Agency Technical Review Summary Report

June 2020

For Review Of:

Rio Grande de Manati Flood Risk Management Study, Ciales, Puerto Rico Final Integrated Feasibility Report & Environmental Assessment

June 2020
Pittsburgh District

Review Management Organization:
FRM PCX

US Army Corps of Engineers ®

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1. Introduction

This Agency Technical Review (ATR) Summary Report documents the ATR performed for the Rio Grande de Manati Flood Risk Management Study, Ciales, Puerto Rico Final Integrated Feasibility Report & Environmental Assessment. The home District point of contact for the review was Eric Merriam, Lead Planner and Elliott Porter, Project Manager. The ATR team and review was led by Katie Opsahl, Planner, CEMVP-PDF. The FRM-PCX was the Review Management Organization (RMO) responsible for managing the ATR and assuring the overall quality of the review.

2. References

The ATR was conducted in accordance or in coordination with the following documents:

a. Engineering Circular (EC) 1165-2-217, Civil Works Review, dated 20 February 2018.
b. Review Plan, Rio Grande de Manati, approved January 2019.
c. District Quality Control Report for the Final Report, June 2020

3. Review Details

a. DrChecks^{SM} Review Record

- *Project ID*: PR_RGdM
- *Project Name*: Puetro Rico Grande de Manati
- *Review ID/Edit*: 00005

b. Type of ATR: Final

c. List of Product(s) Reviewed:

Table 1: Products Reviewed List

Document/Product Title	Approximate Page Count
Integrated Feasibility Report	152
Appendix A – Engineering	244
Appendix B –Environmental	193
Appendix C – Economic Analysis	57
Appendix D – Cost Engineering	15
Appendix E – Real Estate	24

d. ATR Chronology

Table 2 ATR Chronology highlights specific milestones in the ATR timeline. For more complete ATR timeline refer to the ATR Work Plan's Table 5: ATR Schedule.

Table 2: ATR Chronology

Review Stage	Date
DQC/QA Documents Provided	9 June 2020
Review Documents Provided	8 June 2020
ATR Kickoff Meeting / Start of ATR	8 June 2020
ATR Completed	18 June 2020

4. Background Information

a. Brief Description of the Product(s) Reviewed: Products reviewed included the final integrated feasibility report and environmental assessment and technical appendices.
b. Prior ATR History: ATR for the Draft Rio Grande de Manati Flood Risk Management Study, Ciales, Puerto Rico Final Integrated Feasibility

Report & Environmental Assessment and Appendices was conducted between March – May 2020.

5. ATR Team Composition

The ATR team leader (ATR Lead) was selected from outside the home MSC for added independence. The ATR was conducted by a certified review team selected from outside the home district and who were not involved in the day-to-day production of the product(s) reviewed. All the ATR team members, including the ATR Lead, are certified to perform ATR by their respective Communities of Practice.

The composition of the ATR team for this review was based from the study's current review plan (2. References 1.b.), and the scope and content of the product(s) to be reviewed. The contact information and review roles for each ATR team member are provided in Enclosure 1 along with the PDT information. The experience, qualifications, and certifications of each ATR team member are provided in Enclosure 2.

6. Charge to Reviewers

The charge to reviewers established the specific objectives of the ATR and the specific assessment sought from the ATR team. The charge for this review was developed by the Project Delivery Team (PDT), in consultation with the ATR Lead. It was based on the scope and content of the product(s) reviewed and informed by the prior review of the draft report and subsequent guidance from the Project Guidance Memorandum for the study. The charge to reviewers is provided in Enclosure 3.

7. Assessment of DQC

In accordance with Reference 2c, the ATR team examined the relevant DQC records provided by the PDT to assess the apparent adequacy of the DQC effort for the subject product(s). Based on the examination of the DQC records provided, and of the product(s) submitted for review, it appears the DQC effort was adequate.

The DrChecks report provided for the review of the final documents appeared robust and contained comments from all disciplines and all comments were resolved.

8. Review Summary

The review resulted in 20 comments. There were 5 disciplines for which reviewers entered "no comment resulting from the review". These comments

were entered in order to document that the review was conducted but no substantive comments were generated. There were 15 comments entered categorized as low to moderate significance. The 15 comments entered focused on fine tuning the feasibility report, economic analysis, and final cost estimate. All comments were closed and no comments require further coordination.

A complete record of ATR comments, responses, and associated resolutions is available in DrChecks^{SM} and a report is provided in Enclosure 4. Please note – the comments from Katie Opsahl are classified as Plumbing under the Design Discipline, this is inaccurate and should have been listed under Planning.

9. Status of Cost Engineering Mandatory Center of Expertise (MCX) Coordination and Certification

The ATR has been coordinated with the Cost Engineering MCX. The first review was completed for the draft report, which included the TSP cost estimate (March – May 2020). A second review as completed for the final report, which included the recommended plan cost estimate (June 2020). Cost Certification was provided by the Cost Engineering MCX on June 16, 2020.

10. Lessons Learned

The PDT did a great job of clearly providing information on the changes made between the draft report and final report (see Enclosure 3 Charge to Reviewers). This made review of the final report straight forward.

11. Statement of Completion of ATR

A Statement of Completion of Agency Technical Review is provided in Enclosure 5.

