DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, SOUTH ATLANTIC DIVISION
60 FORSYTH STREET SW, ROOM 10M15
ATLANTA GA 30303-8801

CESAD-RBT

21 MAY 2015

MEMORANDUM FOR COMMANDER, JACKSONVILLE DISTRICT

SUBJECT: Central and South Florida Project, Herbert Hoover Dike 2015 Major Rehabilitation Report Supplement and Environmental Assessment, Review Plan Approval

1. References:

a. Memorandum, CESAJ-PD, 16 April 2015, subject: Central and South Florida Project, Herbert Hoover Dike 2015 Major Rehabilitation Report Supplement and Environmental Assessment, Review Plan – Request for Review Plan Approval (Encl 1).

b. Risk Management Center Endorsement – Central and Southern Florida Project, Herbert Hoover Dike, 2015 Major Rehabilitation Report Supplement and Environmental Assessment, Review Plan (Encl 2).

c. C 1165-2-214, Civil Works Review, 15 December 2012.

2. The enclosed subject Review Plan (RP) submitted by the Jacksonville District via reference 1.a and endorsed by the Risk Management Center (RMC) via reference 2.b has been reviewed by this office. Some minor edits to the RP were coordinated with [redacted] and [redacted] of your organization. The enclosed RP, with the coordinated edits incorporated, is hereby approved in accordance with reference 1.c above.

3. We concur with the conclusion of the District Chief of Engineering that a Type II IEPR is not required for this 2015 Major Rehabilitation Report Supplement since its purpose is to assess extending an already approved and previously implemented method of seepage control (a seepage cutoff wall) for an additional 6.6 miles of the Herbert Hoover Dike. The need for a Type II IEPR on the plans and specifications will be addressed in an updated RP prior to initiation of the design phase.

4. The District should post the approved RP to its web site and provide a link to the RMC and CESAD-RBT. Before posting the RP to the web site, the names of Corps/Army employees should be removed. Subsequent significant changes, such as scope or level of review changes, to this RP, should they become necessary, will require new written approval from this office.

5. The SAD point of contact is [redacted], CESAD-RBT, 404-562-5121.

[redacted]
Brigadier General, USA
Commanding

2 Encls
1. Memo, CESAJ-PD, 16 Apr 15
2. Memo, CEIWR-RMC, 1 Apr 15

CF:
CESAJ-PD/Mr. [redacted]
CESAJ-PD-D[redacted]
CESAJ-PD-PW[redacted]
CESAJ-EN/Ms. [redacted]
CESAJ-EN-Q[redacted]
CESAJ-EN-Q[redacted]

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
RISK MANAGEMENT CENTER
12596 WEST BAYAUD AVE., SUITE 400
LAKEWOOD, CO 80228

REPLY TO
ATTENTION OF

CEIWR-RMC

1 April 2015

MEMORANDUM FOR: Commander, Jacksonville District, ATTN: CESAJ-PD-D

SUBJECT: Risk Management Center Endorsement – Central and Southern Florida Project, Herbert Hoover Dike, 2015 Major Rehabilitation Report Supplement and Environmental Assessment, Review Plan

1. The Risk Management Center (RMC) has reviewed the Review Plan (RP) for – Central and Southern Florida Project, Herbert Hoover Dike, 2015 Major Rehabilitation Report Supplement and Environmental Assessment, dated 24 March 2015, and concurs that this RP complies with the current peer review policy requirements outlined in EC 1165-2-214 "Civil Works Review Policy", dated 15 December, 2012.

2. This review plan was prepared by Jacksonville District, reviewed by SAD, and the RMC, and all review comments have been satisfactorily resolved. For this project a Type II IEPR will be performed.

3. The RMC endorses this document to be approved by the MSC Commander. Upon approval of the RP, please provide a copy of the approved RP, a copy of the MSC Commander's approval memorandum to the RMC Senior Review Manager (rmc.review@usace.army.mil).

4. Thank you for the opportunity to assist in the preparation of this RP. Please coordinate all aspects of the Agency Technical Review and the Independent External Peer Review (as appropriate) efforts defined in the RP. For further information, please contact me at 601-631-5896

Sincerely,

[redacted]
Review Manager
Risk Management Center

CF:
CEIWR-RMC ([redacted])
CENAD-DQM (Division Quality Manager)

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
701 San Marco Boulevard
JACKSONVILLE, FLORIDA 32207-8175

REPLY TO
ATTENTION OF

16 APR 2015

CESAJ-PD

MEMORANDUM FOR Commander, U.S. Army Corps of Engineers, South Atlantic Division (ATTN: CESAD-PDP, [redacted]), 60 Forsyth Street, Room 10M15, Atlanta, GA 30303

SUBJECT: Central and South Florida Project, Herbert Hoover Dike 2015 Major Rehabilitation Report Supplement and Environmental Assessment, Review Plan - Request for Review Plan Approval

1. Reference: EC1165-2-214, "Civil Works Review Policy", dated 15 December 2012.

2. Attached is the Review Plan (RP) for the above report. The RP was endorsed by the Risk Management Center (RMC) PCX on 1 April 2015.

3. The RMC-PCX endorsement memo is attached.

4. I hereby request approval of the enclosed subject Review, consistent with the intent of EC1165-2-214.

5. POC for this memorandum is [redacted], telephone 904-232-1818 or Planning Technical Leader, [redacted], telephone 904-232-1058, if you should have any questions relating to the documentation provided.

[redacted]

Encl

Chief, Planning and Policy Division

REVIEW PLAN

CENTRAL AND SOUTHERN FLORIDA PROJECT
Herbert Hoover Dike
2015 Major Rehabilitation Report Supplement and Environmental Assessment
Project #: 114527

Jacksonville District

MSC Approval Date: 21 May 2015
Last Revision Date: N/A

US Army Corps of Engineers ®

REVIEW PLAN

CENTRAL AND SOUTHERN FLORIDA PROJECT
Herbert Hoover Dike

2015 Supplemental Major Rehabilitation Report and Environmental Assessment

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1. PURPOSE AND REQUIREMENTS

Purpose. This Review Plan defines the scope and level of peer review for the Herbert Hoover Dike (HHD) 2015 Major Rehabilitation Report (MRR) Supplement. The HHD 2015 MRR Supplement report is an Implementation Document. The Supplement proposes to extend an already approved method of seepage control (a seepage cutoff wall) for an additional 6.6 miles of the HHD. This Supplement is to identify the best acceptable cutoff wall configuration for the 6.6 mile extension area. This Report is a supplement to the HHD 2000 MRR which is policy compliant and has been approved by USACE HQ.

