2023 DRAFT COASTAL MASTER PLAN

PROJECT DEVELOPMENT DATABASE DOCUMENTATION

ATTACHMENT F6

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PREPARED BY: HEATHER SPRAGUE, TIM NELSON, AMANDA WEIKMANN, DEREK NORMAN, AND DAVE GONG

COASTAL PROTECTION AND
RESTORATION AUTHORITY
150 TERRACE AVENUE
BATON ROUGE, LA 70802
WWW.COASTAL.LA.GOV

COASTAL PROTECTION AND RESTORATION AUTHORITY

This document was developed in support of the 2023 Coastal Master Plan being prepared by the Coastal Protection and Restoration Authority (CPRA). CPRA was established by the Louisiana Legislature in response to Hurricanes Katrina and Rita through Act 8 of the First Extraordinary Session of 2005. Act 8 of the First Extraordinary Session of 2005 expanded the membership, duties, and responsibilities of CPRA and charged the new authority to develop and implement a comprehensive coastal protection plan, consisting of a master plan (revised every six years) and annual plans. CPRA's mandate is to develop, implement, and enforce a comprehensive coastal protection and restoration master plan.

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- Coastal Protection and Restoration Authority (CPRA) of Louisiana - Eric White, Elizabeth Jarrell, Stuart Brown, Krista Jankowski, David Lindquist, Ashley Cobb, Sam Martin, Madeline LeBlanc, Forrest Town, and Denise Reed

The following experts were responsible for the preparation of this document:

- Heather Sprague – Arcadis
- Tim Nelson – Arcadis
- Amanda Weikmann – Arcadis
- Dave Gong - Arcadis
- Derek Norman – Arcadis

EXECUTIVE SUMMARY

As coastal Louisiana faces increasing threats from flooding and sea level rise, there is a great need to advance our scientific understanding of the coast and how coastal Louisiana will need to adapt to future conditions. The Coastal Protection and Restoration Authority (CPRA) is undertaking this challenge through six-year updates of Louisiana's Comprehensive Master Plan for a Sustainable Coast. This document summarizes the process by which CPRA developed candidate projects for consideration in the 2023 Coastal Master Plan.

The 2023 Coastal Master Plan builds on past progress and establishes a clear vision for the future. It refines past plans by improving the methods used to ensure projects are evaluated as efficiently, consistently, and effectively as possible. These improvements include changes to the costing methodology and project structure, as well as the development of the Project Development Geodatabase (PDG), the Project Development Database (PDD), and an automated Project Costing Tool (PCT). This document is intended to serve as the technical documentation as the PDD and PDG are developed for the Louisiana 2023 Coastal Master Plan. It will be a living document subject to revision as various portions of the new tools and processes are developed.

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LIST OF ABBREVIATIONS

ADCIRC ..... ADVANCED CIRCULATION
AWS ..... AMAZON WEB SERVICES
BS ..... BANK STABILIZATION
cf ..... CUBIC FEET
cfs ..... CUBIC FEET PER SECOND
CH ..... CHANNEL CREATION
CL ..... GAP CLOSURES
CLARA ..... COASTAL LOUISIANA RISK ASSESSMENT
CPRA ..... COASTAL PROTECTION AND RESTORATION AUTHORITY
CWCCIS ..... CIVIL WORKS CONSTRUCTION COST INDEX SYSTEM
DI ..... DIVERSION
EL ..... EXISTING LEVEE
ft ..... FOOT/FEET
FWOA ..... FUTURE WITHOUT ACTION
GA ..... PROPOSED GATES
GIS ..... GEOGRAPHIC INFORMATION SYSTEM
HR ..... HYDROLOGIC RESTORATION
ICM ..... INTEGRATED COMPARTMENT MODEL
IP ..... INTEGRATED PROJECT
LS ..... LUMP SUM
MC ..... MARSH CREATION
NAVD88 ..... NORTH AMERICAN VERTICAL DATUM OF 1988
NS ..... NONSTRUCTURAL RISK REDUCTION
O&M ..... OPERATIONS AND MAINTENANCE
OR ..... OYSTER BARRIER REEF
PCT ..... PROJECT COSTING TOOL
PDD ..... PROJECT DEVELOPMENT DATABASE
P/E&D ..... PLANNING/ENGINEERING AND DESIGN
PL ..... PROPOSED LEVEE

PSC ..... PITTSBURGH SUPERCOMPUTING CENTER
PT ..... PLANNING TOOL
PW ..... PROPOSED FLOODWALL
QAQC ..... QUALITY ASSURANCE AND QUALITY CONTROL
RR ..... RIDGE RESTORATION
SP ..... SHORELINE PROTECTION
SR ..... STRUCTURAL RISK REDUCTION
SQL ..... STRUCTURED QUERY LANGUAGE
SWAN ..... SIMULATING WAVES NEARSHORE
USACE ..... U.S. ARMY CORPS OF ENGINEERS
XX ..... MISCELLANEOUS QUANTITY

1.0 INTRODUCTION

As Louisiana faces increasing threats from coastal flooding and sea level rise, there is a great need to advance our scientific understanding of the coast and how coastal Louisiana will need to adapt to future conditions. The Coastal Protection and Restoration Authority (CPRA) is undertaking this challenge through six-year updates of Louisiana's Comprehensive Master Plan for a Sustainable Coast. The 2023 Coastal Master Plan builds on past progress and establishes a clear vision for the future. It refines past plans by improving the methods used to ensure projects are evaluated as efficiently, consistently, and effectively as possible.

As discussed in Appendix F: Project Definition (Sprague, 2021a), previous master plan iterations required hundreds of Excel spreadsheets, dozens of CSV files, and over forty unique Esri shapefiles to measure, quantify, calculate, and aggregate project information, which in turn required frequent manual data transfers between different modeling teams. Because the 2023 Coastal Master Plan is intended to tackle the analysis of broader, more complicated projects than previous plans, a new system was devised for defining and assembling the building blocks used to describe a project. This new system streamlines this process by replacing the cumbersome spreadsheets and shapefiles with five primary features:

1. A centrally accessible PostgreSQL database, called the Project Development Database (PDD), which houses tables of relevant project attributes, metadata, bid items, costs, and any project-level outputs that may need to be passed between modeling teams. Custom Structured Query Language (SQL) scripts are used to access data directly from the PDD as needed.
2. A python program, called the Project Costing Tool (PCT), which reads inputs from the PDD, calculates quantities and costs of each feature within a project, and stores values back into the PDD. Additional data processing scripts are used in conjunction with the PCT to define project attributes and to streamline quality assurance and control (QAQC) procedures.
3. An Esri geodatabase, called the Project Development Geodatabase (PDG), which contains the geospatial representations of all projects in three feature classes (for points, polygons, and polylines); in future iterations of the master plan, geospatial data is intended to be integrated into the PDD with a Spatial Database Engine (SDE). While the PDG is the source of truth for all geospatial data at the Element Level, a copy of the PDG also exists, referred to as the Mapping PDG, which joins project-level attributes from the PDD to the Elements as represented in the PDG. The Mapping PDG is automatically re-created every time the PDD or PDG is updated
4. A reporting system (presently using Jaspersoft software) that reads from the PDD to produce project-level cost summaries

5. A web-based user interface used to access the PDD, run the PCT, and produce the cost summary reports

Ultimately, the PDD and PDG act as a central repository for tabular and basic geospatial data used and generated by the four primary master plan modeling teams: the Advanced CIRCulation (ADCIRC) and Simulating WAves Nearshore (SWAN) team, the Integrated Compartment Model (ICM) team, the Coastal Louisiana Risk Assessment (CLARA) model team, and the Planning Tool (PT) team. Basic project attributes and vector-based geospatial data are developed and then read by the ADCIRC+SWAN, ICM, and CLARA models. Additional project attributes are produced by these models and stored back into the PDD. The PCT reads attributes and produces costs, which are in turn read by the Planning Tool, along with model outputs from the ICM and CLARA, to prioritize projects and store project-level results back to the PDD (Figure 1). This effort is intended to streamline data generation and transfer, while greatly reducing the number of files and overall file size required for project definition within the master plan.

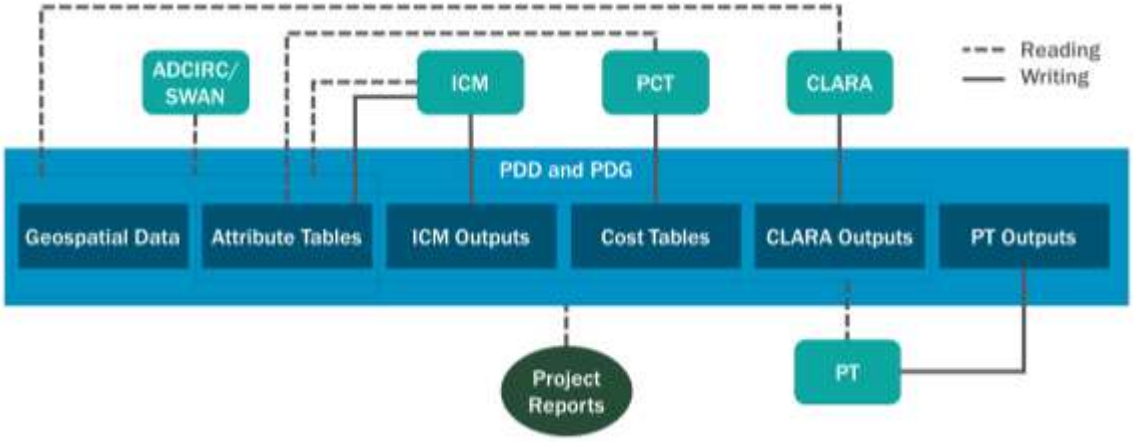

Figure 1. General workflow for data handoffs between modeling teams.

This document is intended to serve as a framework to define the architectural details of the **PDD**, the **PDG**, and the **Mapping PDG** as they are developed for the 2023 Coastal Master Plan. This will be a living document subject to revision as various portions of the new tools and processes are developed in 2020. Sections **Error! Reference source not found.** through **Error! Reference source not found.** detail the structure of the PDD, while Section 6.0 describes the PDG and Mapping PDG.

1.1 PROJECT ORGANIZATION

As detailed in Appendix F: Project Definition, there are seven distinct project types evaluated in the master plan, split into two primary categories: Risk Reduction and Restoration. Risk Reduction projects can either be Structural (designated as SR) or Nonstructural (NS), while Restoration projects may fall under one of five categories: Diversions (DI), Hydrologic Restoration (HR), Marsh Creation (MC), Ridge Restoration (RR), and Integrated Projects (IP). Each Project is composed of one or many Elements, and multiple projects may reference the same Element. There are thirteen unique Element Types used to define Restoration and Structural Risk Reduction projects: Proposed Levees (PL), Improvements to Existing Levees (EL), Proposed Floodwalls (PW), Proposed Gates (GA), Channel Creation (CH), Marsh Creation (MC), Gap Closures (CL), Ridge Restoration (RR), Shoreline Protection (SP), Bank Stabilization (BS), Oyster Reef (OR), Miscellaneous Quantity (XX), and Lump Sum (LS). Nonstructural Risk Reduction projects are defined by the CLARA model based on counts of properties that may be floodproofed, elevated, or acquired, and do not follow the same Project-Element relationships defined elsewhere in the PDD.

Each Element has a subgrouping of Components that comprise some feature of that Element. For example, Shoreline Protection rubble mound Elements include geotextile base, riprap, navigational aid, and settlement plate Components. Lists of Components utilized in costing each Element Type are described in detail in Section 0.

1.2 GENERAL DATABASE INFORMATION

Arcadis created and is hosting a temporary working PostgreSQL Database on an Amazon Web Services (AWS) server where all Project attribute data is developed before being posted to the official PDD, hosted by the Pittsburgh Supercomputing Center (PSC). Credentialed users may access either database directly via Python or other programming languages or by using a SQL client such as PGAdmin (a freeware commonly used for managing and supporting PostgreSQL Databases). To connect to the working database, the server host is *mp23.cgmmqpkm5dni.us-west-1.rds.amazonaws.com* and the database name is *mp23_master*. The host and database name for the official PDD (housed at PSC) are *vm007.bridges2.psc.edu* and *mp23_PDD*, respectively. Additionally, the official PDD utilizes an SSH tunnel with the host *bridges2.psc.edu* that require PSC authentication to connect. Credentials are required to access each database and are available to master plan project team members upon request.

