COST ENGINEERING – APPENDIX A-2

*** NOTE: THIS DOCUMENT WILL BE FINALIZED FOLLOWING RESOLUTION OF REMAINING REVIEW COMMENTS AND COST CERTIFICATION BY USACE. ***

1. INTRODUCTION

This appendix describes the development process and rationale for cost estimates for the Raymondville Drain Project (RDP). Section 2 describes the development of estimates used for the Stage 3 plan formulation round (final array) alternative analysis. Sections 3-8 describe the detailed cost estimate for the Selected Plan.

2. COST ESTIMATE FOR ALTERNATIVE ANALYSIS

Two alternatives were considered in the Stage 3 plan formulation round (final array). Quantity and cost estimates were completed for the two alternatives to prepare the benefit-cost ratios for the comparison of plans in the final array. This estimate provides a basis for equal comparison of alternatives, consistent with Feasibility-level analysis. Detailed description of each alternative are included in Section 3.7.6 of the Main Report.

The primary difference between the two alternatives is the route of the expanded drain. Starting downstream of the proposed detention basin and east of the airport, Alternative 1 continues northward to connect to the West Hargill Drain, while Alternative 2 conveys diverted flow into the Delta Lake Drain, a more southerly route passing along the north side of Delta Lake, with both alternatives connecting to the existing Raymondville Drain northeast of Lasara.

To provide additional confidence in the alternative analysis, this estimate was based on takeoffs from the more developed designs previously completed for portions of the proposed project. Quantity items and the preliminary cost estimates were based on current itemized construction costs using the Texas Department of Transportation statewide low-bid unit price averages.

Construction quantity items were grouped together in the following categories: General, Roadway Improvements, Channel Structures, Drainage Improvements, Utilities, Signing & Striping, Traffic Control and Stormwater Pollution Control. General items consisted of costs associated with mobilization, setting up and maintaining a project office, and maintaining project signs. Roadway Improvements consisted of items typically utilized during roadway construction such as pavement and base removal, structure removal, subgrade, flexible base, and hot mix asphalt. Channel Structure items consisted of structural items such as: bridge beams, columns, piers, drilled shafts, traffic rails, gated control structures, etc. Drainage Improvements included items such as: box culverts, pipe culverts, trench safety systems, channel excavation, headwalls, concrete riprap, etc. Utilities consisted of items associated with repair, relocation and/or modification to existing utilities located at each bridge or culvert crossing along the channel alignment. Signing and Striping improvements are items associated with re-striping roadway crossings once improvements to the bridge or culvert structures have been completed. Traffic Control items are associated with the temporary traffic control needed during the construction of the proposed bridge or culvert improvements. Stormwater Pollution Control items include stabilized construction entrances, sediment control fences, rock filter berms, etc.

In addition to the project construction costs, additional expenses associated with construction of the proposed improvements were included. The following estimated items were added to calculate a total project cost for the alternatives:

- Real estate costs (including fees): Varies by location.
- Architectural and engineering fees: 6% of construction costs.
- Design during construction fees: 10% of construction costs.
- SIOH (Supervision, Inspection, and Overhead): 6.5% of construction costs.
- Contingency allowance: 5% of the project construction total.

While the channel length of Alternative 2 is not significantly different than Alternative 1, and most segments of the project are the same, Alternative 2 is a more costly option. Increased costs along the Delta Lake drain reach include additional hauling because existing development limits the use of overbank areas for spoil disposal, more valuable real estate, and more complex channel crossings. The primary cost differences between the two plans include:

- Construction Cost
  - General Roadway Improvements
  - Channel Structures
  - Drainage Improvements
  - Excavation and export
  - Utilities
  - Signing & Striping
  - Traffic Control
  - Stormwater Pollution Control.
- Real Estate

An annual Operations, Maintenance, Repair, Replacement and Rehabilitation (OMRR&R) was estimated based on the non-federal sponsor (HCDD1) actual budgeted yearly costs divided by number of miles of drain to get a cost per mile. The proposed project primarily consists of the improvement of existing channels and the construction of a new bypass channel. Several relatively simple gated control structures would also be constructed. The bulk of the OMRR&R cost is maintenance of the channels. This would be accomplished by HCDD1 using in-house staff, who are experienced in this type of maintenance work. HCDD1 currently maintains approximately 600 miles of similar channel, and OMRR&R costs were estimated based on extrapolation of the HCDD1 budgeted and actual historical costs to maintain and rehabilitate their current projects. In 2023, HCDD1 had an OMRR&R budget of $18.0 million for bi-annual regular maintenance, as well as larger rehabilitation projects on a case-by-case basis. This translates to approximately $30k per mile of drainage system.