Enclosure 1

Contact Information and Review Role(s) of ATR Team & PDT Members

ATR TEAM CONTACT INFORMATION

Name	Office	Discipline	Phone Number
Katie Opsahl	CEMVP-PD-F	ATR Lead / Plan Formulator	(651) 290-5259
Allen Holland	CENWK-PMP-F	Economist / Flood Risk Analysis	(816) 389-3105
Kat McCain	CEMVP-PD-P	Environmental & Cultural Resources	(314) 331-8047
Ken Lampkin	CELRL-ED-T-H	Hydraulic Engineer	(502) 315-6458
Phillip Sauser	CENAP-EC-EB	Structural Engineer	(651) 769-3447
Kirk Sunderman	CEMVR-EC-DM	Civil Engineer	(309) 794-5140
Mike Navin	CEMVS-EC-GT	Geotechnical Engineer	(314) 331-8441
Bill Bolte	CENWW-ECE	Cost Engineering	(509) 527-7585
Meredith Harmon	CENWK-RE	Real Estate	(816) 389-3557
William Veatch	CEMVN-ED-H	Climate Preparedness & Resilience	(504) 862-2858

PDT CONTACT INFORMATION

Name	Office	Position	Phone Number
Elliott Porter	CELRP-PM-EF	Project Manager	412-395-7479
Jorge Tous	CESAJ-PM-WN	PM Forward	904-763-8587
Andrea Carson	CELRP-PM-EF	Plan Formulation	412-395-7444
Eric R. Merriam	CELRP-PME-F	Plan Formulation	412-395-7185
Susannah Byrd	CELRP-PME-F	Economist	412-395-7164
Erin Stuart	CELRP-PME-V	Environmental Specialist	412-395-7517
John Rusnak	CELRP-EC-NC	Project Engineer/Civil Engineer	412-395-7239
Deepak Neupane	CELRP-ECG-G	Geotechnical Engineer	412-395-7349
Greg Meyer	CELRP-EC-NC	Structural Engineer	412-395-7513
David Druzbicki	CELRC-TS-D-C	Cost Engineer	312-846-5433
Huan Tran	CELRP-ECG-I	Geospatial Specialist	412-395-7512
Christina Urbanczyk	CELRP-ECG-WH	H&H Engineer	412-395-7202
James Kelly	CELRP-RE	Realty Specialist	412-395-7135

Enclosure 2

Experience and Qualifications of ATR Team Members

Katie Opsahl
ATR Lead & Plan Formulation
CEMVP-PD-F
Katie Opsahl is a planner in Regional Environmental Planning Division North, St. Paul District. Katie has been with the U.S. Army Corps of Engineers since 2010. She has served as a lead planner for several Continuing Authorities Program studies and General Investigations focusing on flood risk management and ecosystem restoration. Well versed in USACE planning process, including Risk Informed Planning, IWR Planning Suite, has served on feasibility teams and worked on projects in the design and implementation phase. Other experiences include graduate of USACE Planning Associates Program in 2014, 120-day detail as Planning Specialist for Mississippi Valley Division in 2018, and 120-day detail as Plan Formulation Section Chief in 2019. Katie was certified for Plan Formulation ATR in 2019.
Education: Masters of Urban and Regional Planning, Humphrey School of Public Affairs University of Minnesota, 2011; Bachelors of Science, Recreation and Leisure Services, 2006

Allen Holland
Economist & Flood Risk Analysis
CEMWK-PMP-F
Allen Holland is senior economist at USACE Kansas City District (CENWK), where he has 33 years of experience as a Corps economist and has worked on more than 50 studies with particular emphasis on risk-based economic analyses of flood damage. He is a subject matter expert in flood risk management and dam/levee risk consequence assessment and is certified as an ATR reviewer in these areas by the USACE Planning CoP. He also performs risk and uncertainty ATRs and has served as a technical (DQC) reviewer for both economics and risk on many studies. Mr. Holland's work has included feasibility analyses for existing Federal urban flood risk management projects protecting Kansas City MO/KS, the St. Joseph area (MO/KS), Topeka KS, and Manhattan KS, and he has been involved in Civil Works Review Boards for four major studies that successfully proceeded to design and construction phases. In recent years he has been involved in the evaluation of economic, social, cultural and environmental consequences for

several large-scale, collaborative Missouri River basin studies, including the Missouri River Recovery Program (MRRP) and the Missouri River Stream Bank Degradation Study. The economic analyses for these studies encompass a large range of inland water resource purposes, including flood risk management, water supply and quality, recreation, ecosystem restoration, hydropower, and inland navigation. He also performs consequence analyses for dam and levee safety. Mr. Holland holds a B.A. degree in economics from Park College (now Park University).

Kat McCain, PH.D.
Environmental & Cultural Resources
CEMVP-PD-P
Dr. McCain began her career with the Corps of Engineers, St. Louis District in 2010 as an Ecologist. Prior to the Corps, she was the state-wide floodplain and ecosystem restoration ecologist for the Missouri Department of Conservation. She has been the Regional Planning and Division North Planning Section Chief located in St. Louis since 2013. She is also a Water Resources Certified Planner, PROSPECT instructor for Environmental Impact Assessment course, and the ECO-PCX account manager for the Mississippi Valley Division. Kat has experience with civil works projects within Continuing Authorities, General Investigation, BBA supplemental work, and specifically authorized projects, including the Upper Mississippi River Restoration (UMRR) Program. She has led studies and supported the ecosystem restoration, flood risk management, and coastal storm risk management mission areas. Her primary areas of expertise include restoration ecology, environmental planning, NEPA (EA and EIS; One Federal Decision), environmental compliance (e.g., ESA, FWCA, EFH, CWA, CAA), habitat evaluation and quantification, mitigation, and adaptive management and monitoring.
Education: Bachelor of Arts, summa cum laude, Biology, Augustana College, Rock Island, IL, Minors: Environmental Studies, Geography, and Religion, 2002; Master of Science, Biological Sciences, Western Illinois University, Macomb, IL, July 2004, Emphasis: plant ecology, wetland and riverine ecology, 2004; Doctor of Philosophy, Biology, Kansas State University, Manhattan, KS, Emphasis: Restoration Ecology, 2008; National Environmental Policy Act Certification, Utah State University; graduate certificate, 2017