The foundation of any relational database is the tables and fields which are used to house the information, functions, and calculation results. Relational databases use identification fields called primary keys to store tabular data. Each table will have a primary key that is unique for an entry in the

table and is typically an auto-incremented integer. Data can then be related to another table's data through a foreign key. A foreign key is a link to a different table's primary key. These keys help relate tables together for structure and efficiency. For example:

- Data at the Project level are stored in the *ProjectMetadata* table. That data/table has a primary key *ProjectUID*.
- Another table is *ElementDefinition*, which has a primary key called *ElementUID* and a foreign key *PrimaryProjectUID*, which relates Element data to the Project Metadata Table.

PostgreSQL databases specifically organize data using objects called schemas[1], which in turn contain tables. Different schemas are used to separate tables into logical groups based on relevance to each modeling team. Permissions are set at the schema level to preserve the integrity of the database by allowing users to access only the data relevant for their needs. Similarly, each schema can utilize its own set of rules regarding the primary units of measurement, depending on what is required for the relevant model. Five schemas are defined for the PDD (PCT, PDD[2], ICM, clara, andPlanning Tool), described in Table 1, and discussed in further detail in Sections **Error! Reference source not found.** through **Error! Reference source not found.**.

[1] The term schema may also, at times, reference the architecture of a table itself, including its name, the names and types of each column, and the assignment of primary and foreign keys. In this document, the term schema will only refer to the PostgreSQL definition related to a grouping of tables within a database.

[2] The lowercase *PCT* and *PDD* terminology designates the respective schemas within the (uppercase) PDD database, rather than the PCT python tool or the PDD itself.

Table 1. PDD Schema Definition

SCHEMA	DESCRIPTION	PRIMARY UNITS	PERMISSIONS				
			ADMIN	*ICM*	*CLARA*	*PT*	*ADCIRC*
PCT	ALL TABLES RELATED TO ELEMENTS, COMPONENTS, AND COSTS	IMPERIAL	FULL	READ	READ	READ	READ
PDD	TABLES AT THE PROJECT OR MODEL GROUP LEVEL, NOT SPECIFICALLY REQUIRED FOR THE PCT	METRIC	FULL	READ	READ	READ	READ
ICM	OUTPUTS OF ICM	METRIC	FULL	READ/ WRITE	NONE	READ	NONE
CLARA	OUTPUTS OF CLARA	METRIC	FULL	NONE	READ/ WRITE	READ	NONE
PT	OUTPUTS OFPLANNING TOOL	METRIC	FULL	NONE	NONE	READ/ WRITE	NONE

2.0 PDD SCHEMA

The PDD schema stores information required for the development and modeling of projects but not specifically required for the PCT. Data is in this schema is generally reported at a project or model group level. The PDD tables are read by all modeling teams and linked using the ProjectID field (described in Table 8 in Section 3.0), as opposed to the UID fields utilized in the PCT schema (see Section 3.0). Figure 2 shows the database relations between tables in the PDD schema and their connection to the source of the ProjectID field in the ProjectMetadata table in the PCT schema.

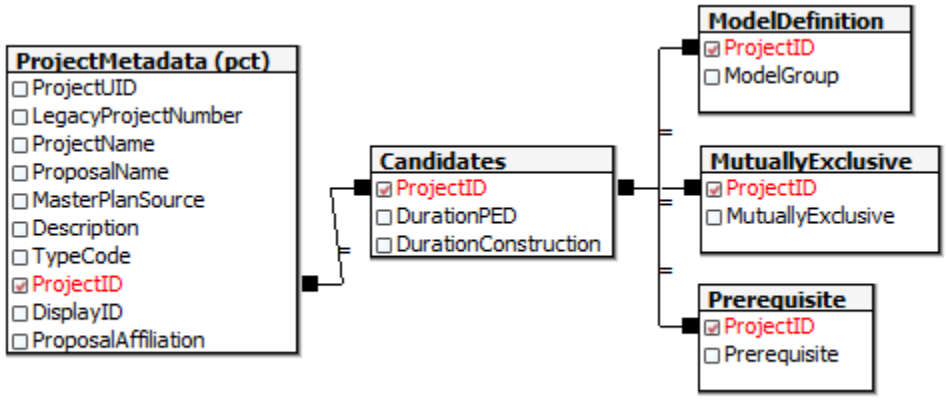

Figure 2. Database relation of PDD tables and link to PCT schema.

Project development information, including candidate project durations, model group assignment, and lists of project prerequisite and mutually exclusive projects, are stored in the PDD tables, as summarized in Table 2.

Table 2. Tables in the PDD Schema

TABLE NAME	DESCRIPTION
CANDIDATES	LIST OF ALL CANDIDATE PROJECTS TO BE EVALUATED IN THE MASTER PLAN MODELS, ALONG WITH ANY ATTRIBUTES AT THE PROJECT-LEVEL THAT ARE REQUIRED FOR MULTIPLE MODELS, BUT NOT FOR THE PCT
MODELDEFINITION	DEFINES RELATIONSHIP BETWEEN PROJECTS AND MODEL GROUPS
MUTUALLYEXCLUSIVE	DEFINES WHICH PROJECTS SHOULD NOT BE IMPLEMENTED WITHIN THE SAME ALTERNATIVE
PREREQUISITE	DEFINES WHICH PROJECTS MUST BE IMPLEMENTED IN A PARTICULAR ORDER WITHIN THE SAME ALTERNATIVE

2.1 PDD TABLES

Table 3 through Table 6 describe the structure of each table in the PDD schema.

Table 3. Candidates

FIELD	DESCRIPTION
PROJECTID	INTEGER IDENTIFIER FOR EACH PROJECT, USED ACROSS MASTER PLAN MODELING TEAMS; SEE *PROJECTMETADATA* TABLE FOR DESCRIPTION
DURATIONPED	ESTIMATED DURATION OF P/E&D PHASE IN YEARS; SEE APPENDIX A FOR DURATION ASSUMPTIONS
DURATIONCONSTRUCTION	ESTIMATED DURATION OF CONSTRUCTION PHASE IN YEARS; SEE APPENDIX A FOR DURATION ASSUMPTIONS

Table 4. Model Definition

FIELD	DESCRIPTION
PROJECTID	INTEGER IDENTIFIER FOR EACH PROJECT, USED ACROSS MASTER PLAN MODELING TEAMS; SEE *PROJECTMETADATA* TABLE FOR DESCRIPTION
MODELGROUP	INTEGER IDENTIFIER FOR TRACKING FUTURE WITHOUT ACTION (FWOA), ALTERNATIVE, DRAFT MASTER PLAN, AND FINAL MASTER PLAN MODEL RUNS

Table 5. Mutually Exclusive

FIELD	DESCRIPTION
PROJECTID	INTEGER IDENTIFIER FOR EACH PROJECT, USED ACROSS MASTER PLAN MODELING TEAMS; SEE *PROJECTMETADATA* TABLE FOR DESCRIPTION
MUTUALLYEXCLUSIVE	INTEGER PROJECTID OF PROJECT(S) THAT WOULD NOT BE INCLUDED IN THE MASTER PLAN SHOULD THE CURRENT PROJECT BE SELECTED

Table 6. Prerequisite

FIELD	DESCRIPTION
PROJECTID	INTEGER IDENTIFIER FOR EACH PROJECT, USED ACROSS MASTER PLAN MODELING TEAMS; SEE *PROJECTMETADATA* TABLE FOR DESCRIPTION
PREREQUISITE	INTEGER PROJECTID OF OTHER PROJECT(S) THAT MUST BE IMPLEMENTED PRIOR TO THE PROJECT, IF SELECTED IN AN ALTERNATIVE OR IN THE MASTER PLAN ITSELF

3.0 PCT SCHEMA

The PCT schema is used to store tables related to Elements, Components, and costs. The PCT reads data from the PCT, PDD, and ICM schemas and writes results back into the PCT schema. All units for fields in the PCT are in imperial units, due to the PCT's dependency on US-based engineering design features, such as the Element design templates themselves and available bid item data.

Figure 3, Figure 4, and Figure 5 show the general structure of the PCT schema, with relations between primary and foreign keys in red. As shown in Figure 3, Elements are initialized in the *ElementDefinition* table and linked to projects in the *ElementAssignment* table. Elements may be assigned to one or many different projects, such as when two DI projects have the same general features, but unique operating regimes. Each element is also assigned a *PrimaryProjectUID*, indicating the source project where that element originated. As Element attributes are changed over time, the PDD archives the change and incrementally increases the version number for that Element. All attributes from the appropriate Attribute table are then linked to the relevant version of the Element in the Version table via the *VersionUID*, and costs are calculated only for the most up-to-date versions of Elements.

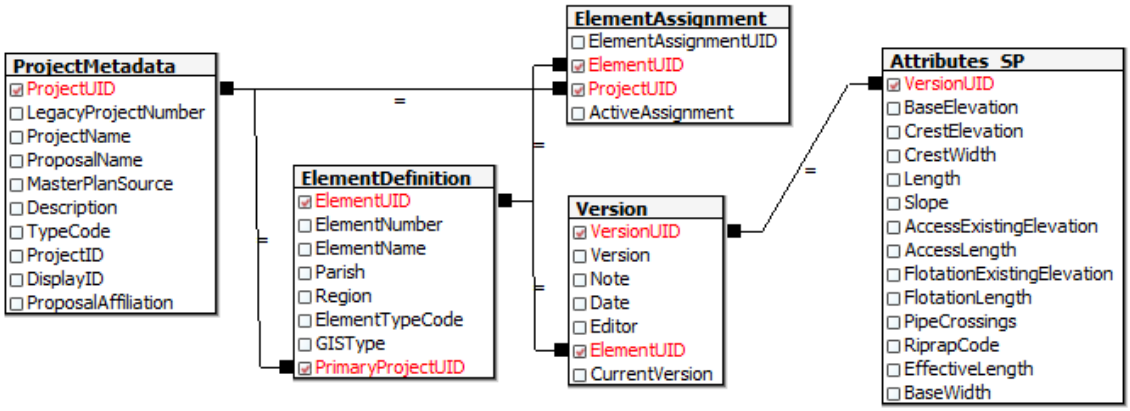

Figure 3. Database relation and structure of metadata and attributes.

The PCT reads from each attribute table to produce quantities and costs for each component within each Element. Figure 4 describes how Components are linked to the *Item* table, which holds the unit costs for each available bid item. Many different types of Components may link to the same bid item; for example, mechanical dredging is used to build ridges for RR elements and to dredge channels for CH elements. The *Item* table is in turn linked to the *CostCategory* and *CostIndex* tables, which are used to escalate inputted bid item costs to 2023 USD using the U.S. Army Corps of Engineers (USACE)

Civil Works Construction Cost Index System (2019). The *Item* table is also linked to the *ConfidenceRanking* table, which is used to provide a range of cost estimates based on assigned uncertainties in each bid item unit cost.

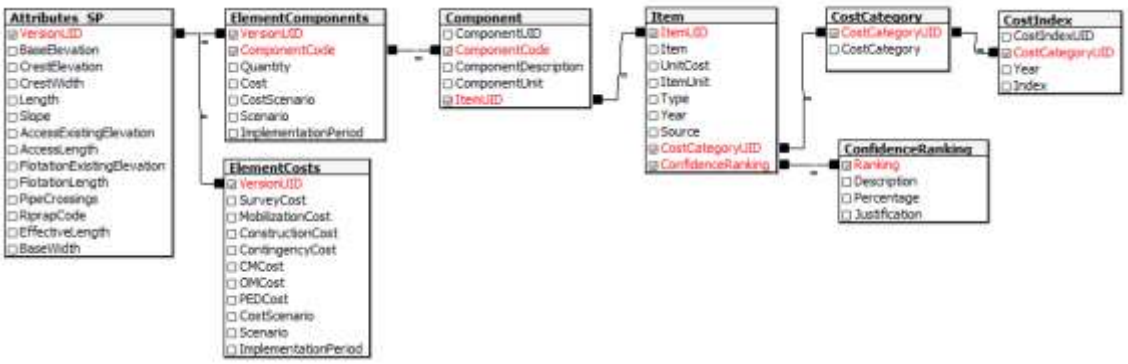

Figure 4. Database relation and structure of attributes and output cost tables.