Summaries of the project construction cost and the total project costs for the two alternatives are found in Table 1. Based on the economic analysis, Alternative 1 was determined to be the National Economic Development (NED) plan, and ultimately the preferred option.

Table 1 Summary of Costs for Alternative Plans

	Alternative 1	Alternative 2
Construction Cost	$ 586,870,392	$646,809,366
5% Contingency	$ 29,343,519.60	$ 32,340,468
Design During Construction	$ 7,042,444.70	$ 7,761,712
Overhead (SIOH)	$ 44,015,279.40	$ 48,510,702
Real Estate Cost	$ 20,772,650	$ 22,537,640
Utility Relocation	$ 29,000,000	$ 29,000,000
Design Fee (6%)	$ 38,212,224	$ 41,808,562
First Cost of Construction	**$ 755,256,509**	**$ 828,768,451**

3. SELECTED PLAN PROJECT COST DEVELOPMENT (ALTERNATIVE 1)

A detailed construction cost estimate for Alternative 1 (the selected plan) was developed using USACE Micro-Computer Aided Cost Estimating System (MCACES) software, with other detailed costs, including the CSRA as developed by the PDT. Development of the cost estimate and CSRA are detailed in sections below. This estimate includes base construction cost and escalation, design during construction, Supervision, Inspection and Overhead (SIOH), design fees, contingency, and other project line items such as real estate costs, and utility relocations.

The project construction is of generally low technical complexity consisting primarily of excavation, mainly expansion of existing drains (channels) with known characteristics. However, the project size and scope (including numerous utilities and bridges) results in a sizable logistical challenge with a significant amount of earthwork and the related relocation / transportation of the excavated materials. The project has been studied for many years, and the scope is well understood and well defined.

4. DESIGN MATURITY

The maturity of the design has been assessed in accordance with the 5 June 2023 CECW-CE memorandum, subject: "Guidance on Cost Engineering Products update for Civil Works Projects in accordance with Engineer Regulation 1110-2-1302 – Civil Works Cost Engineering," and the 20 July 2023 Engineering and Construction Bulletin (ECB) 2023-9, subject "Civil Works Design Milestone Checklists." The memorandum requires a determination of the maturity of the design when developing cost products. At a minimum, the memo requires addressing three basic areas in determining the level of design: (1) Geotechnical data quality; (2) Hydraulics and Hydrology model type; and (3) Survey data quality and risks. The ECB helps define submittal requirements for USACE design projects, and the definitions help to define maturity of USACE projects in Preconstruction Engineering and Design (PED) phase. While the RDP is not currently a USACE PED project, as it is awaiting authorization, the design effort to date exceeds a normal USACE Feasibility study and includes significant PED-level effort, so there is a significantly higher level of confidence and less uncertainty in the cost estimate for this project. These factors are described below and documented in the risk register, Appendix A-6. The quality of the

project scope and construction quantities is also documented below. A Design Maturity determination form is Attachment 1.

As a below-grade drainage project, failure or misoperation of the project would not lead to risks greater than the without project condition. This project does not utilize USACE Dam and Levee Safety criteria, and a Safety Assurance Review (SAR) will not be required. HCDD1 recognizes that additional effort prior to construction advertisement will be required on the existing Hidalgo County construction documents in the future to update design details and ensure compliance with USACE construction requirements.