Kenneth Lampkin, P.E.
Hydraulic Engineer
CELRL-ED-T-H
Mr. Lamkin's expertise includes: Hydrologic and Hydraulic design and evaluation of navigation project and flood risk management projects. Utilization of GIS technology in H&H study and analysis. Familiar with related

hydrologic and hydraulic evaluations including duration curves, erosion studies, application of probabilistic techniques, water surface profiles, steady and unsteady flow modeling (1-D and 2-D) and design calculations.
Since 1998, Mr. Lampkin has served as a hydraulic engineer in the Hydrology and Hydraulic Design Section in the Louisville District. Present responsibilities include providing direction for and execution of H&H portions of Local Protection, Navigation, and Dam Safety projects and studies. Serves as H&H Regional Technical Specialist for LRD (H&H – Navigation). Serves as Hydraulic Engineer for Olmsted Locks and Dam PDT, providing technical input for design and construction related issues for in-the-wet construction and operations. Coordinates and oversees physical and numerical modeling in support of construction and environmental decision making for that project. Also serves as Louisville District Hydropower Coordinator, performing as project manager for multi-discipline teams in review of all aspects of non-federal hydropower development at Louisville District navigation and flood control projects, including design reviews, 33 U.S.C. 408 approvals, and construction coordination. These reviews require understanding the potential for multi-disciplinary impacts to the existing project, including hydrodynamics and navigation, structural, geotechnical, environmental, legal, operations and maintenance.
Served as Hydraulic Engineer for the Louisville District Levee Cadre for East St. Louis BCRA and Plaquemines Parish Risk Assessments, performing complex hydrodynamic 2-D modeling utilizing HEC-RAS and/or FLO-2D in support of team consequence analysis. Has also served as Project Engineer or Hydraulic Engineer for Civil Works Flood Risk Management studies and construction projects, Planning Assistance to States Studies, and other specialized studies, utilizing or developing HEC-HMS, HEC-RAS (Steady- and Unsteady-state) models and other specialized software. These numerical models require use of GIS and geospatial data to improve the accuracy of hydrologic and hydraulic parameters used in these models. Other responsibilities include H&H Inspector and Team Member during Periodic Assessments and Inspections for dams within the Louisville District.
Education: B.S., Engineering Science, University of Louisville1993. M. Eng.; Civil Engineering (Water Resources), University of Louisville 1994' M. Science, Geography and Environmental Resources (Water Resource Planning), Southern Illinois University of Carbondale, 2009

Phillip W. Sauser, P.E.
Structural Engineer
CENAP-EC-EB
Structural Engineer with the US Army Corps of Engineers. Responsibilities include development, implementation, and maintenance of the USACE Hydraulic Steel Structures (HSS) and Bridge Safety Program, design and evaluation of flood control, navigation, and other water control projects,

design and evaluation of HSS and bridges, and inspection of HSS, bridges, and dams. Also serves as the USACE National Technical Specialist for HSS Bridge Safety and Technical Focus Team leader for the USACE HSS and Bridge Safety Programs.
Education: Bachelor of Science in Civil Engineering – South Dakota School of Mines and Technology, Rapid City, South Dakota, 1986**;** Master of Science in Civil Engineering – University of Minnesota, Minneapolis, Minnesota, 1989

Kirk Sunderman, P.E.
Civil Engineer
CEMVR-EC-DM
Mr. Sunderman is known for his expertise on leading regional, multi-discipline, technical design teams on large and complex flood risk management, navigation, and vertical construction projects. He has strong communication and collaboration skills developed through years of experience with customers, public, outside agencies and media outlets. Civil Engineering design skills include site planning and development, utilities, geometric design, civil plans and profile, and 3-D modeling (Inroads and Sketchup). Over 20 years experience in leading flood emergency response teams, conducting levee inspections and modification reviews. Conducted well over a 100 reviews (DQCRs, ATRs, BCOES) on planning, engineering, and construction documents. He co-authored a policy that set MVR guidelines for documenting civil engineering analysis.
Education: Bachelor of Science, Civil Engineering, Iowa State University, 1991

Mike Navin, P.E., PhD
Geotechnical Engineer
CEMVS-EC-GT
Dr. Mike Navin is a Geotechnical Engineer in the St. Louis District, where he started as a CO-OP in 1991 and has 28 years of experience, with a BS from the University of Missouri in 1993, MS and PhD from Virginia Tech (1999 and 2005). Mike is the lead instructor for PROSPECT 250, Seepage and Piping, and taught Earth Pressures and Foundations while at VT. He has been involved with many Risk Assessments for Dams and Levees, typically where seepage related issues are the predominant failure mode, and has served on the PDT for updates the EM's 1110-2-1901, -1913, -1914, and -2502 (those are Seepage, Levees, Relief Wells, and Floodwalls). Performed numerical stress-strain analyses with the program FLAC for his research on column-supported embankments, for the development of the T-Wall design procedure and for other structures in New Orleans that form part of the HSDRRS.

Bill Bolte., C.C.E., ATR Cost Coordinator
Cost Engineering
CENWW-ECE
Mr. Bolte is the Civil Works Cost ATR Coordinator at the Cost Engineering Center of Expertise, Walla Walla District. He is a cost engineer with over15 years of experience in military, HTRW and civil works projects including flood risk management and navigation improvement projects. Since 2011, Mr. Bolte has served as the assistant and now lead Cost ATR Coordinator for the MCX performing ATRs on various civil works projects throughout the nation. On average Mr. Bolte has been involved with forty or more ATR reviews per year, ranging from $5M or less CAP projects to Multi-Billion programmatic updates. Mr. Bolte earned a Bachelor's Degree in Civil Engineering and Masters Degree in Structural Engineering the Missouri University of Science and Technology, Rolla. He is a licensed Professional Engineer in the state of Washington and is registered with the Corps of Engineers as a Certified Cost Engineer. Mr. Bolte has served many lead roles in both developing and reviewing budgets for Department of Energy and Corps projects.