This Review Plan is intended to ensure a quality engineering project is developed by the Corps of Engineers. This Review Plan was prepared in accordance with EC 1165-2-214, "Civil Works Review". The Review Plan lays out a value added process that assures the correctness of the information shown. It is imperative that the vertical teaming efforts are proactive and well coordinated to assure collaboration of the report findings, conclusions, and recommendations, and that there is consensus at all levels of the organization with the recommended path forward. This Review Plan describes the scope of review for the current phase of work, and will be included in the Project Management Plan (P2 #114527). All appropriate levels of review are included in this Review Plan. The Review Plan identifies the most important skill sets needed in the reviews and the objective of the review and the specific advice sought, thus setting the appropriate scale and scope of review for the individual project. This Review Plan will be provided to PDT and all review teams.

a. References

(1) Engineering Circular (EC) 1165-2-214, Civil Works Review, 15 Dec 2012
(2) Engineering Regulation (ER) 1110-1-12, Quality Management, Change 2, 11 Mar 2011
(3) ER 1110-2-1156, Safety of Dams – Policy and Procedures, 31 Mar 2014
(4) EC 1105-2-412, Assuring Quality of Planning Models, 31 Mar 2011
(5) Enterprise Standard (ES)-08101, Software Validation for the Hydrology, Hydraulics, and Coastal Community of Practice, 01 Jun 2011
(6) Jacksonville District and South Atlantic Division Quality Management Plans

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 applicable 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, cost engineering review and certification (per EC 1165-2-214) and planning models are subject to certification/approval (per EC 1105-2-412). Guidance on quality assurance for engineering models is contained in ER 1110-2-1150, Engineering and Design for Civil Works Projects.

(1) District Quality Control/Quality Assurance (DQC). All **implementation 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 Major Subordinate Command (MSC).

(2) Agency Technical Review (ATR). ATR is mandatory for all **implementation 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 US Army Corps of Engineers (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 a designated Risk Management Organization (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. To assure independence, the leader of the ATR team shall be from outside the home MSC.

(3) Independent External Peer Review (IEPR). IEPR may be required for **implementation 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 is generally for decision documents and Type II is generally for implementation products.

(a) Type I IEPR – for decision documents. 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 an biological opinions of the project study. Type I IEPR will cover the entire decision document or action and will address all the 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.

(b) Type II IEPR – for implementation documents (design and construction activities). 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.

(4) Policy and Legal Compliance Review. All **implementation documents** will be reviewed throughout the study process for their compliance with law and policy. 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. 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.

(5) Cost Engineering Review and Certification. All **implementation documents** shall be coordinated with the Cost Engineering Directory of Expertise (DX), located in the Walla Walla District. The DX, or in some circumstances regional cost personnel that are pre-certified by the DX, will conduct the cost ATR. The DX will provide certification of the final total project cost.

(6) Model Certification/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). Additional guidance pertaining to the process applied by the Hydrology, Hydraulics, and Coastal Community of Practice (HH&C CoP) to use and validate engineering software for use in planning studies and to satisfy the requirements of the SET initiative are documented in ES-0801.

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 the peer review effort described in this Review Plan is the Risk Management Center since the primary purpose of the HHD 2015 MRR Supplement is dam safety.

The RMO will coordinate with the Cost Engineering Directory of Expertise (DX) to conduct ATR of cost estimates, construction schedules and contingencies. The HHD MRR Supplement is a single-purpose

dam safety project. Thus, at this time coordination with other centers of expertise is not anticipated to be needed.

3. STUDY/2015 MRR SUPPLEMENT/PROJECT INFORMATION

a. 2015 MRR SUPPLEMENT Objective. The objective of the HHD 2015 Major Rehabilitation Report Supplement is to identify the technically acceptable cutoff wall configuration, least cost, and economically and environmentally justified solution to reduce the risk (probability of failure and consequences) to tolerable levels for the entirety of the area between the St. Lucie Canal and the Miami Canal (Refer to Figure 1, the area labeled A and shaded light blue) by extending the cutoff wall to the Miami Canal. Implementation of the HHD seepage cutoff wall described in the 2000 MRR started at the St. Lucie Canal but stopped approximately 6.6 miles before reaching the Miami Canal. This Supplement will evaluate extending the seepage cutoff wall the remaining distance. This document is a Supplement to the HHD 2000 Major Rehabilitation Report.

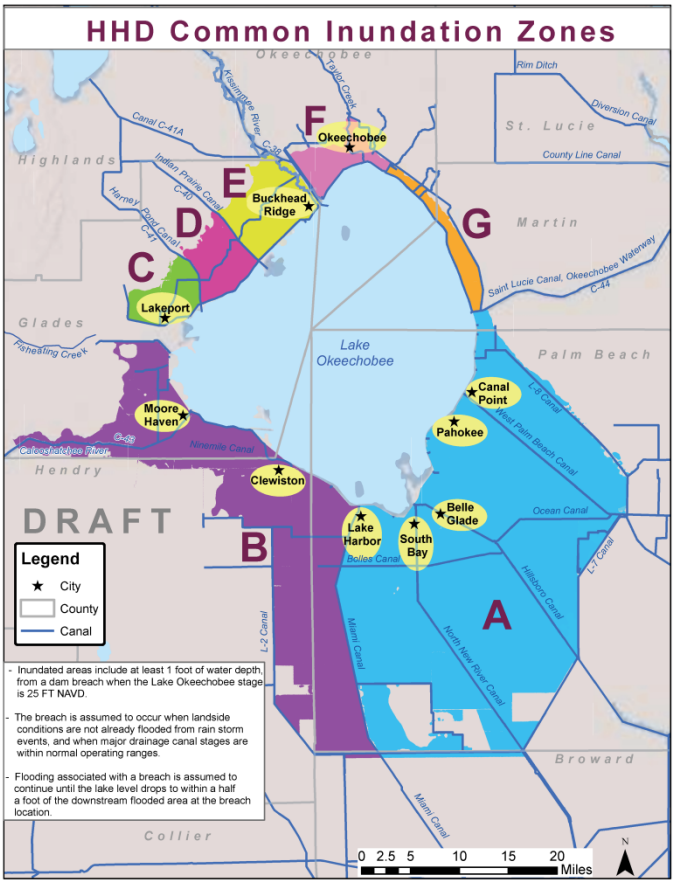

Figure 1 Common Inundation Zone A – Supplement MRR Area

Estimates of dam failure risks require a quantification of the likelihood of the hydraulic loadings, the likelihood of the structural response of the dike and existing water control structures in the dike given the loading, and the adverse consequences (loss of life, property damage or lost benefits) if dike failure occurs. The overarching goal in managing risk for Federal dam infrastructure is to balance available financial resources while providing citizens in areas adjacent to Federal dams (such as Herbert Hoover Dike) a tolerable level of risk.

