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GLWA
Great Lakes Water Authority

Submitted by:
AECOM
July 2022

Program Management Plan (PMP)
Chapter 00 - Overview

Capital Improvement Plan (CIP) Delivery Team

Great Lakes Water Authority

Capital Improvement Plan

Program Management Plan

Overview
Rev. 1.0

Prepared for

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Revision history

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Acronyms

AACE	Association for the Advancement of Cost Engineering International
AMLT	Asset Management Leadership Team
AMSO	Asset Management Strategic Organization
BU	Business Unit
CACO	Chief Administrative and Compliance Officer
CAR	Construction Accounting and Reporting
CC	Construction Contractor
CD	Change Directive
CEO	Chief Executive Officer
CIP	Capital Improvement Plan
CIPST	Capital Improvement Plan Satellite Team
CM	Construction Manager
CMAR	Construction Manager at Risk
CO	Change Order
COO	Chief Operating Officer
CP	Change Proposal
CPM	Critical Path Method
CPO	Chief Planning Officer
CR	Change Request
DB	Design-Build
DBB	Design-Bid-Build
DBC	Design-Build Contractor
DC	Design Consultant
DCB	Detailed Cost Breakdown
DIR	Daily Inspection Report
EOR	Engineer of Record
FO	Field Order
GC	General Contractor
GLWA	Great Lakes Water Authority
IBC	International Building Code
IT	Information Technology
KPI	Key Performance Indicator
LOTO	Lock-Out/Tag-Out
LPM	Lifecycle Project Manager
NCN	Non-Conformance Notice
NCR	Non-Conformance Report

NTP	Notice to Proceed
O&M	Operations and Maintenance
OPCC	Opinion of Probable Construction Cost
OR	Operations Representative
PAM	Program Assurances Manager
PCM	Program Controls Manager
PCML	Project Construction Management Lead
PCMT	Project Construction Management Team
PDB	Progressive DB
PDL	Project Design Lead
PDT	Project Design Team
PgM	Program Manager
PM	Project Manager
PMC	Program Management Consultant
PMIS	Program Management Information System
PMP	Program Management Plan
PMSP	Prerequisite to Mobilization Submittal Package
PO	Purchase Order
PPA	Progress Payment Application
PQM	Program Quality Manager
PWBS	Project Work Breakdown Structure
QA	Quality Assurance
QA/QC	Quality Assurance / Quality Control
QC	Quality Control
QMS	Quality Management System
RACI (chart)	Responsible, Accountable, Consulted, and Informed
RFI	Request for Information
RFP	Request for Proposal
SCADA	Supervisory Control and Data Acquisition
SH&E	Safety, Health, and Environmental
SLA	Service Level Agreement
SOP	Standard Operating Procedure
SOV	Schedule of Values
SOW	Scope of Work
TA	Task Adjustment
VE	Value Engineering
WRRF	Water Resource Recovery Facility

1 Introduction

1.1 Purpose and Application

This Great Lakes Water Authority (GLWA) Capital Improvement Plan (CIP) *Program Management Plan (PMP)* establishes the framework, business requirements, processes, and procedures for use by the CIP Delivery Team (defined in PMP Chapter 02 – Organization and Governance) in delivering the CIP. The PMP's purpose is to provide a method for delivering a consistent level of quality and predictable products, expectations, and outcomes across the CIP program and project delivery. The CIP Delivery Team's use of standard processes and procedures helps reduce delivery risks and provides a common delivery language, which helps build cohesive project teams and quality CIP projects.

The PMP and the CIP procedures contained in it are considered "living documents," and, in a continual improvement model, will be revised as required per a set process detailed later in this chapter. As described in Section 3 of this chapter, the PMP will include lessons learned and new practices for improving CIP project delivery. Also as detailed in Section 3 of this chapter and the associated Standard Operating Procedure (SOP), the CIP Director coordinates revisions, with updates approved by the CIP Satellite Team (CIPST). In the case of conflicts, deviations, revisions, or corrections to the PMP, GLWA's Asset Management Leadership Team (AMLT) will be the ultimate arbiter for resolution and direction of PMP content. This governance structure is further detailed in Chapter 02 – Organization and Governance of this PMP.

Each chapter of the PMP includes a list of CIP procedures that are related to that chapter. CIP procedures describe how selected business processes are executed. They include step-by-step workflow requirements, specific roles and responsibilities, and standard forms and templates.

The PMP is to be used in its entirety, as chapters are integrated and rely on cross referencing. All CIP Delivery Team personnel are expected to become familiar with PMP requirements and incorporate them into all CIP delivery services and work activities, as applicable, unless the PMP contradicts the contract requirements of a specific contract. Questions and clarifications regarding the PMP and procedures should be addressed to the CIP Director.

Key management principles include:

- Consistent application of the PMP leads to quality outcomes and increased likelihood of CIP success.
- All members of the CIP Delivery Team, as defined in Chapter 02 – Organization and Governance, are required to use the PMP in executing CIP work activities.
- Personnel engaged in CIP activities are to be completely versed in the PMP's content.
- PMP use and application are to be incorporated into consultant, vendor, and construction contract requirements, as appropriate.
- The PMP includes CIP procedures that adhere to the specific requirements for executing the business processes defined by the PMP.
- Application of the PMP and CIP procedures is intended to foster an environment of collaboration and continuous open communication between all CIP Delivery Team members.

1.2 CIP Program Management Plan

Table 1-1 provides a list of the chapters contained in the PMP. The PMP is formatted as separate chapters to provide flexibility to develop, approve, revise, and to add chapters over time without having to reissue the entire PMP.

Table 1-1: GLWA CIP PMP Chapters

Chapter	TITLE
00	PMP Overview
01	CIP Program Description
02	Organization and Governance
03	Communications Management
04	Document Management
05	Schedule and Budget Management
06	Change Management
07	Quality Management
08	Risk Management
09	Engineering and Design Management
10	Procurement and Contracts Management
11	Permitting and Regulatory Management
12	Environmental Health and Safety
13	Public Information and Stakeholder Management
14	Construction Management
15	CIP Planning and Development

1.3 Intended Audience

This PMP is intended to be used by the following CIP Delivery Team participants:

- GLWA CIP Delivery Team Critical Partners
- CIP Core Delivery Team Members (Water, Wastewater, and CIP groups)
- Project Design Teams (PDTs), if internal
- Project Construction Management Teams (PCMTs), if internal

The PMP processes and procedures should also be incorporated into consultant, vendor, and construction contract requirements, as appropriate.

Throughout the PMP, the term PDT is used for any engineering team or firm providing design services from the study phase to preliminary engineering and through final design. Therefore, requirements of the PDT are applicable to both GLWA in-house design teams and consultant design teams. Similarly, the term PCMT is used throughout the PMP for any construction management team or firm providing construction management services, and requirements of the PCMT are applicable to both GLWA in-house construction management teams and consultant construction management teams.

1.4 Accessing the PMP and CIP Procedures

The PMP is located on the One Water Connect SharePoint site at link. The CIP Group's Professional Administrative Analyst (reports to the CIP Director) should be contacted by GLWA staff to gain access to the One Water Connect SharePoint site and the PMP and procedures.

1.5 Supporting Software Requirements

The CIP Delivery Team uses Microsoft SharePoint, Microsoft Project 2010, Primavera P6 Version 7.0, and Prism software, as well as a web-based CIP Portal developed internally for the CIP. These software packages are discussed in the chapters they pertain to. In addition, GLWA is currently in the process of procuring a Program Management Information System (PMIS) for the CIP, and once implemented, the PMP will be revised to reflect the processes and procedures changed by the PMIS.

1.6 PMP Content Summary

The content of individual chapters comprising the PMP is summarized in Table 1-2 below.

Table 1-2: PMP Content Summary

Chapter	Content Summary
01	Describes the CIP Program, including CIP scope and background, CIP goals and performance metrics, and values statement of the CIP Delivery Team.
02	Describes the organizational structure of the CIP Delivery Team, the role of the Asset Management Strategic Organization (AMSO), Asset Management Leadership Team (AMLT), and the CIP Satellite Team (CIPST), as well the CIP Delivery Team integrated team structure and roles and responsibilities.
03	Describes how CIP communications will be managed and executed, identifies standard meetings and reports, and provides guidance for Incident Communications Plans.
04	Explains document management processes and requirements, version control, records retention, and compliance with GLWA Public Records Policy.
05	Defines how schedules and budgets are developed and maintained, managed, and monitored, including forecasting, variance analysis, and reporting.
06	Establishes requirements for change management of CIP contracts, and reviewing, processing, and reporting change.
07	Establishes a Quality Management System (QMS) for the CIP, including quality assurance (QA) and quality control (QC) standards, guidelines, and processes for Quality Plans, quality reviews, and quality audits.
08	Defines the risk management process, developing risk registers, and assessing, managing, and reporting risks.
09	Establishes the processes and requirements for managing engineering and design, including design oversight and coordination, reviews, and design contract management.
10	Describes the CIP Delivery Team's role in procurement processes; requirements for professional services, construction, and owner-furnished material and equipment; and for managing and administering contracts.
11	Establishes the requirements for permits plans, managing permit and agency approvals and regulatory compliance, and managing and reporting on regulatory and permit compliance actions.
12	Defines the policies and requirements for consultants, contractors, and the CIP Delivery Team to protect and report on health and safety during CIP activities.