This estimate is presented as a Class 3 estimate (overall) as defined by AACE International Recommended Practice No. 56R-08. The overall design maturity for this project is assessed at approximately 60%. The Hidalgo County portion is based on plans and specifications level of design and is considered to be at approximately 90% design maturity (Class 1 estimate). The Willacy County portion does not currently have plans and specifications and is considered to be at schematic level; however, it has been informed by the Hidalgo County portion, and is considered to be at approximately 40% design maturity (Class 3 estimate). Since the study is at a Feasibility Study phase and the design is more detailed and complete than a typical Feasibility Study, it does not require any engineering waivers from design policy.

4.1 SCOPE DEFINITION

This study has been thoroughly investigated, and the scope is well defined. As an expansion of an existing project, the location and features are well defined. Detailed fieldwork, including survey, has been accomplished to ensure no project elements or features have been omitted.

4.2 GEOTECHNICAL DATA QUALITY

This project is an expansion of an existing drain. The PDT is well acquainted with the geology, conditions, and construction of drains in the project area. The risk associated with geotechnical conditions is low, and not expected to introduce additional risk to the project or cost estimate. The excavation is generally below grade, so life safety and construction failure concerns are minimal. Investigations along the length of the project corridor (including borings for bridges and structures, and preliminary channel borings) have been accomplished, and the risks are considered very low. Geotechnical reports for Hidalgo and Willacy Counties are included as attachments to the Engineering Appendix (A-1).

4.3 H&H MODELING

The H&H modeling documented in Appendix A-1 of this Feasibility report was developed for planning and economic analysis. The Feasibility study modeling for this project was accomplished using HEC-RAS 1-D. This is considered appropriate for feasibility-level analysis because of the relatively flat topography and low flow velocity of the drains. This analysis is proper for the economic analysis accomplished in this feasibility study. However, additional detailed H&H analysis was used for the plans and specifications level design development done for the Hidalgo County construction documents. While the specific H&H updated analysis was not completed for the downstream Willacy County plans and specifications, consistent with this feasibility effort, the analysis for Hidalgo County sufficiently informed the design section assumed for the cost estimate. The H&H modeling used for the plans and specifications design level effort in Hidalgo County, and therefore Willacy County by proxy is considered to be 90% design maturity. The risks for the remaining Willacy County portion are very low.

4.4 SURVEY DATA

Detailed LIDAR surveys of the RVD corridor were accomplished by the PDT as part of the RESTORE Act work initiated in 2019 and completed in 2021. A design survey was done for the Hidalgo County portion of the proposed project, including the new upstream connection to the North Main Drain in Hidalgo County. Existing conditions

were examined, and 400-foot-wide channel cross sections were taken, including bridges, culverts, and intersecting drains.

The watersheds and sub-watersheds were previously delineated for H&H modeling based on surface topography using HEC-GeoHMS. HEC-GeoHMS enabled RRP to delineate each watershed and sub-watershed using digital terrain data. Light Detection and Ranging (LIDAR) survey data was used in combination with Digital Elevation Models (DEMs) representing United States Geological Service (USGS) quad maps to develop a 60-ft X 60-ft grid. The relatively flat topography required the watershed to be reconditioned to ensure that HEC-GeoHMS identifies the main drain within each watershed. A line file was created to delineate and identify the main drainage drain. This line file was subsequently used to modify the existing grid to more easily identify the main drainage path within the flat topography. The current detailed survey data is considered to be at 90% design maturity for the entire project.

4.5 QUANTITIES AND CIVIL DESIGN

4.5.1 Hidalgo County

Quantities for the more complex (upstream) Hidalgo County portion were based on plans and specifications-level design detail, as prepared by the PDT (S&B/RRP). The channel profile was later changed to include additional spoil bank construction to reduce costs. All elements of design, including Civil, have been fully considered.

The quantities used for the MCACES estimate were updated to reflect the channel profile change as part of the Civil design. The Hidalgo County portion is considered to be at approximately 90% design maturity.

4.5.2 Willacy County

The downstream Willacy County portion does not have plans and specifications level design; however there was significant rigor in the unique, most significant cost elements in the estimate, increasing confidence. Any additional quantity revisions during the development of P&S are not expected to be significant.