The two primary numerical values will be employed in this Supplement to gauge the condition of HHD are Annual Probability of Failure (APF) and Average Annualized Life Loss (AALL or "Risk"). Guidelines on tolerable levels of risk have been established and adopted for use in USACE Dam Safety Studies. Other risks defined in USACE Engineering Regulation (ER) 1110-2-1156 include economic and environmental risks; however, specific tolerable risk guidelines do not exists for evaluation of these risk.

b. Project Description

Lake Okeechobee is approximately 35 miles from north to south, 30 miles from east to west, and covers approximately 724 square miles in surface area. The Lake occupies portions of Glades, Hendry, Martin, Okeechobee, and Palm Beach Counties. The Lake is approximately 30 miles west of the Atlantic Ocean and 60 miles east of the Gulf of Mexico, and is hydrologically connected by the St. Lucie Canal and Estuary east of the Lake and the Caloosahatchee River to the west. The Lake and surrounding drainage basin encompass approximately 5,650 square miles, going as far north as Orlando with the Kissimmee River. Directly south of the Lake is the Everglades Agricultural Area (EAA), with the Water Conservation Areas (WCA) and Everglades National Park (ENP) further south (**Figure 2**).

Figure 2 Herbert Hoover Dike and Lake Okeechobee Watershed

The HHD, surrounding Lake Okeechobee, is currently recognized as requiring urgent repairs to minimize risks to public safety and to provide a tolerable level of economic and environmental security in the region. Without intervention, progression toward probable failure is confirmed to be taking place under the normal range of reservoir operating conditions, and the life loss, economic, and adverse environmental consequences of a breach are considered very high. In 2006, HHD was assigned a Dam Safety Action Classification (DSAC) of 1. The purpose of this report is to identify and recommend solutions to reduce the risk of dike failure and associated inundation related damages to Pahokee and Belle Glade; while also providing significant reductions in expected life loss and economic damages to residents of South Bay and Lake Harbor and impacts to the Everglades and agricultural industry.

The U.S. Army Corps of Engineers, Jacksonville District published a MRR in 2000 that analyzed the integrity of the existing dike system, primarily focused on the risk of failure due to internal erosion. The 2000 HHD MRR addressed the overall condition of the entire dike but due to the size and cost of the project recommended rehabilitation of eight reaches prioritized by risk. In 2005, a prior Supplemental MRR and Environmental Impact Statement (EIS) modified the plan recommended in the 2000 HHD MRR to include a cut-off wall. The rehabilitation of Reach 1 (the area between the St. Lucie and North New River Canals) includes installation of a 22-mile seepage cut-off wall in the south-east section of the dike (Figure 6). Construction in this section is nearing completion and will reduce risk related to internal erosion. Completion of this section of cut-off wall will reduce the average annual life loss (AALL) several orders of magnitude for the cities of Pahokee and Belle Glade.

The construction of the cutoff wall is considered successful at reducing the probability of life-loss, and a step forward in reducing the DSAC rating of the dam. However, during high lake stages (greater than 25 feet), a breach in Reach 3 (the 6.6 mile portion of the dike adjacent to Reach 1 between the North New River and Miami Canals [Figure 4]), would flood much of the same area as a breach in Reach 1. Together this area is known as Common Inundation Zone (CIZ) A (Figure 6). This results in downstream areas, including the cities of Pahokee, Belle Glade, Lake Harbor and South Bay; remaining vulnerable to damages. Potential damages include life loss and human suffering, economic damages including impacts to the economically significant agriculture industry (including sugar cane), environmental damages to the Everglades, and adverse social impacts.

c. Failure Modes

The significant failure modes described below have been identified as high risk contributors to the project and should be mitigated to meet tolerable risk guidelines in Segments where these risks are actionable.

Internal Erosion through the Embankment and Foundation

Failure modes due to internal erosion through the embankment or foundation were heavily influenced by the geologic conditions, embankment geometry and performance history within each segment and at times defined where segment boundaries were placed. The event tree developed for the internal erosion failure modes was defined as follows.

1) Hydraulic Loading – pool rises to a certain elevation
2) Erosion Initiates – Exit Gradients are sufficiently high to erode soil particles
2) Unfiltered Exit – Material erodes at an unfiltered point on the landside slope/toe.
3) Roof Support – A material or layer is capable of forming a roof.

4) **Crack Stopper Not Present** – There is no material present to stop the flow of material by filling the defect or the pipe.
5) **Flow Unlimited** – The amount of water passing through the pipe is sufficient to enlarge the pipe.
6) **Intervention Unsuccessful** – All attempts made to stop the erosion are unsuccessful; intervention can occur at any point during development of the PFM.
7) **Breach** – Pipe enlarges sufficiently to allow collapse of the embankment. The breach enlarges until the reservoir is evacuated with resulting downstream consequences.

Node 6 above (Intervention Unsuccessful) relies on human intervention to prevent catastrophic failure of the dam. The RA reports results as two scenarios; 1) giving consideration to the potential for intervention, and 2) ignoring the potential for successful intervention of each failure mode. While both scenarios are presented in the reports, plan formulation utilizes the without intervention risk to compare alternatives, but further examines whether intervention would sufficiently reduce the risk enough to not require federal action.

Figure 3 presents typical internal erosion failure paths for HHD. Specifics of the failure modes in each individual segment are presented in the RA report dated March 2014.

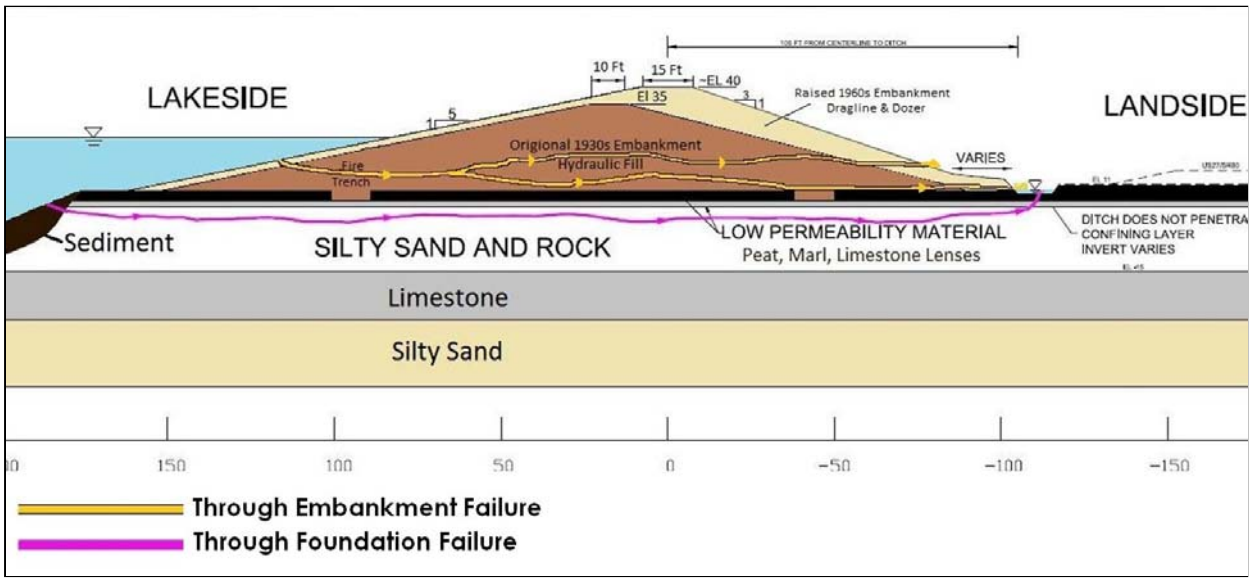

Figure 3 Typical failure mode paths for internal erosion through embankment and through foundation. This figure also shows typical geology in Consequence Zone A as well as the cross section of the 2 construction eras (i.e. 1930s regional construction and the 1960s raising and widening of the embankment).