Design marsh elevations vary over time due to sea level rise and subsidence. As such, the ICM determines the required area and volume to build marsh at each implementation period and environmental scenario, and the PCT calculates MC Element costs for each combination of thereof. Additionally, the PCT also determines MC Element costs for multiple borrow source options so that the Planning Tool can optimize project selection based on limited sediment availability. Figure 5 describes how these costs are linked to both inputted dredge mobilzation attributes that vary by Element and Borrow Source and by the ICM-producced area and volume attributes that vary by implementation period and scenario.

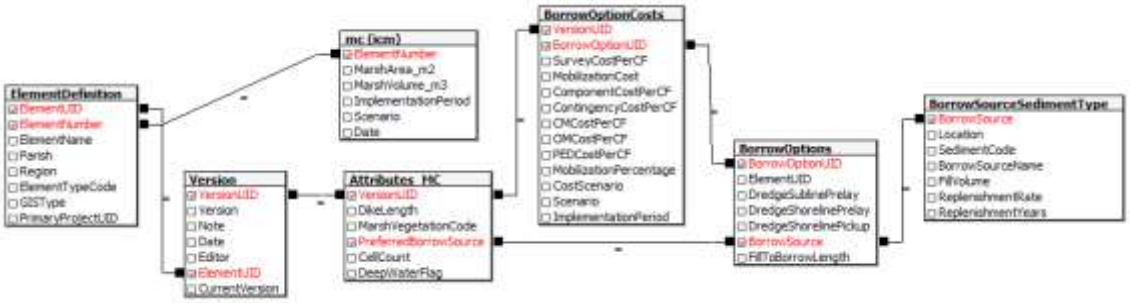

Figure 5. Database relation and structure of MC, borrow source, and output cost tables.

Tables in the PCT schema fall into four general categories, shown below and discussed in greater detail in Sections 3.1 through 3.4.

Table 7 provides a summary of all database tables in the PCT schema.

1. **Metadata and Version Tracking**. Project, Element, and Version metadata, including descriptive attributes (e.g., names and descriptions) as well as data related to how Elements and Projects are linked to each other.
2. **General Lookup Tables**. Background data needed to estimate costs, such as bid item unit costs and cost escalation indices.
3. **Element Attributes**. Attribute data used to define projects and determine costs for each of the 13 Element types.
4. **PCT Outputs.** Outputted costs at the Element and Component levels.

Table 7. Tables in the PCT Schema

CATEGORY	TABLE NAME	DESCRIPTION
METADATA AND VERSION TRACKING	PROJECTMETADATA	LIST OF ALL PROJECTS AND THEIR METADATA
	ELEMENTDEFINITION	LIST OF ALL ELEMENTS AND THEIR METADATA
	ELEMENTASSIGNMENT	LINK BETWEEN ELEMENTDEFINITION AND PROJECTMETADATA, USED TO MATCH ONE ELEMENT TO ONE OR MANY PROJECTS

CATEGORY	TABLE NAME	DESCRIPTION
	VERSION	LINK BETWEEN ELEMENTS AND VERSIONS
GENERAL LOOKUP TABLES	ITEM	LIBRARY OF UNIT COSTS AND LINK TO THE COSTCATEGORY
	COMPONENT	LIBRARY OF ALL COMPONENTS USED IN ANY ELEMENT, AND THEIR LINK TO THE SPECIFIC BID ITEMS WITH CORRESPONDING UNIT COSTS
	CONFIDENCERANKING	LOOKUP TABLE THAT RELATES CONFIDENCE RANKINGS FOR UNIT COSTS TO DESCRIPTIONS AND PERCENTAGE VALUES.
	CONVERSIONS	LIBRARY OF CONVERSION FACTORS BETWEEN UNITS (I.E., SQUARE FEET TO ACRES)
	COSTCATEGORY	SUMMARY OF EACH OF THE TWENTY CATEGORIES IN THE USACE CIVIL WORKS CONSTRUCTION COST INDEX SYSTEM
	COSTINDEX	LIBRARY OF COST INDEXES PER CATEGORY PER YEAR, PULLED FROM THE USACE CIVIL WORKS CONSTRUCTION COST INDEX SYSTEM
	COSTPERCENTAGE	DEFAULT PERCENTAGES FOR EACH OF THE SIX PRIMARY COST PARAMETERS APPLIED TO SUMS OF COMPONENT COSTS (CONSTRUCTION MANAGEMENT, SURVEYS, MOBILIZATION, OPERATIONS AND MAINTENANCE (O&M), P/E&D, AND CONTINGENCY)
	COSTPERCENTAGEOVERRIDE	PERCENTAGE OVERRIDES BY PROJECTID FOR ANY OF THE RELEVANT SIX PRIMARY COST PARAMETERS
	GATE	LOOKUP TABLE RELATING GATE CODES TO GATE-SPECIFIC ATTRIBUTES USED IN THE ICM, SUCH AS INVERT ELEVATION AND WIDTH
	DIVERSIONFEATURE	LOOKUP TABLE RELATING DIVERSION INTAKE FEATURE CODES TO INTAKE-SPECIFIC ATTRIBUTES USED IN THE ICM, SUCH AS GATE COUNT AND TYPE

CATEGORY	TABLE NAME	DESCRIPTION
	TYPES	LOOKUP TABLE THAT RELATES TYPE CODES TO TYPE DESCRIPTIONS (E.G., HR: HYDROLOGIC RESTORATION).
	BORROWSOURCESEDIMENTTYPE	DESCRIPTION OF SEDIMENT TYPE IN EACH BORROW SOURCE
ELEMENT ATTRIBUTES	ATTRIBUTES_**	ATTRIBUTES FOR EACH OF THE 13 ELEMENT TYPES (BS, CH, CL, EL, GA, LS, MC, OR, PL, PW, RR, SP, AND XX), ASSOCIATED WITH EACH VERSION OF EACH ELEMENT
	BORROWOPTIONS	DREDGE MOBILIZATION ATTRIBUTES FOR EACH ELEMENT-BORROW SOURCE COMBINATION
PCT OUTPUTS	BORROWOPTIONCOSTS	COSTS ASSOCIATED WITH EACH THE LATEST VERSION OF EACH ELEMENT ASSOCIATED WITH EACH BORROW SOURCE IT IS LINKED TO IN THE BORROWOPTIONS TABLE
	ELEMENTCOMPONENTS	QUANTITIES AND COSTS ASSOCIATED WITH THE COMPONENTS OF THE LATEST VERSION OF EACH ELEMENT
	ELEMENTCOSTS	COSTS ASSOCIATED WITH THE LATEST VERSION OF EACH ELEMENT

3.1 METADATA AND VERSION TRACKING TABLES

The Project Metadata table (Table 8) is used to define and describe all Projects that have ever been considered in any master plan since 2012. This table serves as the foundation for Project organization within the PDD. These metadata attributes are common for all Restoration and Risk Reduction projects.

Table 8. ProjectMetadata Field Descriptions

FIELD NAME	DESCRIPTION
PROJECTUID	UNIQUE, SEQUENTIAL INTEGER ASSIGNED TO EACH PROJECT; PRIMARY KEY OF PROJECTMETADATA
PROJECTNUMBER	THREE-DIGIT NUMBER ASSIGNED TO EACH PROJECT, INCREMENTING FROM THE FIRST PROJECT PROPOSED IN THE 2012 COASTAL MASTER PLAN
PROJECTVERSION	LETTER INDICATING A VARIATION OF A PROPOSED PROJECT WHERE THE FIRST ALTERNATE VERSION IS DENOTED WITH A "B" (E.G., 014B) AND THE ORIGINAL PROJECT IS ASSIGNED AN "A" (E.G., 014A)
DISPLAYID	CONCATENATION OF PROJECTNUMBER AND PROJECTVERSION, STORED AS A STRING (E.G., 155, 004B, 090B)
PROJECTID	INTEGER IDENTIFIER FOR EACH PROJECT, USED AS PRIMARY AND FOREIGN KEY IN TABLES ACROSS ALL SCHEMAS FOR ALL MODELING GROUPS; REPRESENTS BOTH THE PROJECT NUMBER AND VERSION, EQUAL TO THE PROJECTNUMBER MULTIPLIED BY 10,000, PLUS 100 FOR EACH VARIANT OF THE PROJECT AFTER "A" (I.E. 014A TRANSLATES TO 140000, AND 014B TRANSLATES TO 140100)
LEGACYPROJECTNUMBER	A UNIQUE PROJECT IDENTIFICATION NUMBER ARRANGED BY "PLANNING UNIT. PROJECT TYPE. SEQUENTIAL NUMBER" (E.G., 001.MC.09) FOR RESTORATION, STRUCTURAL RISK REDUCTION, AND INTEGRATED PROJECTS
PROJECTNAME	TEXTUAL PROJECT NAME (E.G., "LAKE HERMITAGE SHORELINE PROTECTION" ETC.)
DESCRIPTION	BRIEF DESCRIPTION OF PROJECT FEATURES AND INTENT

FIELD NAME	DESCRIPTION
TYPECODE	IDENTIFIER INDICATING ONE OF THE SEVEN MAJOR PROJECT TYPES: SR (STRUCTURAL RISK REDUCTION), DI (DIVERSION), HR (HYDROLOGIC RESTORATION), MC (MARSH CREATION), RR (RIDGE RESTORATION), IP (INTEGRATED PROJECT), OR NS (NONSTRUCTURAL RISK REDUCTION).
MASTERPLANSOURCE	THE MASTER PLAN FOR WHICH THE PROJECT WAS FIRST PROPOSED
PROPOSALNAME	PROJECT NAME AS SPECIFIED IN THE SOURCE DOCUMENT, IF DIFFERENT FROM PROJECTNAME
PROPOSALAFFILIATION	THE SOURCE PLANNING DOCUMENT OR GROUP FOR WHICH THE PROPOSED PROJECT IS ATTRIBUTED

As described in Figure 3 and

Table 7, the ElementDefinition, ElementAssignment, and Version tables are used to define Element-level metadata and link Elements to specific projects and versions. Table 9 through Table 11 describe the data housed in each of these Element-level tables.

Table 9. ElementDefinition Field Descriptions

FIELD NAME	DESCRIPTION
ELEMENTUID	SEQUENTIAL COUNT FOR EACH ELEMENT; PRIMARY KEY OF ELEMENTDEFINITION
ELEMENTID	INTEGER IDENTIFIER FOR EACH ELEMENT, USED AS PRIMARY AND FOREIGN KEY IN TABLES ACROSS ALL SCHEMAS FOR ALL MODELING GROUPS; REPRESENTS THE PROJECT NUMBER, PROJECT VERSION, AND ELEMENT COUNT, EQUAL TO THE PROJECTNUMBER MULTIPLIED BY 10,000, PLUS 100 FOR EACH VARIANT OF THE PROJECT AFTER “A”, PLUS 1 FOR EACH ELEMENT (I.E., THE FIRST ELEMENT IN PROJECT 014B TRANSLATES TO 140101, WHILE THE SECOND ELEMENT TRANSLATES TO 140102)

FIELD NAME	DESCRIPTION
LEGACYELEMENT NUMBER	A UNIQUE IDENTIFICATION TAG ARRANGED BY “LEGACY PROJECT NUMBER. SEQUENTIAL NUMBER” (E.G., 001.MC.09.12) FOR RESTORATION, STRUCTURAL RISK REDUCTION AND INTEGRATED PROJECTS
PRIMARYPROJECTUID	PROJECTUID OF PROJECT WHERE THE ELEMENT ORIGINATED.
ELEMENTNAME	TEXTUAL ELEMENT NAME (E.G., “REACH NO. 2”)
PARISH	PARISH(ES) IN WHICH THE ELEMENT FOOTPRINT IS LOCATED
REGION	REGION IN WHICH THE ELEMENT FOOTPRINT IS LOCATED
ELEMENTTYPECODE	IDENTIFIER INDICATING ONE OF THE THIRTEEN MAJOR ELEMENT TYPES: BS (BANK STABILIZATION), CH (CHANNEL CREATION), CL (MARSH CLOSURE FEATURES), EL (IMPROVEMENTS TO EXISTING LEVEES), GA (GATES), LS (MISCELLANEOUS LUMP SUMS), MC (MARSH CREATION), OR (OYSTER REEF), PL (PROPOSED LEVEE), PW (PROPOSED WALL), RR (RIDGE RESTORATION), SP (SHORELINE PROTECTION), OR XX (MISCELLANEOUS QUANTITIES).
GISTYPE	IDENTIFIES HOW THE ELEMENT IS REPRESENTED IN GIS (E.G., “LINE”, “POLYGON”, “POINT” OR “NONE”)