There are 3 major categories of quantities in the Willacy County segments of the estimate: Earthwork, Unique components, and Common design features. (1) The earthwork quantities are based on actual survey and lidar data, collected for the length of the drain. Earthwork quantities were developed by overlaying the channel cross section on the terrain survey. (2) Unique components of the project, such as bridges, utilities, culverts, and roadways, were individually identified and quantified for inclusion in the estimate. (3) Common design features include preparation of ROW, clearing of brush, field drains, and items that are repeated at regular intervals. These items were extrapolated from the Hidalgo County design. Quantities were updated to reflect the additional spoil bank in the MCACES estimate, and the design is considered to be at approximately 40% design maturity.

5. ESCALATION AND PRICE LEVEL

The construction cost of the recommended plan includes an escalation based on a base bid construction duration of one hundred twenty (120) months, and a midpoint of construction of Third Quarter 2033, based on multiple construction contracts. The price level of the MCACES estimate is June 2025.

6. MCACES CONSTRUCTION COST DEVELOPMENT

A detailed MCACES estimate for the RDP project was developed by MOCA Systems Inc. (MSI) under subcontract to S&B / RRP. The estimate was based on existing conditions, quantities, and dimensional information developed by S&B in July 2023, and updated by RRP in May 2025. The project is divided into seven segments in Hidalgo County, and four segments in Willacy County. The MCACES estimate is Attachment 2. The contract cost, which

includes a 5% Construction Contingency and 6.5% SIOH, is estimated to be to be $249,264,000 for the Hidalgo County Section and $348,207,000 for the Willacy County Section, for a combined contract cost $597,471,000.

6.1 MCACES COST ESTIMATE BASIS

6.1.1 Material Costs

Our estimate is based on the Corps of Engineers Unit Price Book (UPB) "MII English Cost Book 2023" (CB23EN) as adjusted for current local pricing. Material prices are inflated from the date of the Corp's database (01/2023) to the date of the estimate (06/2025) using the Engineering News Record (ENR) Material Cost Index.

6.1.2 Labor Costs

This estimate is based on the lates Davis-Bacon wage decision, Ft. Worth, TX.

6.1.3 Labor Productivity

This estimate is based on the USACE Unit Price Book (UPB) "MII English Cost Book 2023" (CB23EN) taking into account potential equipment breakdown delays, material deliveries, subcontractor scheduling conflicts, and other miscellaneous delays. Labor productivity was set at 85%.

6.1.4 Equipment Costs

Our estimate is based on the Corps of Engineers equipment database MII Equipment 2022 Region 03 (EP22R03) with current local fuel rates as of the date of the estimate. Equipment rates are inflated from the date of the Corp's database (01/2022) to the date of the estimate (06/2025) using the ENR Construction Cost Index.

6.1.5 Other Indirect Costs

Our estimate is based on the assumption of open competitive bidding by the parties involved. We have assumed a minimum of five (5) qualified and responsive prime contractor bidders. Prices may increase if competition levels are reduced. Prime contractor markups include Overhead, General Conditions and Profit.

6.1.6 Subcontractor Cost

Our estimate is based on the assumption of open competitive bidding by the parties involved. We have assumed a minimum of three (3) qualified and responsive subcontractors/suppliers for each major trade. Prices may increase if competition levels are reduced. Subcontractor markups include Overhead, General Conditions and Profit.

6.1.7 Escalation

This estimate includes escalation based on a base bid construction duration of 120 months, and a midpoint of construction of December 2028.

6.1.8 Other Costs

This estimate includes 5% construction contingency and 6.5% SIOH.

6.1.9 Exclusions

The construction estimate does not include furnishings, professional fees, equipment, abatement of hazardous materials, municipal impact fees, utility tap fees, or any items not specifically identified in the itemized report.

6.2 MCACES ESTIMATE NOTES

6.2.1 General

This estimate is presented as a Class 3 estimate as defined by AACE International Recommended Practice No. 56R-08. The level of design definition for a Class 3 estimate is between 10% and 40%. The typical purpose for a Class 3 estimate is a project budget. The estimating method for a Class 3 estimate is detailed level, assembly level, and parametric. The expected accuracy range for a Class 3 estimate is -5% to-15% on the low side and +10% to +20% on the high side, depending on the construction complexity of the project, appropriate reference information and other risks (after inclusion of an appropriate contingency determination.) Ranges could exceed those shown if there are unusual risks.

