DECISION DOCUMENT REVIEW PLAN

Modifications to STA-1E to Correct Deficiencies Culverts and Trash Rake Systems

Letter Report

Jacksonville District

MSC Approval Date: *22 July 2011*
Last Revision Date: *20 July 2011*

US Army Corps
of Engineers ®

Encl. 1

REVIEW PLAN

Modifications to STA-1E to Correct Deficiencies
Culverts and Trash Rake Systems
Letter Report

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1. PURPOSE AND REQUIREMENTS

a. **Purpose.** This Review Plan defines the scope of review activities for the Letter Report titled: Modifications to STA-1E to Correct Deficiencies, Culverts and Trash Rake Systems. Stormwater Treatment Area 1 East (STA-1E) was completed in 2005 and has experienced certain problems that have the potential to affect its ability to perform the objectives for which it was authorized and designed.

The letter report was prepared in accordance with the requirements of ER 1165-2-119, Modifications to Completed Projects. Therefore, it does not follow the planning steps provided in ER 1105-2-100. The letter report, since it is in essence a design deficiency report, it is a decision document. Therefore the processes for deciding types and level of independent review were considered on that basis. Upon approval, this review plan will be included into the Project Management Plan as an appendix to the Quality Management Plan.

b. **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 2010
(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) 1165-2-119, Modifications to Completed Projects, 31 Aug 1999

c. **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 the Water Management and Reallocation PCX.

Normally, 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. The Cost DX at Walla Walla District reviewed the cost estimates and the cost and schedule risk analysis as they were developed during the period of November 2010 to February 2011, and provided a cost certification dated 18 February 2011.

3. STUDY INFORMATION

a. **Decision Document.** The purpose of the Modifications to STA-1E to Correct Deficiencies, Culverts and Trash Rake Systems Letter Report, is to demonstrate that the project is consistent with the criteria for eligibility for Corps participation in the modifications under the existing project authority.

b. **Study/Project Description.** Stormwater Treatment Area 1 East (STA-1E) was authorized in Section 315 of the Water Resources Development Act (WRDA) of 1996:

> SEC. 315. CENTRAL AND SOUTHERN FLORIDA, CANAL 51.
> The project for flood protection of West Palm Beach, Florida (C-51), authorized by section 203 of the Flood Control Act of 1962 (76 Stat. 1183), is modified to provide for the construction of an enlarged stormwater detention area, Storm Water Treatment Area 1 East, generally in accordance with the plan of improvements described in the February 15, 1994, report entitled "Everglades Protection Project, Palm Beach County, Conceptual Design", with such modifications as are approved by the Secretary. The additional work authorized by this section shall be accomplished at Federal expense. Operation and maintenance of the stormwater detention area shall be consistent with regulations prescribed by the Secretary for the Central and Southern Florida project, and all costs of such operation and maintenance shall be provided by non-Federal interests.

The C-51 canal is a component of the Central and Southern Florida Project **(Figure 1)**. The C-51 basin (East and West) is located in Palm Beach County, Florida and extends from the edge of WCA-1 on the west almost to the Atlantic Ocean on the east **(Figure 1)**. The drainage area of the basin is approximately 164 square miles. STA-1E is between WCA-1 and the C-51 canal, near the western end of the C-51 canal **(Figure 2)**.

