increased pressure from Great Lakes stakeholders for action to be taken. Historical channel deepening projects performed by the Corps and by private entities in the St. Clair River have reduced water levels on Lakes Michigan and Huron. Many stakeholders would like structures to be built to compensate for this reduction in water levels.

The "compensatory works" would be in the form of structures that would be placed at the head of the St. Clair River (in the river channel) that would be designed to slow or reduce the flow of water from southern Lake Huron into the St. Clair River, in an amount roughly equal to that as if the river were left natural and not deepened.

Only limited scoping has been done to date towards the cost, level of involvement for critical Project Delivery Team (PDT) functions, timeframe, extent of coordination and other key elements regarding the development of the GRR. The level of approval for the GRR is anticipated to be with the Chief of Engineers.

- c. **Factors Affecting the Scope and Level of Review.** Construction of compensating works will require an assessment of potential effects on shoreline property owners and may require associated work to modify select areas of shoreline affected by changes due to a compensating works. Since compensating works in the river would cause impacts both in the U.S. and Canada, any study would

need full coordination with Canadian agencies to ensure compliance with the Boundary Waters Treaty of 1909. The construction of any compensation works would require agreement between the U.S. State Department and Foreign Affairs Canada before proceeding.

Compensation structures constructed would most likely be of a static nature, meant to raise the upstream lakes back to their pre-dredging levels. There have been recent suggestions of looking at flexible systems that could be removed or altered during high water periods. This would essentially mean that Lakes Michigan and Huron would become regulated. It would require the creation of a regulation plan for the middle lakes and a corresponding IJC Board of Control to oversee operations. As such, the scope of this GRR would involve significant bi-national coordination and multi-level review, likely up to the Office of Management and Budget, the U. S. Congress and Canadian Parliament.

- The development of this GRR will be challenging, considering the complications that will result with the vast number of stakeholders and partners that would be directly or indirectly impacted by the development and implementation of any recommendations formulated in the GRR. The potential economic, environmental and social impacts of such compensation works would be felt across the entire Great Lakes watershed.
- The project risks primarily involve the correct modeling of the considered structures as to effectiveness and performance, the ability of the study team to work effectively with the Canadian Government in the execution of this project; the underestimation of the impacts of compensation structure(s) to Great Lakes coasts and their ecosystems; the ability of the Government(s) to continuously fund this work through completion of construction, and the potential of future flooding on Lakes Michigan-Huron as a result of these structures;
- Per preceding investigations, which have largely recommended submerged in-river structures external to the shipping channel, there would be little to no significant threat to human life/safety regarding the implementation of compensating works structures. However, a few proposed plans involve constructing in-river structures that would extend above the water surface, similar to other breakwaters found throughout the Great Lakes. This should pose no more threat to human life/safety than any other navigation structure;
- To date, there has been no request by a Governor of an affected state for a peer review by independent experts;
- The potential exists for the project to involve significant public dispute as to the effects of the project, as the project is intended to reduce flows from southern Lake Huron into the upper St. Clair River and may reduce water levels in the lower lakes, until the system returns to equilibrium. This could result in the dissatisfaction of commercial shippers, pleasure boaters, ecologists, lakefront and riverfront homeowners, businesses and resort operators, municipal utility managers and any other interest that would be negatively impacted by lower water levels on Lakes St. Clair, Erie and Ontario, and their connecting channels. As such, the study and project is likely to involve significant public dispute as to the potential economic costs or environmental impacts of the project;

- Because of the balancing which will be needed between competing interests (shippers, environmental proponents, utilities, waterfront property owners) the potential exists that the project design could be based on novel methods, involve the use of innovative materials or techniques, and present complex challenges for implementation.