6.2.2 Civil Work

This estimate includes: Site clearing and grubbing, Earthwork (fill material, sand fill), and Drainage Structures.

7. COST AND SCHEDULE RISK ANALYSIS (CSRA)

A detailed formal CSRA was developed by MSI under subcontract to S&B / RRP. The CSRA was prepared to support the derivation of a contingency value for the project cost estimate. The baseline estimate assumes estimating parameters based on the estimator's and project team's best judgement; the CSRA accounts for any uncertainty in that judgement by applying risk analysis techniques to the baseline estimate. The CSRA considered all project costs, as listed above.

MSI facilitated a virtual CSRA Brainstorming session on 31 May 2023. The session sought PDT input on risk identification and definition. Participants in the CSRA Brainstorming included an MSI representative (session leader / facilitator), S&B/RRP representatives, and a representative of the Nonfederal Sponsor. The PDT identified 29 opportunities and risks that have cost and schedule impacts, or in many cases both. The PM, CSRA lead, and lead cost estimator reviewed the draft risk register and refined definitions and scope to assess the magnitude of potential cost and schedule impacts. As a result of Independent Technical Review comments, the CSRA was updated in June 2025.

The contingency derived using this process was added to the baseline estimate to derive the total project cost estimate. To derive the total project cost estimate, MSI has adjusted the project cost estimate by adding cost and schedule contingency derived using a Monte Carlo simulation approach. This process measures cost and schedule risks and opportunities inherent in the project as determined jointly by the PDT and MSI. The result is a continuum of costs- a cumulative probability density function, or "S curve" – where higher confidence is attained with higher costs.

The primary contributors to the contingency values determined in the CSRA are related to the uncertainty about the acquisition strategy and the numerous contractors likely to participate and labor inefficiencies resulting from harsh weather conditions and periodic stop-work orders due to a lack of funding availability. Due to the length of the schedule and included allowances for delays, the CSRA determined that schedule risks were unlikely to have an impact on the project schedule.

The CSRA Report is Attachment 3. The CSRA spreadsheet is Attachment 4. The total contingency determined by the CSRA is $185,362,000 at 80% confidence level, which is equal to 31% of the estimated construction cost. The 31% contingency has been applied to each cost category in the TCPS for consistency.

8. DEVELOPMENT OF OTHER PROJECT COSTS

This section describes development of the costs broken down by the elements of the Civil Works Work Breakdown Structure (CW-WBS). Costs are apportioned into the Total Project Cost Summary (TCPS) Summary (Table 2) as described below. The TCPS spreadsheet is included as Attachment 5. All amounts in the sub-paragraphs below are in the TCPS Preparation Date of September 2025 dollars, based on the MCACES estimate. The amounts in Table 2 include the CSRA determined contingency of 31% applied to each account below..

TCPS Summary

Account	Item	Included in MCACES Estimate?	Estimated Cost plus Contingency	Project First Cost Including Escalation (to Sep 2025)
01	Lands and Damages	No	$20,772,650	$21,885,398
02	Relocations	No	$33,034,782	$34,810,525
06	Fish and Wildlife Facilities	No	$7,191,900	$7,578,429
09	Channels & Canals	Yes	$782,833,116	$824,905,337
18	Cultural Resource Preservation	No	$1,886,400	$1,987,795
30	Planning, Engineering & Design	No	$211,251,626	$224,552,240
31	Construction Management	No	$100,431,101	$106,754,344
33	HTRW	No	$56,956	$60,007
	Total Cost		**$1,149,921**	**$1,222,534,075**

Table 2

8.1 Real Estate (01 - Lands and Damages)

The real estate values contained in this study were estimated using data from public records which are primarily the appraisal district valuation records from Hidalgo and Willacy Counties. The sales of comparable properties in terms of physical proximity, location, access, and highest and best use will be taken into consideration during the appraisal process, which represents the best available comparisons when providing second land purchase offer letters to the owners. Several bona fide land sales for each property type will be compiled to offer reasonable support for unit land values used in providing the second compensation offer letters to the owners.