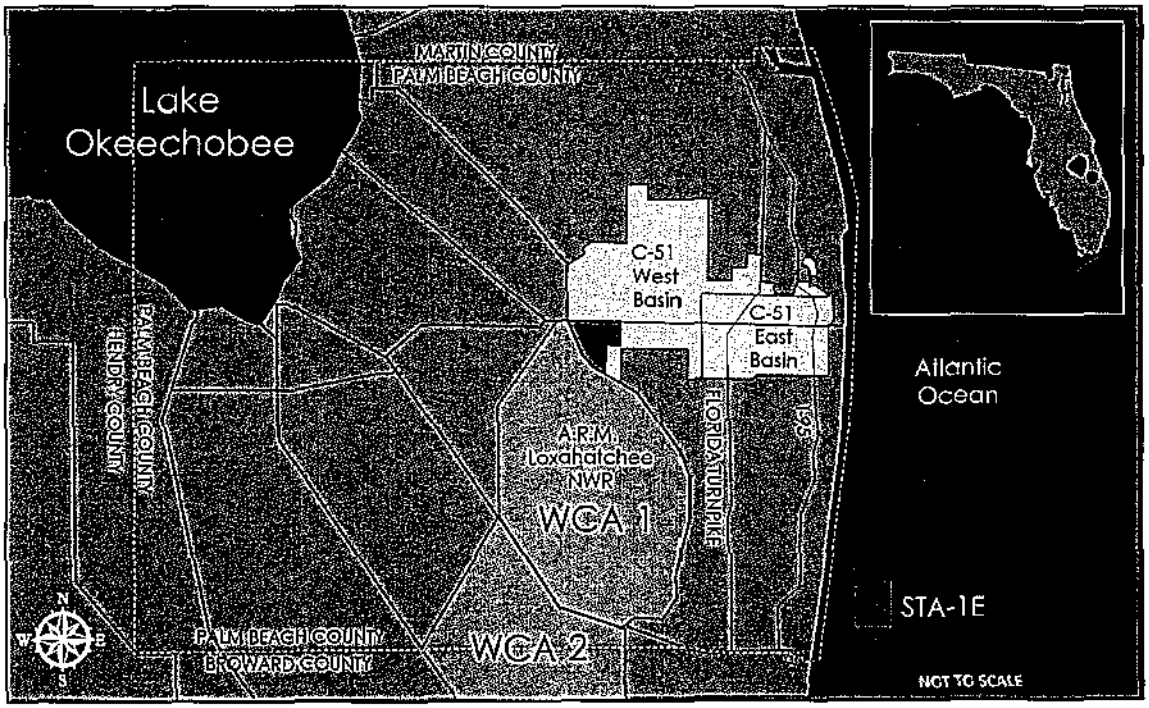

Figure 1: C-51 Basin and Project Area.

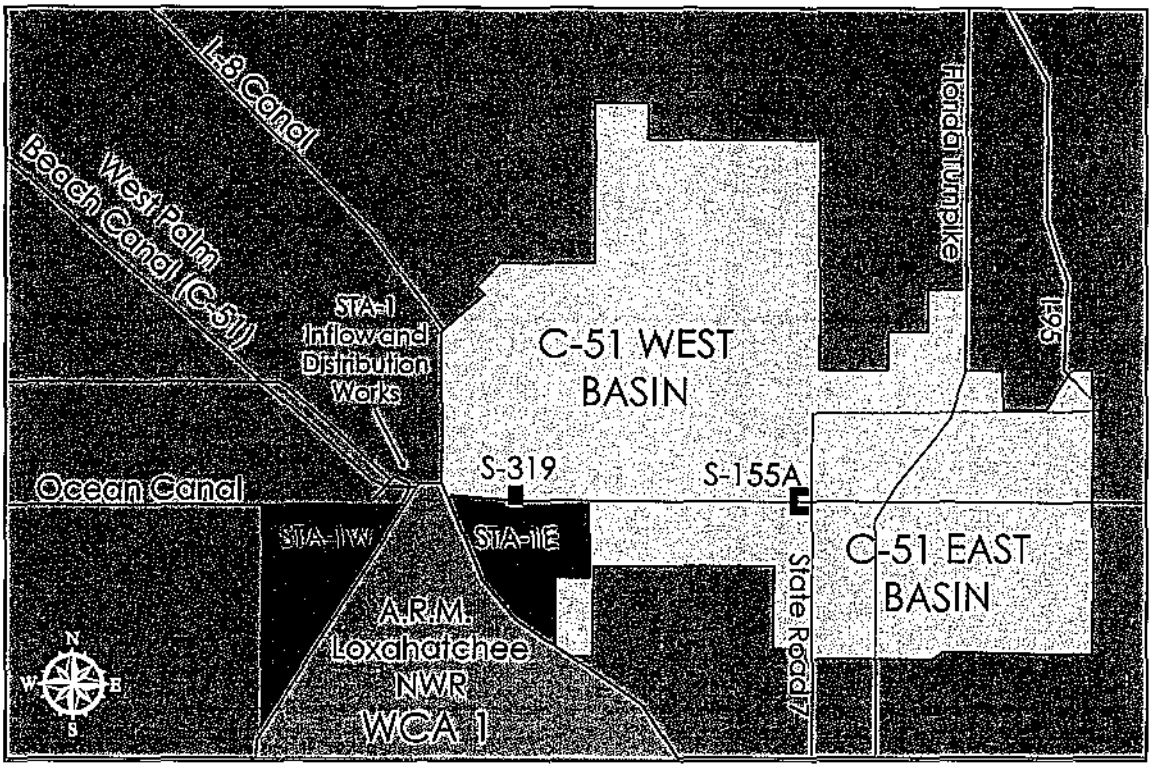

Figure 2: STA-1E location.