Chapter	Content Summary
13	Provides guidance on the CIP Delivery Team's role in public outreach and communications to the public and stakeholder groups.
14	Defines the processes and requirements for managing and reporting on construction, and for administering construction contracts.
15	Defines the processes and requirements for managing and documenting the planning and CIP development processes used to define the CIP and modify it as needed, including obtaining Board approval each year.
CIP Procedures	Outlines CIP procedures, also referred to as Standard Operating Procedures (SOPs), including workflows, standard forms, tools, and templates, which are also included in the above PMP chapters where appropriate.

2 Roles and Responsibilities

Roles and responsibilities of key members of the CIP Delivery Team for implementing the PMP and the CIP procedures are defined below.

2.1 CIP Director

- Leads the development of the CIP PMP
- Monitors the PMP and included procedures for concurrence with GLWA procedural, legislative, funding, and regulatory requirements
- Approves the PMP and CIP procedures, modifications, and revisions
- Consistently monitors and enforces the application of the PMP and CIP procedures to execute the CIP work, as applicable, throughout the GLWA organization
- Arbitrates disputes and conflicts associated with the PMP and its application

2.2 Water and Wastewater Directors of Engineering

- Ensure Project Managers within their business units incorporate PMP requirements into CIP-related consulting agreements and construction contracts
- Arbitrate, together with the CIP Director, disputes and conflicts associated with the PMP and its application to projects within their business unit

2.3 CIP Program Manager (PgM) – or Program Controls Manager if no PgM in place

- Leads the development of the PMP and CIP procedures following industry-accepted standards and practices and GLWA-specific business requirements
- Develops and maintains systems and tools that support and enable the PMP
- Provides training, guidance, clarification, and direction to those firms and personnel engaged in CIP activities
- Acts as central point of contact for all questions, clarifications, and directions associated with the PMP and CIP procedures
- Provides access and security for the PMP
- Manages the collection, review, approval, and incorporation of recommended improvements to the PMP and CIP procedures

2.4 CIP Program Assurances Manager (PAM)

- Provides input to quality, risk, and safety processes in the PMP
- Reviews each update to the PMP for quality prior to the PMP update being published
- Develops Key Performance Indicators and metrics for monitoring the effectiveness of the PMP in addressing program- and project-level quality, risk, and safety approaches

2.5 Project Manager (PM)

- Verifies PMP and procedural requirements are included in the consulting agreements and construction contracts for his or her projects
- Coordinates PMP training for in-house project teams, consultants, and contractors, as necessary
- Directs questions and requests for clarification regarding PMP content and procedures to the PgM
- Provides suggestions for enhancements and revisions to PMP processes and procedures to the CIP Director

2.6 Project Design Lead (PDL) – if internal

- Familiarizes PDT personnel, whether internal to GLWA or external, on PMP requirements
- Consults the PM regarding questions or clarifications of PMP and procedure content and intended use
- Coordinates with the PM, as necessary, for PMP training
- Submits recommended PMP improvements to the CIP Director

2.7 Project Construction Management Lead (PCML) – if internal

- Familiarizes PCMT personnel, whether internal to GLWA or external, on PMP requirements
- Consults the PM regarding questions or clarifications of PMP and procedure content and intended use
- Coordinates with the PM, as necessary, for PMP training
- Submits recommended PMP improvements to the CIP Director

3 Changes to the PMP

As the CIP progresses, it is anticipated that the CIP Delivery Team will discover improved methods and procedures that will provide additional value to GLWA through cost, schedule, quality, risk, and operational efficiencies. It is important that the CIP Delivery Team capture these value-added improvements and codify them in the PMP for future projects. The PMP was developed to be applicable to the entire CIP; therefore, recommended improvements should be vetted to determine their application and value to the entire CIP, and not just to a specific project and its conditions.

The procedure for updating the PMP is as described in this subsection and in Program Procedure 0001 – PMP Updates. The CIP Director is responsible for preparing, revising, and controlling the PMP. The CIP Director, or designee, will review the PMP as necessary, typically annually, and revise it accordingly to reflect current requirements. Revisions will be numbered and dated on the revisions history page at the beginning of each chapter. Initial approval of the PMP is shown on the approval page. All subsequent revisions require the level of approval documented in Program Procedure 0001 prior to implementation.

The process for recommending, reviewing, and approving revisions to the PMP and/or CIP procedures is as follows:

- Recommendations for revisions to individual chapters can be submitted to the CIP Director at any time by PMP users; however, the PMP user must obtain approval of his or her Business Unit Director of Engineering prior to submission to the CIP Director
- The CIP Director uses CIP Group staff to consolidate the recommendations received and investigate each recommendation with the CIP Delivery Team members involved, and prepares a recommendation for the CIPST as to whether to accept or decline the suggested change(s)
- As appropriate, typically annually, the CIP Director convenes the CIPST to review and provide recommendations on changes to the PMP
- The CIP Director briefs the AMLT on all recommendations from the CIPST
- The CIP Director leads the revision of the PMP and/or CIP procedures, including a quality review by the PAM, and distributes notification of updates and arranges for training, if required

4 Version Control

The PMP must adhere to the version control and document management procedures as described in Chapter 04 – Document Management.

The final and approved versions of the PMP chapters are stored on the CIP Program pages of the One Water Connect SharePoint site (link). The pdf versions of the PMP chapters stored at this site are controlled and are to be the only versions used. Those obtained otherwise are not controlled versions and may not constitute the approved information or requirements. The PMP also includes forms and templates that are part of the processes and procedures detailed in the PMP. Fillable/editable versions of the forms and templates are also stored at the above-listed CIP Program pages of the One Water Connect SharePoint site, and are available for use by all those involved in the delivery of the CIP. The native versions of the PMP documents, including the forms and tools, will be stored by the CIP Group so they are not modified or changed except by the CIP Director.

5 PMP Quality Assurance

The PMP provides one of the core components of a sound quality management system and a standardized method for performing the work by accepted methods, thereby establishing a standard level of quality for the entire CIP. For the PMP to be effective and produce the intended level of quality, it must be applied consistently and thoroughly across the CIP, wherever the PMP is applicable. Implementing the PMP will require four key quality management principles:

- Training
- Communicating the value and benefits of the PMP
- Understanding responsibilities and expectations
- Periodic compliance audits

5.1 Training

While it is the responsibility of each CIP Project Team to thoroughly understand these PMP and CIP procedures, the CIP Delivery Team will assist individual CIP Project Teams with orientation and training.

5.2 Communications

The CIP Director will communicate revisions of the PMP to all members of the CIP Delivery Team. From time to time, the CIP Director should also communicate exemplary use of the PMP and specific examples of where the PMP has provided a level of quality to CIP execution.

5.3 Responsibilities

It is important that each individual and CIP Project Team understand their responsibilities under the PMP in executing their respective scope of work. The various chapters in the PMP describe business process responsibilities and expectation of the various entities, and the CIP procedures provide step-by-step procedural roles and requirements. The CIP Director should be contacted for clarification of these roles and responsibilities.

5.4 Compliance Audits

Consistent application of the PMP and the CIP procedures is critical to achieving the goals of the CIP in an efficient and effective manner. To confirm consistent and proper application of the PMP and the CIP procedures, the CIP Director will, with the support of the PAM, periodically perform compliance audits. Audits will evaluate how the PMP is being used, deficiencies, and good practices, corrective actions, and will be used to communicate lessons learned to the CIP Director in an effort to promote continual improvements. All participating entities are expected to support the audits and act on the findings.

6 General PMP Procedures

The following are the Program procedures and standard forms and templates related to this section of the PMP.

6.1 Procedures

- Program Procedure 0001 – PMP Updates

6.2 Tools and Templates

- None

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Great Lakes Water Authority

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AECOM
March 2022

Program Management Plan (PMP)

Chapter 01 - Capital Improvement Plan Description

Capital Improvement Plan (CIP) Delivery Team

Great Lakes Water Authority

Capital Improvement Plan

Program Management Plan

Chapter 01 – Capital Improvement Plan (CIP) Program Description
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Acronyms

See the Overview Chapter for a list of acronyms used in the PMP.

1 Introduction

1.1 Great Lakes Water Authority

Formed in 2016, the Great Lakes Water Authority (GLWA) provides nearly 40 percent of Michigan's population with water of unquestionable quality, as well as effective and efficient wastewater services to nearly 30 percent of the state.

GLWA's MISSION

> *To exceed our customers' expectations by utilizing best practices in the treatment and transmission of water and wastewater, while promoting healthy communities and economic growth.*

GLWA's VISION

> *Through regional collaboration, GLWA strives to be the provider of choice, dedicated to efficiently delivering the nation's best water and sewer services in partnership with our customers.*

1.2 Capital Improvement Plan Program Background

GLWA has, through a process managed by the CIP Delivery Team (defined in Chapter 02 – Organization and Governance), developed a Capital Improvement Plan (CIP). The CIP is a forward-looking roadmap that is developed and is maintained on an ongoing basis, usually annually, using the processes described in Program Management Plan (PMP) Chapter 15 – CIP Planning and Development. As required by GLWA's Articles of Incorporation, each year the current 5-year CIP with a 10-year outlook is submitted by the CIP Director to GLWA leadership for approval by GWLA's Board.

The latest version of the CIP is available to the public at https://www.glwater.org/cip/.

1.3 CIP Program Goals

The goal of the CIP is to continue major capital asset investments in programs and projects that will upgrade the Authority's aging water and wastewater system infrastructure, as well as the overarching centralized service infrastructure that supports both systems. The CIP is a forward-thinking 5-year plan that identifies capital projects and programs and their respective financing options. This plan is updated annually to reflect changing system needs, priorities, and funding opportunities.