Meredith Harmon
Real Estate
CENWK-RE
Meredith Harmon has worked in Corp real estate for 11 years and is currently the team lead for NWK Civil Cost Shared and MRRP programs. She is the NWK SME for planning projects, educating team members on the planning process, reviewing each REP during DQC and participating in a number of ATRs for FRM and Ecosystem Restoration projects.

William Veatch
Climate Preparedness & Resilience
CEMVN-ED-H
Mr. Will Veatch is a Hydrologist with the New Orleans District. He currently serves in the Water Management Section of the Hydrology and Hydraulics Branch of the New Orleans District, and is also a Regional Technical Specialist for Climate Change Adaptation for the Mississippi Valley Division. Will's responsibilities include river forecasting, regulation of water control structures, data management, and supporting engineering studies and designs with statistical analyses of river flow, precipitation, and coastal water levels. As a technical specialist he supports teams throughout USACE with integration of climate adaptation and resilience into designs and other studies, and through ATR and policy compliance reviews. He is a national Subject Matter Expert in the areas of sea level change and inland hydrology nonstationarity with the Climate Preparedness and Resilience Community of Practice. He is a member of several interagency teams and has served on international partnership missions in the Netherlands, Brazil, and South

Korea. Will holds a BA degree in Environmental Studies (Hydrology focus) from the University of Colorado and an MS degree in Hydrology from the University of Arizona. He is registered Professional Hydrologist with the American Institute of Hydrology.

Enclosure 3

Charge to Reviewers

Charge to Reviewers

A. Objective.

A. The Agency Technical Review Team (ATR Team) will review products/documents listed in Table 1 Products to be Reviewed List of the study ATR Work plan and ensure they are consistent with established agency criteria, guidance, procedures, and policy for this mission area. The ATR Team will assess whether the analyses presented are technically sound and comply with published Corps guidance, and that the document explains the analyses and results in a reasonably clear manner for the public and decision makers.

The following charge is issued as directive statements to encourage critical thinking by the ATR Team, and will guide the focus of the review.

B. Charge Statement

The following details more substantial changes made to the integrated feasibility report and environmental assessment since the ATR review of the draft report. A red-lined version of the main integrated feasibility report and environmental assessment was provided that includes changes made as a result of ATR and policy review of the draft report to aid in identifying these changes.

Bank Stabilization and Bridge Scour Measures

- The policy review resulted in complete removal of stream bank stabilization and bridge scour protection from the plan formulation process. However, this was identified as a problem by the municipality, local sponsor, and study team. Therefore, it was agreed upon with the vertical team to describe the problem within the existing and future without project conditions. We then provide a disclaimer at the beginning of the plan formulation section that that notes USACE policy and authority preclude us from including it further. All analyses related to bank

stabilization and bridge scour have been pulled from the main report and all appendices.

Plan Formulation:

- The existing and future without project conditions section of the report was revised to more prominently describe current and future flood risk.
- The plan formulation section of the main report was completely re-worked to include sections that compare alternatives based on the four accounts and risk and uncertainty.
- Policy review also resulted in the removal of the original scoring methodology/results used to compare criteria.

Climate Change:

- The climate change assessment was updated to include an analysis of potential sea level rise impacts on the project. This analysis was conducted to assess potential impacts over a 100-year period per USACE policy/guidance. This analysis is now mentioned in the FWOP conditions section of the main report and within the engineering appendix.

Economics:

- Benefits were updated to 2020 Price levels and costs were updated. The content methodology has not changed.

Real Estate:

- Real estate costs were updated based on the results of the gross appraisal.

Enclosure 4

DrChecks Report of All Comments

Comment Report: All Comments
Project: Puerto Rico_Rio Grande de Manati
Review: FY20 Final Feasibility Report ATR Rvw
Displaying 20 comments for the criteria specified in this report.

Id	Discipline	DocType	Spec	Sheet	Detail
8632353	Environmental	Feasibility Study	n/a	Table 1	n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**
(Document Reference: Executive Summary)

Concern: Table states in compliance for all environmental laws and regs listed; however, the following paragraph describes that various laws and regs would be completed prior to construction. NEPA not listed on the table.

Basis: ER-1105-2-100 Appendix G, Exhibit G-8

Significance: low

Recommendation: Update table with an "asterisk" or other annotation along with table footnote stating full compliance would be achieved with signing of the FONSI/ 404b1. Ensure table reflects the narrative. Include NEPA and match the laws listed in chapter 5 in the table. I'd also recommend grouping the laws together by type; list all the public laws in numerical or alphabetical order first, then the EOs.

Submitted By: Kathryn Mccain (314-331-8047). Submitted On: Jun 10 2020

1-0 Evaluation **Concurred**
Footnote added to table. NEPA and other laws discussed in chapter 5 added to table. Table grouped by laws and EOs in alphabetical order.

Submitted By: Erin Stuart (412-395-7517) Submitted On: Jun 11 2020

1-1 Backcheck Recommendation **Close Comment**
Closed without comment.

Submitted By: Kathryn Mccain (314-331-8047) Submitted On: Jun 18 2020
Current Comment Status: **Comment Closed**

8632361	Environmental	Feasibility Study	n/a	n/a	n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**
(Document Reference: Main Report)

Concern: No summarized list of environmental commitments needed to happen during PED and construction

Basis: NEPA

Significance: Low

Recommendation: In section 4.4 (maybe) include an "environmental considerations" section or in the FONSI summarize all the environmental commitments/ considerations/ BMPs found in Chapters 3 and 5 that will occur during PED and construction to ensure compliance in the future (and more readily found).