STA-1E encompasses approximately 6,000 acres divided into 10 cells **(Figure 3)**. Eight of the ten (Cells 1 though 7) comprise the overall treatment area of STA-1E. The STA cells are divided by levees, and water levels and flows are controlled in parallel flow paths via a series of gated culverts through the levees. Two distribution cells that run along the north side of the STA are not considered treatment cells. Their purpose is to allow some operator flexibility in sending water to different cells. The project site slopes from northeast to southwest. Elevations at the project site range between approximately 19.0 feet NGVD near the northeast corner to approximately 12.0 feet NGVD along the L-40 Levee located adjacent to the southwest side of the project. The development of cells in a series was a result of the difference in elevation in the existing topography and alignment of the overall treatment area boundary.

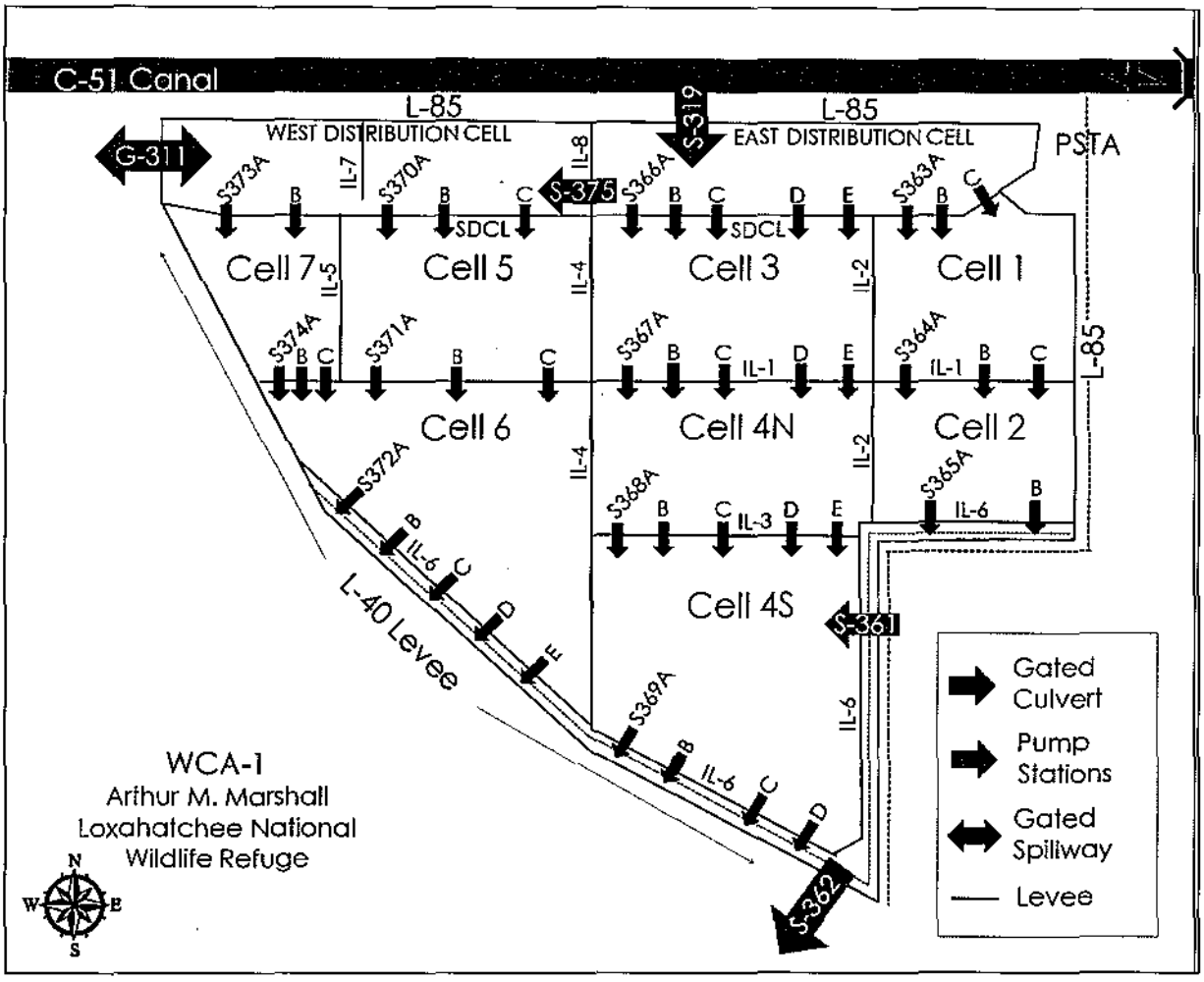

Figure 3: STA-1E cell locations.