Table 10. Element Assignment Field Descriptions

FIELD NAME	DESCRIPTION
ELEMENTASSIGNMENTUID	SEQUENTIAL COUNT FOR EACH ELEMENT-PROJECT ASSIGNMENT PAIR; PRIMARY KEY OF ELEMENTASSIGNMENT
ELEMENTUID	LINK TO THE PRIMARY KEY IN THE ELEMENTDEFINITION TABLE
PROJECTUID	LINK TO THE PRIMARY KEY IN THE PROJECTMETADATA TABLE; EACH ELEMENTUID MAY BE LINKED TO MULTIPLE PROJECTUIDS
ACTIVEASSIGNMENT	BOOLEAN VALUE INDICATING IF THE ELEMENT SHOULD BE COSTED AS PART OF THE PROJECT TO WHICH IT IS ASSIGNED

Table 11. Version Field Descriptions

FIELD NAME	DESCRIPTION
VERSIONUID	SEQUENTIAL COUNT THAT REPRESENTS A UNIQUE VERSION OF AN ELEMENT; PRIMARY KEY OF VERSION AND ALL ELEMENT TYPE ATTRIBUTE TABLES.
VERSION	SEQUENTIAL COUNT STARTING AT 1 AND INCREASING EACH TIME AN ELEMENT'S ATTRIBUTES ARE UPDATED
NOTE	FIELD TO THE DOCUMENT THE CHANGES ASSOCIATED WITH A NEW VERSION OF AN ELEMENT
DATE	DATE OF MOST THE RECENT EDIT
EDITOR	USER RESPONSIBLE FOR MOST RECENT EDIT
ELEMENTUID	LINK TO THE PRIMARY KEY IN THE ELEMENTDEFINITION TABLE
CURRENTVERSION	BOOLEAN VALUE INDICATING IF THE VERSIONUID IS THE MOST RECENT VERSION; ONLY CURRENT VERSIONS ARE COSTED IN THE PCT

3.2 GENERAL LOOKUP TABLES

Several tables are required to facilitate intermediate calculations in the PCT as well as to provide additional information to other modeling teams and to any report generation software. Table 12 through Table 19 summarize tables corresponding to application of unit costs and cost percentages, while Table 20 through Table 23 link to Attribute and Component tables to describe general information not provided elsewhere in the PDD.

Table 12. Item Field Descriptions

FIELD	DESCRIPTION
ITEMUID	SEQUENTIAL COUNT FOR EACH ENTRY IN THE TABLE; PRIMARY KEY OF ITEM.
ITEM	NAME OR SHORT DESCRIPTION OF THE BID ITEM
UNITCOST	PRICE PER UNIT OF THE ITEM
ITEMUNIT	UNIT OF MEASUREMENT (E.G., EACH, MILE, ACRE)
TYPE	CATEGORY DESCRIBING THE UNIT OF MEASUREMENT (E.G., LENGTH, AREA, PER, VOLUME, WEIGHT, TIME, RATE)
YEAR	YEAR THE UNITCOST ORIGINATED; USED TO ADJUST FOR INFLATION.
SOURCE	SOURCE DOCUMENTATION OF UNITCOST ESTIMATE
COSTCATEGORYUID	LINK TO THE PRIMARY KEY OF THE COSTCATEGORY TABLE; DEFINITION OF THE CATEGORY OF THE ITEM USED TO ESCALATE COSTS TO ADJUST FOR INFLATION.
CONFIDENCERANKING	CONFIDENCE RANK (1-5) ASSOCIATED WITH THE ASSUMED ACCURACY OF THE UNIT COST ESTIMATE (SEE APPENDIX A FOR MORE INFORMATION)

Table 13. Component Field Descriptions

FIELD	DESCRIPTION
COMPONENTUID	SEQUENTIAL COUNT FOR EACH ENTRY IN THE TABLE; PRIMARY KEY OF COMPONENT
COMPONENTCODE	SHORTHAND CODE USED AS INPUT IN ATTRIBUTE TABLES (E.G., DI025K)
COMPONENTDESCRIPTION	DESCRIPTION OF THE COMPONENT (E.G., DIVERSION INTAKE: 25 CFS)
COMPONENTUNIT	UNIT OF MEASUREMENT (E.G., EACH, LINEAR FEET, SQUARE YARDS)
ITEMUID	LINK TO THE PRIMARY KEY IN ITEM

Table 14. ConfidenceRanking Field Descriptions

FIELD	DESCRIPTION
RANKING	CONFIDENCE RANK (1-5) ASSOCIATED WITH THE ASSUMED ACCURACY OF THE UNIT COST ESTIMATE (SEE APPENDIX A FOR MORE INFORMATION)
DESCRIPTION	QUALITATIVE DESCRIPTION OF THE CERTAINTY OF THE CONFIDENCE RANK; EXCELLENT, POSITIVE, OKAY, FAIR, POOR
PERCENTAGE	PERCENT UNCERTAINTY APPLIED TO THE UNIT COST ESTIMATE
JUSTIFICATION	REASONING SUPPORTING ASSIGNED CONFIDENCE PERCENTAGE

The Conversions table (Table 15) is used to link the units of measurement of the components to the bid items.

Table 15. Conversions Field Description

FIELD	DESCRIPTION
CONVERSIONUID	SEQUENTIAL COUNT FOR EACH ENTRY IN THE TABLE
COMPONENTTUNIT	LINK TO COMPONENTUNIT IN THE COMPONENT TABLE
ITEMUNIT	LINK TO ITEMUNIT IN THE ITEM TABLE
CONVERSIONFACTOR	FACTOR USED TO CONVERT COMPONENT QUANTITY TO ITEM QUANTITIES

Table 16 and Table 17 contain price index information from the US Army Corps of Engineers Civil Works Construction Cost Index System (USACE 2019). These are used to adjust Unit Costs for inflation based on Year and Cost Category UID. See Appendix A for a description of the cost escalation process.

Table 16. CostCategory Field Descriptions

FIELD	DESCRIPTION
COSTCATEGORYUID	SEQUENTIAL COUNT FOR EACH ENTRY IN THE TABLE; PRIMARY KEY OF COSTCATEGORY.
COSTCATEGORY	DESCRIPTIVE NAME OF ONE EACH OF THE TWENTY COST INDEX CATEGORIES DEVELOPED BY THE CWCCIS

Table 17. CostIndex Field Descriptions

FIELD	DESCRIPTION
COSTINDEXUID	SEQUENTIAL COUNT FOR EACH ENTRY IN THE TABLE; PRIMARY KEY OF COSTINDEX.
COSTCATEGORYUID	LINK TO THE PRIMARY KEY OF THE COSTCATEGORY TABLE
YEAR	RELEVANT YEAR FOR EACH INDEX FOR EACH COSTCATEGORY
INDEX	COST INDEX VALUES FROM THE CWCCIS PER YEAR AND COSTCATEGORY

Certain costs are generally applied as a percentage of other costs (e.g., contingency is typically 20% of construction costs). These costs and their associated percentage values are contained in Table 18. Certain Projects may require cost percentages that differ from the default values, and these exceptions are assigned to specific Projects in the CostPercentageOverride Table (Table 19). See Appendix A for more detail regarding how cost percentages are applied.

Table 18. CostPercentage Field Descriptions

FIELD	DESCRIPTION
COSTPERCENTAGEUID	SEQUENTIAL COUNT FOR EACH ENTRY IN THE TABLE; PRIMARY KEY OF COSTPERCENTAGE.
COSTPERCENTAGECODE	AN ABBREVIATION USED TO IDENTIFY THE COSTPERCENTAGEPARAMETER IN THE PCT (E.G., SURVEY, CM)

FIELD	DESCRIPTION
COSTPERCENTAGEPARAMETER	DESCRIPTION OF THE COST PARAMETER BASED ON A PERCENTAGE OF OTHER COSTS (E.G., SURVEY, CONSTRUCTION MANAGEMENT, CONTINGENCY)
PERCENTAGE	PERCENTAGE (STORED AS A DECIMAL FRACTION OF 1) APPLIED IN THE PCT FOR EACH COSTPERCENTAGEPARAMETER
DESCRIPTION	DESCRIBES WHICH COST PARAMETERS THE PERCENTAGE IS APPLIED TO (E.G., CONSTRUCTIONCOST, COMPONENTCOST)

Table 19. CostPercentageOverride Field Descriptions

FIELD	DESCRIPTION
PROJECTUID	LINK TO PRIMARY KEY OF PROJECTMETADATA
PERCENTAGE	THE OVERRIDING PERCENTAGE USED IN THE PCT
COSTPERCENTAGECODE	AN ABBREVIATION USED TO IDENTIFY THE COSTPERCENTAGEPARAMETER IN THE PCT (E.G., CM, SURVEY, ETC.); FOREIGN KEY TO THE COSTPERCENTAGE TABLE

The following tables are general reference tables, used by model teams to link Components or Elements to other descriptive fields not included in the Attribute tables. These include Gates (Table 20), Diversion Features (Table 21), Types (Table 22) and Sediment Borrow Sources (Table 23).

Table 20. Gate Field Descriptions

FIELD	DESCRIPTION
GATEUID	SEQUENTIAL COUNT FOR EACH ENTRY IN THE TABLE; PRIMARY KEY OF GATE.
GATECODE	LINK TO THE PRIMARY KEY OF THE COMPONENT TABLE
GATELENGTH (FT)	GATE LENGTH OR WIDTH, VARYING BY GATE TYPE. THE WIDTH OF SWING AND ROLLER GATES IS BASED ON GIS DATA AND SET TO AN OPENING SIZE OF EITHER 30 OR 40 FEET TO ACCOMMODATE ROAD/RAILROAD TRAFFIC. SECTOR GATE LENGTHS RANGED FROM 30 TO 250 FEET, BARGE GATES RANGED FROM 30 TO 250 FEET, STOP LOG GATES RANGED FROM 20 TO 30 FEET, AND SWING GATES RANGED FROM 25 TO 40 FEET. THE WIDTH OF GATES IS DETERMINED BY THE ANTICIPATED TRAFFIC LOADS IN THE WATERWAY AND AUTHORIZED DIMENSIONS OF THE CHANNEL.