1.4 CIP Program Performance Metrics

<To be developed.>

2 CIP Delivery Team Organization

The CIP Delivery Team is a single, unified, team that delivers the CIP Program. The CIP Delivery Team is a cross-functional team, with members from multiple business units working collaboratively to leverage the skills and strengths of each business unit to achieve CIP Program goals. The organizational structure of the CIP Delivery Team is detailed in Chapter 02 – Organization and Governance.

2.1 CIP Delivery Team Values Statement

The CIP Delivery Team has developed a Values Statement that is included in this chapter as Appendix A. The Values Statement was developed by a sub-team of the CIP Delivery Team through multiple workshops designed to identify the guiding principles and essential attributes of the CIP Delivery Team. Three important areas were identified: Talent, Trust, and Team. These areas emphasize lifelong learning and development of our valued team members, high performance behaviors as a standard of excellence, and consistency in the availability and application of standardized processes and tools.

2.2 Integration of the CIP Delivery Team and the Program Management Consultant

AECOM was retained by GLWA to act in the capacity of the Program Management Consultant (PMC) between 2019 and 2023. As PMC, AECOM staffs select roles on the CIP Delivery Team. The CIP Delivery Team will maintain a solutions-focused culture firmly fixed on the achievement of defined program and individual project goals. A collaborative partnering approach will be critical to maintaining clarity and momentum as the CIP develops.

In any fully engaged team of dedicated professionals, differences of opinion should be expected and welcomed. It is an indication of strength that results in better decisions, better projects, and a better program, provided that all such differences are handled within a clear resolution framework in a respectful, civil, and professional manner. The integration plan and team structure are set up to readily communicate and resolve differences. Full and open engagement of all team members in agreed roles, according to agreed processes, will continually build real teamwork of the highest order and enable all team members to deal rapidly and effectively with any challenge that arises. Above all, teamwork should rely on the principles of openness and mutual trust and the rapid resolution of issues and differences of opinion as they arise.

GLWA, AECOM, and other members of the CIP Delivery Team must operate as a tightly integrated team to successfully manage the CIP delivery. The Team will be committed to fostering and developing superior teamwork based on collaboration and trust from beginning to end, supported through best management practices. The values of the management approach will be based on clear organization, processes, and procedures that drive accountability and clarity. Every team member will thoroughly understand and commit to their agreed, defined roles and responsibilities, and teamwork will be enhanced through training, proactive communication, frequent meetings, and reviews of program performance and partnering.

An effective and supportive program environment focused on solutions starts with a clearly defined strategic leadership and governance structure. The CIP Delivery Team’s approach to establishing and maintaining close collaboration and effective teamwork on the program is based on the following principles:

- Setting clear goals, objectives, and expectations
- Aligning interests
- Providing clear business processes and procedures
- Establishing and maintaining effective communications
- Applying appropriate technologies
- Resolving disputes rapidly
- Performing sustained, effective monitoring of CIP Program performance metrics, as detailed above

2.3 Process and Continuous Improvement

GLWA has created the Asset Management Strategic Organization (AMSO) to provide oversight and governance to the management of GLWA's assets throughout an asset's lifecycle. The AMSO is led by the Asset Management Leadership Team (AMLT), which is assisted as needed by a variety of satellite teams, including the CIP Satellite Team (CIPST). The purpose of the CIPST is to be a key advisor to the CIP Delivery Team on process and continuous improvement, including reviewing and approving the PMP, and managing the PMP's implementation and training. After the PMP is completed and fully implemented, the CIPST will continue to provide oversight on the continuous improvement of CIP processes and systems. The roles of the AMLT and CIPST are discussed in more detail in Chapter 02 – Organization and Governance.

3 CIP Program Description Procedures

There are no procedures, forms, or template standards related to this chapter.

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Appendix A
CIP Delivery Team Values Statement

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GLWA
Great Lakes Water Authority

Our Values

Talent, Trust, Team

CIP Delivery Team

Rev. 09.01.20

Values Development

BUILDING AND DEVELOPING OUR VALUES

Our value statements are the result of the hard-work and sustained efforts of our value development team, who organized multiple workshops designed to identify the guiding principles and essential attributes of the CIP Delivery Team. Three important areas were identified: Talent, Trust, and Team. These areas emphasize lifelong learning and development of our valued team members, high performance behaviors as a standard of excellence, and consistency in the availability and application of standardized processes and tools.

VALUES DEVELOPMENT WORKSHOP TEAM

Advisors

Suzanne Coffey, Interim CEO
Cheryl Porter, COO, Water
Navid Mehram, COO, Wastewater
Bill Wolfson, CACO
Nicolette Bateson, CFO
Jody Caldwell, COO, Planning
Dima El-Gamal, CIP Director

Contributors

Philip Kora, Wastewater Construction Manager
Michael Lasley, Procurement Manager
Erich Klun, Engineering Manager
Peter Fromm, Water Engineering
Brian VanHall, Water Engineering
Kashmira Patel, Wastewater, CSO
Derek Bennett, Wastewater Inspection Team Leader

CIP Delivery Team

VALUES FRAMEWORK

The Values Framework applies to all those involved in the delivery of CIP projects. Our path to excelling at the three important areas of "talent, trust, and team" begins with this Values Framework.

Values Statements

Who We Are

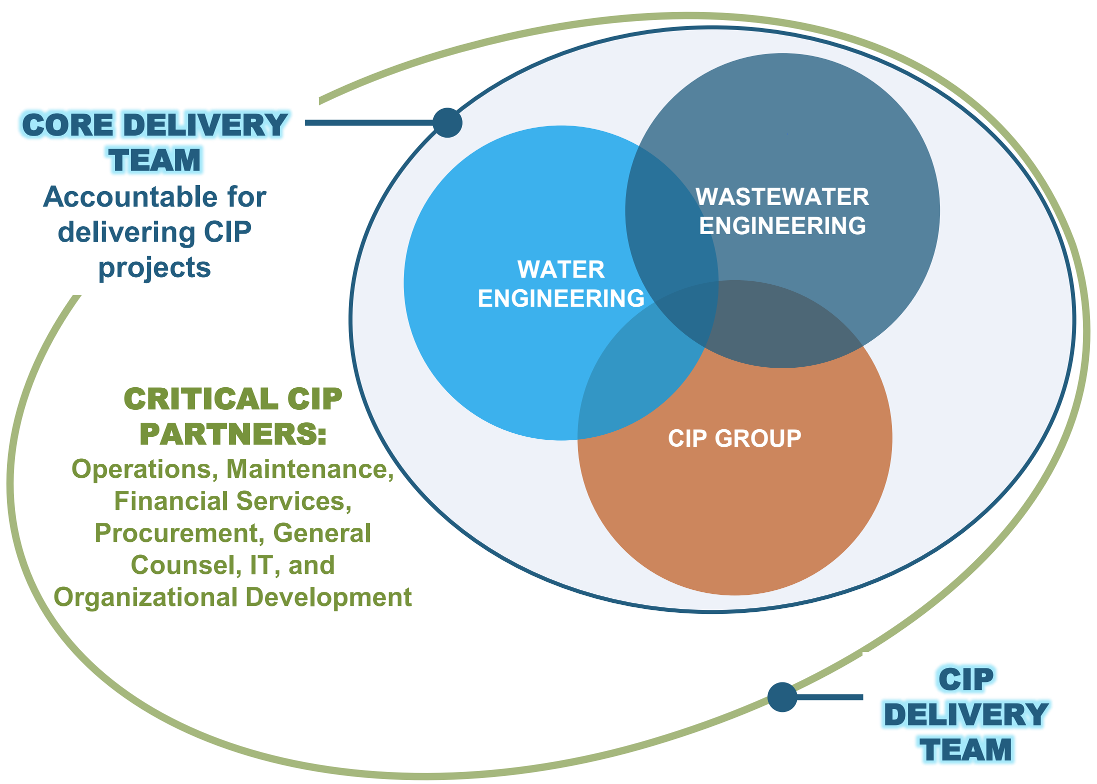
The CIP Delivery Team strives to achieve exceptional outcomes by continuously raising performance and quality, while maintaining regional responsibilities of GLWA infrastructure. We will achieve this through the application of recognized expertise, fiscal stewardship, within a diverse, accountable, highly inclusive, and operationally minded team.

+

How We Get There

We will build a ***high-performance cross-functional team****, accountable for the continuous improvement of GLWA infrastructure, through the development of a service driven team culture, the consistent application of dependable systems, implementation of standardized and streamlined processes, adoption of key performance indicators and rigorous team training.*

Single Unified CIP Delivery Team Diagram



CIP Delivery Team

CIP Delivery Project Implementation Examples

Metering Improvements at Northeast Water Plant

Rehabilitation of Various Sampling Sites and PS#2 Ferric Chloride System at WRRF

Metering Improvements at Southwest Water Plant

Wick Road 48" Water Transmission Main Construction

Values Foundation

Guiding Principles

Guiding elements are foundational elements for the CIP Delivery team

Balanced Priorities

Demonstrate financial stewardship to our member partners by balancing financial, operational, health & safety, and capital priorities.

Cross-functional Collaboration

Work is optimized through effective cross-functional collaboration.

Empowerment & Accountability

Everyone is empowered to create GLWA's success, and everyone is accountable for their commitments.

Scope Definition

Capital Improvement Plan Projects are clearly defined, refined, and informed by data-driven decisions.

Communication & Transparency

Project status transparency and communication of critical information to the team, for awareness and proactive management.