- d. In-Kind Contributions.** It is recommended that the reevaluation study for this project be pursued utilizing the same requirements of local cooperation as the original authorization. Per Paragraph 139 of the Chief’s Report as presented in Senate Document 71, 84<sup>th</sup> Congress, 1<sup>st</sup> Session, as authorized by the River and Harbor Act of 1956, (PL 84-434, 70 Stat 54), approved March 21, 1956, for the proposed local cooperation requirements:

*“In view of the general nature of the benefits anticipated from provision of the proposed plan for improvement of the connecting channels, it is considered equitable that the cost of this plan should be borne entirely by the United States. This policy has also been held for past improvements of the Great Lakes Connecting Channels. Necessary alterations to utility crossings will be undertaken by local interests as required by a condition of the authority granted to the owners for such installations in navigable waters.”*

The conditions under which the statements made in the Chief’s Report supporting the original authorization have not changed. As such, the requirements for local cooperation for the follow-on reevaluation of the approved project (in this case a GRR) should also be consistent with the requirements for local cooperation in the original authorization. As such, it is recommended that the GRR should be developed at full Federal expense.

#### **4. DISTRICT QUALITY CONTROL (DQC)**

All decision documents (including supporting data, analyses, environmental compliance documents, etc.) shall undergo DQC. 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. The Detroit District formerly had a specific District QCP, however, with the emergence of the RBMP, the District has adopted the LRD quality control process.

- a. Documentation of DQC.** The Detroit District review team will provide quality assurance review on the draft GRR and its appendices, and provide comments using DrChecks review software. All responses to review comments will be entered into DrChecks by the PDT members responsible for satisfactory resolution of the comments.

**b. Products to Undergo DQC.**

- Draft General Reevaluation Report (GRR);
- Draft Environmental Impact Statement (DEIS);
- Final Draft GRR; and
- Final EIS (FEIS).

**c. Required DQC Expertise.**

| <b>DQC Team Members/Disciplines</b> | <b>Expertise Required</b>  |
|-------------------------------------|--|
| Planning                            | The team member shall have extensive knowledge of Planning processes, with experience in projects that involve altered riverine hydraulics (i.e. dams, diversions, in-stream flow modifiers, etc.)   |
| Economics                           | The team member should have a background in developing economic analysis for large, complex regional investigations, involving traditional project and habitat-based benefit determination.  |
| Environmental Resources             | The team member should have a background in performing an environmental analysis for large, complex regional investigations, involving traditional project and habitat-based impacts. It is anticipated that an Environmental Impact Statement will be the required document for this GRR; as such, the reviewer should be thoroughly versed in NEPA national environmental statutes and guidelines. |
| Hydraulic Engineering               | The team member will be an expert in the field of hydrology & hydraulics and have a thorough understanding of open channel dynamics, application of in-river structures and their impacts on riverine flow dynamics, watershed hydrology and a working knowledge of HEC-RAS and 3-D hydraulic modeling.  |
| Geotechnical Engineering            | The team member should have an extensive knowledge in the field to provide the capability of providing a geotechnical evaluation of constructing structures on riverbeds of large, dynamic river systems.  |
| Cost Engineering                    | The Cost Engineer team member shall be familiar with estimates for civil works/civil engineering structural work. The Cost Engineer will be required to be proficient in the USACE estimating software MII in reviewing the cost estimates.  |
| Civil Design Engineering            | The Civil Design team member will be experienced in the design of in-river structures and familiar with flow compensating methods. Member should also be a licensed professional engineer.   |

**5. AGENCY TECHNICAL REVIEW (ATR)**

ATR is mandatory for all decision documents (including supporting data, analyses, environmental compliance documents, etc.). 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.

**a. Products to Undergo ATR.**

- Draft General Reevaluation Report;
- Final Draft Environmental Impact Statement;
- Final General Reevaluation Report; and
- Final Environmental Impact Statement.