Table 21. DiversionFeature Field Descriptions

FIELD	DESCRIPTION
DISCHARGETHRESHOLD	CAPACITY OF THE DIVERSION INTAKE STRUCTURE, EXPRESSED IN CUBIC FEET PER SECOND
INTAKECOMPONENTCODE	LINK TO THE PRIMARY KEY OF THE COMPONENT TABLE
GATECOUNT	COUNT OF THE NUMBER OF GATES INCLUDED IN THE INTAKE STRUCTURE
GATETYPE	LINK TO THE PRIMARY KEY OF THE COMPONENT TABLE
GATEWIDTH	OVERALL OPENING WIDTH OF THE INTAKE STRUCTURE
GATEHEIGHT	OVERALL OPENING HEIGHT OF THE INTAKE STRUCTURE

Table 22. Types Field Descriptions

FIELD	DESCRIPTION
TYPEUID	SEQUENTIAL COUNT FOR EACH ENTRY IN THE TABLE; PRIMARY KEY OF TYPES.
TYPECODE	IDENTIFIER INDICATING ONE OF THE THIRTEEN ELEMENT TYPES (E.G., BS) OR ONE OF THE SEVEN PROJECT TYPES
TYPEDESCRIPTION	DESCRIPTION OF TYPE CODE (E.G., BANK STABILIZATION)

Table 23. BorrowSourceSedimentType Field Descriptions

FIELD	DESCRIPTION
BORROWSOURCE	DESIGNATED CODE (E.G., AAA, CCC) FOR EACH AVAILABLE BORROW SOURCE; PRIMARY KEY OF BORROWSOURCESEDIMENTTYPE
LOCATION	THE TYPE OF SEDIMENT (OFFSHORE, RIVER, OR INTERIOR) CONTAINED WITHIN A GIVEN BORROW SOURCE
SEDIMENTCODE	LINK TO THE PRIMARY KEY IN THE COMPONENT TABLE; EACH SEDIMENT TYPE AS A UNIQUE UNIT-COST FUNCTION FOR DREDGING BASED ON THE DISTANCE BETWEEN BORROW SOURCE AND THE SEDIMENT PLACEMENT LOCATION.
BORROWSOURCENAME	DESCRIPTIVE NAME OF THE BORROW SOURCE ASSOCIATED WITH A SPECIFIC BORROWSOURCE CODE
FILLVOLUME	VOLUME OF SEDIMENT AVAILABLE (IN CUBIC FEET) FOR MARSH CREATION ACTIVITIES, AFTER CONSIDERATION OF POTENTIAL LOSSES DURING DREDGING AND INITIAL SETTLEMENT
REPLENISHMENTRATE	VOLUME OF SEDIMENT REPLENISHED ANNUALLY VIA NATURAL DEPOSITION PROCESSES
REPLENISHMENTYEARS	NUMBER OF YEARS REQUIRED TO COMPLETELY REFILL THE BORROW SOURCE WITH SEDIMENT

3.3 ELEMENT ATTRIBUTE TABLES

The following sections present information about the principal attributes and corresponding assumptions for each Element Type that comprise projects proposed in the 2023 Coastal Master Plan. Appendix F: Project Definition provides additional project-level assumptions that become relevant when multiple Element types are combined within a Project Type.

The attribute tables contain all information required for the functions of the PCT. Inputs are versioned; however, outputs are not versioned since the database will always reflect a live view of the latest information. Versioning inputs will allow for the regeneration of past attributes versions, should they be required. This strategy will also assist in minimizing the size of the data stored online and the size of data pulled from the database by end users. PDD users will be notified via email when the database reflects a new version of inputs.

PROPOSED LEVEES (PL) AND IMPROVEMENTS TO EXISTING LEVEES (EL)

Table 24 lists attributes common for each EL and PL Element. Attributes designated with an asterisk (*) are provided in both the Attributes_EL and Attributes_PL tables for both the proposed and existing levee feature (respectively, if applicable) for the PCT to appropriately calculate required quantities of materials.

Table 24. Attributes_EL and Attributes_PL Field Descriptions

FIELD NAME	UNIT	DESCRIPTION
VERSIONUID	N/A	LINK TO THE PRIMARY KEY OF THE VERSION TABLE; PRIMARY KEY OF ATTRIBUTES_EL AND ATTRIBUTES_PL
CRESTELEVATION*	FT NAVD88	THE CREST ELEVATION(S) OF THE PROPOSED LEVEE AND OF THE EXISTING LEVEE, IF APPLICABLE
BASE ELEVATION	FT NAVD88	THE AVERAGE BASE ELEVATION/EXISTING GROUND ELEVATION
LENGTH	FT	THE LENGTH ALONG THE CENTERLINE OF THE ELEMENT
TOPSLOPEPROTECTED*	H:V	THE MAIN EMBANKMENT SLOPES OF AN EXISTING LEVEE PROPOSED FOR IMPROVEMENT
TOPSLOPEFLOOD*	H:V	
CRESTWIDTH*	FT	THE CREST WIDTH OF THE EXISTING LEVEE OR PROPOSED LEVEE

FIELD NAME	UNIT	DESCRIPTION
BERMSLOPE PROTECTED*	H:V	THE STABILITY BERM SLOPE OF THE PROTECTED SIDE OF A LEVEE AND THE WAVE BERM SLOPE ON THE FLOOD SIDE, IF BERMS ARE PRESENT IN THE PROPOSED OR EXISTING LEVEE
BERMSLOPEFLOOD*	H:V	
BOTTOMSLOPE PROTECTED*	H:V	THE TOE SLOPES OF THE PROTECTED AND FLOOD SIDE OF A LEVEE, IF BERMS ARE PRESENT IN THE PROPOSED OR EXISTING LEVEE
BOTTOMSLOPEFLOOD*		
BERMTOP ELEVATION*	FT	THE ELEVATION OF THE TOP OF A WAVE OR STABILITY BERM, IF BERMS ARE PRESENT IN THE PROPOSED OR EXISTING LEVEE
BERMBOTTOM ELEVATION*	FT	THE ELEVATION OF THE BOTTOM OF A WAVE OR STABILITY BERM, IF BERMS ARE PRESENT IN THE PROPOSED OR EXISTING LEVEE
INSPECTIONWIDTH PROTECTED	FT	THE WIDTH OF ANY PRESENT INSPECTION CORRIDOR ADJACENT TO THE PROTECTED OR FLOOD SIDE TOE OF A PROPOSED LEVEE
INSPECTIONWIDTH FLOOD		
ACCESSROAD WIDTH	FT	THE WIDTH OF HAUL ROAD REQUIRED FOR PROPOSED LEVEE CONSTRUCTION
LEVEECODE	N/A	A CODE REPRESENTING THE UNIT COST OF LEVEE MATERIAL. LINK TO THE PRIMARY KEY OF THE COMPONENT TABLE.
COVERINGCODE	N/A	A CODE REPRESENTING THE TYPE OF COVERING OVER THE SURFACE AREA OF THE LEVEE. LINK TO THE PRIMARY KEY OF THE COMPONENT TABLE.
BASEWIDTH	FT	THE CROSS-SECTIONAL WIDTH OF THE ENTIRE FEATURE (INCLUDING ACCESS ROADS AND INSPECTION CORRIDORS) FROM FLOOD SIDE TOE TO PROTECTED SIDE TOE.

PROPOSED FLOODWALLS (PW)

Table 25 lists attributes common for each PW Element.

Table 25. Attributes_PW Field Descriptions

FIELD NAME	UNIT	DESCRIPTION
VERSIONUID	N/A	LINK TO THE PRIMARY KEY OF THE VERSION TABLE; PRIMARY KEY OF ATTRIBUTES_PW.
BASE ELEVATION	FT NAVD88	THE BASE/EXISTING GROUND ELEVATION OF THE PROPOSED FLOODWALL
CRESTELEVATION	FT NAVD88	THE ELEVATION OF THE TOP OF THE FLOOD WALL STEM
LENGTH	FT	THE LENGTH ALONG THE CENTERLINE OF THE ELEMENT
WALLBASETHICKNESS	FT	THE BASE THICKNESS OF THE PROPOSED FLOODWALL
WALLBASEWIDTH	FT	THE WIDTH OF THE BASE OF THE PROPOSED FLOODWALL
WALLTHICKNESS	FT	THE STEM THICKNESS OF THE PROPOSED FLOODWALL
PILELENGTH	FT	THE ASSUMED LENGTH OF ALL STEEL H-PILES SUPPORTING THE PROPOSED FLOODWALL
PILEROWS	COUNT	THE NUMBER OF ASSUMED ROWS OF STEEL H-PILES REQUIRED TO SUPPORT THE FLOOD WALL BASE
PILESPACING	FT	THE CENTER-TO-CENTER SPACING OF THE STEEL H-PILES PILES REQUIRED TO SUPPORT THE FLOOD WALL BASE
SHEETPILELENGTH	FT	THE LENGTH OF THE STEEL SHEET PILES USED FOR THE SEEPAGE CUTOFF UNDER THE PROPOSED FLOODWALL.
INSPECITIONWIDTH PROTECTED	FT	THE WIDTH OF ANY PRESENT INSPECTION CORRIDOR ADJACENT TO THE PROTECTED SIDE TOE OF THE PROPOSED LEVEE
INSPECTIONWIDTH FLOOD	FT	THE WIDTH OF ANY PRESENT INSPECTION CORRIDOR ADJACENT TO THE FLOOD SIDE TOE OF THE PROPOSED LEVEE

FIELD NAME	UNIT	DESCRIPTION
ACCESSROAD WIDTH	FT	THE WIDTH OF HAUL ROAD REQUIRED FOR PROPOSED WALL CONSTRUCTION
BASEWIDTH	FT	THE CROSS-SECTIONAL WIDTH OF THE ENTIRE FEATURE (INCLUDING ACCESS ROADS AND INSPECTION CORRIDORS)

PROPOSED GATES (GA)

Table 26 lists attributes common for each GA Element.

Table 26. Attributes_GA Field Descriptions

FIELD	UNIT	DESCRIPTION
VERSIONUID	N/A	LINK TO THE PRIMARY KEY OF THE VERSION TABLE; PRIMARY KEY OF ATTRIBUTES_GA.
GATECODE	N/A	LINK TO THE PRIMARY KEY OF THE COMPONENT TABLE; A CODE REPRESENTING THE TYPE OF GATE.
GATECOUNT	COUNT	THE NUMBER OF INDIVIDUAL GATES WITHIN A GA ELEMENT
INVERTELEVATION	FT NAVD88	ELEVATION AT THE BOTTOM OF THE GATE
DESIGNELEVATION	FT NAVD88	ELEVATION AT THE TOP OF THE GATE

CHANNEL CREATION (CH)

Table 27 summarizes the attributes used to describe CH Elements.

Table 27. Attributes_CH Field Descriptions

FIELD	UNIT	DESCRIPTION
VERSIONUID	N/A	LINK TO THE PRIMARY KEY OF THE VERSION TABLE; PRIMARY KEY OF ATTRIBUTES_CH.

FIELD	UNIT	DESCRIPTION
BASEELEVATION	FT	THE EXISTING GROUND ELEVATION OF THE LAND TO BE EXCAVATED OR OF THE BANK IMMEDIATELY ADJACENT TO AN EXISTING CHANNEL
CHANNELCODE	N/A	AN INDICATION OF WHETHER THE CHANNEL IS AN INTAKE, CONVEYANCE, OR OUTFALL CHANNEL, AND WHETHER THE CHANNEL IS DREDGED OR EXCAVATED. LINK TO THE PRIMARY KEY OF THE COMPONENT TABLE.
INVERTELEVATION	FT NAVD88	THE BOTTOM ELEVATION OF A PROPOSED CHANNEL
LENGTH	FT	TOTAL LENGTH OF THE ELEMENT'S CENTERLINE
BOTTOMWIDTH	FT	TOTAL WIDTH OF THE BOTTOM OF THE PROPOSED CHANNEL
SLOPE	H:V	SLOPE OF THE PROPOSED TRAPEZOIDAL CHANNEL
SCOURPROTECTION CODE	N/A	LINK TO THE PRIMARY KEY OF THE COMPONENT TABLE; THE TYPE OF ARMORING USED TO PROTECT AGAINST EROSION.
SCOURPROTECTION THICKNESS	FT	IF RIPRAP IS PROVIDED AS SCOUR PROTECTION, A THICKNESS OF REQUIRED RIPRAP IS PROVIDED
GEOTEXTILECODE	N/A	LINK TO THE PRIMARY KEY OF THE COMPONENT TABLE; AN INDICATION OF WHETHER GEOTEXTILE IS ASSUMED TO LINE THE CHANNEL BOTTOM.
EXISTINGINVERT ELEVATION	FT NAVD88	ELEVATION AT THE BOTTOM OF THE EXISTING CHANNEL, IF APPLICABLE
EXISTINGTOPWIDTH	FT	TOTAL WIDTH OF THE TOP OF THE EXISTING CHANNEL, IF APPLICABLE
TOPWIDTH	FT	TOTAL WIDTH OF THE TOP OF A CHANNEL AT EXISTING GROUND ELEVATION

MARSH CREATION (MC) AND BORROW OPTIONS

Table 28 and Table 29 summarize attributes used to describe MC Elements. As described in Figure 5, the PCT pulls data from the Attributes_MC and BorrowOptions tables in the PCT schema, along with the mc table in the ICM schema, to produce costs that vary by implementation period, scenario, and borrow source. Data listed in the BorrowOptions table (Table 29) are determined at the Cell level before being aggregated within an Element.