Values Framework

These team attributes are essential to adhering to our values

Talent

"Provide implementable guidelines through training and sustainable job expectations" – Bill Wolfson, CACO

Trust

"Provide support to our Project Managers to do their best work" – Suzanne Coffey, Interim CEO

"Leverage innovation through the right projects, at the right time, with the right resources" – Nickie Bateson, CFO

Team

"Simplify the process, so Project Managers can focus on project service delivery" – Navid Mehram, COO, Wastewater

"Tell our story through internal cross-functional partners and data-driven information" – Cheryl Porter, COO, Water

Values Characteristics

Our path to achieving our goals leverages these essential characteristics

Skills

- *Dedicated & responsible*
- *Technical expertise*
- *Training & recruiting*

Team Qualities

- *Flexible & adaptable*
- *Cross functional mindset*
- *Inclusive, open and trusting culture*

Tools & Structure

- *Standardized operating procedures*
- *Continuous improvement of quality*
- *Long term system stability*

CIP Delivery Team

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Program Management Plan (PMP)

Chapter 02 - Organization and Governance

Capital Improvement Plan (CIP) Delivery Team

Great Lakes Water Authority

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Acronyms

See the Overview Chapter for a list of acronyms used in the PMP.

1 Introduction

1.1 Purpose

The Great Lakes Water Authority (GLWA) Capital Improvement Plan (CIP) *Program Management Plan (PMP) Chapter 02 – Organization and Governance* defines the organizational structure and key roles and responsibilities for the delivery of the CIP.

Key organizational principles include the following:

- Facilitate integrated, cross-functional CIP Delivery Team and CIP project delivery teams
- Define and document roles and responsibilities
- Establish a culture of collaboration with and between all CIP and project team members, including the CIP Delivery Team, CIP Satellite Team (CIPST), Project Design Teams (PDTs) (internal or external), Project Construction Management Teams (PCMTs) (internal or external), contractors, vendors, and program stakeholders
- Define and communicate goals, objectives, and expectations
- Maintain continuous effective communications between all teams and team members involved in delivering the CIP
- Monitor and improve program standards and procedures and performance
- Work together to empower and support CIP Program delivery

All organizational charts in this chapter are subject to change and may be periodically updated to reflect organizational changes as required. When this occurs, the PMP will be updated following the procedures described in Chapter 00 – Overview.

1.2 Staffing Requirements

The roles of the CIP Delivery Team will be filled by personnel drawn from the resources of GLWA or consultants or contractors, as determined by GLWA and on a ‘best-for-project’ basis while maintaining focus on the achievement of CIP and individual project goals.

2 GLWA Organizational Structure

2.1 Overall GLWA Organization

Figure 2-1 is a schematic depiction of GLWA's organization.

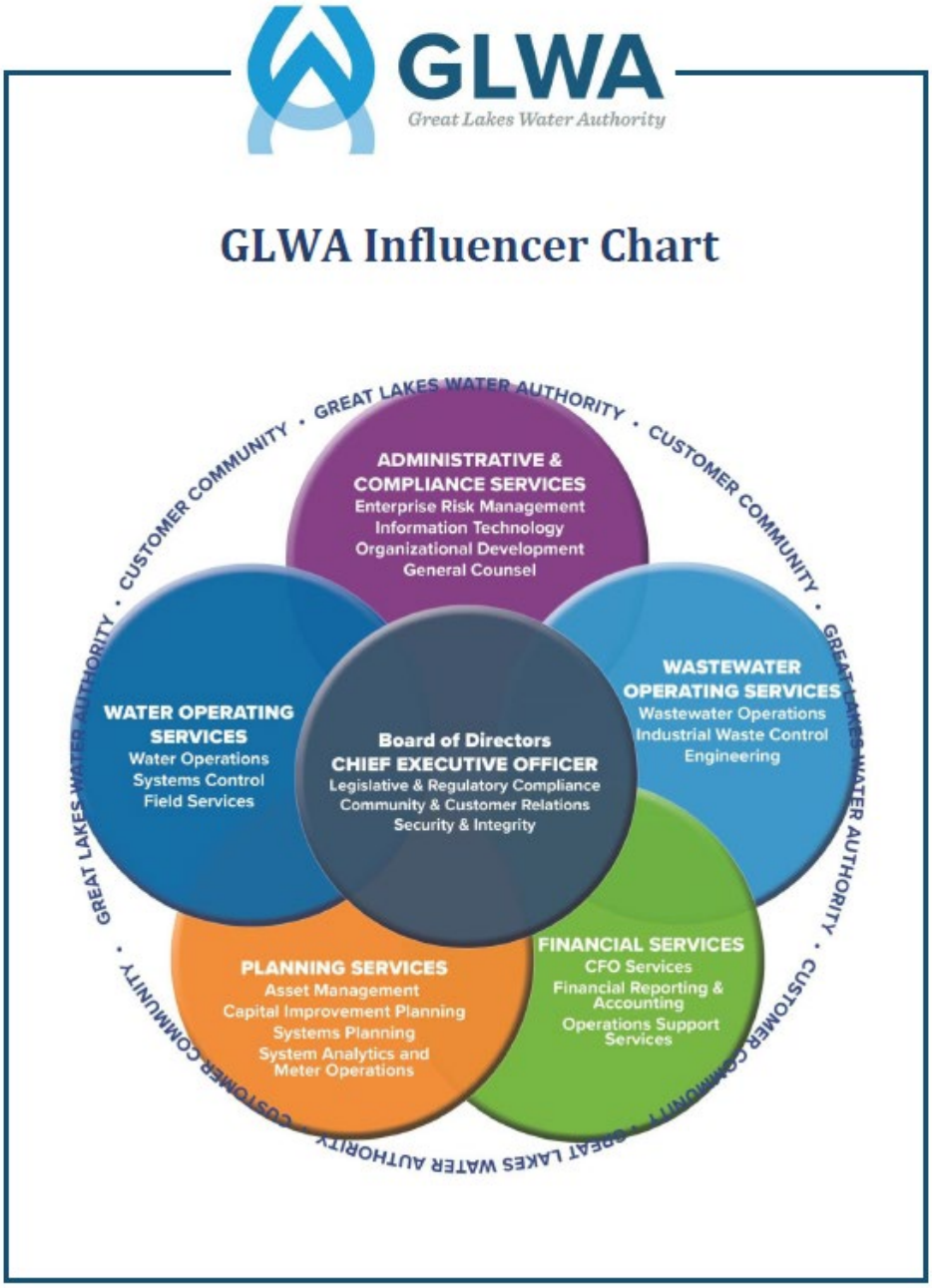

Figure 2-1: GLWA Influencer Chart

3 Asset Management Governance

3.1 Asset Management Lifecycle

Figure 2-2 is a schematic depiction of the asset management lifecycle at GLWA, and indicates graphically the place of both CIP Planning and CIP Program delivery within GLWA's asset lifecycle.

Figure 2-2: GLWA Asset Lifecycle Chart

Governance of the various asset management processes within GLWA is provided by the Asset Management Strategic Organization (AMSO). The AMSO's mission is to "govern asset management activities strategically and consistently across the organization and in alignment with GLWA's asset management vision, principles and objectives."

3.3 Asset Management Leadership Team

The Asset Management Leadership Team (AMLT) provides overall leadership to GLWA's asset management process. The AMLT's responsibilities include oversight and authority over the CIPST, described below.

3.4 CIP Satellite Team

The CIPST is one of the teams that comprise the AMLT. The CIPST's primary responsibility is to consult on and approve standard processes used by the CIP Delivery Team, with a focus on continuous improvement. Other responsibilities include:

- Providing monthly status updates to the AMLT
- Fostering a culture of continuous improvement within the CIP Delivery Team, including ensuring that best practices are shared across all phases of the asset management lifecycle
- Ensuring improvement initiatives are properly recorded and monitored

- Ensuring improvement initiatives are properly recorded and monitored
- Overseeing projects/tasks assigned to the Sprint teams (described below)
- Approving Project Charters from Sprint teams

3.5 CIP Sprint Teams

Sprint teams are shorter-term, ad hoc project teams formed for specific purposes and dissolved at the completion of the initiative.

Sprint team responsibilities include oversight and authority over a specific project or task as directed by the CIPST, including developing the project/task Charter, and completing the project/task as approved in the Project Charter approved by the CIPST at the formation of the Sprint team.

Sprint teams report directly to the CIPST, including providing at least monthly updates to the CIPST.

4 CIP Delivery Team

The CIP Delivery Team is a single, unified team that delivers the CIP Program as part of the asset management lifecycle. The CIP Delivery Team is a cross-functional team, with members from multiple business units who work collaboratively to leverage the skills and strengths of each business unit to achieve CIP Program goals.

4.1 Delivery Team Organization

The makeup of the CIP Delivery Team is shown graphically in Figure 2-3 below. The CIP Delivery Team includes the Core CIP Delivery Team, defined below, as well as critical CIP partners across GLWA, including Operations, Maintenance, Financial Services, Procurement, General Counsel, Information Technology (IT), and Organizational Development.

Contact points for each of these critical partner teams is provided in Section 4.6 below.

4.2 Core CIP Delivery Team Organization

The Core CIP Delivery Team is composed of staff from the Water, Wastewater, and CIP Group Business Units with primary responsibility for delivering the CIP and the projects that make up the CIP. CIP Delivery Team business unit responsibilities are depicted in Figure 2-4 below, and the organization of the Core CIP Delivery Team is shown in more detail in Figure 2-5.