Submitted By: Kathryn Mccain (314-331-8047). Submitted On: Jun 10 2020

1-0 Evaluation **Concurred**
Environmental considerations added to section 4.4.

Submitted By: Erin Stuart (412-395-7517) Submitted On: Jun 11 2020

1-1 Backcheck Recommendation **Close Comment**
Closed without comment.

Submitted By: Kathryn Mccain (314-331-8047) Submitted On: Jun 18 2020
Current Comment Status: **Comment Closed**

8632363	Environmental	Feasibility Study	n/a	n/a	n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**
(Document Reference: FONSI)

Concern: FONSI is currently embedded into the main report. The FONSI should be a standalone document.

Basis: NEPA; 1508.13

Significance: Low

Recommendation: Separate the FONSI from the main report (don't have it included with the page numbers of the main report) and attach the EA to it. If you want to keep it as one word document, then move the FONSI to the beginning or at the end of the report after the report references and don't have it toggled to main report page numbers.

Submitted By: Kathryn Mccain (314-331-8047). Submitted On: Jun 10 2020

1-0 Evaluation **Concurred**
FONSI separated from main report to be standalone document.

Submitted By: Erin Stuart (412-395-7517) Submitted On: Jun 11 2020

1-1 Backcheck Recommendation **Close Comment**
Closed without comment.

Submitted By: Kathryn Mccain (314-331-8047) Submitted On: Jun 18 2020
Current Comment Status: **Comment Closed**

8636384 Cost Engineering Cost Estimate n/a n/a n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**
(Document Reference: Receipt of Documents)

1. This Cost ATR review is based upon MCACES MII file for the Rio Grande de Manati Project; dated 21 May 2020. The MII estimate totaled some $153M including all Alternatives. Alternative 3b (Recommended) totals some $1.425M for construction costs. The review comments are primarily based upon the following Corps regulations and Guidance that must be adhered to:

ER 1110-2-1150, Engineering and Design for Civil Works Projects
ER 1110-2-1302, Civil Works Cost Engineering
ETL 1110-2-573, Construction Cost Estimating Guide for Civil Works

Submitted By: William Bolte (509 527 7585). Submitted On: Jun 11 2020

1-0 Evaluation **Concurred**
Concur. No action required.

Submitted By: David Druzbicki (312-846-5433) Submitted On: Jun 12 2020

1-1 Backcheck Recommendation **Close Comment**
Comment for documentation only.

Submitted By: William Bolte (509 527 7585) Submitted On: Jun 16 2020
Current Comment Status: **Comment Closed**

8636385 Cost Engineering Cost Estimate n/a n/a n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**
(Document Reference: Receipt of Documents)

2. Documents Received. CONCERN: Documents received included updated scoping documents, quantity summaries, MCACES MII files, Cost and Schedule Risk Analysis, and TPCS.

Submitted By: William Bolte (509 527 7585). Submitted On: Jun 11 2020

1-0 Evaluation **Concurred**
Concur. No action required.

Submitted By: David Druzbicki (312-846-5433) Submitted On: Jun 12 2020

1-1 Backcheck Recommendation **Close Comment**
Comment for documentation only.

Submitted By: William Bolte (509 527 7585) Submitted On: Jun 16 2020
Current Comment Status: **Comment Closed**

8636387	Cost Engineering	Cost Estimate	n/a	n/a	n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**
(Document Reference: Summary of Changes)

3. Tentatively Selected Plan ATR Review. OBSERVATION. TSP Estimate Cost ATR review was completed in February 2020. Bank Protection and Bridge Scour have been removed from TSP. Demolition Costs remain almost entirely unchanged except the removal of Building 88 from inventory ($70k reduction) and an additional 440CY of contaminated soil disposal (~$50K) for building 87 (Gas Station).

Submitted By: William Bolte (509 527 7585). Submitted On: Jun 11 2020

1-0 Evaluation **Concurred**
Concur. After DQC additional excavation qty was added to allow for contaminated soil around underground storage tank.

Submitted By: David Druzbicki (312-846-5433) Submitted On: Jun 16 2020

1-1 Backcheck Recommendation **Close Comment**
Comment for documentation only.

Submitted By: William Bolte (509 527 7585) Submitted On: Jun 16 2020
Current Comment Status: **Comment Closed**

8636388	Cost Engineering	Cost Estimate	n/a	n/a	n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**
(Document Reference: Abbreviated Risk Analysis)

4. Project Contingency. CONCERN. ARA is well written and develops a 44% contingency. SIGNIFICANCE: MEDIUM. RESOLUTION: Primary construction work is all demolition and disposal. Please explain the Cost Engineer and PDT's comfort with 44% contingency. Risk Category has been assigned "Moderate Risk – Typical Project Construction Type". Changing to "Low Risk: Typical Construction, Simple" would reduce overall contingency to 37%. Reviewer is not directing change, only wanting additional insights into Cost Engineers comfort level and concerns. Thanks!

Submitted By: William Bolte (509 527 7585). Submitted On: Jun 11 2020

1-0 Evaluation **Concurred**

Concur. Although Demolition is probably a Low Risk construction type, given the relative low cost of demolition any changes encountered (additional utility relocates, etc.) could result in a relatively large potential increase in cost. I think the 44% contingency would allow for this and prefer to keep it unchanged.

Submitted By: David Druzbicki (312-846-5433) Submitted On: Jun 16 2020

1-1 Backcheck Recommendation **Close Comment**

Judgment appears reasonable. No further action.

Submitted By: William Bolte (509 527 7585) Submitted On: Jun 16 2020

Current Comment Status: **Comment Closed**

8641206	Geotechnical	Planning Report	n/a	n/a	n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**
Coordinating Discipline(s): Geotechnical

It is clear in Section 6 Recommendations that the floodwall is not part of the project. But that section also recommends considering local implementation of the floodwall to further reduce flood risk. I assumed that is why the floodwall was retained under Alternative 3 in various places in the report (Sections 3.4.3, 3.6.3.2, 3.6.8 and 3.6.6.1 for example).