There are a total of three pump stations within STA-1E. S-319 is a 3,980 cubic feet per second (cfs) pump station (3 pumps at 960 cfs and 2 pumps at 550 cfs) at the north side of STA-1E. It is the major entry point for water into the STA from the C-51 Canal. S-362 is the primary discharge structure and consists of a 4,200 cfs pump station (3 pumps at 960 cfs, 2 pumps at 550 cfs, and 2 pumps at 110 cfs) at the southernmost point of STA-1E, discharging treated water to the Refuge. S-361 is a smaller, secondary inflow pump station (75 cfs) that discharges water directly into Cell 4S of STA-1E. This pump station provides flood protection for the Rustic Ranches residential area and agricultural areas adjacent to the southeast perimeter of STA-1E. These areas of the C-51 basin were hydraulically separated from the C-51 canal by the construction of STA-1E. This pump station also returns to the STA seepage water in the eastern perimeter seepage canal.

G-311 is a 3,200 cfs gated spillway designed to allow bi-directional movement of water between STA-1E and the STA-1 Inflow Basin. G-311 and the STA-1 Inflow Basin allow SFWMD operators flexibility to use both STA-1E and STA-1W to treat runoff from the C-51 West basin and other locations prior to discharge to WCA-1. G-311 can also be used to send water supply releases from STA-1E to the L-8 canal. G-311 was constructed by the SFWMD and is not a feature of the STA-1E project.

STA-1E contains 44 culverts. One culvert, S-375, is a 1,580 cfs 3-barrel gated segmented precast concrete box culvert. It allows water to flow from the East Distribution Cell to the West Distribution Cell. The other 43 culverts are single barrel, 8-foot by 8-foot gated segmented precast concrete box culverts and are located within the internal levees. Each culvert is approximately 150 feet long. The design capacities of the 43 culverts range from 287 to 430 cfs, and most are between 300 and 320 cfs. These structures facilitate the distribution of water through the treatment cells and allow flexibility in the operation of the STA.

Some of the joints between the concrete boxes of many of the single barrel culverts are no longer water-tight, leading to migration of the surrounding embankment fill into the culverts. If not repaired, this condition would lead to erosion of the soil around the culverts. Continued erosion could cause the culvert segments to misalign and cause the culvert to fail. Culvert S-375, a 3-barrel gated segmented precast concrete box culvert, has sinkholes which indicate an apparent loss or subsidence of foundation soil beneath portions of the discharge barrels, and barrels have become misaligned. This culvert was removed from service in 2008 and is currently undergoing repair. Culverts S-365A and S-365B were the single-barrel structures that needed to be repaired first. They were temporarily taken out of service, and repairs were completed in 2009 and 2010.

The report addresses three alternatives for repair of the problems with the culverts. One alternative is to replace the culverts with corrugated metal pipe culverts. A second alternative is to replace the culverts with cast-in-place concrete culverts. This is the method being used for S-375. The third alternative is to replace the existing sealant with grout and add several structural measures to stabilize the concrete box units. This method was successfully used for S-365A and S-365B. All three alternatives would prevent the leaks and the subsequent destabilization, and ensure that the culverts remain operable. The third method is the lowest cost.

The main structure to take water into STA-1E is pump station S-319, and the primary discharge structure is pump station S-361. Both pump stations are outfitted with trash rake systems to remove debris and vegetation from their intake structures. The systems utilize a cable/drum hoist to raise and lower a mechanical picker/rake head that grabs debris from the pump intake trash racks. The design required that the systems operate in winds up to 75 miles per hour (mph). The non-federal sponsor who operates the pump stations state that the trash systems do not operate in winds exceeding 35 mph. The trash racks were constructed of extra high molecular weight polyethylene (EHMWPE), as was specified in the contract documents. This material has deformed and this deformation has reduced the trash rake's ability to remove material from the rack. During severe storm events, the amount of floating vegetation at the pump stations exceeds the trash rake systems' capacities to keep the intakes clear.

The report addresses two alternatives to resolve the problems with the existing trash rake systems and allow the project features to operate as designed. One alternative is to replace the existing system with a similar but larger cable/drum hoist system and a trash rack that matches the new trash rake and would be constructed of stainless steel. The second alternative is to replace the existing rakes system with a rail and telescoping arm type system and a trash rack that matches the new trash rake and would be constructed of stainless steel. Both alternatives would allow the trash rake systems to operate more effectively during storm conditions. The second alternative would be operable in 75 mph wind.

c. **Factors Affecting the Scope and Level of Review.** This section discusses the factors affecting the risk informed decisions on the appropriate scope and level of review. The discussion is intended to be detailed enough to assess the level and focus of review and support the PDT, PCX, and vertical team decisions on the appropriate level of review and types of expertise represented on the various review teams. Pertinent areas of importance, from EC 1165-2-209 are presented as bullets that are then addressed for this specific letter report:

- *If parts of the study will likely be challenging (with some discussion as to why or why not and, if so, in what ways – consider technical, institutional, and social challenges, etc.);*

  The purpose of the letter report is to demonstrate that the project is consistent with the criteria for eligibility for Corps participation in the modifications under the existing project authority. The letter report provides a basis for approving the use of federal construction funding on a locally operated feature of the federal project to make repairs to the existing project deficiencies. The current fixes outlined in the letter report are not highly technical in nature but have robustness as to ensure that they adequately address the issues. The Jacksonville District has used the proposed fixes for the culverts previously, and has had success in the performance of those structures. The review of the proposed changes are not likely to be scrutinized by an independent review team because of their relative low risk scope.