The CIP Delivery Team is founded on the following two key principles:

1. CIP goals are best achieved when the CIP project teams are part of the Water and Wastewater Engineering Business Units that are the ultimate customers for their projects, and
2. To achieve consistent and high-quality outcomes, the project teams will be supported by planning, controls, and assurance support from dedicated staff in the CIP Group.

4.3 CIP Group Core CIP Delivery Team Support

As shown in Figure 2-6, the CIP Group provides key resources to the Core CIP Delivery Team in leadership, planning, program controls, and assurances. The organization of the CIP Group is shown in Figure 2-5.

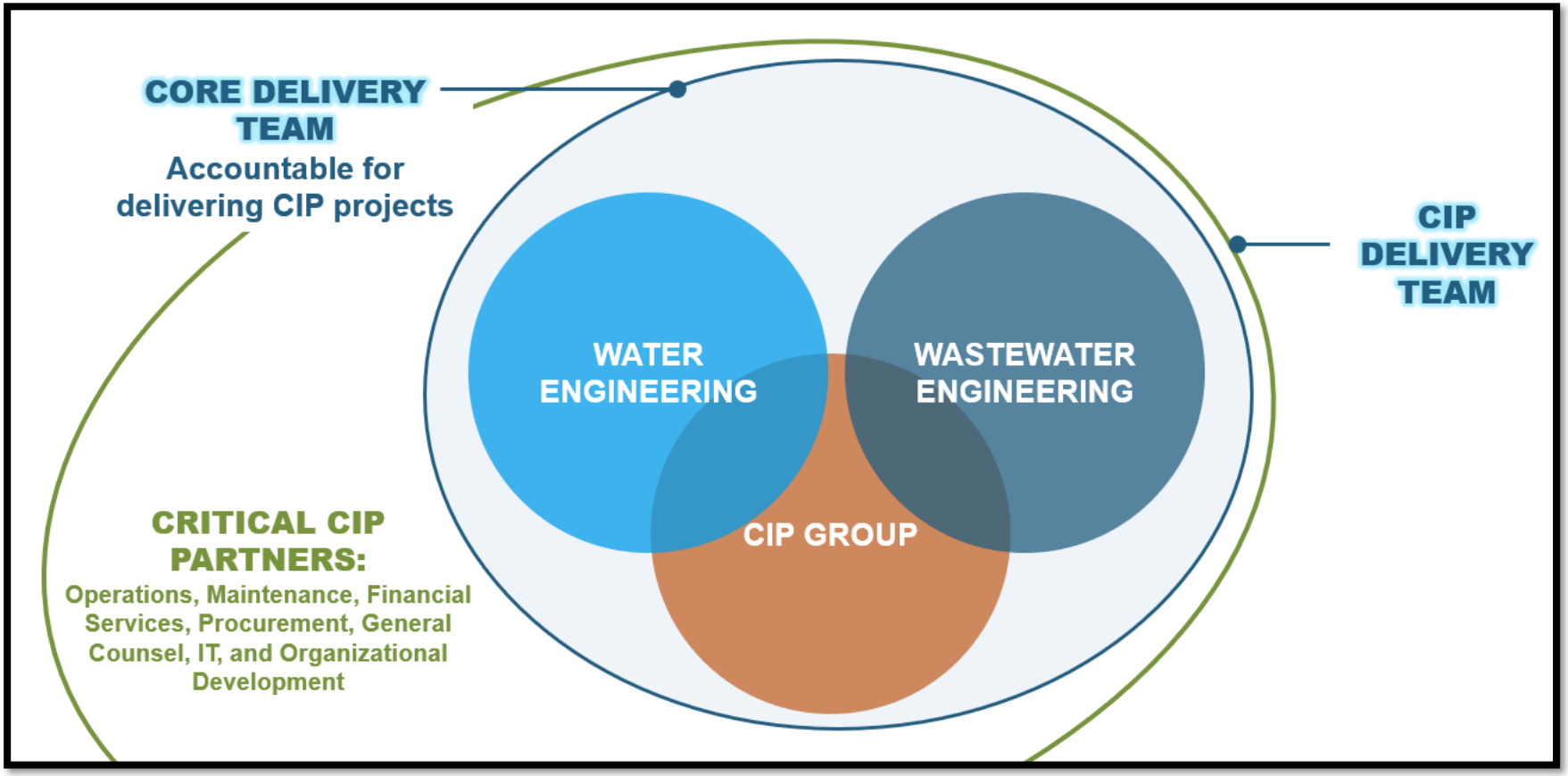

Figure 2-3: CIP Delivery Team Structure

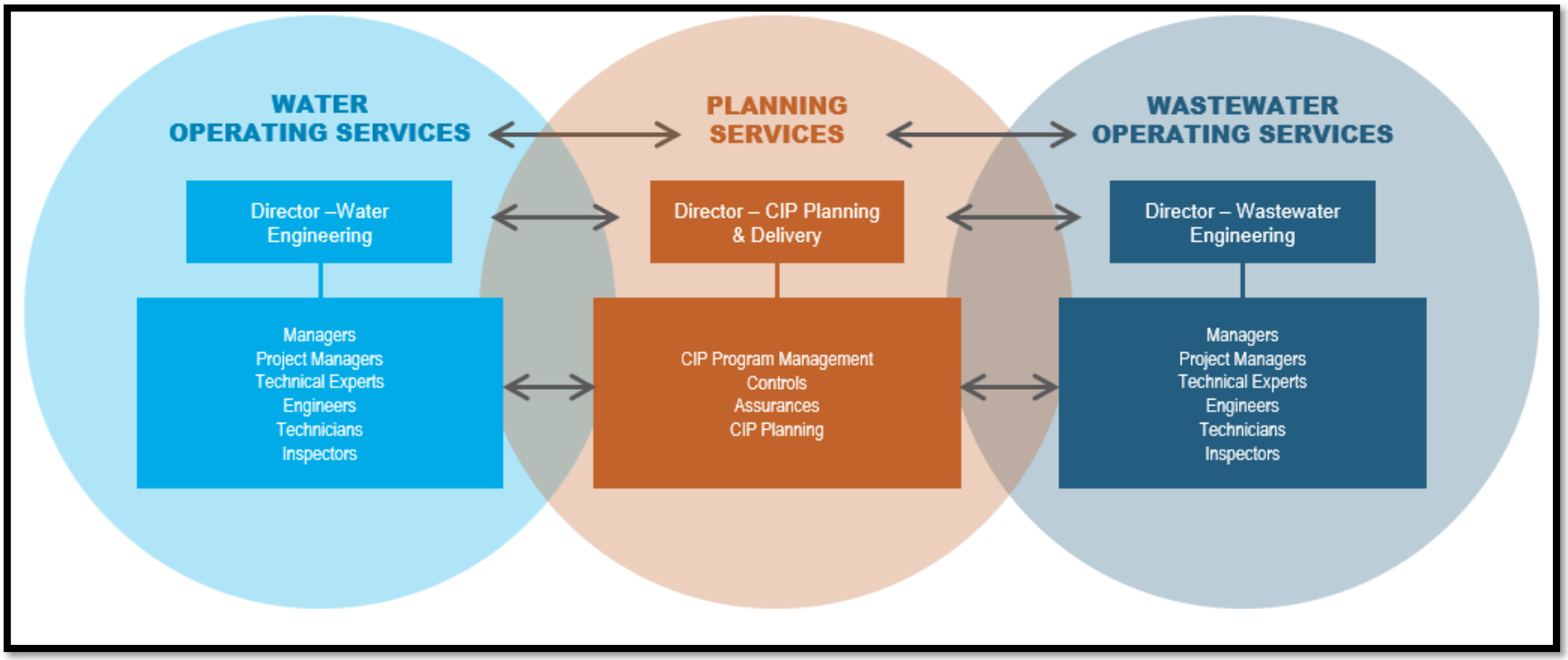

Figure 2-4: Core CIP Delivery Team Business Unit Responsibilities

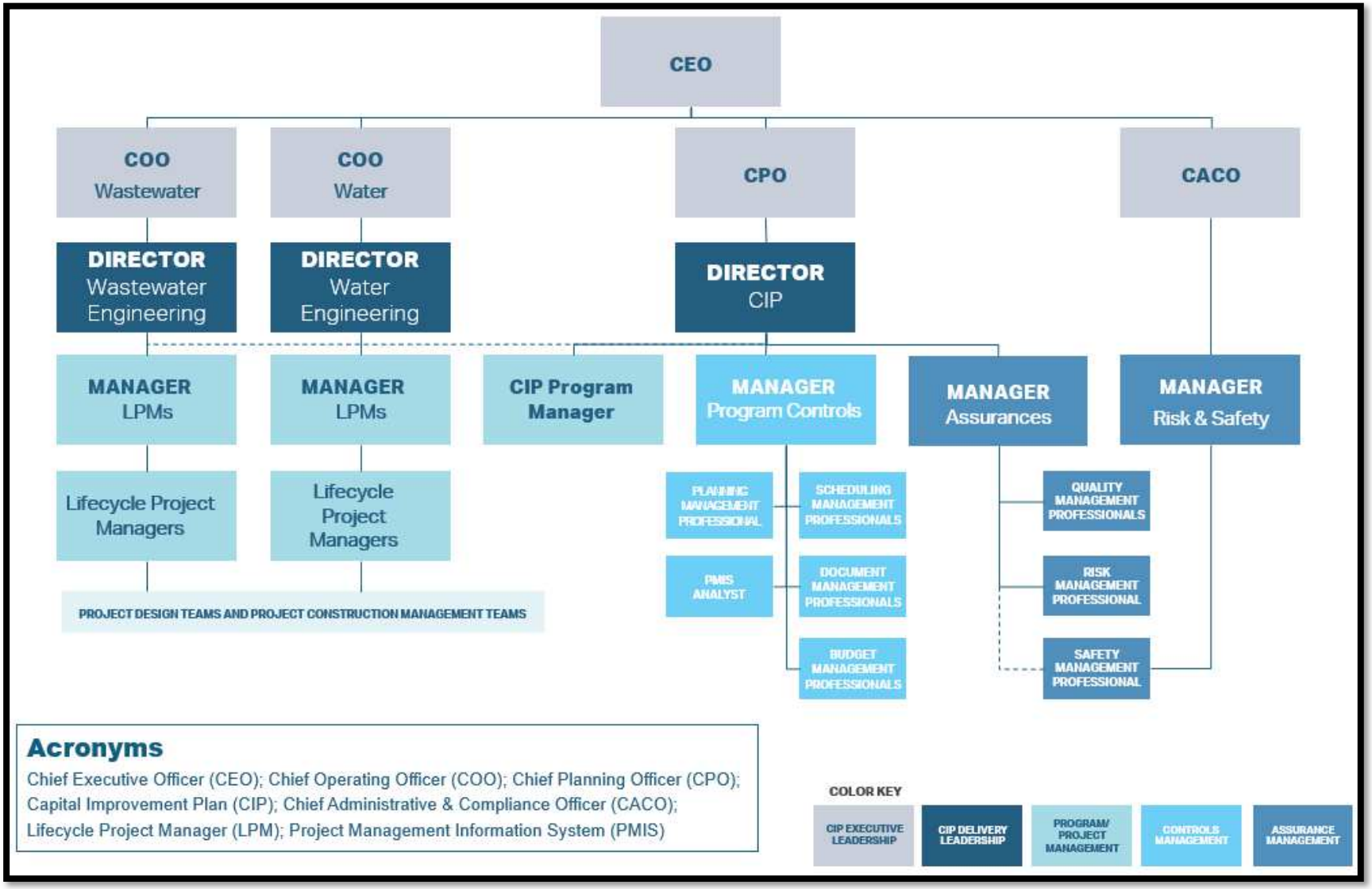

Figure 2-5: Core CIP Delivery Team Project Decision Making Structure

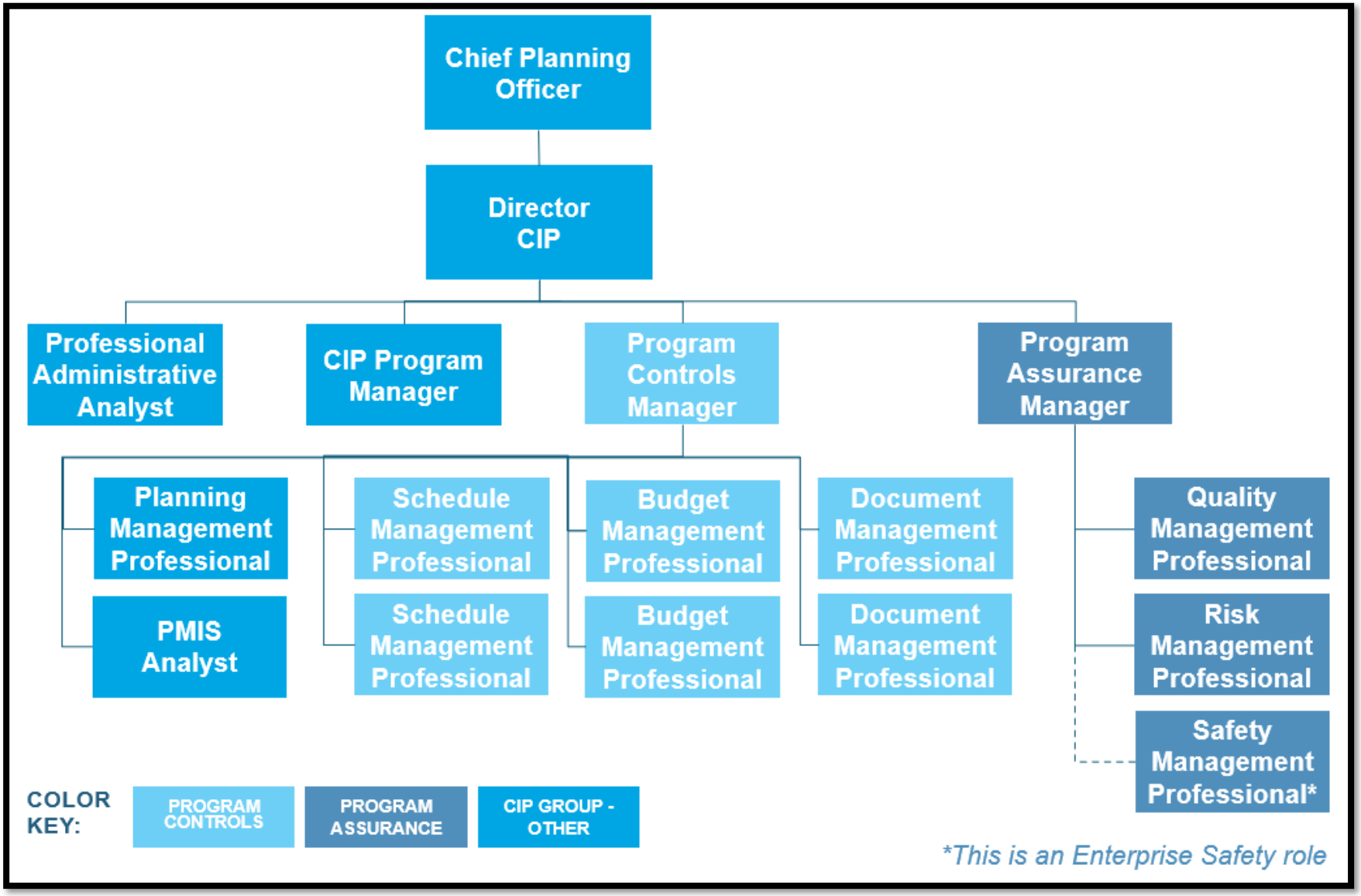

Figure 2-6: CIP Group Organizational Chart

4.4 Reporting

Project teams delivering CIP projects are responsible to the Chief Operating Officer (COO) and the Director of Engineering of the business unit that initiated their project. The Chiefs and Directors of the three business units shown in Figure 2-3, Figure 2-4, and Figure 2-5 collaborate in leading the CIP Delivery Team, with the Chief Planning Officer (CPO) ultimately accountable to the GLWA Chief Executive Officer (CEO) for CIP Program delivery outcomes.

4.5 Core CIP Delivery Team Roles and Responsibilities

The following are the titles, roles, and responsibilities for CIP delivery of key roles of the Core CIP Delivery Team.

4.5.1 Chief Planning Officer (CPO)

- Reports to the CEO
- Works with the COOs of the Wastewater Operations and Water & Field Services Business Units (collectively referred to as the BU Chiefs) to develop and communicate the vision and mission statement of the CIP Delivery Team
- Collaborates with the BU Chiefs to be the escalation point for program and project delivery issues on which the CIP Director and the Directors of Engineering for the Wastewater Operations and Water & Field Services Business Units (collectively referred to as the BU Directors) have not achieved agreement
- Where necessary, escalates program and project delivery issues on which the CPO and BU Chiefs have not achieved agreement to GLWA's Executive Leadership Team (ELT)