**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 should also have experience with Hydraulics and Hydrology-based planning products, including feasibility-phase efforts. |
| Planning                     | The team member shall have extensive knowledge of Planning processes, with special emphasis on hydrology & river hydraulics - based studies.  |
| Real Estate                  | Should real estate takings be identified as a potential need as the GRR progresses, a Takings Analysis would need to be conducted by a Realty Specialist, and be reviewed during ATR by a senior Real Estate member familiar with takings policy and processes.   |
| Economics                    | The team member should have a background in developing economic analysis for large, complex regional investigations, involving traditional project and habitat-based benefit determination.   |
| NEPA Compliance              | The team member should have experience in reviewing Environmental Impact Statements for large, complex regional investigations, involving traditional project and habitat-based impacts. The reviewer should be thoroughly versed in national environmental statutes and guidelines.  |
| Hydraulic Engineering        | The team member will be an expert in the field of hydrology & hydraulics and have a thorough understanding of riverine systems and open channel dynamics, application of in-river structures and their impacts on riverine flow dynamics, watershed hydrology and a working knowledge of HEC-RAS and 3-D hydraulic modeling.  |
| Geotechnical Engineering     | The team member should have an extensive knowledge in the field to provide the capability of providing a geotechnical evaluation of constructing structures on the beds of large, dynamic river systems and lakes.  |
| Cost Engineering             | The Cost Engineering reviewer shall be familiar with estimates for civil works/civil engineering structural work. The reviewer must be proficient in the USACE estimating software MII.   |

|                          |   |
|--------------------------|---|
| Civil Design Engineering | The Civil Design reviewer will be experienced in the design of in-river structures and familiar with flow compensating methods. Member should also 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 been 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 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 1165-2-214, 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 1165-2-214.
  - **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, and flood risk management projects or other projects where existing and 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 IEPR.** A total project cost greater than \$45M requires an IEPR. In the *Summary of Findings and Recommendations* (March 2012) of the IJC's *International Upper Great Lakes Study*, the section discussing the "Restoration of Lake Michigan-Huron Levels" on page 10 states "Construction cost estimates ranged from about \$30M to about \$170M (to implement St. Clair River compensation works), depending on the technology and level of restoration provided." Therefore, it seems likely that total project costs will exceed the threshold of \$45M.

Furthermore, the project is anticipated to be controversial as the development of compensating works in the St. Clair River would be supported by many Lake Michigan and Huron harbor communities, property owners, and the navigation industry, and opposed by environmental groups and property owners who expect to have erosion problems with higher water levels. Also, the report cited above also states "restoration structures in the St. Clair River would adversely affect important spawning habitat of the lake sturgeon, an endangered species, and would have adverse

effects on the Lake St. Clair fishery”. In accordance with this, an EIS is anticipated to be prepared for this study. With all of this information taken into consideration, the PDT will plan to undertake a Type I IEPR for this project.

**b. Products to Undergo Type I IEPR.**

Draft GRR and DEIS

**c. Required Type I IEPR Panel Expertise**

| IEPR Panel Members/Disciplines | Expertise Required  |
|--------------------------------|---|
| Economist                      | The Team member should have an understanding of hydrologic data adequate to recognize sufficiency and appropriate utilization in alternative evaluation. Requires knowledge of Corps accepted benefits and costs utilized in the alteration of hydraulic flows in a major Great Lakes connecting channel and potential benefits and damages that would result from the placement of such works basin-wide. Able to implement and assess risk evaluation methodology. Able to evaluate coordination between hydrologic engineering and economics as it pertains to the formulation and evaluation of the potential compensating works plans. |
| Environmental Scientist        | Team member should have extensive knowledge of the integration of environmental evaluation and compliance requirements, pursuant to national environmental statutes (NEPA), applicable executive orders and other Federal planning requirements, into the planning of Civil Works comprehensive plans and implementation projects.  |
| Geotechnical Engineer          | The Geotechnical Engineer panelist should have an extensive knowledge in the field to provide the capability of providing a geotechnical evaluation of constructing structures on the beds of large, dynamic river systems and lakes.   |
| Hydraulic Engineer             | The Hydraulic Engineer will be an expert in the field of hydrology & hydraulics and have a thorough understanding of open channel dynamics, the application of riverine compensation/flow-reduction structures, and a working knowledge of HEC-RAS and HEC-HMS.   |
| Civil Design Engineer          | The Civil Design reviewer will be experienced in the design of in-river structures and familiar with flow-compensating methods. Member should also be a licensed professional engineer.   |

**d. Documentation of Type I IEPR.** The IEPR panel will be selected and managed by an Outside Eligible Organization (OEO) per EC 1165-2-214, Appendix D. Panel comments will be compiled by the OEO and should address the adequacy and acceptability of the economic, engineering and environmental methods, models, and analyses used. IEPR comments should generally include the same four key parts as described for ATR comments in Section 4.d above. The OEO will prepare a final Review Report that will accompany the publication of the final decision document and shall:

- 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; 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.