Section 3.4.3 Summary of Alternatives currently includes the following paragraph;
"Alternative 3 also incorporates a floodwall around the wastewater treatment plant as described under Alternatives 1 and 2 (Fig. 3-6). Stone and concrete material would be sourced from a commercial quarry located within the region. Excavated material would be reused on site as fill and construction material to the extent possible. Any remaining material would be disposed of at a commercial landfill."

If this paragraph is retained, we should point out they may need to locate off-site fill to use for floodwall construction if on-site material is not acceptable.

Submitted By: Michael Navin (314 331-8441). Submitted On: Jun 12 2020

Revised Jun 12 2020.

1-0 Evaluation **Concurred**

The following sentence was added to this paragraph:

"Fill may need to be sourced from an off-site location depending on suitability of on-site material."

This sentence was also added to the descriptions of alternatives 1, 2, and 4 as suitability of on-site material could require off-site fill under these alternatives, as well.

Submitted By: Eric Merriam (412-395-7185) Submitted On: Jun 15 2020

1-1 Backcheck Recommendation **Close Comment**
Closed without comment.

Submitted By: Michael Navin (314 331-8441) Submitted On: Jun 16 2020
Current Comment Status: **Comment Closed**

8641847 Hydraulics Feasibility Study n/a n/a n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

Review of the report has resulted in no technical comments.

Submitted By: Ken Lamkin (502-315-6458). Submitted On: Jun 12 2020

1-0 Evaluation **Concurred**
No action necessary.

Submitted By: Eric Merriam (412-395-7185) Submitted On: Jun 15 2020

1-1 Backcheck Recommendation **Close Comment**
Closed without comment.

Submitted By: Ken Lamkin (502-315-6458) Submitted On: Jun 18 2020
Current Comment Status: **Comment Closed**

8642221 Economics Feasibility Study n/a n/a n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

(This comment is entered for the purpose of documenting the scope of the economic review and requires no response from the PDT other than simple acknowledgement.)

The current ATR is for the economic analysis contained in the final draft of the feasibility report for the Rio Grande de Manati project. This phase of the ATR follows on two earlier phases of ATR for the study and economic analysis, the second of which was very recent. The HEC-FDA economic model was not reviewed for this phase but was examined in the previous phase and no serious issues were found; the remaining economic concerns at that time were unrelated to the model. Generally, the issues that were previously raised with the economic analysis have been addressed in this final report draft. These issues included uncertainty factors used in the risk analysis for first-floor elevation and depreciated replacement values, selection and documentation of occupancies including depth-damage functions and contents valuation, lack of documentation for the damage analysis results, compliance with ER 1105-2-101, annual cost calculations and consistence between the main report and the economics appendix. A separate bank stabilization economic analysis previously included in the report, which provoked a number of comments regarding the economic justification, has subsequently been withdrawn. Most of the other concerns have been addressed by the PDT in the current draft. Only a few additional minor concerns were identified, and these are commented on separately.

Submitted By: Allen Holland (816-389-3105). Submitted On: Jun 12 2020

1-0 Evaluation **Concurred**
No action required.

Submitted By: Susannah Byrd (412-395-7164) Submitted On: Jun 15 2020

1-1 Backcheck Recommendation **Close Comment**
Closed without comment.

Submitted By: Allen Holland (816-389-3105) Submitted On: Jun 16 2020

Current Comment Status: **Comment Closed**

8642226	Economics	Feasibility Study	n/a	n/a	n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

CONCERN: IDC remains calculations are not shown in the report.

BASIS: (a) A comment was made in the last round of ATR that IDC calculations need to be shown in the report. Tables 40 and 49 have been added to the econ appendix, and they show the IDC total and parameters, but the calculations are not shown. (b) The 3-month construction period assumed for demolition of 58 structures appears to be very optimistic.

SIGNIFICANCE: Low to medium, but reasonableness of annual cost computations used in the BCR cannot be verified without reference to the calculations and how they were done.

ACTION: (a) Show the IDC computations for the recommended plan either in Table 49 or an additional accompanying table. (b) Verify with the construction engineers that the 3-month construction phase assumed is realistic.

Submitted By: Allen Holland (816-389-3105). Submitted On: Jun 12 2020

1-0 Evaluation **Concurred**
Concur; the IDC computations for the recommended plan were added following Table 49 in the economic appendix.

Submitted By: Susannah Byrd (412-395-7164) Submitted On: Jun 15 2020

Backcheck not conducted

2-0 Evaluation **Concurred**
Concur. The 3 month schedule is assuming 2 demolition crews. Given the number of structures and size of demolition area, multiple crews were assumed to be used without any impact to productivity. For a single crew the duration would be 6 months.

Submitted By: David Druzbicki (312-846-5433) Submitted On: Jun 16 2020

2-1 Backcheck Recommendation **Open Comment**

Submitted By: Allen Holland (816-389-3105) Submitted On: Jun 16 2020

2-2 Backcheck Recommendation **Close Comment**
Closed without comment.

Submitted By: Allen Holland (816-389-3105) Submitted On: Jun 16 2020
Current Comment Status: **Comment Closed**

8642230	Economics	Feasibility Study	n/a	n/a	n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

CONCERN: BCR presentation.