- Provides certain approvals of contractual changes with the CIP Program, as defined by the processes and delegated authorities described in the PMP
- Defines, documents, and communicates the performance expectations and performance metric criteria for the CIP Delivery Team
- Works with the COOs of the Wastewater Operations and Water & Field Services Business Units (BU Chiefs) to approve CIP project mix and timing modifications recommended by the CIP and BU Directors to adjust to variances from the approved CIP and financial plan

4.5.2 Chief Operating Officers (COOs) of the Wastewater Operations and Water & Field Services Business Units (BU Chiefs)

- Report to the CEO
- Work with the CPO to develop and communicate the vision and mission statement of the CIP Delivery Team
- Collaborate with the CPO and other BU Chiefs to be the escalation point for program and project delivery issues on which the CIP and BU Directors have not achieved agreement
- Provide certain approvals of contractual changes for CIP Program projects related to their BU, as defined by the processes and delegated authorities described in the PMP
- Work with the CPO to define, document, and communicate the performance expectations and performance metric criteria for the CIP Delivery Team
- Work with the CPO to approve CIP project mix and timing modifications recommended by the CIP and BU Directors to adjust to variances from the approved CIP and financial plan

4.5.3 CIP Director

- Reports to the CPO
- Works with the BU Directors to develop and communicate the vision and mission statement of the CIP Delivery Team
- Where necessary, escalates program and project delivery issues on which the CIP Director and BU Directors have not achieved agreement
- Provides day-to-day management and leadership across CIP Delivery Team activities
- Defines, documents, and communicates the performance expectations and performance metric criteria for the CIP Delivery Team, including the Program Management Consultant (PMC)
- Manages the CIP Delivery Team support, controls, and assurances to support the delivery of the CIP
- Provides certain approvals of contractual changes for CIP Program projects, as defined by the processes and delegated authorities described in the PMP
- Works with the BU Directors to modify CIP project mix and timing to adjust to variances from the approved CIP and financial plan