Table 28. Attributes_MC Field Descriptions

FIELD	UNIT	DESCRIPTION
VERSIONUID	N/A	LINK TO THE PRIMARY KEY OF THE VERSION TABLE; PRIMARY KEY OF ATTRIBUTES_MC.
DIKELENGTH	FT	TOTAL PERIMETER OF ALL MARSH CELLS WITHIN AN ELEMENT
MARSHVEGETATION CODE	N/A	LINK TO THE PRIMARY KEY OF THE COMPONENT TABLE; AN INDICATION OF THE APPROPRIATE STARTER VEGETATION POST-CONSTRUCTION.
PREFERREDBORROW SOURCE	N/A	LINK TO THE PRIMARY KEY OF THE BORROWSOURCESEDIMENTTYPE TABLE
CELLCOUNT	COUNT	THE NUMBER OF CELLS WITHIN A SINGLE MC ELEMENT
DEEPWATERFLAG	N/A	INDICATION THAT THE MC ELEMENT SHOULD BE FILLED WITH SEDIMENT EVEN WHEN THE ELEVATION WITHIN THE FOOTPRINT WAS LESS THAN 2.5 FEET BELOW MSL

Table 29. BorrowOptions Field Descriptions

FIELD	UNIT	DESCRIPTION
BORROWOPTIONID	N/A	PRIMARY KEY OF BORROWOPTIONS
ELEMENTUID	N/A	LINK TO THE PRIMARY KEY OF THE ELEMENTDEFINITION TABLE
DREDGESUBLINE PRELAY	FT	THE LENGTH OF DREDGE PIPELINE REQUIRED TO BE PLACED UNDER WATER BEFORE DREDGING COULD BEGIN

FIELD	UNIT	DESCRIPTION
DREDGESHORELINE PRELAY	FT	THE LENGTH OF DREDGE PIPELINE REQUIRED TO BE PLACED ON LAND BEFORE DREDGING COULD BEGIN
DREDGESHORELINE PICKUP	FT	THE LENGTH OF DREDGE PIPELINE REQUIRED TO BE PICKED UP AFTER DREDGING IS FINISHED
BORROWSOURCE	N/A	LINK TO THE PRIMARY KEY OF THE BORROWSOURCESEDIMENTTYPE TABLE; THE LOCATION WHERE MATERIAL IS EXCAVATED FROM TO BUILD THE ELEMENT.
FILLTOBORROW LENGTH	FT	THE AVERAGE DISTANCE BETWEEN A BORROW SOURCE AND THE CELLS WITHIN EACH ELEMENT, USED TO DETERMINE THE UNIT COST PER CUBIC YARD OF SEDIMENT

GAP CLOSURES (CL)

Table 30 summarizes attributes used to describe CL Elements.

Table 30. Attributes_CL Field Descriptions

FIELD	UNIT	DESCRIPTION
VERSIONUID	N/A	LINK TO THE PRIMARY KEY OF THE VERSION TABLE; PRIMARY KEY OF ATTRIBUTES_CL.
BASEELEVATION	FT NAVD88	THE BASE ELEVATION/EXISTING GROUND ELEVATION
CRESTELEVATION	FT NAVD88	TOP OF THE SHEET PILE WALL ELEVATION OF THE ELEMENT
LENGTH	FT	TOTAL BANK-TO-BANK LENGTH OF THE ELEMENT'S CENTERLINE
CLOSUREOPEN	N/A	BOOLEAN VALUE TO INDICATE IF THERE IS AN OPENING FOR SMALL CRAFT NAVIGATION

RIDGE RESTORATION (RR)

Table 31 summarizes attributes used to describe RR Elements.

Table 31. Attributes_RR Field Descriptions

FIELD	UNIT	DESCRIPTION
VERSIONUID	N/A	LINK TO THE PRIMARY KEY OF THE VERSION TABLE; PRIMARY KEY OF ATTRIBUTES_PW.
BASEELEVATION	FT NAVD88	THE EXISTING GROUND ELEVATION
CRESTELEVATION	FT NAVD88	TOP OF CROWN ELEVATION OF THE ELEMENT
CRESTWIDTH	FT	TOTAL WIDTH AT TOP OF ELEMENT PERPENDICULAR TO THE CENTERLINE
LENGTH	FT	TOTAL LENGTH OF THE ELEMENT'S CENTERLINE
SLOPE	H:V	THE SLOPE OF THE FILL EXPRESSED AS THE RATIO OF HORIZONTAL DISTANCE TO VERTICAL DISTANCE ON FLOOD SIDE OF PROJECT
CONSTRUCTION CODE	N/A	LINK TO THE PRIMARY KEY OF THE COMPONENT TABLE; THE TYPE OF CONSTRUCTION USED TO BUILD THE RIDGE.
ACCESSEXISTING ELEVATION	FT NAVD88	THE AVERAGE EXISTING ELEVATION ALONG THE ACCESS CHANNEL ALIGNMENT
ACCESSLENGTH	FT	THE TOTAL LENGTH OF ACCESS CHANNELS CONNECTING THE PROJECT TO THE NEAREST NAVIGABLE WATERS FOR BARGE-BASED CONSTRUCTION EQUIPMENT ACCESS
BASEWIDTH	FT	TOTAL WIDTH AT BASE OF ELEMENT PERPENDICULAR TO THE CENTERLINE

SHORELINE PROTECTION (SP)

Table 32 summarizes attributes used to describe SP Elements.

Table 32. Attributes_SP Field Descriptions

FIELD	UNIT	DESCRIPTION
VERSIONUID	N/A	LINK TO THE PRIMARY KEY OF THE VERSION TABLE; PRIMARY KEY OF ATTRIBUTES_SP.
BASEELEVATION	FT NAVD88	THE EXISTING GROUND ELEVATION
CRESTELEVATION	FT NAVD88	TOP OF CROWN ELEVATION OF THE ELEMENT
CRESTWIDTH	FT	TOTAL WIDTH AT TOP OF ELEMENT PERPENDICULAR TO THE CENTERLINE
LENGTH	FT	TOTAL LENGTH OF THE ELEMENT'S CENTERLINE.
SLOPE	H:V	THE SLOPE OF THE ROCK FEATURE EXPRESSED AS THE RATIO OF HORIZONTAL DISTANCE TO VERTICAL DISTANCE ON FLOOD SIDE OF PROJECT
ACCESSEXISTING ELEVATION	FT NAVD88	THE AVERAGE EXISTING ELEVATION ALONG THE ACCESS CHANNEL ALIGNMENT
ACCESSLENGTH	FT	THE TOTAL LENGTH OF ACCESS CHANNELS CONNECTING THE PROJECT TO THE NEAREST NAVIGABLE WATERS FOR BARGE-BASED CONSTRUCTION EQUIPMENT ACCESS
FLOTATIONEXISTING ELEVATION	FT NAVD88	THE AVERAGE EXISTING ELEVATION ALONG THE FLOTATION CHANNEL ALIGNMENT
FLOTATIONLENGTH	FT	THE TOTAL LENGTH OF FLOTATION CHANNELS REQUIRED TO CONSTRUCT THE FEATURE, RUNNING PARALLEL TO THE ELEMENT TO ALLOW FOR THE PLACEMENT OF STONE FROM BARGES
PIPECROSSINGS	COUNT	NUMBER OF INTERSECTIONS BETWEEN ELEMENT AND EXISTING OIL AND GAS LINES CROSSING THE PROPOSED FEATURE ALIGNMENT

FIELD	UNIT	DESCRIPTION
RIPRAPCODE	N/A	LINK TO THE PRIMARY KEY OF THE COMPONENT TABLE; DENOTES WHETHER LARGE OR SMALL RIPRAP COST IS TO BE USED TO BUILD FEATURE.
BASEWIDTH	FT	TOTAL WIDTH AT BASE OF ELEMENT PERPENDICULAR TO THE CENTERLINE
EFFECTIVELENGTH	FT	TOTAL LENGTH MINUS ALL THE REQUIRED OPENINGS FOR FISH GAPS AND PIPELINES CROSSING OPENINGS

BANK STABILIZATION (BS)

Table 33 summarizes attributes used to describe BS Elements.

Table 33. Attributes_BS Field Descriptions

FIELD	UNIT	DESCRIPTION
VERSIONUID	N/A	LINK TO THE PRIMARY KEY OF THE VERSION TABLE; PRIMARY KEY OF ATTRIBUTES_BS.
BASEELEVATION	FT NAVD88	THE EXISTING GROUND ELEVATION
CRESTELEVATION	FT NAVD88	TOP OF CROWN ELEVATION OF THE ELEMENT
CRESTWIDTH	FT	TOTAL WIDTH AT TOP OF ELEMENT PERPENDICULAR TO THE CENTERLINE
LENGTH	FT	TOTAL LENGTH OF THE ELEMENT'S CENTERLINE
SLOPEFLOOD	H:V	THE SLOPE OF THE FILL EXPRESSED AS THE RATIO OF HORIZONTAL DISTANCE TO VERTICAL DISTANCE ON FLOOD SIDE OF PROJECT
SLOPEPROTECTED	H:V	THE SLOPE OF THE FILL EXPRESSED AS THE RATIO OF HORIZONTAL DISTANCETO VERTICAL DISTANCE ON PROTECTED SIDE OF PROJECT

FIELD	UNIT	DESCRIPTION
ACCESSEXISTING ELEVATION	FT NAVD88	THE AVERAGE EXISTING ELEVATION ALONG THE ACCESS CHANNEL ALIGNMENT
ACCESSLENGTH	FT	THE TOTAL LENGTH OF ACCESS CHANNELS CONNECTING THE PROJECT TO THE NEAREST NAVIGABLE WATERS FOR BARGE-BASED CONSTRUCTION EQUIPMENT ACCESS
ARMORCODE	N/A	LINK TO THE PRIMARY KEY OF THE COMPONENT TABLE; THE TYPE OF ARMORING USED TO PROTECT AGAINST EROSION.
BASEWIDTH	FT	TOTAL WIDTH AT BASE OF ELEMENT PERPENDICULAR TO THE CENTERLINE
BORROWVOLUME	CF	TOTAL DREDGE VOLUME REQUIRED FOR PROJECT

OYSTER BARRIER REEF (OR)

Table 34 summarizes attributes used to describe OR Elements.

Table 34. Attributes_OR Field Descriptions

FIELD	UNIT	DESCRIPTION
VERSIONUID	N/A	LINK TO THE PRIMARY KEY OF THE VERSION TABLE; PRIMARY KEY OF ATTRIBUTES_OR.
CRESTELEVATION	FT NAVD88	TOP OF CROWN ELEVATION OF THE ELEMENT
BASEWIDTH	FT	TOTAL WIDTH AT BASE OF ELEMENT PERPENDICULAR TO THE CENTERLINE
LENGTH	FT	TOTAL LENGTH OF THE ELEMENT'S CENTERLINE
ACCESSEXISTING ELEVATION	FT NAVD88	THE AVERAGE EXISTING ELEVATION ALONG THE ACCESS CHANNEL ALIGNMENT

FIELD	UNIT	DESCRIPTION
ACCESSLENGTH	FT	THE TOTAL LENGTH OF ACCESS CHANNELS CONNECTING THE PROJECT TO THE NEAREST NAVIGABLE WATERS FOR BARGE-BASED CONSTRUCTION EQUIPMENT ACCESS
FLOTATIONEXISTING ELEVATION	FT NAVD88	THE AVERAGE EXISTING ELEVATION ALONG THE FLOTATION CHANNEL ALIGNMENT
FLOTATIONLENGTH	FT	THE TOTAL LENGTH OF FLOTATION CHANNELS REQUIRED TO CONSTRUCT THE FEATURE, RUNNING PARALLEL TO THE ELEMENT TO ALLOW FOR THE PLACEMENT OF STONE FROM BARGES.
PIPECROSSINGS	COUNT	NUMBER OF INTERSECTIONS BETWEEN ELEMENT AND EXISTING OIL AND GAS LINES CROSSING THE PROPOSED FEATURE ALIGNMENT.
EFFECTIVELENGTH	FT	TOTAL LENGTH MINUS ALL THE REQUIRED OPENINGS FOR FISH GAPS AND PIPELINES CROSSING OPENINGS

MISCELLANEOUS (XX AND LS)

Table 35 and

Table 36 summarize the fields for XX and LS Elements.