BASIS: Presentation of BCRs in both the main report and econ appendix is not consistent with longstanding guidance for feasibility studies. (Granted that the guidance I'm referring to has been somewhat informal.) (a) BCR is presented at 7% discount rate in Table 4-2 of main report. This rate is not used in planning studies, it is only a programming tool for budgeting. We have been cautioned in recent years not to use it in feasibility reports. The current 2.75% discount rate is the only one used in planning guidance and the only one that should be used and displayed in the report. (b) BCRs in the main report (Tables 3-7 and 4-2) and the econ appendix (Tables 42 and 52) should be rounded off to one place, e.g., 1.7 rather than 1.72.

SIGNIFICANCE: Low, just maintaining consistency with standard operating procedures for feasibility reports. But also, the 7% BCR for the recommended plan is below unity; why show that if you don't have to and it isn't expected?

ACTION: (a) Suggest removing the 7% BCR from the report and just keeping it in your back pocket. You eventually will need it, for budgeting and probably for the Chiefs Report, but not for the feasibility report. (b) Round off the BCRs in the report to one place unless they are between 0.9 and 1.1.

Submitted By: Allen Holland (816-389-3105). Submitted On: Jun 12 2020

1-0 Evaluation **Concurred**
The 7% BCR was removed from the main report. All other BCRs were rounded to the nearest tenth unless they were between 0.9 and 1.1.

Submitted By: Susannah Byrd (412-395-7164) Submitted On: Jun 15 2020

1-1 Backcheck Recommendation **Close Comment**
Closed without comment.

Submitted By: Allen Holland (816-389-3105) Submitted On: Jun 16 2020
Current Comment Status: **Comment Closed**

8642260	Plumbing	Feasibility Study	n/a	n/a	n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

Concern: Wording choice - Program vs Project, section 3.4.1 Program implies over time and things can grow/change. Project implies a finite number/spacing. The Corps typically does Projects, we don't do Programs. Consider the wording choice and update as necessary.
Basis: Accuracy of document
Significance: Low
Recommended action: Recommend double checking if it is a program. More than likely it is a Project and the text should be changed.

Submitted By: Katie Opsahl (651-290-5259). Submitted On: Jun 12 2020

1-0 Evaluation **Concurred**

The word 'program' was replaced with the word 'project' when referring to the acquisition nd relocation effort within this and subsequent sections of the report.

Submitted By: Eric Merriam (412-395-7185) Submitted On: Jun 15 2020

1-1 Backcheck Recommendation **Close Comment**

Closed without comment.

Submitted By: Katie Opsahl (651-290-5259) Submitted On: Jun 16 2020

Current Comment Status: **Comment Closed**

8642283	Plumbing	Feasibility Study	n/a	n/a	n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

Concern: 3.5.5.2 residual risk due to climate change and use of 100 year project life
Basis: readability and clarity of document
Significance: Low
Recommended action: Consider adding some background as to why the 100 year is used compared to the 50 year. For this study since it is non-structural the life of the project and period of analysis are less critical since the risk will be removed, but it should be clarified why the years used are different.

Submitted By: Katie Opsahl (651-290-5259). Submitted On: Jun 12 2020

1-0 Evaluation **Concurred**

We changed the project life to 100 years as a result of a comment received during policy review. Per USACE guidance, the project life and assessment of climate impacts should be 100 years for studies involving major infrastructure projects. Since we did include levees and floodwalls in our alternative, we needed to consider the full 100 year timeframe, even though the recommended plan was purely non-structural.

The following text was added to the beginning of Section 3.5.5.2:

"In accordance with USACE policy and guidance (USACE 2018), potential effects

of and uncertainty associated with climate change were assessed over a 100-year period. Changes in flood risk over that timeframe may impact the performance, operation, and maintenance of each alternative."

Submitted By: Eric Merriam (412-395-7185) Submitted On: Jun 15 2020

1-1 Backcheck Recommendation **Close Comment**
Closed without comment.

Submitted By: Katie Opsahl (651-290-5259) Submitted On: Jun 16 2020
Current Comment Status: **Comment Closed**

8642288	Plumbing	Feasibility Study	n/a	n/a	n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

The review concern: 3.8 Optimization – What about 1.74 makes it not reasonable to look at other AEPs for consideration?
The basis for the concern: Readability and accuracy
The significance of the concern: Low
The probable specific action needed to resolve the concern: 3.8 Optimization – Text reads: "Given the BCR of 1.74 for, the technical team determined that optimizing the number and extent of the non-structural relocations to include additional structures was not feasible." What about the 1.74 makes further optimization un-warranted? Later is states the benefits would likely not be worth the cost, but was any analysis, even preliminary work, done to confirm/back up this statement. It may appear obvious to the team, but to the public and decision makers there needs to be information to back up the statements. Add what level of analysis (rough order of benefits to costs) were used to arrive at this determination.

Submitted By: Katie Opsahl (651-290-5259). Submitted On: Jun 12 2020

1-0 Evaluation **Concurred**
The team did not conduct any formal analyses to look at optimizing the relocation effort. The primary reason for this decision was that the 0.04 AEP floodplain contained those structures with the greatest flood risk (i.e., average inundation depth of >15 feet). Structures outside of the 0.04 floodplain had much lower flood risk (i.e., average inundation depth of
Given the low risk and associated damages to structures outside of the 0.04 AEP floodplain, the technical team also believed that the incremental benefit of relocating those structures would not offset the cost; however, no formal analysis was conducted because it was determined that the most appropriate avenue for further risk reduction was through existing programs.

The text of the report was updated to read:

"The 0.04 AEP floodplain was selected to include those structures with the majority of recurring flood damages, as well as those with the greatest life and safety risk during major flood events. Under this alternative, the average inundation depth during the 0.01 AEP event for structures included in the relocation is 15.7 feet. In

contrast, the average inundation depth for structures within the 0.01 AEP floodplain that are not included in the relocation program project is 2.7 feet. Thus, the extent of damages to structures outside of the 0.04 AEP floodplain would not justify the increased acquisition and relocation costs and would likely result in a BCR less than 1. Although there is residual risk to structures not included in the relocation effort, there are other relocation programs these residents can take advantage of to reduce their remaining risk. Therefore, no further optimization of the non-structural relocation measure was pursued."