4.5.4 BU Directors of Engineering

- Report to the COO of their BU
- Work with the CIP Director and other BU Directors to develop and communicate the vision and mission statement of the CIP Delivery Team
- Provide day-to-day management and leadership across CIP Delivery Team activities within their BU
- Define, document, and communicate the performance expectations and performance metric criteria for the CIP Delivery Team members within their BU
- Provide certain approvals of contractual changes for CIP Program projects related to their BU, as defined by the processes and delegated authorities described in the PMP
- Implement the PMP
- Monitor and lead the financial alignment processes
- Work with the CIP Director to modify CIP project mix and timing to adjust to variances from the approved CIP and financial plan
- Accountable for Lifecycle Project Managers' (LPMs') and CIP projects' performance

4.5.5 CIP Program Manager

- Reports to CIP Director
- Leads and manages the day-to-day operations of the CIP Delivery Team
- Provides direct supervision of the CIP PMC staff assigned to the CIP
- Manages and is the primary point of contact for the PMC Agreement for the AECOM Team's contract for CIP delivery
- Makes available program leadership, project management, technical, controls, and assurance staff on a temporary basis as requested by the CIP Director
- Leads the implementation and maintenance of CIP Program procedures, standards, and management practices
- Works with the CIPST to continuously review and improve the CIP Program procedures, standards, and management practices

4.5.6 Manager of Lifecycle Project Managers

- Reports to the Director of Engineering of his or her Business Unit
- Assists the BU Director in providing direct supervision of the CIP Lifecycle Project Managers (LPMs) leading CIP project teams for his or her Business Unit
- Plans for and manages CIP Delivery Team resources necessary to meet the requirements of the CIP projects for his or her Business Unit, including the project management, engineering, technical, consultant, and contractor resources needed to accomplish CIP Program goals
- Works with his or her Business Unit Director to make available qualified technical experts, task leaders, project managers, and other appropriate staff to satisfy CIP Program needs

4.5.7 Lifecycle Project Manager

- Reports to the Manager of LPMs for the BU the that originated the project
- Performs as the Project Manager (as defined and used within this PMP) for CIP projects assigned to him or her (Note: Project Manager is a project delivery role, while LPM is a career path)
- Is accountable for defining and maintaining scope, schedule, and budget for assigned projects from inception to completion and closeout
- Ensures that the needs and input from key stakeholders are reflected in the project scope and outcomes. Key stakeholders include representatives of the operations staff affected by the project, the engineers planning and designing the project, the construction managers and constructors for the project, and the functions and assurances staff defined in the PMP.
- Works, with the support of the CIP Delivery Team technical, commercial, quality, and construction specialists, to apply the requirements of the PMP, program procedures, and GLWA procedures to execute projects
- Is the primary interface with the Project Design Leads (PDLs) and Project Construction Management Leads (PCMLs), whether internal or consultant, holding them accountable to the design phase and construction management scopes he or she manages, including the requirements of the contract if the design and/or construction management are/is externally procured
- Monitors and reports on the status, progress, and costs of projects
- Ensures that the quality and risk management procedures of the CIP Delivery Team are maintained for projects
- Manages closeout of assigned contracts and projects
- Leads the coordination with GLWA staff as needed to support execution of the projects through completion and closeout
- Communicates and actively provides updates to the CIP Delivery Team on project budgets, estimates to complete, schedule updates, status reporting, etc. for all his/her project teams at least monthly
- Works closely with the CIP Delivery Team to ensure that changes to CIP project scope, schedule, or budget are mitigated and budget is met or reallocated to meet overall plan needs

4.5.7.1 CIP Program Controls Manager (PCM)

- Reports to the CIP Director
- Supports the LPMs in implementing the project controls requirements of the PMP for the CIP projects being managed by the LPM
- Leads the development and maintenance of the CIP Master Program Schedule and Budget
- Supports GLWA's CIP planning, updating, and disbursement reporting

- Tracks and reports program budget and expenditures, changes, and cost forecasts
- Tracks Key Performance Indicators (KPIs) and monitors CIP performance to meet KPIs
- Oversees CIP program document management efforts and objectives

4.5.8 CIP Program Assurances Manager (PAM)

- Reports to the CIP Director
- Supports the LPMs in applying the quality, risk, and safety management processes detailed in the PMP to his or her CIP projects
- Works with PMs to schedule and perform project quality, risk, and safety reviews as required by the PMP
- Provides input to project quality, risk, and safety processes led by the PM
- Ensures that quality, risk, and safety review outcomes are documented appropriately in the quality, risk, and safety review documents
- Drives accountability for the closure of quality, risk, and safety management actions identified in reviews
- Leads the Program-level quality, risk, and safety processes
- Ensures that quality, risk, and safety review outcomes are documented appropriately
- Drives accountability for the closure of assurance-management actions identified
- Produces monthly quality input to the CIP Program Progress Report
- Develops KPIs and metrics for monitoring the effective management of program- and project-level quality, risk, and safety approaches

4.5.9 Key GLWA Roles and Responsibilities That Interact with CIP Delivery Team Roles

On CIP projects, the PDT (see Chapter 09 – Engineering and Design Management) and Project Construction Management Team (see Chapter 14 – Construction Management) can be external consultants under contract to GLWA or in-house GLWA staff. In either case, the leader of the PDT is the PDL, and the leader of the PCMT is the PCML. The decision as to whether to use an internal or external PDT or PCML is made by the affected Business Unit Director, based on the recommendation of the Project Manager, and in consultation with the Business Unit COO and CIP Director. Roles and responsibilities of internal PDL and PCML are summarized below.

4.5.9.1 Project Design Lead – if internal

- Reports to the Director of Engineering of his/her business unit
- Conducts day-to-day management of the team of engineers performing the project design scope of the CIP project
- Monitors the workload of engineers, ensuring that the experience and technical expertise of the engineers match the CIP project's scope requirements
- Performs staff evaluations and reviews performance routinely for engineers, ensuring that feedback from the CIP Delivery Team is incorporated into these reviews
- Ensures that PDTs deliver CIP project design and construction support on schedule, within budget, and in accordance with the requirements of the PMP and program procedures

4.5.9.2 Project Construction Management Lead – if internal

- Reports to the Director of Engineering of his/her business unit
- Conducts day-to-day management of the construction managers or inspectors performing the project construction management scope of the CIP project

- Monitors the workload of construction managers or inspectors, ensuring that the experience and technical expertise of the construction managers or inspectors match the CIP project's scope requirements
- Performs staff evaluations and reviews performance routinely for construction managers and inspectors, ensuring that feedback from the CIP Delivery Team is incorporated into these reviews
- Ensures that construction management teams deliver CIP project scopes for construction management on schedule, within budget, and in accordance with the requirements of the PMP and program procedures

4.6 Critical CIP Delivery Team Partners

In development.

5 CIP Delivery Team Office

While the CIP Delivery Team, being a cross-functional team, has team members located at several GLWA facilities, the CIP Director and the CIP Group controls and assurance resources are housed at GLWA's Water Resource Recovery Facility (WRRF) at:

300 W. Jefferson Detroit,
Michigan 48209

6 Organization and Governance Procedures

There are no procedures, forms, or templates related to this PMP chapter.

Rev: v.09.01.24

GLWA
Great Lakes Water Authority

Submitted by:
AECOM
August 2023

Program Management Plan (PMP)

Chapter 03 - Communications Management

Capital Improvement Plan (CIP) Delivery Team

Great Lakes Water Authority

Capital Improvement Plan
Program Management Plan

Chapter 03 – Communications Management
Rev. 1.0

Prepared for

Great Lakes Water Authority

Prepared by

AECOM

August 2023

Revision history

Revision	Revision date	Details
1.0	August 2023	As approved by CIPST
xxxxx	xxxxx	xxxxx
xxxxx	xxxxx	xxxxx

Table of Contents

List of Appendices

Acronyms

See the Overview Chapter for list of acronyms used in the PMP.

1 Introduction

1.1 Purpose

The Great Lakes Water Authority (GLWA) Capital Improvement Plan (CIP) **Program Management Plan (PMP) Chapter 03 – Communications Management** defines the communication processes for the CIP Program and how communications will be managed within the CIP Delivery Team. Communications to the public and stakeholders are not included in the processes described in this chapter and are detailed in PMP Chapter 13 – Public Information and Stakeholder Management, and communications with project consultants and contractors are covered in other chapters of the PMP. Due to the large number of team members that make up the CIP Delivery Team and CIP Program and the wide range of physical locations of project teams, effective communication is a critical aspect of the Program's success.

Effective communications management includes:

- Providing timely dissemination of verified/validated information.
- Facilitating informed decision making.
- An organized and retrievable platform for storing written communications.
- Providing an auditable CIP history.
- Integrating CIP information and providing a common basis for analysis and recording of information.
- A structured set of meetings that provide a forum, along with other types of communication, for informing, exchanging information, solving problems, and making decisions.
- Providing critical links between people, ideas, and information necessary for CIP success.
- Promoting effective communication among all stakeholders.

Key management principles include:

- Effective communication is a responsibility of each member of the CIP Delivery Team.
- Program reports are to be developed and made available to CIP Delivery Team members.
- Once implemented, the CIP Program’s Project Management Information System (PMIS) is to be the primary data source to ensure consistency of data and information at all reporting levels.
- Communication documents are considered project and public records and therefore each team member should keep communications professional and concise.
- To ensure that Program decisions are thoroughly and appropriately documented, all meetings, reviews, conferences, and decisions of material significance are to be documented through meeting/conference minutes (formal or e-mail), notes, and/or action item lists.