Table 35. Attributes_XX Field Descriptions

FIELD	DESCRIPTION
VERSIONUID	LINK TO THE PRIMARY KEY OF THE VERSION TABLE; PRIMARY KEY OF ATTRIBUTES_XX.
COMPONENTCODE	LINK TO THE PRIMARY KEY OF THE COMPONENT TABLE; DEFINITION OF MISCELLANEOUS FEATURE.
QUANTITY (VARYING UNITS)	THE QUANTITY OF THE MISCELLANEOUS FEATURE, IN UNITS CORRESPONDING TO THE COMPONENTCODE

Table 36. Attributes_LS Field Descriptions

FIELD	DESCRIPTION
VERSIONUID	LINK TO THE PRIMARY KEY OF THE VERSION TABLE; PRIMARY KEY OF ATTRIBUTES_LS.
QUANTITY ($)	LUMP SUM DOLLAR AMOUNT OF THE MISCELLANEOUS FEATURE
SOURCE	A REFERENCE TO WHERE THE COST ORIGINATED; MAY OR MAY NOT BE THE SAME AS THE SOURCE FROM PROJECTMETADATA.
COSTCATEGORYID	LINK TO THE PRIMARY KEY OF THE COSTCATEGORY TABLE; DEFINITION OF THE CATEGORY OF FEATURE USED TO ESCALATE COSTS TO ADJUST FOR INFLATION.
COSTYEAR	USED WITH COSTCATEGORYID TO LINK TO THE COSTINDEX TABLE; YEAR THE COST ORIGINATED, USED TO ESCALATE VALUES TO ADJUST FOR INFLATION.

3.4 PCT OUTPUT TABLES

PCT output tables are used to store the cost estimation results from the PCT, calculated for each Component comprising each Element in the *ElementComponents* table (Table 37), for each Element in the *ElementCosts* table (Table 38), and for each MC Element-borrow source combination in the *BorrowOptionsCosts* table (Table 39). Costs are produced for three unique Cost Scenarios to determine a likely range of values, and ranges may vary by summarize environmental scenario and Implementation Period. All costs are reported in 2023 USD, and are reported either in direct dollar values or, in the *BorrowOptionsCosts* table, in dollars per cubic foot of sediment required to build an MC Element. Additional information regarding cost calculation assumptions can be found in Appendix F: Project Definition.

Table 37. ElementComponents Field Descriptions

FIELD	DESCRIPTION
VERSIONUID	LINK TO THE PRIMARY KEY OF THE VERSION TABLE
COMPONENTCODE	LINK TO THE PRIMARY KEY OF THE COMPONENT TABLE
QUANTITY	CALCULATED QUANTITY OF THE COMPONENT
COST	CALCULATED COST OF EACH COMPONENT
COSTSCENARIO	INTEGER VALUE DENOTING IF THE COST FIELD REPRESENTS THE LOW (1), MOST LIKELY (2), OR HIGH (3) COST ESTIMATION, BASED ON THE ITEM'S CONFIDENCE RANKING
SCENARIO	INTEGER VALUE DENOTING THE ENVIRONMENTAL SCENARIO CORRESPONDING TO THE INPUTTED MC SEDIMENT VOLUME; 0 FOR NON-MC ELEMENTS
IMPLEMENTATIONPERIOD	INTEGER VALUE DENOTING THE IMPLEMENTATION PERIOD CORRESPONDING TO THE INPUTTED MC SEDIMENT VOLUME; 0 FOR NON-MC ELEMENTS

Table 38. ElementCosts Field Descriptions

FIELD	DESCRIPTION
VERSIONUID	LINK TO THE PRIMARY KEY OF THE VERSION TABLE; PRIMARY KEY OF ELEMENTCOSTS.
SURVEYCOST	COST TO PERFORM REQUIRED CONSTRUCTION SURVEYS
MOBILIZATIONCOST	COSTS TO MOBILIZE AND DEMOBILIZE EQUIPMENT TO THE PROJECT SITE
CONSTRUCTIONCOST	COSTS ASSOCIATED WITH ALL ASPECTS OF CONSTRUCTION PHASE, EQUAL TO THE SUM OF ALL COMPONENT COSTS FOR A GIVEN ELEMENT, PLUS SURVEYCOST AND MOBILIZATIONCOST

FIELD	DESCRIPTION
CONTINGENCYCOST	ALLOWANCE FOR COSTS EXPECTED TO BE INCURRED, BUT NOT SPECIFICALLY IDENTIFIED OR FOR WHICH NO QUANTITIES HAVE BEEN ESTIMATED
CMCOST	COSTS FOR PROFESSIONAL SERVICES DURING CONSTRUCTION TO MONITOR CONTRACTOR COMPLIANCE WITH CONTRACT REQUIREMENTS, GENERAL SCHEDULES, AND PROJECT BUDGETS
OMCOST	COSTS ASSOCIATED WITH ALL ASPECTS OF THE ANNUAL O&M ASSOCIATED WITH A PROJECT
PEDCOST	COSTS ASSOCIATED WITH ALL ASPECTS OF THE PLANNING/ ENGINEERING AND DESIGN PHASE, INCLUDING ENGINEERING, SURVEYING, HYDRAULIC MODELING, GEOTECHNICAL WORK, WETLAND DELINEATIONS, LAND RIGHTS, AND CULTURAL RESOURCES INVESTIGATION
COSTSCENARIO	INTEGER VALUE DENOTING IF THE COST FIELD REPRESENTS THE LOW (1), MOST LIKELY (2), OR HIGH (3) COST ESTIMATION, BASED ON THE ITEM'S CONFIDENCE RANKING
SCENARIO	INTEGER VALUE DENOTING THE ENVIRONMENTAL SCENARIO CORRESPONDING TO THE INPUTTED MC SEDIMENT VOLUME; 0 FOR NON-MC ELEMENTS
IMPLEMENTATIONPERIOD	INTEGER VALUE DENOTING THE IMPLEMENTATION PERIOD CORRESPONDING TO THE INPUTTED MC SEDIMENT VOLUME; 0 FOR NON-MC ELEMENTS

Table 39. BorrowOptionCosts Field Descriptions

FIELD	DESCRIPTION
VERSIONUID	LINK TO THE PRIMARY KEY OF THE VERSION TABLE
BORROWOPTIONID	LINK TO THE PRIMARY KEY OF THE BORROWOPTIONS TABLE

FIELD	DESCRIPTION
SURVEYCOSTPERCF	COST TO PERFORM REQUIRED CONSTRUCTION SURVEYS; EXPRESSED IN DOLLARS PER CUBIC FOOT OF SEDIMENT REQUIRED TO BUILD THE MC ELEMENT
MOBILIZATIONCOST	COSTS TO MOBILIZE AND DEMOBILIZE EQUIPMENT TO THE PROJECT SITE
COMPONENTCOSTPERCF	SUM OF ALL COMPONENT COSTS FOR A GIVEN ELEMENT; EXPRESSED IN DOLLARS PER CUBIC FOOT OF SEDIMENT REQUIRED TO BUILD THE MC ELEMENT
CONTINGENCYCOSTPERCF	ALLOWANCE FOR COSTS EXPECTED TO BE INCURRED, BUT NOT SPECIFICALLY IDENTIFIED OR FOR WHICH NO QUANTITIES HAVE BEEN ESTIMATED; EXPRESSED IN DOLLARS PER CUBIC FOOT OF SEDIMENT REQUIRED TO BUILD THE MC ELEMENT
CMCOSTPERCF	COSTS FOR PROFESSIONAL SERVICES DURING CONSTRUCTION TO MONITOR CONTRACTOR COMPLIANCE WITH CONTRACT REQUIREMENTS, GENERAL SCHEDULES, AND PROJECT BUDGETS; EXPRESSED IN DOLLARS PER CUBIC FOOT OF SEDIMENT REQUIRED TO BUILD THE MC ELEMENT
OMCOSTPERCF	COSTS ASSOCIATED WITH ALL ASPECTS OF THE ANNUAL O&M ASSOCIATED WITH A PROJECT; EXPRESSED IN DOLLARS PER CUBIC FOOT OF SEDIMENT REQUIRED TO BUILD THE MC ELEMENT
PEDCOSTPERCF	COSTS ASSOCIATED WITH ALL ASPECTS OF THE PLANNING/ ENGINEERING AND DESIGN PHASE, INCLUDING ENGINEERING, SURVEYING, HYDRAULIC MODELING, GEOTECHNICAL WORK, WETLAND DELINEATIONS, LAND RIGHTS, AND CULTURAL RESOURCES INVESTIGATION; EXPRESSED IN DOLLARS PER CUBIC FOOT OF SEDIMENT REQUIRED TO BUILD THE MC ELEMENT
MOBILIZATIONPERCENTAGE	PROPORTION OF THE CONSTRUCTIONCOST ATTRIBUTABLE TO MOBILIZATION AND DEMOBILIZATION ACTIVITIES
COSTSCENARIO	INTEGER VALUE DENOTING IF THE COST FIELD REPRESENTS THE LOW (1), MOST LIKELY (2), OR HIGH (3) COST ESTIMATION, BASED ON THE ITEM'S CONFIDENCE RANKING
SCENARIO	INTEGER VALUE DENOTING THE ENVIRONMENTAL SCENARIO CORRESPONDING TO THE INPUTTED MC SEDIMENT VOLUME; 0 FOR NON-MC ELEMENTS

FIELD	DESCRIPTION
IMPLEMENTATIONPERIOD	INTEGER VALUE DENOTING THE IMPLEMENTATION PERIOD CORRESPONDING TO THE INPUTTED MC SEDIMENT VOLUME; 0 FOR NON-MC ELEMENTS

4.0 CLARA SCHEMA

4.1 CLARA TABLES

Table 40. NMS Field Descriptions

FIELD	DESCRIPTION
MODELGROUP	INTEGER IDENTIFIER FOR TRACKING FWOA, ALTERNATIVE, DRAFT MASTER PLAN, AND FINAL MASTER PLAN MODEL RUNS; DEFINED IN THE *MODELDEFINITION* TABLE IN THE PCT SCHEMA
SCENARIO	INTEGER VALUE DENOTING THE ENVIRONMENTAL SCENARIO CORRESPONDING TO THE NMS VALUE OUTPUTTED BY CLARA
FRAGILITYSCENARIO	INTEGER VALUE DENOTING THE FRAGILITY SCENARIO CORRESPONDING TO THE NMS VALUE OUTPUTTED BY CLARA
YEAR	MODEL YEAR
COMMUNITY	CODE CORRESPONDING TO THE EVALUATED COMMUNITY
ASSETCLASS	CLASSIFICATION OF STRUCTURE (E.G., INDUSTRIAL, RESIDENTIAL)
NMS	NUMBER OF MITIGATED STRUCTURES
DATE	DATE RESULTS WERE PRODUCED

5.0 ICM SCHEMA

Tables in the ICM schema fall into two general categories, shown below and discussed in greater detail in Section 0. Table 41 provides a summary of all database tables in the ICM schema. Units for all data in the ICM schema are metric, and may be converted to imperial units for use in other models.

1. **General Lookup Tables**, including project-level definition of operation regimes and ecoregions
2. **Model outputs** required for running either the PCT or the Planning Tool

Table 41. Tables in the ICM Schema

TABLE NAME	DESCRIPTION
OPERATION_REGIME	DEFINITION OF OPERATIONAL STRATEGIES AND TRIGGERS FOR DIVERSION STRUCTURES
ECOREGION_DEFINITION	USED TO ASSIGN PROJECTS TO ECOREGIONS USED TO GROUP ICM OUTPUTS
MC	MC AREAS AND VOLUMES FOR EACH IMPLEMENTATION PERIOD AND SCENARIO; USED IN THE PCT
HSI	HABITAT SUITABILITY INDICES FOR EACH MODEL GROUP, ECOREGION, AND ENVIRONMENTAL SCENARIO
LANDVEG	VEGETATION COVER FOR EACH MODEL GROUP, ECOREGION, AND ENVIRONMENTAL SCENARIO

5.1 ICM TABLES

The operation_regime (Table 42) and ecoregion_definition (Table 43) tables each represent general look-up tables used to link project-level attributes to ICM inputs or outputs. The mc (Table 44) table records marsh areas and volumes estimated by the ICM by determining the amount of sediment required to build a marsh to a certain elevation, given a particular implementation period and environmental scenario. The HSI and landveg tables (Table 45 and Table 46) record ICM model outputs at the model group and ecoregion level for use in prioritizing projects within the Planning Tool.