The estimated real estate costs for the recommended plan include land valuation, acquisition costs, appraisal costs, associated legal fees and anticipated condemnation proceedings, surveying, mapping, and administrative costs. The CSRA determined contingency was applied to the real estate costs. All land values are based on 2023 County appraisal district valuation.

Details on the Real Estate costs are in Appendix A-4. The total Real Estate cost including contingency was estimated to be $20,773,000.

8.2 Utility Relocations (02 – Relocations)

There are multiple instances of utility crossings along the alignment of the recommended plan. These utility crossings include both above and below ground crossings, of which there are more subsurface crossings. None of the utility adjustments required by the recommended plan require the acquisition of additional LERRDs beyond those required for the components of the recommended plan, as each utility crossing has an easement which can contain the adjustments required by the recommended plan.

Coordination with utility companies has been ongoing related to modifications to the various crossings. As the project proceeds further in design, additional details will be developed. A list of relocations/modifications

identified is included in the Real Estate Appendix (A-4) as Attachments C and D, and includes the description of the facility or utility relocation that must be performed, the nature of the impact to each facility, the facility owners and the purpose of the facilities. Utility modifications will agree with the corresponding utility requirements and at times relocation may not be required.

HCDD1 will provide the real property interests, acquire or compel the removal of obstructions, and perform or ensure the performance of relocations required for construction, and O&M of the project. For each relocation of a utility, or portion thereof, located in or under the improvements included in the recommended plan that is required to accommodate the recommended plan, the NFS shall pay to the owner of the utility the owner's relocation costs, unless the owner voluntarily agrees to waive all or a portion of the NFS's contribution.

A summary of relocation costs is Attachment 6. The current estimated cost for fifty-nine (59) identified utility adjustments including contingency is $33,035,000.

8.3 Mitigation (06 – Fish and Wildlife Facilities)

This element is the allowance for environmental mitigation, including wetlands and vegetative plantings or critical habitat for Threatened & Endangered Species. The estimate was developed by the PDT utilizing costs from similar projects, based on the assumptions outlined below. Additional considerations and assumptions have been included in the CSRA. The total estimated cost is $5,490,000, plus the 31% contingency, for a total of $7,192,000.

8.3.1 Wetland Mitigation Assumptions

- Waters of the US, including wetlands (and/or other aquatic sites) are identified within the proposed project limits.
- Wetland mitigation costs of $30,000/acre (excluding land acquisition costs).
    - Assume 0.25 wetland acres/mile X 57 miles of drain = 14.25 acres X 2:1 mitigation ratio = 28.5 acres of wetland mitigation (drain).
    - Assume detention basin consists of 3% wetlands X 272-acre detention area = 8.2 acres X 2:1 mitigation ratio = 16.3 acres of wetland mitigation (detention basin).
    - To offset unlikely, but possible, indirect impacts to wetlands (in response to an IEPR review comment), the total allowance for mitigation acreage has been increased from 44.8 acres (28.5 acres (drain) + 16.3 acres (detention basin), to a total of 60 acres.
    - Total mitigation cost (excluding land) = $30,000 X 60 acres = $1,800,000.
- Average project acquisition cost/acre of land = $11,500 X 60 acres = $690,000 land costs.
- Total estimated cost is $2,490,000.

8.3.2 Vegetative Plantings or Critical Habitat for Threatened & Endangered Species Assumptions

- Assumes the proposed project will remove scrub-shrub vegetation which could provide cover, foraging or other habitat uses for threatened/endangered species.
- Includes mitigation in the form of planting vegetative species conducive for use by Ocelots and Jaguarundi for foraging, cover, etc. The Ocelot and Gulf Coast Jaguarundi are federally listed endangered species.
- Vegetative species plantings may include scrub-shrub or native grasses/forbs; seed planting may be preferrable particularly during drought conditions.
- Assumes the planting of native seed covered with topsoil at a rate of $10,000/acre X 150 acres = $1,500,000 (1:1 mitigation ratio) for the purpose of supporting threatened/endangered species.
- Assumes 150 acres X $10,000 acquisition cost/acre of land (Willacy County land cost) = $1,500,000 additional costs. Note, land could be donated to the USFWS or a non-profit organization such as the East Foundation in lieu of other mitigation requirements (such as seeding or planting).