- *A preliminary assessment of where the project risks are likely to occur and what the magnitude of those risks might be (e.g., what are the uncertainties and how might they affect the success of the project):* The risks are associated with the function of the existing completed project. Repair of culverts and trash rakes would serve to lessen risks that exist with the current features. There are no risks to life safety. Water is discharged into an unpopulated water conservation area. In the event of non-performance, water would have to bypass the treatment or be incompletely treated, then be discharged to the Everglades. The proposed fixes for the trash rake are currently being employed at other structures. Performance of these trash rakes fit the design criteria needed and have been all but standardized on similar projects by the sponsor. The risk of using this trash rake design is further mitigated by the fact that they are currently in service and have performed as intended in storm events. Internal and external review of the trash rakes have yielded minimal changes in this proposed solution. The culvert repairs were reviewed by the sponsor and Jacksonville District team. Several discussions were held on the solutions for suitability. There is a robust design that has not only been proposed but is already in practice, with long term success. The robustness is incorporated to ensure that the problems will more than likely never occur again.

- *If the project will likely be justified by life safety or if the project likely involves significant threat to human life/safety assurance (with some discussion as to why or why not and, if so, in what ways – consider at minimum the safety assurance factors described in EC 1165-2-209 including, but not necessarily limited to, the consequences of non-performance on project economics, the environmental and social well-being [public safety and social justice]; residual risk; uncertainty due to climate variability, etc.) – the discussion of life safety should include the assessment of the home District Chief of Engineering on whether there is a significant threat to human life associated with the project (per EC 1165-2-209 Frequently Ask Question 3.j.):* The proposed repairs are not justified by, nor will they affect, life safety. Also see above bullet.

- *If there is a request by the Governor of an affected state for a peer review by independent experts:* There has not been, nor is there expected to be, a request by the Governor of an affected state for a peer review by independent experts.

- *If the project/study is likely to involve significant public dispute as to the size, nature, or effects of the project (with some discussion as to why or why not and, if so, in what ways):* The project/study is not likely to involve significant public dispute as to the size, nature, or effects of the project. Repairs are associated with maintaining performance of an existing project.

- *If the project/study is likely to involve significant public dispute as to the economic or environmental cost or benefit of the project (with some discussion as to why or why not and, if so, in what ways):* The project/study is not likely to involve significant public dispute as to the economic or environmental cost or benefit of the project. Repairs are associated with maintaining performance of an existing project. The letter report describes three alternatives for the culvert modifications and demonstrates that the proposed corrective repairs are less costly than the other potential repairs that would resolve the problems. Similarly, the report describes two alternatives for trash rake systems and demonstrates that the proposed corrective modifications to the pump station trash rake systems are the least costly approach. The report contains cost estimates for the three alternatives for culvert modifications and the two alternatives for trash rake system modifications. The cost estimates and the cost and schedule risk analysis were reviewed by the Cost DX and certified on 18 February 2011. The project was authorized and designed to achieve specific performance standards for phosphorus concentration in the water discharged to Water Conservation Area 1. Monetized benefits of alternatives were not developed in the original documents. This study maintains a focus on achieving the same performance standards. Selection among the corrective repairs was based the lowest cost to achieve the intent and expected performance of the original design.

  Initial construction of the project was covered by an EIS. No new EA or EIS is needed; the modifications (repairs) to the existing features are covered under NEPA by a Categorical Exclusion. ER 200-2-2, paragraph 9a, provides a categorical exclusion for activities at completed Corps projects which carry out the authorized project purposes. Examples include routine operation and maintenance actions, equipment purchases, erosion control, painting, rehabilitation, replacement of existing structures and facilities such as buildings, roads, levees, groins and utilities and installation of new buildings utilities, or roadway in developed areas.