Structures

There are 12 structure penetrations through the HHD embankment in Consequence Zone A. These include water control structures consisting of culverts, spillways, locks, and pump stations. The eight Federal culverts that penetrate HHD are currently being replaced, many of which are already under construction. These structures are being designed to current industry standards and are therefore low risk. The remaining structures were each evaluated individually based on as-built drawings, performance history at the structures, and inspection reports (Table 1). Structural failure of these robust concrete structures was considered to be remote; therefore, no detailed failure modes related to structural failure were developed. The failure modes identified at the structures include:

- Internal erosion along conduit or along concrete sidewall
- Internal erosion under the structure

Table 1 Potential Failure Modes at Structures

Segment	Structure	Description
24	S-2 Pump Station	Internal erosion along side of structure and under structure
24	S-351 Spillway	Internal erosion along side of structure
22	S-308_B&C	Internal erosion along side of structure
24	S-352 Spillway	Internal erosion along side of structure and under structure

d. The general overall purposes of the HHD 2015 MRR Supplement:

This 2015 supplement to the 2000 MRR (referred to as the HHD 2015 Supplemental MRR) is the document that will be used to obtain USACE approval to extend the cutoff wall and to include all of CIZ A (Reaches 1 and 3 [Figure 4]). Expedited construction will be undertaken to the extent possible/practical to reduce the imminent threat to areas, including the cities of Pahokee, Belle Glade, Lake Harbor and South Bay. This will lower the annual probability of potential damages including life loss and human suffering, economic damages including impacts to the economically significant agriculture industry (including sugar cane), environmental damages to the Everglades, and adverse social impacts.

Figure 4 Cross Reference for HHD Reach vs. Segment and Consequence Zone Delineation

Due to the variability of conditions that exist along its length, the dike is sub-divided into areas to facilitate the evaluation of risk and determination of consequences in the aftermath of a dam failure. The 2000 MRR established 8 reaches based on factors such as physical characteristics of the dike, foundation conditions, drainage features, and the location of population centers. Each reach was assigned a priority rating which corresponds to the assumed severity of potential seepage and stability problems within that reach. Reach 1 was assigned the highest priority and rehabilitation efforts are now close to completion in that reach based on the 2000 MRR and subsequent 2005 Supplemental.

The current approach being employed by the Dam Safety Modification Study does not adopt the eight reach designations used in the MRR, but instead divides the dike into thirty-two (32) segments based on significant changes in geologic conditions, embankment geometry, tail water conditions, and downstream consequences (Figure 5 **HHD Segment Map**). The Dam Safety Modification Study also recognizes Common Inundation Zones (CIZ) (Figure 6). A CIZ is a set of adjacent segments where a breach in any individual segment of the CIZ would result in the same downstream flooding and consequences as a breach in any other segment within the CIZ.