The final Review Report will be submitted by the OEO no later than 60 days following the close of the public comment period for the draft decision document. The Detroit District shall consider all recommendations contained in the Review Report and prepare a written response for all recommendations adopted or not adopted. The final decision document will summarize the Review Report and District response. The Review Report and District response will be made available to the public, including through electronic means on the internet.

## **7. 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.

## **8. 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 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 DX will also provide the Cost Engineering DX certification. The RMO is responsible for coordination with the Cost Engineering DX.

## **9. 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.** The following planning models are anticipated to be used in the development of the decision document:

| Model Name and Version | Brief Description of the Model and How It Will Be Applied in the Study | Certification / Approval Status |
|------------------------|--|---------------------------------|
| TBD                    | TBD  | TBD                             |

- b. **Engineering Models.** The following engineering models are anticipated to be used in the development of the decision document

| Model Name and Version | Brief Description of the Model and How It Will Be Applied in the Study | Approval Status |
|------------------------|--|-----------------|
| TBD                    | TBD  | TBD             |

- c. **Environmental Models.** The following planning models are anticipated to be used:

| Model Name and Version | Brief Description of the Model and How It Will Be Applied in the Study | Certification / Approval Status |
|------------------------|--|---------------------------------|
| None                   | N/A  | N/A                             |

## 10. REVIEW SCHEDULES AND COSTS

- a. **Quality Control Schedule and Cost.**

| Description                                     | Scheduled Date | Cost      |
|---|----------------|-----------|
| Alternative Formulation Briefing (AFB)          | 2015           | TBD       |
| District Quality Control                        | 2018           | TBD       |
| Draft GRR & DEIS Complete                       | 2021           | TBD       |
| ATR of Draft GRR and DEIS                       | 2022           | TBD       |
| Public Review GRR & DEIS                        | 2022-23        | TBD       |
| District Response to Comments/Route & sign FEIS | 2023           | TBD       |
| Independent External Peer Review                | 2015-24        | \$500,000 |
| Submittal to LRD of Final GRR and FEIS          | 2025           | TBD       |

- b. **Type I IEPR Schedule and Cost.** The estimated cost for the IEPR is \$500,000 and may take several years from initial notification to final certification.

| Description      | Scheduled Date |
|------------------|----------------|
| Draft GRR & DEIS | 2015-24^       |

*^ Review of the Draft GRR & FEIS will likely occur using a phased approach and be subject to the provision of additional Federal funding.*

- c. **Model Certification/Approval Schedule and Cost.** For decision documents prepared under the model National Programmatic Review Plan, use of existing certified or approved planning models is encouraged. Where uncertified or unapproved model are used, approval of the model for use will be accomplished through the ATR process. The ATR team will apply the principles of EC 1105-2-412 during the ATR to ensure the model is theoretically and computationally sound, consistent with USACE policies, and adequately documented. If specific uncertified models are identified for repetitive use within a specific district or region, the appropriate PCX, MSC(s), and home District(s) will identify a unified approach to seek certification of these models.

It is anticipated all of the models used for this project are certified.

## 11. PUBLIC PARTICIPATION

- a. **Scoping.** State and Federal resource agencies will be invited to participate in the study covered by this review plan as partner agencies or as technical members of the PDT, as appropriate. Agencies with regulatory review responsibilities will be contacted for coordination as required by applicable laws and procedures. The ATR team will be provided copies of public and agency comments. In accordance with the Council of Environmental Quality regulations for NEPA, a Notice of Intent to prepare an Environmental Impact Statement will be published in the Federal Register, initiating the Scoping Process.