- *If the information in the decision document or anticipated project design is likely to be based on novel methods, involve the use of innovative materials or techniques, present complex challenges for interpretation, contain precedent-setting methods or models, or present conclusions that are likely to change prevailing practices (with some discussion as to why or why not and, if so, in what ways):* . STA-1E construction was performed from 2000 to 2004. Information contained in the letter report regarding the problems at the project was obtained from field visits and surveys performed by Corps of Engineers staff, South Florida Water Management District staff, and by contractors. No novel methods, innovative materials or techniques were used to collect the information and forecast the problems. The information does not present complex challenges for interpretation.

  The alternatives proposed are neither novel nor precedent setting. Alternatives were developed to allow the project to function as designed and intended. Choices among alternatives were

based on least cost to achieve the functions of the project. The report includes three alternatives that represent different methods to replace or repair culverts. The Corps has significant experience constructing and repairing culverts. Corrugated metal pipe and cast in place concrete pipe have both been used throughout the nation. The alternative to repair the existing culverts was based on the methods the Jacksonville District used successfully to repair culverts S-365A and S-365B in STA-1E. The rail and telescoping arm alternative for pump station trash rake systems is working successfully at other pump stations operated by the South Florida Water Management District.

- *If the project design is anticipated to require redundancy, resiliency, and/or robustness, unique construction sequencing, or a reduced or overlapping design construction schedule (with some discussion as to why or why not and, if so, in what ways):* . The proposed alternatives do not require additional redundancy, resiliency, robustness, unique construction sequencing or scheduling over common Corps practice. The culvert repairs were reviewed by the sponsor and Jacksonville District team. The result is a robust design that not only has been proposed but is already in practice, with long term success. The robustness is incorporated to ensure that the problems will more than likely never occur again.

d. **In-Kind Contributions.** Products and analyses provided by non-Federal sponsors as in-kind services are subject to DQC, ATR, and IEPR. The in-kind products and analyses to be provided by the non-Federal sponsor include: None.

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.

a. **Documentation of DQC.** District Quality Control was accomplished by comprehensive review by the PDT and independent reviewers. Comments were provided by tracked changes to the report. Tracked changes/comments were incorporated into the subsequent version. This DQC involved the PDT as well as the supervisory chain of command, independent review from District and Division and sponsor review.

b. **Products to Undergo DQC.** The letter report, only. The designs have been reviewed separately from this letter report by ATR and sponsor review. The letter report review has been reviewed by the sponsor for concurrence as well as the PDT, and has undergone level supervisory review.

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.** The draft letter report will be submitted for review, plus attachments: SFWMD letter dated August 20, 2009, table of internal culverts and results of inspection, and cost estimates for the three recommended actions and alternatives. An updated Review Plan is being developed for the implementation phase, which will include ATR of the design However, the letter report has gone through its own ATR aside from the design(s). The letter report ATR was needed to determine if the proposed changes are adequate.

b. **Required ATR Team Expertise.** ATR members will be sought from the following sources: regional technical specialists (RTS); appointed subject matter experts (SME) from other districts; senior level experts from other districts; Center of Expertise staff; experts from other USACE commands; contractors; academic or other technical experts; or a combination of the above. The ATR Team will be comprised of the following disciplines; knowledge, skills and abilities; and experience levels.

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 that is able to determine if alternatives considered were sufficient, and appropriately considered, within the context of evaluation under ER 1165-2-119, Modifications to Completed Projects .
Economics	The Economics reviewer should be a senior water resources economist that is able to determine if alternatives considered were sufficient, and appropriately considered, within the context of evaluation under ER 1165-2-119, Modifications to Completed Projects.
Environmental Resources	The Planning reviewer should be a senior water resources environmental resources specialist that is able to determine if the NEPA Categorical Exclusion is appropriate, within the context of evaluation under ER 1165-2-119, Modifications to Completed Projects.
Geotechnical Engineering	The team member should be a registered professional engineer and have 10 or more years experience in geotechnical engineering. Experience needs to include geotechnical evaluation of water management structures. Experience needs to encompass static and dynamic slope stability evaluation; evaluation of the seepage through earthen embankments and under seepage through the foundation of the water management structures, including levee embankments, floodwalls, closure structures and other pertinent features; soil grouting products and methods; and settlement evaluations.

Structural Engineering	The team member should be a registered professional engineer and have 10 or more years experience in structural engineering. Experience needs to include the engineering and design of water management project features such as water control structures, conveyance culverts, and spillways, and grouting products and methods for watertight joints in concrete structures. Team member able to determine if alternatives considered were sufficient, and appropriately considered, within the context of evaluation under ER 1165-2-119, Modifications to Completed Projects.
Mechanical Engineering	The team member should be a registered professional engineer and have 10 or more years experience in structural engineering. Experience needs to include the engineering and design of water management project features such as pump stations. Team member able to determine if alternatives considered were sufficient, and appropriately considered, within the context of evaluation under ER 1165-2-119, Modifications to Completed Projects.
Cost Engineering	Cost Engineering review has been completed. No additional required.
Policy Compliance	The policy compliance team member should have experience related to design deficiency review and approval in accordance with ER 1165-2-119.
All Team Members	The letter report has been preliminarily reviewed by SAJ, SAD and HQ. The ATR team will review the comments and responses to ensure SAD and HQ reviews comments were addressed and letter report revised.