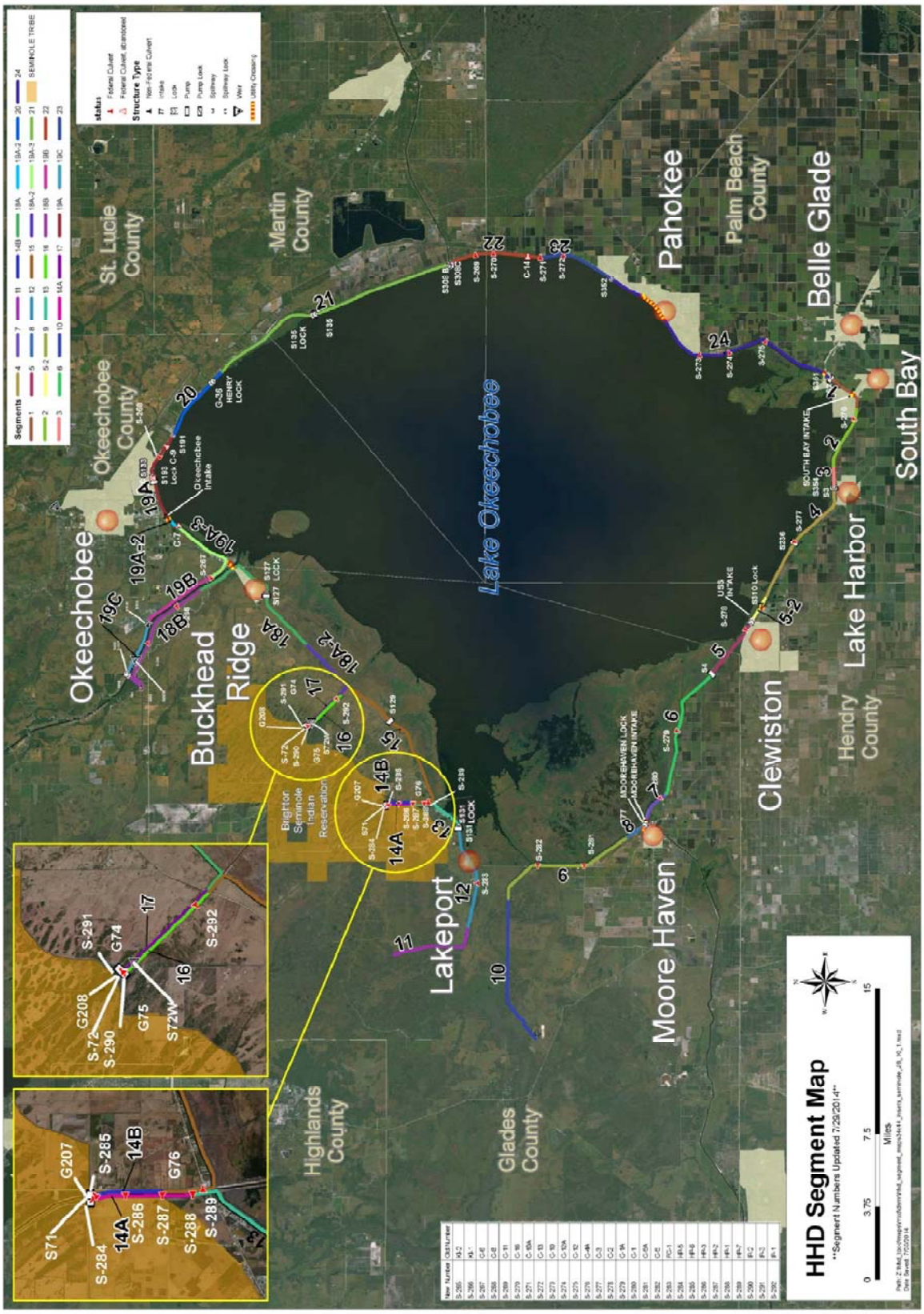

Figure 5 HHD Segment Map

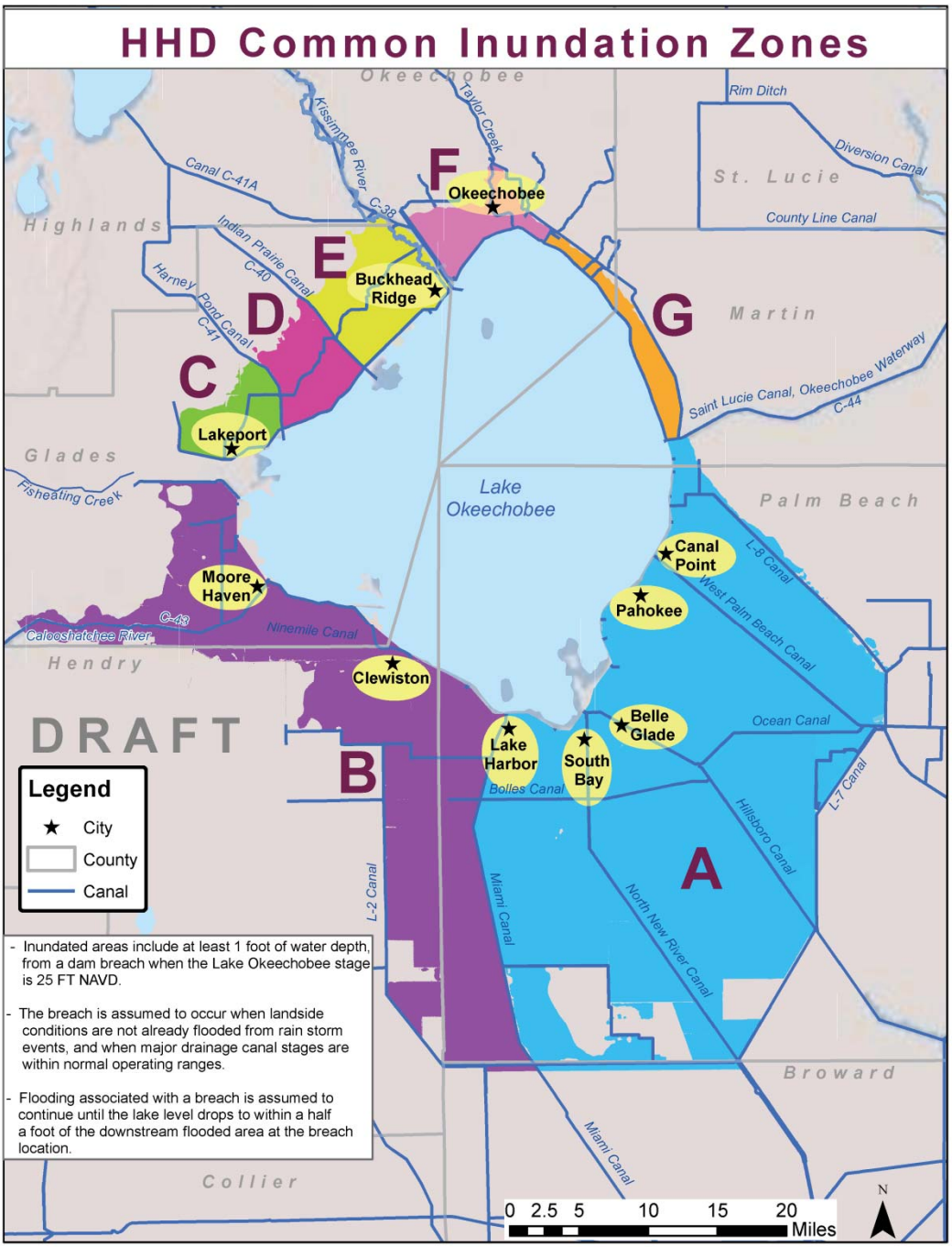

Figure 6 HHD Segment Map (upper) and HHD Common Inundation Zones for Economic and Environmental Impacts for Lake Stages at 25ft NGVD (lower)

The 2015 MRR Supplement focuses on the area of Consequence Zone A of Herbert Hoover Dike, which extends from the Miami Canal to the Saint Lucie Canal (C-44) (Figure 3), and is fully contained within Palm Beach County. This stretch of Herbert Hoover Dike will exhibit similar downstream flooding and consequences in the event of a dam failure anywhere in this area; as such, it is necessary to evaluate the

completeness of any solution comprehensively over the entire span. The towns of Lake Harbor, Pahokee, South Bay and Belle Glade are adjacent to the Supplement Report area.

e. Implementation Plan and Costs

The approved plan will be implemented as quickly as funding and legal constraints allow. The order of work is expected to prioritize the average annual life loss estimates, highest to lowest, and will be influenced by site constraints (access points, staging areas, etc) and other factors (relocation of existing utilities, modifications to boat ramps and campgrounds, etc). The funding stream assumption for the recommended plan begins with preconstruction design costs and construction awards in FY 2017, followed by the remainder of construction, engineering during construction, and supervision and administration costs beginning in FY 2018 through project completion in FY 2020. The expected cost of remediation is between $50 and $100 million.

f. Factors Affecting the Scope and Level of Review

This section discusses factors pertinent to 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 needed to support the PDT, RMC, and vertical team decisions. The discussion will help to determine the types of expertise required on the various review teams to adequately review the document. The following is a discussion of pertinent risk factors:

- Is total project cost estimated to exceed $45M?

  While 2034 of WRDA 2007 required projects over $45M to undergo IEPR, Section 1044 of WRRDA 2014 amended Section 2034 of WRDA 2007 by increasing this limit from $45 million to $200 million. The estimated cost of this project is well below the new criterion.

- Does the project pose significant technical, institutional, social, or other challenges?

  No. A similar cutoff wall has been successfully installed along approximately 20 miles of Reach 1 of HHD.

- Where are significant project risks likely to occur and at what magnitude (e.g., what are the uncertainties and how might they affect the success of the project)?

  Due to uncertainty in hydrologic loading, risk assessments were conducted for two loading curves. It is likely that the final curve will plot somewhere between the Draft 2010 MRR curve and the MCRAM stage frequency curve. Despite the uncertainty in hydrologic loading and the risk assessments, there is a high degree of confidence that Segment 1 is above tolerable risk guidelines for expected average annual life loss, using either loading curve. As a result, Federal action is warranted for this segment. There is also a high level of confidence that the annual probability of failure in the gap in Consequence Zone A exceeds tolerable risk guidelines, as supported by both loading curves. However, the variability in the risk assessments for Segments 2 and 3 as noted by the two different loading curves leads to greater uncertainty in whether these segments are above or below risk tolerance guidelines for life safety. Project justification is provided by consideration of economic, environmental and societal damages prevented. Therefore, it can be concluded that any change in the MCRAM results that plots a curve somewhere in the middle of the 2 existing curves will also result in the same risk reduction decisions. Therefore this uncertainty that remains in the stage frequency curve will not affect the

risk reduction plans in Segments 1 through 3, and could only lead to stronger rationale for remediation.