Because of the anticipated scope and reach of the project, and per Executive Order 12114 – Environmental Effects Abroad of Major Federal Actions (4 January 1979), significant coordination and input will be required with the Canadian Federal and Provincial government(s) and their appropriate agencies. Additionally, a scoping notice will be mailed to a broad list of U.S. Federal, state, and local government agencies,; binational stakeholder and interest groups; binational business and trade groups; tribal interests, and notification of the general public via news media. . Because of the wide-ranging impacts that are possible by the implementation of such a project, it is anticipated that numerous public information and input meetings will be held in both the U.S. and Canada, and throughout the Great Lakes basin, during the development of the draft GRR.

- b. **NEPA Documents.** The Draft GRR and DEIS will be distributed for a 45-day public comment period , beginning with publication of a Notice of Availability in the Federal Register, per NEPA regulations.. Public meeting may be held, if warranted, to address concerns with the project if they arise. Comments received on the DEIS public review would be addressed in the FEIS, which would then be distributed to the public for a 30-day review and comment period. Comments from the FEIS review would be addressed and the Record of Decision package would be prepared and forwarded to Corps Headquarters for signature. Upon signature of a ROD, and it’s publication in the Federal Register, the NEPA process will be completed and the project can proceed to construction phase.

- c. **Clean Water Act Review:** The DEIS will include a draft Section 404(b)(1) Evaluation of the effects of fill placement in the waters of the United States. The evaluation fulfills the Section 404 permit process for Corps civil works projects. The affected states would then be asked to review the DEIS and 404 Evaluation and provide Section 401 Water Quality Certification of the proposed action, which would be necessary prior to the signing of a Record of Decision. Because of the complexity of this project and the numerous states that would be involved, it is not practicable to obtain Section 401 certification from multiple states; therefore, it is recommended that Corps seek Section 404(r) exemption of the State 401 certification requirement.

**12. REVIEW PLAN APPROVAL AND UPDATES**

The Great Lakes and Ohio River Division (LRD) 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 Detroit District is responsible for keeping the Review Plan up to date. Minor changes to the review plan since the last LRD 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 LRD 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 Detroit District’s webpage. The latest Review Plan should also be provided to the RMO and LRD.

**13. REVIEW PLAN POINTS OF CONTACT**

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

| Title                        | Name          | Office Phone Number |
|------------------------------|---------------|---------------------|
| Project Manager              | CELRE-PPPM    | 313-226-2223        |
| Planner                      | CELRE-PL-P    | 313 226-6710        |
| Plan Form. Office Chief      | CELRE-PL      | 313 226-6758        |
| PCXIN Peer Review Acct. Mgr. | CELRH-PM-PD-F | 304 399-5848        |



**ATTACHMENT 1: DEVELOPMENT/REVIEW TEAM ROSTERS**

**PROJECT DELIVERY TEAM (PDT) MEMBERS**

| <b>Discipline</b>                  | <b>Office Symbol</b> | <b>Telephone Number</b> |
|------------------------------------|----------------------|-------------------------|
| Project Manager                    | LRE-PL-P             | 313-226-2223            |
| Plan Formulator                    | LRE-PL-P             | 313-226-6710            |
| Environmental Specialist           | LRE-PL-E             | 313-226-7590            |
| Geotechnical Engineer              | LRE-EC-G             | 313-226-2225            |
| Design Engineer                    | LRE-EC-G             | 313-226-6076            |
| Hydrology and Hydraulics Engineer  | LRE-HH-E             | 313-226-4689            |
| Economist                          | PM-PL                | 313-226-3443            |
| Cost Engineer/Risk and Uncertainty | LRE-EC-C             | 313-226-1305            |
| Real Estate Specialist             | LRE-RE               | 313-226-3445            |
| Lawyer                             | LRE-OC               | 313-226-6822            |

**DISTRICT QUALITY CONTROL (DQC) MEMBERS**

| <b>Discipline</b>                  | <b>Office Symbol</b> | <b>Telephone Number</b> |
|------------------------------------|----------------------|-------------------------|
| Plan Formulator                    | LRE-PL-P             | TBD                     |
| Environmental Specialist           | LRE-PL-E             | TBD                     |
| Geotechnical Engineer              | LRE-EC-G             | TBD                     |
| Design Engineer                    | LRE-EC-G             | TBD                     |
| Hydrology and Hydraulics Engineer  | LRE-HH-E             | TBD                     |
| Economist                          | PM-PL                | TBD                     |
| Cost Engineer/Risk and Uncertainty | LRE-EC-C             | TBD                     |
| Real Estate Specialist             | LRE-RE               | TBD                     |