More details on ICM modeling and attributes can be found in the Appendix D: Overview of Improvements to Landscape Modeling (ICM) to the 2023 Coastal Master Plan.

Table 42. operation_regime Field Descriptions

FIELD	DESCRIPTION
PROJECTID	INTEGER IDENTIFIER FOR EACH ELEMENT, USED ACROSS MASTER PLAN MODELING TEAMS; DEFINED *PROJECTMETADATA* TABLE IN THE PCT SCHEMA
FLOWRATINGCURVE	TEXT DESCRIPTION OF OPERATION REGIME FLOW CURVES
LOWFLOWRULE	TEXT DESCRIPTION OF DIVERSION BASEFLOW
HIGHFLOWRULE	TEXT DESCRIPTION OF UPPER LIMITS TO DIVERSION FLOW
SCENARIO	INTEGER VALUE DENOTING THE ENVIRONMENTAL SCENARIO CORRESPONDING TO THE MARSH AREAS AND VOLUMES OUTPUTTED BY THE ICM
DATE	DATE RESULT WERE PRODUCED

Table 43. ecoregion_definition Field Descriptions

FIELD	DESCRIPTION
PROJECTID	INTEGER IDENTIFIER FOR EACH ELEMENT, USED ACROSS MASTER PLAN MODELING TEAMS; DEFINED IN THE *PROJECTMETADATA* TABLE IN THE PCT SCHEMA
ECOREGION	ECOREGION(S) TO WHICH THE ELEMENT IS ASSIGNED

Table 44. mc Field Descriptions

FIELD	DESCRIPTION
ELEMENTID	INTEGER IDENTIFIER FOR EACH ELEMENT, USED ACROSS MASTER PLAN MODELING TEAMS; DEFINED *ELEMENTDEFINITION* TABLE IN THE PCT SCHEMA
MARSHAREA_M2	THE TOTAL AREA OF MARSH BASED ON SURFACE FOOTPRINT OF FILLED ELEMENT AREAS
MARSHVOLUME_M3	THE TOTAL ESTIMATED VOLUME OF MARSH FILL MATERIAL REQUIRED TO CONSTRUCT THE ELEMENT USING ONE INITIAL LIFT BASED ON THE CONSTRUCTION GRADE ELEVATION
IMPLEMENTATIONPERIOD	INTEGER VALUE DENOTING THE IMPLEMENTATION PERIOD CORRESPONDING TO THE MARSH AREAS AND VOLUMES OUTPUTTED BY THE ICM

Table 45. HSI Field Descriptions

FIELD	DESCRIPTION
MODELGROUP	INTEGER IDENTIFIER FOR TRACKING FWOA, ALTERNATIVE, DRAFT MASTER PLAN, AND FINAL MASTER PLAN MODEL RUNS; DEFINED IN THE *MODELDEFINITION* TABLE IN THE PCT SCHEMA
SCENARIO	INTEGER VALUE DENOTING THE ENVIRONMENTAL SCENARIO CORRESPONDING TO THE HSI VALUE OUTPUTTED BY THE ICM
YEAR	MODEL YEAR
HABITATCODE	CODE DENOTING THE ORGANISM CORRESPONDING TO THE HSI VALUE OUTPUTTED BY THE ICM
ECOREGION	CODE DENOTING TO THE ECOREGION CORRESPONDING TO THE HSI VALUE OUTPUTTED BY THE ICM
HABITATSUITABILITY	OUTPUT HABITAT SUITABILITY INDEX (HSI)
DATA	DATE RESULT WERE PRODUCED

Table 46. landveg Field Descriptions

FIELD	DESCRIPTION
MODELGROUP	INTEGER IDENTIFIER FOR TRACKING FWOA, ALTERNATIVE, DRAFT MASTER PLAN, AND FINAL MASTER PLAN MODEL RUNS; DEFINED IN THE *MODELDEFINITION* TABLE IN THE PCT SCHEMA
SCENARIO	INTEGER VALUE DENOTING THE ENVIRONMENTAL SCENARIO CORRESPONDING TO THE VEGETATION AREA VALUE OUTPUTTED BY THE ICM
YEAR	MODEL YEAR
VEGETATIONCODE	CODE DENOTING THE LAND VEGETATION TYPE CORRESPONDING TO THE AREA VALUE OUTPUTTED BY THE ICM
ECOREGION	CODE DENOTING TO THE ECOREGION CORRESPONDING TO THE AREA VALUE OUTPUTTED BY THE ICM
AREA_M2	AREA OF THE CORRESPONDING LAND VEGETATION TYPE, IN SQUARE METERS
DATE	DATE RESULTS WERE PRODUCED

6.0 PDG STRUCTURE

The PDG and Mapping PDG contain geospatial data required to support project definition, PCT cost estimation, and communication of project details to the public. Feature classes within the PDG are listed in Table 47, and feature classes that are also present in the Mapping PDG are denoted with an asterisk (*). Each Element with a corresponding geospatial footprint contains one record in either the Points, Lines, or Polygons feature class in the PDG; however, if an Element is linked to multiple Projects in the ElementAssignment table in the PCT schema, multiple records for that Element exist in the corresponding feature class in the Mapping PDG. Additionally, feature classes in the PDG contain attributes at the Element level, while those in the Mapping PDG contain additional attributes at the Project level. Element-level attributes are common across the Points, Lines, Polygons, and Polygons_cells feature classes (Table 48), though the Polgyons_cells feature class contains additional fields detailed in Table 49. Default GIS fields (ObjectID, Shape, Shape_Length, and Shape_Area) are present in all feature classes but are not included in the tables below.

Attributes are linked to the PDD using LegacyElementNumber, as primary keys. The PDD remains the source of truth for attributes that are populated from the PDD, as they are only included as fields in PDG feature classes as references to facilitate mapping and GIS tool calculations. These attributes are populated with data from the PDD after updates are made to the PDD or PCT, as described in the *Project Costing Tool Technical Documentation* (Sprague 2021b). Conversely, some fields (noted in the tables below) are only defined in the PDG and are used solely to facilitate GIS tool calculations.

Table 47. PDG Structure

FEATURE CLASS	DESCRIPTION
POINTS*	MULTIPOINT FEATURES OF PROPOSED ELEMENTS, SUCH AS GATES OR PUMPS
LINES*	LINE FEATURES OF PROPOSED ELEMENTS, SUCH AS STONE ARMOR OF SHORELINE PROTECTION OR LEVEE ALIGNMENTS OF STRUCTURAL RISK REDUCTION
POLYGONS*	POLYGON FEATURES OF PROPOSED MC ELEMENTS
POLYGONS_CELLS	POLYGON FEATURES PROPOSED MC 2,000-ACRE CELLS

FEATURE CLASS	DESCRIPTION
ELEMENTPATH*	LINE FEATURES REPRESENTING THE PATHS DRAWN FROM BORROW SOURCES TO MC ELEMENTS, AS PRODUCED BY THE DREDGE MOBILIZATION TOOL, DESCRIBED IN THE PROJECT COSTING TOOL TECHNICAL DOCUMENTATION
ELEMENTASSIGNMENT	TABLE MIRRORING THE ELEMENTASSIGNMENT TABLE IN THE PDD, USED TO LINK ELEMENT-LEVEL GEOSPATIAL DATA IN THE POINTS, LINES, POLYGONS, POLYGONS_CELLS, AND ELEMENTPATH FEATURE CLASSES TO PROJECTS AS NECESSARY

Table 48. Field Descriptions for Element Feature Classes in the PDG

FIELD	DESCRIPTION
ELEMENTNUMBER	LEGACYELEMENTNUMBER ASSIGNED TO THE GEOSPATIAL FEATURE (E.G., 001.MC.01.01); USED AS THE PRIMARY KEY TO LINK THE FEATURE CLASS TO TABLES IN THE PDD
ELEMENTNAME	POPULATED FROM PROJECTMETADATA TABLE
ELEMENTTYPECODE	POPULATED FROM ELEMENTDEFINTION TABLE
COMPONENTDESCRIPTION	POPULATED FROM COMPONENT OR ELEMENTDEFINITION TABLE WHEN ELEMENT IS AN XX OR LS TYPE, RESPECTIVELY
REGION	POPULATED FROM ELEMENTDEFINTION TABLE
POINTCOUNT	COUNT OF INDIVIDUAL POINT FEATURES WITHIN A MULTIPOINT; ONLY PREVALENT IN POINTS FEATURE CLASS; NOT INCLUDED IN PDD

Table 49. Additional Field Descriptions for Polygons_Cells Feature Class

FIELD	DESCRIPTION
PROJECTNUMBER	POPULATED FROM PROJECTMETADATA, REPRESENTING THE LEGACYPROJECTNUMBER ASSOCIATED WITH THE PRIMARYPROJECTUID ASSIGNED TO THE ELEMENT

FIELD	DESCRIPTION
CELLID	THE ASSIGNED ELEMENT NUMBER PLUS CELL NUMBER (E.G., CELL .06 IN ELEMENT .02 OF PROJECT 001.MC.101 BECOMES “001.MC.101.02.06”); NOT INCLUDED IN THE PDD
GISGROUP	AGGREGATION OF CELLS USED TO DEFINE DREDGE MOBILIZATION PATHWAYS; OFTEN BUT NOT ALWAYS DESIGNATING THE SAME GROUPING AS ELEMENTS; NOT INCLUDED IN THE PDD.
PROJGISGROP	CONCATENATION OF PROJECTNUMBER AND GIS GROUP; TEMPORARY INTERMEDIATE FIELD USED BY THE DREDGE MOBILIZATION TOOL; NOT INCLUDED IN THE PDD.
CELLGISGROUP	CONCATENATION OF CELLID AND GIS GROUP; TEMPORARY INTERMEDIATE FIELD USED BY THE DREDGE MOBILIZATION TOOL; NOT INCLUDED IN THE PDD.

Table 50. Additional Field Descriptions for Element Feature Classes in the Mapping PDG

FIELD	DESCRIPTION
LEGACYPROJECTNUMBER	POPULATED FROM THE PROJECTMETADATA TABLE
DISPLAYID	
PROJECTID	
PROJECTNAME	
PROJECTTYPECODE	
ACTIVEPROJECT	
ACTIVEASSIGNMENT	POPULATED FROM THE ELEMENTASSIGNMENT TABLE

Table 51. ElementPath Field Descriptions

FIELD	DESCRIPTION
ELEMENTNUMBER	LEGACYELEMENTNUMBER ASSIGNED TO THE GEOSPATIAL FEATURE (E.G., 001.MC.01.01); USED AS THE PRIMARY KEY TO LINK THE FEATURE CLASS TO TABLES IN THE PDD
GISGROUP	AGGREGATION OF CELLS USED TO DEFINE DREDGE MOBILIZATION PATHWAYS; OFTEN BUT NOT ALWAYS DESIGNATING THE SAME GROUPING AS ELEMENTS; NOT INCLUDED IN THE PDD.
BORROWREGIONCODE	BROADER PROCESSING REGION ASSOCIATED WITH THE BORROW SOURCE, AS DESIGNATED BY THE DREDGE MOBILIZATION TOOL; NOT INCLUDED IN THE PDD.
BORROWSOURCE	BORROW SOURCE ASSOCIATED WITH THE PATH AS DESIGNATED BY THE DREDGE MOBILIZATION TOOL
DREDGEPATHTYPE	STRING INDICATING IF THE FEATURE REPRESENTS THE PATH FROM THE BORROW SOURCE TO THE GISGROUP OR FROM THE GISGROUP TO THE CELLS AS DESIGNATED BY THE DREDGE MOBILIZATION TOOL
ISPREFERREDBORROW	BOOLEAN VALUE DENOTING IF THE ELEMENTPATH CONNECTS THE MC ELEMENT TO THE PREFERREDBORROWSOURCE AS DESIGNATED BY THE DREDGE MOBILIZATION TOOL

7.0 REFERENCES

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