Significant uncertainty has been identified with the probability estimates for the overwash and overtopping mode. Major sources of uncertainty include joint probability of high lake stages and tropical cyclone impact on the lake and duration of overwash during a storm event. Studies are currently in progress to reduce this uncertainty and to conclude a more defendable risk estimate for this failure mode. The existing level of uncertainty associated with the failure mode is considered too high guide a risk informed decision process. Considering this, the overwash/overtopping failure mode is not addressed in this report; however, preliminary results using the MCRAM stage frequency curve indicate that the failure mode will not be actionable anywhere in Consequence Zone A.

- Is the project likely to have significant economic, environmental, and/or social effects to the Nation?

  There will be positive effects - a reduction of life safety risk associated with reduced likelihood of a breach of HHD. Based on the prior installation of cutoff walls, any negative environment and social effects are expected to be insignificant and short-term, associated with construction activities.

- Does the project likely involve significant threat to human life/safety assurance?

  The purpose of the study is to formulate and evaluate alternatives on their ability to reduce risk to human life and safety. The local communities will benefit from the reduction of likelihood of HHD breach. As HHD is currently considered a DASAC Level 1 dam, with failure imminent, to take no action will prove to be a much greater threat to human life and safety assurance.

- Is the project/study likely to have significant interagency interest?

  No.

- Is the project/study highly controversial (with some discussion as to why or why not and, if so, in what ways)?

  No. A similar cutoff wall has been successfully installed along approximately 20 miles of Reach 1 of HHD.

- Is the project/study likely to contain influential scientific information or be a highly influential scientific assessment (with some discussion as to why or why not and, if so, in what ways)?

  No. It is not anticipated that the project/study has, or will have, a clear and substantial impact on important public policies or private sector decisions.

- Is there information in the proposed project design that will likely 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)?

No. Existing methods and techniques were adopted to develop and evaluate the cutoff wall configurations. A similar cutoff wall has been successfully installed along approximately 20 miles of Reach 1 of HHD.

- Will the proposed project design require redundancy, resiliency, and/or robustness (with some discussion as to why or why not and, if so, in what ways – see EC 1165-2-214, Appendix E, Paragraph 2 for more information about redundancy, resiliency, and robustness)?

  The proposed seepage barriers being analyzed would increase resiliency and robustness of the existing HHD embankment across a range of conditions.

- Does the proposed project have 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)?

  No. The project does not anticipate an unusual timeline for construction.

In-Kind Contributions. Products and analyses provided by non-Federal sponsors as in-kind services are subject to DQC, ATR, and IEPR. No in-kind contributions from the South Florida Water Management District are expected during this report preparation.

4. DISTRICT QUALITY CONTROL (DQC)

a. Documentation of DQC. DQC will usually be documented by memorandum for record (MFR). DQC documentation will be provided to the ATR team at its review.

b. Products to Undergo DQC. The 2015 Major Rehabilitation Report Supplement, with technical appendices, will be submitted to DQC prior to formal ATR. DQC comments will be provided via electronic track-changes and in-line review comments in the DQC document. The separate Draft Environmental Assessment will also undergo DQC. DQC of interim products, in a "continuous" process, will be documented at least by memorandum. Continuous DQC will managed by the office generating the work product.

c. Required DQC Expertise. Experienced Jacksonville District team members, representing all pertinent disciplines, will participate in DQC, including: plan formulation, economics, environmental, engineering design, hydraulics and hydrology, geotechnical engineering, geology, cost engineering and real estate.

5. AGENCY TECHNICAL REVIEW (ATR)

a. Products to Undergo ATR. ATR will be performed, at a minimum, on all products subjected to formal review outside of the Jacksonville District, in this case, the Final Supplemental MRR and the Environmental Assessment.

b. Required ATR Team Expertise. The ATR team will be finalized by the DSMMCX and will be comprised of individuals from all the technical disciplines that were significant in the preparation of the report. ATR members who have previously been assigned to work on and conducted reviews of the HHD DSMS is desired.

Skilled and experienced personnel who have not been associated with the development of the Supplemental Report will perform the ATR. ATR team members may be employees of U.S. Army Corps of Engineer Districts, other Federal agencies, state or local government agencies, universities, private contractors or other institutions. The key factor is extensive, expert knowledge in their field of expertise. ATR team members are listed in Attachment 1. Technical disciplines determined to be appropriate for this review include: Plan Formulation, Economics, Environmental Impact Analysis, Civil Engineering Design, Real Estate, Cost Estimating, Hydraulics and Hydrology (H&H), and Geotechnical Engineering.

ATR Team Members/Disciplines	Expertise Required
ATR Lead	The ATR lead should be a senior professional with extensive experience conducting ATR. The lead should also have the necessary skills and experience to lead a virtual team through the ATR process. Typically, the ATR lead will also serve as a reviewer for a specific discipline (such as planning, economics, environmental resources, etc).
Planning	The Planning reviewer should be a senior water resources planner with a minimum of 10 years demonstrated experience in planning USACE studies with a preference for experience in Dam Safety Modification Studies.
Economics	The economics reviewer should be a senior economist with a minimum of 10 years demonstrated experience evaluating life loss and flood risk project benefits and costs, with experience in identifying incidental benefits.
Hydrology, Hydraulic Engineering and Modeling	This reviewer should be a senior hydraulic engineer with a minimum of 10 years demonstrated experience in the field of hydrology, hydraulics and H&H modeling, including a general knowledge of south Florida hydrology and water management. The reviewer(s) should have a thorough understanding of water storage and conveyance and sediment control and be knowledgeable of associated hydrologic and hydraulic model applications.
Geotechnical Engineering	Experience in geotechnical aspects of earthen dams, seepage barriers, seepage filter systems, grouting and south Florida geology. An understanding of local geology, including aquifer characteristics and ground water quality, would be ideal. A minimum of 10 years demonstrated experience is preferred.
Real Estate	Senior real estate specialist experienced in contributing to large civil works projects. A minimum of 5 years demonstrated experience is preferred.
Civil Engineering	Experience in engineering/construction management for water storage and conveyance in both structural and non-structural systems, wetland restoration, and sediment control. A minimum of 10 years

	demonstrated experience is preferred.
Cost Engineering	Approved by the Cost DX

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 draft report and final report. A sample Statement of Technical Review is included in Attachment 2.

6. INDEPENDENT EXTERNAL PEER REVIEW (IEPR)

a. General.