**AGENCY TECHNICAL REVIEW (ATR) MEMBERS**

| <b>Discipline</b>                  | <b>Office Symbol</b> | <b>Telephone Number</b> |
|------------------------------------|----------------------|-------------------------|
| Plan Formulator                    | TBD                  | TBD                     |
| Environmental Specialist           | TBD                  | TBD                     |
| Geotechnical Engineer              | TBD                  | TBD                     |
| Design Engineer                    | TBD                  | TBD                     |
| Hydrology and Hydraulics Engineer  | TBD                  | TBD                     |
| Economist                          | TBD                  | TBD                     |
| Cost Engineer/Risk and Uncertainty | TBD                  | TBD                     |
| Real Estate Specialist             | TBD                  | TBD                     |
| Lawyer                             | TBD                  | TBD                     |

**INDEPENDENT EXTERNAL PEER REVIEW (IEPR) PANEL MEMBERS**

| <b>Discipline</b>                  | <b>Department and Location</b> | <b>Telephone Number</b> |
|------------------------------------|--------------------------------|-------------------------|
| Water Resources Planner            | TBD                            | TBD                     |
| Environmental Specialist           | TBD                            | TBD                     |
| Geotechnical Engineer              | TBD                            | TBD                     |
| Design Engineer                    | TBD                            | TBD                     |
| Hydrology and Hydraulics Engineer  | TBD                            | TBD                     |
| Economist                          | TBD                            | TBD                     |
| Cost Engineer/Risk and Uncertainty | TBD                            | TBD                     |
| Real Estate Specialist             | TBD                            | TBD                     |
| Lawyer                             | TBD                            | TBD                     |

**ATTACHMENT 2: SAMPLE STATEMENT OF TECHNICAL REVIEW FOR DECISION DOCUMENTS  
COMPLETION OF AGENCY TECHNICAL REVIEW**

The Agency Technical Review (ATR) has been completed for the feasibility study for St. Clair River Compensating Works, St. Clair River (Michigan and Ontario). The ATR was conducted as defined in the project’s Review Plan to comply with the requirements of EC 1165-2-214. 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 US 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<sup>sm</sup>.

|                                       |      |
|---------------------------------------|------|
| SIGNATURE                             | Date |
| <a href="#">Name</a>                  |      |
| ATR Team Leader                       |      |
| <a href="#">Office Symbol/Company</a> |      |

|                               |      |
|-------------------------------|------|
| SIGNATURE                     | Date |
| <a href="#">Name</a>          |      |
| Project Manager               |      |
| <a href="#">Office Symbol</a> |      |

|   |      |
|---|------|
| SIGNATURE                                       | Date |
| <a href="#">Name</a>                            |      |
| Architect Engineer Project Manager <sup>1</sup> |      |
| <a href="#">Company, location</a>               |      |

|   |      |
|---|------|
| SIGNATURE                               | Date |
| <a href="#">Name</a>                    |      |
| Review Management Office Representative |      |
| <a href="#">Office Symbol</a>           |      |

**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 |
| <a href="#">Name</a>          |      |
| Chief, Engineering Division   |      |
| <a href="#">Office Symbol</a> |      |

|                               |      |
|-------------------------------|------|
| SIGNATURE                     | Date |
| <a href="#">Name</a>          |      |
| Chief, Planning Division      |      |
| <a href="#">Office Symbol</a> |      |

<sup>1</sup> Only needed if some portion of the ATR was contracted

**ATTACHMENT 3: REVIEW PLAN REVISIONS**

| <b>Revision Date</b> | <b>Description of Change</b> | <b>Page / Paragraph Number</b> |
|----------------------|------------------------------|--------------------------------|
|                      |                              |                                |
|                      |                              |                                |
|                      |                              |                                |
|                      |                              |                                |
|                      |                              |                                |