Submitted By: Eric Merriam (412-395-7185) Submitted On: Jun 15 2020

1-1 Backcheck Recommendation **Close Comment**
Closed without comment.

Submitted By: Katie Opsahl (651-290-5259) Submitted On: Jun 16 2020
Current Comment Status: **Comment Closed**

8642293	Plumbing	Feasibility Study	n/a	n/a	n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

Concern: 3.5.2.5 – Account Summary & Comparison. Table (3-4) and text above don't align.
Basis: ER 1105-2-100
Significance: Low
Recommended action: Section 3.5.2.5 – I think the table (Table 3-4) has some lines that may be mislabeled. I believe the no action should be shown as a negative effect for several amounts, based on the text in the sections above. Review these sections to ensure the table is accurate and if needed revise and revise corresponding text. Additional information is contained in the word document with editorial comments provided outside of DrChecks.

Submitted By: Katie Opsahl (651-290-5259). Submitted On: Jun 12 2020

1-0 Evaluation **Concurred**
Changes were made per recommendations in comments provided outside of DrChecks. Table 3-4 now indicates that the No Action plan would have negative effects on RED, EQ, and OSE. Supporting text was updated as necessary to ensure it matches information provided in Table 3-4.

Submitted By: Eric Merriam (412-395-7185) Submitted On: Jun 15 2020

1-1 Backcheck Recommendation **Close Comment**
Closed without comment.

Submitted By: Katie Opsahl (651-290-5259) Submitted On: Jun 16 2020
Current Comment Status: **Comment Closed**

8644057	Structural	Planning Report	n/a	n/a	n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

no comments from me on this review

Submitted By: Phil Sauser (651-290-5722). Submitted On: Jun 12 2020

1-0 Evaluation **Concurred**
No action necessary.

Submitted By: Eric Merriam (412-395-7185) Submitted On: Jun 15 2020

1-1 Backcheck Recommendation **Close Comment**
Closed without comment.

Submitted By: Phil Sauser (651-290-5722) Submitted On: Jun 17 2020

Current Comment Status: **Comment Closed**

8646224	Real Estate	Feasibility Study	n/a	n/a	n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

No additional comments

Submitted By: Meredith Harmon (816-389-3557). Submitted On: Jun 15 2020

1-0 Evaluation **Concurred**
No action necessary.

Submitted By: Eric Merriam (412-395-7185) Submitted On: Jun 15 2020

1-1 Backcheck Recommendation **Close Comment**
Closed without comment.

Submitted By: Meredith Harmon (816-389-3557) Submitted On: Jun 18 2020

Current Comment Status: **Comment Closed**

8647051	Civil	Feasibility Study	n/a	n/a	n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

No civil engineering ATR comments on the draft final feasibility report.

Reviewed the main report, engineering appendix, and cost appendix. Previous responses to 65% comments were retained within the draft final report.

Submitted By: Kirk Sunderman (309-794-5140). Submitted On: Jun 15 2020

1-0 Evaluation **Concurred**
No action necessary.

Submitted By: Eric Merriam (412-395-7185) Submitted On: Jun 15 2020

1-1 Backcheck Recommendation **Close Comment**
Closed without comment.

Submitted By: Kirk Sunderman (309-794-5140) Submitted On: Jun 16 2020

Current Comment Status: **Comment Closed**

8647075	Hydrology	Engineering Appendix	n/a	n/a	n/a

Comment Classification: **Unclassified\\For Official Use Only (U\\FOUO)**

The final documents have been reviewed for appropriate application of guidance for climate preparedness and resilience. The documents are found to be complete and no further comment is necessary.

Submitted By: William Veatch (504-862-2858). Submitted On: Jun 15 2020

1-0 Evaluation **Concurred**
No action necessary.

Submitted By: Eric Merriam (412-395-7185) Submitted On: Jun 15 2020

1-1 Backcheck Recommendation **Close Comment**
Closed without comment.

Submitted By: William Veatch (504-862-2858) Submitted On: Jun 16 2020

Current Comment Status: **Comment Closed**

Enclosure 5

Statement of Completion of Agency Technical Review

COMPLETION STATEMENT OF AGENCY TECHNICAL REVIEW

The Agency Technical Review (ATR) has been completed for the Final Rio Grande de Manati Flood Risk Management Study, Ciales, Puerto Rico Draft Integrated Feasibility Report & Environmental Assessment, Pittsburgh District.

The ATR was conducted as defined in the project's Review Plan to comply with the requirements of EC 1165-2-217, 20 February 2018, Water Resources Policies and Authorities, CIVIL WORKS REVIEW.

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 team assessed the District Quality Control (DQC) documentation and determined that the DQC activities employed appear to have been appropriate and adequate.

All comments resulting from the ATR have been resolved and all comments have been closed in DrChecks.

OPSAHL.KATHERINE.M.1392668663 Digitally signed by OPSAHL.KATHERINE.M.1392668663 Date: 2020.06.18 14:44:25 -05'00'

Katie Opsahl
ATR Team Leader
CEMVP-PDF

Date

PORTER.ELLIOTT.1366851204 Digitally signed by PORTER.ELLIOTT.1366851204 Date: 2020.06.19 06:28:19 -04'00'

Elliott Porter, PM
Project Manager
CELRP-PM-EF

Date

THAUT.ERIC.WILLIAM.1231631824 Digitally signed by THAUT.ERIC.WILLIAM.1231631824 Date: 2020.06.18 12:32:21 -07'00'

Eric Thaut
Deputy Director of the FRM-PCX
CESPD-PDP

Date