EC 1165-2-214 provides implementation guidance for both Sections 2034 and 2035 of the Water Resources Development Act (WRDA) of 2007 (Public Law (P.L.) 110-114). Sections 2034 and 2035 call for peer review procedures for both the Planning and the Design and Construction (PED) phases. The EC terms the Section 2034 Independent Peer Review, Type I Independent External Peer Review and the Section 2035 Safety Assurance Review, Type II Independent External Peer Review.

b. Decision on Type-I IEPR

The document being reviewed is an **implementation document** and a Type I IEPR is not recommended and will not be conducted on the 2015 MRR Supplement and EA.

c. Decision on Type-II IEPR

Type II Independent External Peer Review (IEPR) Determination and Methodology: A Type II IEPR (SAR) shall be conducted on design and construction activities for any project where potential hazards pose a significant threat to human life (public safety). This applies to new projects and to the major repair, rehabilitation, replacement, or modification of existing facilities. The requirement for Type II IEPR is based upon Section 2035 of WRDA 2007, the OMB Peer Review Bulletin and other USACE policy considerations. Since the cutoff wall concept has been previously approved and installed on a portion of the HHD and is considered a success at reducing the probability of life-loss, and a step forward in reducing the DSAC rating of the dam, no Type II IEPR of the conceptual design of the 2015 MRR Supplement to extend the cutoff wall is needed or required. The District Chief of Engineering, as the Engineer-In-Responsible-Charge, supports this determination.

When a Type II review is included in the project's approved Review Plan, the District Chief of Engineering is responsible for ensuring the Type II review is conducted in accordance with EC-1165-214, and will fully coordinate with the Chief of Construction, the Chief of Operations, and the project manager through the Pre-Engineering and Design (PED) and construction phases. The project manager will coordinate with the RMO to develop the review requirements and to include them in the Review Plan. The default RMO for flood risk management projects and Type II reviews is the USACE Risk Management Center (RMC).

For the PED or design phase, the Type II (SAR) should focus on unique features and changes from the assumptions made and conditions that formed the basis for the design during the decision document/conceptual phase. The SAR shall as a minimum address the following questions: (1) Do the assumptions made during the decision document phase for hazards remain valid through the completion of design as additional knowledge is gained and the state-of the-art evolves? (2) Do the project features adequately address redundancy, resiliency, or robustness with an emphasis on interfaces between structures, materials, members, and project phases? (3) Do the project features and/or components effectively work as a system? The PED or design phase documents are not currently addressed in this Review Plan. A risk-informed decision concerning the timing and appropriate level of reviews for the PED/design/implementation phase will be prepared and submitted for approval in an updated/revised Review Plan prior to initiation of the design phase.

For the construction phase, the Type II (SAR) shall as a minimum address the following questions: (1) Do the assumptions made during design remain valid through construction as additional knowledge is gained and the state of the art evolves? (2) For O&M manuals, do the requirements adequately maintain the conditions assumed during design and validated during construction; and will the project monitoring adequately reveal any deviations from assumptions made for performance? The construction phase is not currently addressed in this Review Plan. A risk-informed decision concerning the timing and appropriateness of construction phase Type II IEPR (SAR) reviews for the construction phase will be prepared and submitted for approval in an updated/revised Review Plan prior to initiation of construction activities.

d. Type II IEPR Report Approval. The approval authority for Type II IEPR Reports is the South Atlantic Division (SAD). Approval activities and responsibilities are stipulated in EC 1165-2-209. Related excerpt is below.

"District Responsibilities to complete the SAR Report.

a. The host district Chief of Engineering is responsible for coordinating with the RMO, for attending review meetings with the SAR review panel, communicating with the agency or contractor selecting the panel members, and for coordinating the approval of the final report with the MSC.

b. After receiving a report on a project from the peer review panel, the District Chief of Engineering shall consider all comments contained in the report and prepare a written response for all comments and note agreement and subsequent action or disagreement with an explanation. The reviewer's report and the Districts responses shall be submitted to the MSC for final approval and made available to the public on the District's website."

e. Type II IEPR Schedule

Based on existing project scheduling and projected plan and specifications (not currently addressed by this review plan) development durations the current estimate for Type II IEPR is expected to occur during the October – December 2016 time frame. As the project progresses this window will be reviewed and revised as necessary with revisions to the review plan as required. Also as indicated above, the schedule for the Type II IEPRs will be addressed in an updated/revised review plan prepared prior to initiation of the design and construction phases.

7. POLICY AND LEGAL COMPLIANCE REVIEW

All documents will be reviewed throughout the report development process for their compliance with law and policy. These reviews determine whether the recommendations in the reports, supporting analyses, and coordination comply with law and policy, and warrant approval or further recommendation to higher authority. 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.

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

All 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 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

a. Planning Models. The following table contains a comprehensive list of planning models that were used to evaluate and compare plans.

Model Name and Version	Brief Description of the Model and How It Will Be Applied in the Report	Certification / Approval Status
Flood Impact Analysis Model V. 2.2	This version of HEC-FIA is a single event consequence estimation software package designed to deterministically analyze an event (e.g. a dam failure, historic floods, or hypothetical floods) and determine the resulting consequences.	Certified

b. Engineering Models. This is a comprehensive list of engineering models that may be used to evaluate and compare plans. For the final subset, full details of the methodology will be provided to the USACE SET team for review and approval for individual use if not already approved for use. The following engineering models are anticipated to be used in the development of the report.

Model Name and Version	Brief Description of the Model and How It Will Be Applied in the Report	Certification or Approval Status
HEC-1: USACE model software	The HEC-1 model is designed to simulate the surface runoff response of a watershed to precipitation by representing the basin as an interconnected system of hydrologic and hydraulic components. Each component models an aspect of the precipitation-runoff process within a portion of the basin, commonly referred to as a subbasin. The result of the modeling process is the computation of flow hydrographs at desired locations in the Lake Okeechobee Watershed.	USACE Approved: Allowed for Use
HEC-HMS and HEC-RAS: USACE model software	The HEC-HMS model may be used to simulate the rainfall runoff response within the project area. The HEC-RAS model may be utilized to evaluate natural and manmade channels within the project area. Output from HEC-HMS can be used as input to HEC-RAS to simulate the stages and flows within the canals, streams and water bodies of the Lake Okeechobee Watershed as well as stillwater stages within Lake Okeechobee under specific design storm events. Outputs from these models are	USACE Approved: Endorsed as Community of Practice (CoP) Preferred

	utilized during engineering design to ensure adequate sizing of canals and water control structures.	
HEC-SSP: USACE model software	HEC-SSP can perform statistical analyses of hydrologic data. The current version of HEC-SSP can perform flood flow frequency analysis based on Bulletin 17B, "Guidelines for Determining Flood Flow Frequency" (1982), a generalized frequency analysis on not only flow data but other hydrologic data as well, a volume frequency analysis on high and low flows, a duration analysis, a coincident frequency analysis, and a curve combination analysis. HEC-SSP was used to perform frequency analysis of historical rainfall at gage locations as well as stage-frequency analysis for historical and modeled stages on Lake Okeechobee.	USACE Approved: Allowed for Use
SFWMM (2X2): South Florida Water Management Model	The SFWMM is a physically-based simulation model that combines the hydrology and management of aspects of a greater portion of the South Florida Water Management District (SFWMD). The model is regional in spatial extent and it encompasses an area of substantial heterogeneity in both natural and managed hydrology. The model has a 2-mile by 2-mile fixed-resolution grid system. The SFWMM is a coupled surface water-groundwater model which incorporates overland flow, canal routing, unsaturated zone accounting and 2D single layer aquifer flow. The model is site-specific because it was exclusively developed for the south Florida region.	USACE Approved: Allowed for Use
MIKEFLOOD	MIKE FLOOD is a flood modeling tool which includes a selection of 1D and 2D flood simulation engines. The program can model virtually any flood problems involving rivers, floodplains, floods in streets, drainage networks, coastal areas, dam, levee and dike breaches, or any combination. The breach capabilities will be used for the purposes of this report.	USACE Approved: Allowed for Use
MCRAM (Monte Carlo Reservoir Analysis Model)	MCRAM is a Microsoft Excel based application that uses Excel as the user interface, while computations are performed in code via Visual	Not currently USACE approved. Currently in the review process managed by