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 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, 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.** An exclusion from the requirement for Type I IEPR was requested for this letter report since the project cost exceeds $45M total. However, execution of the work described in the letter report does not require additional Congressional authorization.

EC 1165-2-209 provides for a potential Type I IEPR exclusion when 1) no other mandatory conditions are met, 2) the project does not include an EIS, 3) the various aspects of the problems or opportunities being addressed are not complex, and 4) there is no controversy surrounding the study. Applicable decision criteria are addressed in greater detail below:

- *Significant threat to human life:* No. The project poses no threat to human life. This is further addressed in a paragraph that follows below.

- *Where the estimated total cost of the project, including mitigation costs, is greater than $45 million:* Yes, the total project cost is estimated to be approximately $70M. However, as noted above, EC 1165-2-209 provides for a potential Type I IEPR exclusion for projects costing over $45 Million. These are addressed in detail below.

- *Where the Governor of an affected State requests a peer review by independent experts:* No such request has been made.

- *Where a request to conduct IEPR has been made by a Federal or state agency charged with reviewing the project, if he/she determines that the project is likely to have a significant adverse impact on environmental, cultural, or other resources under the jurisdiction of the agency after implementation of any planned mitigation:* No such request has been made.

- *Where there is significant public dispute over the size, nature, or effects of the project or the economic or environmental costs or benefits of the project:* No such determination has been made.

- *Where information is based on novel methods, presents complex challenges for interpretation, contains precedent setting methods or models, or presents conclusions that are likely to change prevailing practices.* No novel methods, innovative materials or techniques were used to collect the information and forecast the problems. The information does not present complex challenges for interpretation, nor were any methods or models used that were precedent setting - information contained in the letter report regarding the problems at the project was obtained from field visits and surveys performed by experienced Corps of Engineers staff, as well as staff from the South Florida Water Management District and contractors.

- *Where the Chief has determined that Type I IEPR is warranted.* No such determination has been made.

- *How the decision document meets any of the possible exclusions described in Paragraph 11.d.(3) and Appendix D of EC 1165-2-209:* The letter report does not include an EIS, and the determination made by the Chief is attached and incorporated as a part of this Review Plan.

  Further, the proposed work is so limited in scope or impact, involving only repair of existing culverts and trash rakes. The work is categorically excluded from NEPA and it would not significantly benefit from Type I IEPR. USACE and industry have ample experience in replacement of culverts and trash\rake systems.

In addition, Type II IEPR is not required. This project does not trigger WRDA 2007 Section 2035 factors for Safety Assurance Review (termed Type II IEPR in EC 1165-2-209) and therefore, a Type II review under Section 2035 is not required. These risk factors, which are described in Paragraph 2 of Appendix E of EC 1165-2-209, are specifically addressed below:

- *Is the Federal action justified by life safety or would failure of the project pose a significant threat to human life?* No.

- *Does the project involves the use of innovative materials or techniques where the engineering is based on novel methods, present complex challenges for interpretation, contain precedent-setting methods or models, or present conclusions that are likely to change prevailing practices?* No.

- *Does the project design require redundancy, resiliency, and/or robustness?* No.

- *Does the project have unique construction sequencing or a reduced or overlapping design construction schedule?* No.

b. Products to Undergo Type I IEPR. An exclusion from Type I IEPR was approved by the Chief of Engineers and is attached as a part of this Review Plan.

c. Required Type I IEPR Panel Expertise. Not applicable.

d. Documentation of Type I IEPR. Not applicable.

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. The approval level for this report is at HQ USACE.

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

The Cost Engineering DX has already reviewed and provided cost certification on 18 February 2011.

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: None.

b. **Engineering Models.** The following engineering models are anticipated to be used in the development of the decision document: No engineering models are being employed.

10. REVIEW SCHEDULES AND COSTS

a. **ATR Schedule and Cost.** One ATR is planned, of the draft letter report. ATR should start as soon as possible, in May, 2011. Anticipated duration breakdown includes initial ATR Team review and comment, 1 week; PDT comment evaluation, 1 week; ATR Team comment backcheck; 1 week; PDT provides revised report with commitments to ATR Team, 1 week; and ATR verification of commitments and certification, 1 week. Or a total 5 week total process.