- Assumes topsoil is available at no additional acquisition cost. Presumes that earthwork would be conducted by others.
- Does not include the general cover of excavated/disturbed areas with native grass/forb species for sediment retention within the right-of-way of the proposed project.
- Total estimated cost is $3,000,000.

8.4 Channels and Canals (09)

The RD project consists primarily of construction of channels / canals (non-navigation related), supporting systems such as detention basins, floodway control structures, and impacted roadways. All construction contract costs were included in cost Account 09, as detailed by the MCACES Cost Estimate. This is the bulk of the overall cost for this project. The amount allocated to this item totals approximately $782,833,000 including contingency.

8.5 Cultural Resource Preservation (18)

This element is the allowance for potential post-feasibility cultural resource investigations. The estimate was developed by the PDT utilizing costs from similar projects, and is based on the assumptions below. Additional considerations and assumptions have been included in the CSRA. Total estimated cost for the tasks identified below is $1,440,000.

- Cultural resources are anticipated to be identified within the proposed project limits. A total of 200 trenches are anticipated (scoped). Historical/Archeological data recovery excavations are scoped.
- A Memorandum of Understanding (MOU), Memorandum of Agreement (MOA), or Programmatic Agreement (PA) may be executed between HCDD1/USACE and the Texas Historical Commission, State Historic Preservation Officer (THC SHPO) if data recovery excavations are required.
- Assumption of one site/mile requiring recovery excavations and curation for 57 miles = 57 sites.
- Data recovery excavations at 57 sites X $15,000/excavation activity + $5,000/curation activity/per site = $1,140,000 in mitigation.
- Assumes two eligible sites for the National Register of Historic Places (NRHP) at $100,000/site X 2 sites = $200,000 for NRHP listing.
- Assumes $100,000 for preparation of a documentation report.

Total estimated cost of the Cultural Resource Preservation including contingency was estimated to be $1,886,400.

8.6 Planning, Engineering, and Design (30)

Estimated PED costs for the project are estimated to be approximately $211,252,000. This value was calculated using the default percentages in the TCPS worksheet, with contingency applied.

8.7 Construction Management (31)

Estimated Construction Management costs for the project are estimated to be approximately $100,431,000. This value was calculated using the default percentages included in the TCPS worksheet, with contingency applied.

8.8 Hazardous Toxic and Radioactive Waste (HTRW) (33)

While no HTRW has been discovered to date, an allowance has been made in the estimate for its potential discovery. Additional considerations and assumptions have been included in the CSRA. Total estimated cost is $50,000 based on the following assumptions determined by the PDT.

- Assumption 1: Soil testing for contamination may be required at 2 potential sites in which hazardous materials/wastes have been disposed within the proposed project limits.

- Assumption 2: Removal of materials/wastes (car parts, containers, etc.), soil testing and soil disposal to a TCEQ disposal site = $43,478

Total HRTW Cost including contingency was estimated to be $57,000.

9. USACE COST CERTIFICATION

Review to obtain cost certification from the USACE Cost Engineering Mandatory Center of Expertise (MCX) in the Walla Walla District is currently underway. This appendix will be updated upon completion of the review process.

*** NOTE: COST ESTIMATE ATTACHMENTS 2-6 (CONTAINING DETAILED CONSTRUCTION COST ESTIMATE INFORMATION) ARE CONSIDERED FOUO (FOR OFFICIAL USE ONLY) AND ARE NOT INCLUDED IN THE PUBLIC REVIEW DRAFT. ***

ATTACHMENT 1 - Design Maturity Determination for Cost Certification

ATTACHMENT 2 – MCACES Estimate

ATTACHMENT 3 – CSRA Report

ATTACHMENT 4 – CSRA Spreadsheet

ATTACHMENT 5 – TCPS Spreadsheet

ATTACHMENT 6 – Relocation Costs