	Basic for Applications (VBA). The basic concept of MCRAM is to use a deterministic hydrologic model with treatment of select inputs as random variables instead of fixed values. Monte Carlo sampling procedures are used to allow the inputs to vary as observed in nature, maintaining any natural dependencies that exist between them. This model will be used to develop a reservoir stage-frequency curve with uncertainty bounds for Lake Okeechobee.	the RMC. ATR began 14 November 2014. The estimated completion date is 31 March 2015.
STWAVE: USACE model software	STWAVE (STeady State spectral WAVE) is a wind-wave growth model that simulates depth-induced wave refraction and shoaling, current-induced refraction and shoaling, depth- and steepness-induced wave breaking, diffraction, and wave-wave interaction and whitecapping that redistribute and dissipate energy in growing wave fields. The model was used to estimate wind wave climate for Lake Okeechobee and the associated effect on the surrounding Herbert Hoover Dike.	USACE Approved: Allowed for Use
ACES: USACE model software	The ACES is a microcomputer-based design and analysis system in the field of coastal engineering. The contents range from simple algebraic expressions both theoretical and empirical in origin, to numerically intense algorithms spawned by the increasing power and affordability of computers. The methods in the ACES range from classical theory describing wave motion, to expressions resulting from tests with structures in wave flumes, and to recent numerical models describing the exchange of energy from the atmosphere to the sea surface. Although the ACES interface was not used in this analysis, the equations were used to estimate wind setup, and run-up and over-wash values.	USACE Approved: Allowed for Use

10. CONSOLIDATED REVIEW SCHEDULES AND COSTS

- DQC of 2015 Supplement to MRR, 2-6 Feb 2016 (Est. Cost $15K)
- District Legal Review of 2015 Supplement to MRR, 2-6 Feb 2015 (Est. Cost $5K)

- ATR of 2015 Supplement to MRR, 16 Feb – 05 Mar 2015 (Est. Cost $50K)
- DQC of the Environmental Assessment, 16 -24 Feb 2015 (Est. Cost $15K)
- District Legal Review of the Environmental Assessment, 16 -24 Feb 2015 (Est. Cost $5K)
- ATR of the Environmental Assessment, 24-27 Feb 2015 (Est. Cost $5k)

- Public and Agency review of Draft Environmental Assessment, 10 Mar – 11 May 2015
- Policy and Legal Review of 2015 Supplement by South Atlantic Division, 06-26 Mar 2015
- Policy and Legal Review of 2015 Supplement by RMC and HQ Vertical Team May 19 2015
- Type II IEPR Review of 2015 Supplement PED by IEPR Team October – December 2016 (Est. Cost $150K to $200K) (See paragraph 6.e)

11. PUBLIC PARTICIPATION

As required by EC 1165-2-214, the approved Review Plan will be posted on the Jacksonville District public website (http://www.saj.usace.army.mil/Missions/CivilWorks/ReviewPlans.aspx).

Public review of the Draft Environmental Assessment (EA) is listed in Section 10. Availability of the Draft EA will be noticed using the Federal Register, press releases, email notifications, and posting to the Jacksonville District website. The public will have 45 days to provide comments on the Draft EA. Review comments will be addressed and the EA revised as necessary.

The HHD 2015 MRR Supplement will not be released for public review. It is subject to the same protections as Dam Safety Modification Reports (ER 1110-2-1156, Safety of Dams – Policy and Procedures).

12. REVIEW PLAN APPROVAL AND UPDATES

The South Atlantic Division (SAD) Commander is responsible for approving this Review Plan. The MSC 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 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 will be documented in Attachment 3. Significant changes to the Review Plan (such as changes to the scope and/or level of review) must 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 website: (http://www.saj.usace.army.mil/Missions/CivilWorks/ReviewPlans.aspx).

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:

- Project Manager, Jacksonville District, 904-232-2436
- Program Manager, South Atlantic Division, 404-562-5121
- Review Management Organization POC, RMC, 304-399-5217

ATTACHMENT 1: TEAM ROSTERS

PROJECT DELIVERY TEAM (PDT)

Discipline	Agency
Project Management	USACE
Plan Formulation	USACE
Real Estate	USACE
Economics	USACE
Archaeology/Cultural Resources	USACE
Biology/NEPA	USACE
Hydrologic/Hydraulic Modeling	USACE
Civil Engineering	USACE
Geotech	USACE
Geology	USACE
Cost Engineering	USACE
Value Engineering	USACE
Office of Counsel	USACE
Project Management – Non-Federal Sponsor	South Florida Water Management District

ATR TEAM (To be determined by PCX)

Discipline/Expertise	District/Division
ATR Lead	LRH
Plan Formulation	IWR
Economics	LRH
Environmental	LRN
Real Estate	LRH
Civil Design	TBA
Geotechnical	MVS
Hydrology and Hydraulics	LRH
Cost Engineering	LRH

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 *implementation report* for *the 2015 Supplemental Herbert Hoover Dike Major Rehabilitation Report, south Florida.* 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[sm].

SIGNATURE _____ Date _____

ATR Team Leader
CELRH-DSPC-GS

SIGNATURE _____ Date _____

Project Manager
CESAJ-PM

SIGNATURE _____ Date _____

Review Management Office Representative
CEIWR-RMC

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 _____

Chief, Engineering
Division *CESAJ-EN*

SIGNATURE _____ Date _____

Chief, Planning Division
CESAJ-PD

[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: LIST OF TYPICAL 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		
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
		RED	Regional Economic Development
HQUSACE	Headquarters, U.S. Army Corps of Engineers	RMC	Risk Management Center
IEPR	Independent External Peer Review	RMO	Review Management Organization
ITR	Independent Technical Review	RTS	Regional Technical Specialist
MRR	Major Rehabilitation Report	SAR	Safety Assurance Review
MSC	Major Subordinate Command	USACE	U.S. Army Corps of Engineers
MCX	Mandatory Center of Expertise	WRDA	Water Resources Development Act