   Estimated total ATR Team cost is $17K, broken down as follows:
   ATR Lead, $3K
   Plan Formulation, $2K
   Economics, $2K
   Environmental Analysis, $2K
   Structural Engineering, $4K
   Geotechnical Engineering, $2K
   Policy compliance, $2K

b. **Type I IEPR Schedule and Cost.** Not applicable.

c. **Model Certification/Approval Schedule and Cost.** Not applicable.

11. PUBLIC PARTICIPATION

The initial construction of the project was covered by an EIS and the project documents were coordinated with the public. The Modifications Report describes repairs to some of the existing facilities, to enable the project to perform as planned and designed. The team considered environmental effects and NEPA compliance is documented using a Categorical Exclusion that does not require additional public coordination.

12. REVIEW PLAN APPROVAL AND UPDATES

The South Atlantic 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:

- Jacksonville District Project Manager, 904-232-1065
- Jacksonville District Planning Technical Lead, 904-232-2110
- Jacksonville District Review Coordinator, 904-232-2698
- South Atlantic Division Point of Contact, 404-562-5206
- Water Management and Reallocation Planning Center of Expertise Point of Contact, 469-487-7033

ATTACHMENT 1: TEAM ROSTERS

PDT

Name	Organization	Role
Robert Medlock	Jacksonville District	Project Manager
Steve Barth	Jacksonville District	Engineering Technical Lead
Brad Foster	Jacksonville District	Planning Lead
Milton Switanek	Jacksonville District	Cost Estimator

ATR Team

Name	Organization	Role
Marc Masnor	Tulsa District	ATR Lead
Marc Masnor	Tulsa District	Plan Formulation
Greg Baer	HQUSACE Rehired Annuitant	Policy Compliance and Geotech
Ed Rossman	Tulsa District	Economics
Stephen Nolen	Tulsa District	Environmental Analysis
David Sullivan	Huntington District	Structural Engineering
James Neubauer	Walla Walla District	Cost Engineering
James McKinnie	Louisville District	Mechanical Engineering

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 *<type of product>* for *<project name and location>*. 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 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[sm].

SIGNATURE _____ Date _____

Name
ATR Team Leader
Office Symbol/Company

SIGNATURE _____ Date _____

Name
Project Manager
Office Symbol

SIGNATURE _____ Date _____

Name
Architect Engineer Project Manager[1]
Company, location

SIGNATURE _____ Date _____

Name
Review Management Office Representative
Office Symbol

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 _____

Name
Chief, Engineering Division
Office Symbol

SIGNATURE _____ Date _____

Name
Chief, Planning Division
Office Symbol

[1] Only needed if some portion of the ATR was contracted

ATTACHMENT 3: REVIEW PLAN REVISIONS

Revision Date	Description of Change	Page / Paragraph Number

ATTACHMENT 4: ACRONYMS AND ABBREVIATIONS

Term	Definition	Term	Definition
AFB	Alternative Formulation Briefing	NED	National Economic Development
ASA(CW)	Assistant Secretary of the Army for Civil Works	NER	National Ecosystem Restoration
ATR	Agency Technical Review	NEPA	National Environmental Policy Act
CSDR	Coastal Storm Damage Reduction	O&M	Operation and maintenance
DPR	Detailed Project Report	OMB	Office and Management and Budget
DQC	District Quality Control/Quality Assurance	OMRR&R	Operation, Maintenance, Repair, Replacement and Rehabilitation
DX	Directory of Expertise	OEO	Outside Eligible Organization
EA	Environmental Assessment	OSE	Other Social Effects
EC	Engineer Circular	PCX	Planning Center of Expertise
EIS	Environmental Impact Statement	PDT	Project Delivery Team
EO	Executive Order	PAC	Post Authorization Change
ER	Ecosystem Restoration	PMP	Project Management Plan
FDR	Flood Damage Reduction	PL	Public Law
FEMA	Federal Emergency Management Agency	QMP	Quality Management Plan
FRM	Flood Risk Management	QA	Quality Assurance
FSM	Feasibility Scoping Meeting	QC	Quality Control
GRR	General Reevaluation Report	RED	Regional Economic Development
Home District/MSC	The District or MSC responsible for the preparation of the decision document	RMC	Risk Management Center
HQUSACE	Headquarters, U.S. Army Corps of Engineers	RMO	Review Management Organization
IEPR	Independent External Peer Review	RTS	Regional Technical Specialist
ITR	Independent Technical Review	SAR	Safety Assurance Review
LRR	Limited Reevaluation Report	USACE	U.S. Army Corps of Engineers
MSC	Major Subordinate Command	WRDA	Water Resources Development Act