Communication is accomplished through verbal and written methods. Once implemented, the PMIS is to be the primary tool for facilitating and tracking communication, meeting minutes, and resulting actions among the CIP Delivery Team and project team members.

2 Communications Management

Communication management involves planning for communications, distributing information, and collecting and archiving information. Within the CIP Delivery Team this includes:

- Communication with and between the CIP Delivery Team and project teams
- Communication with GLWA team members
- Communication with regulatory agencies
- Formal communication including reports, memorandums, etc.

It is essential that the Delivery Team members communicate in a timely, clear, concise, and effective manner. Listening is also part of effective communication.

2.1 Planning for Communications

Each process and procedure documented in the various chapters of the PMP will produce information that needs to be communicated to be useful. Communication paths include vertical communication within GLWA and horizontal communication within the CIP Delivery Team and project teams. Communication paths for each process and procedure are documented in the relevant chapter of the PMP. The consultants' and contractors' scope of work and contracts will also define some communication processes, such as recurring progress meetings and progress reports. Project teams may need to modify these communication requirements to address needs unique to a project, and when so the Project Manager should add these unique project communications processes to the consultants' and contractors' scope of work and contracts.

Informal communications among CIP Delivery Team members to share information, discuss issues and problems, and collaborate on solutions in a collaborative and open environment are highly encouraged in addition to the formal communications discussed in this chapter.

2.2 Reporting Status

The procedures documented in the various chapters of the PMP establish requirements for reporting Program and project status information including content, audience, frequency, and formats.

2.3 Collecting and Archiving Information

Program and project information will be collected and archived through a standard system of procedures and a centralized document management system. PMP Chapter 04 – Document Management describes the business process for reviewing and approving (where appropriate), collecting, and archiving Program and project information.

3 Stakeholder Communications

Stakeholder management and communication with stakeholders is covered in PMP Chapter 13 – Public Information and Stakeholder Management.

4 Meetings

Well planned and conducted meetings can be an effective method for communicating and exchanging information. Meetings should be limited to specific topics with relevant attendees to be as concise and

effective as possible. Meetings should be well prepared and well documented to quickly review actions and disseminate information. Meetings are required to have an agenda, sign-in sheet, and meeting leader, and produce meeting minutes that include attendees, key decisions, and action items.

Appendix A: Program Meetings is a list of standard meetings that will be held at various levels within the CIP Program organization, the purpose, participants, and frequency. The meeting listing in Appendix A is not meant to encompass all meetings attended by CIP Delivery team members, rather just the recurring meetings that are convened and led by the CIP Delivery Team in support of CIP Program delivery activities.

Meeting leaders are to ensure an agenda is distributed to the meeting distribution list no less than 24 hours prior to a meeting. For meetings developed within 24 hours of the meeting time, the agenda should be distributed as soon as possible. Meeting leaders should ensure minutes are distributed to the meeting distribution list for review within 72 hours following meeting close.

The PMIS, once available, is to be used for managing meetings using the calendar functionality of the PMIS for scheduling, and the document management function for agendas, meeting minutes, and action items.

4.1 Meeting Agenda and Meeting Minutes

Meeting leaders are responsible for developing a meeting agenda, completing sign-in sheets, and ensuring minutes are documented.

Meeting agendas, sign-in sheets, and minutes will use the standard forms included with the forms and templates at the end of this chapter. Minutes should clearly identify any decisions made and subsequent action items. Any omissions or errors in the minutes should be brought to the meeting leader's attention at or before the next meeting date for recurring meetings, or within 5 days of issue date for non-recurring meetings, or the minutes will be deemed accepted by participating parties and posted on PMIS once available. Best practice is for minutes to only include items discussed in the meeting, with responsible persons shown for decisions or actions. If the minutes includes a clarification made after the meeting, this should be noted as a post meeting clarification. The listing of action items should indicate the person responsible for addressing the action item and indicate a due date for a response. The action items list should be maintained by the meeting's organizer and closed or updated at the next recurring meeting, if one takes place, or as a ball-in-court action in the PMIS (once available).

In addition, the meeting leader should endeavor to identify Issues that need to be addressed and ensure they are communicated to the Project Manager for projects in design and to the Project Construction Management Lead (PCML) for projects in construction so they can be added to the project's Issues Logs.

5 Reports

The CIP Program's PMP defines standard reporting processes for the Program. The PMP includes report templates to establish standard content, format, responsibilities, detail level, and controlled information distribution. Changes in the Program may warrant adjustments to the standard report process in the future, and in such cases, changes are approved though the PMP change process defined in PMP Chapter 00 – Project Management Plan Overview.

Reports fall into the following three categories:

- **Progress/Status Reports:** Project- and Program-level reports that address work accomplished, schedule and milestone progress, budget status, applicable contract status, risks, issues, and actions are to be produced on defined dates. Construction reports are to also include the status of various contract administration processes including Submittals, Requests for Information (RFIs), Change Orders, Punch Lists, etc.
- **Performance Reports:** Performance reports show administrative details for various Program elements (i.e., task, contract, project) against a predetermined performance metrics set (i.e., cost, schedule, safety, risk, quality, work processes), goals, or benchmarks. Performance reports deal with exceptions to a defined metric or variance threshold, as well as overdue actions.
- **Technical Reports:** Technical reports include a variety of documents or submittals required to perform the work as detailed in the contract documents (e.g., design reports, operations and maintenance (O&M) manuals).

As detailed in PMP Chapter 05 – Schedule and Budget Management, Project Managers prepare Project Progress Reports for each project monthly. In addition to the status of the overall project, this report summarizes the statuses of the various project contracts. The CIP Program Controls Manager summarizes key project information from Project Progress Reports as they prepare the Program Status Report each month.

Appendix B: Program Reports is a list of standard Program reports and their purpose, general content, author, audience, and frequency. Preparers of reports are encouraged to be brief and concise, using graphics, charts, tables, and photographs to summarize information as appropriate.

6 Incident Communication Plan

In addition to routine communications, major unplanned incidents can occur that may have adverse effects to public health, the environment, local surface water use, or customer service. Examples of major incidents include human-caused threats, natural disasters, and failures related to Program construction activities. GLWA's approach for response to such incidents is discussed in PMP Chapter 12 – Health and Safety Management.

7 Communications Management Procedures

The following Program procedures and/or standard forms and templates are related to this chapter of the PMP.

7.1 Procedures

None beyond those already documented in the other chapters of the PMP.

7.2 Forms and Templates

GLWA has the following standard forms and templates available at the links contained in the list.

- Meeting Agenda
- Sign-In Sheet
- Meeting Minutes

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Appendix A
Program Meetings

Appendix A describes various standard Program meetings. This list is not inclusive of all meetings.

Monthly Critical Project Review (CPR) Meeting	
Purpose	Discuss Program status, key performance indicators (KPIs), major variances issues, and required actions
Frequency	Monthly on the first Thursday of the month
Chair	Capital Improvement Planning Director
Agenda/Minutes	Capital Improvement Planning Administration
Attendees	GLWA executive level management Managers of Lifecycle Project Managers Project Managers Program Controls and Assurances Managers Key CIP Delivery Team management staff
Agenda	Review of CIP project statuses, following reporting processes and procedures documented in PMP Chapter 05 – Schedule and Budget Management
Deliverables	Program Status Report per PMP Chapter 05 – Schedule and Budget Management

Project Progress Meetings during Design	
Purpose	Address project status/issues/concerns and assign actions
Frequency	Monthly
Chair	GLWA Project Manager
Agenda/Minutes	GLWA Project Manager
Attendees	GLWA staff (as required) Planning or Engineering Lead Project Design Lead and members of the Project Design Team (as required) Project Construction Management Lead (as required) Project Controls staff (as required) Project team members
Agenda	See PMP Chapter 09 – Engineering and Design Management
Deliverables	Project Status Report per PMP Chapter 05 – Schedule and Budget Management

Project Design Kickoff Meeting	
Purpose	Initiate project design
Frequency	One at initiation of design
Chair	Project Manager
Agenda/Minutes	Project Manager
Attendees	GLWA staff (as required) CIP Delivery Team staff Business Unit Engineering Lead Project Design Team Project Manager Technical staff (as required) Project Controls staff (as required) Operation staff (as required)
Typical Agenda Items	See PMP Chapter 09 – Engineering and Design Management
Deliverables	Project Description, Schedule, and Budget Design Work Plan and Scope of Work

Pre-Construction Conference	
Purpose	Initiate construction phase
Frequency	One after issuance of the Construction Contractor's NTP, but prior to commencement of work
Chair	Project Construction Management Lead (PCML)
Agenda/Minutes	PCML
Attendees	GLWA staff: Project Manager, Program Assurances Manager, Cost/Schedule Specialist, Operations Representative, and any other program or GLWA staff considered essential to conducting the meeting Construction Contractor's attendees: Project Manager, Project Superintendent, Safety Manager, Quality Control Manager, Scheduler, and any other key personnel as determined by the Construction Contractor PCML and members of their team as required Business Unit Engineering Lead Project Design Lead and members of their team as required
Typical Agenda Items	See PMP Chapter 14 – Construction Management
Deliverables	Project Description, Schedule, and Budget Design Work Plan and Scope of Work

Construction Status Meetings	
Purpose	Construction status, plans, issues, and actions
Frequency	Weekly
Chair	Project Construction Management Lead (PCML)

Construction Status Meetings	
Agenda/Minutes	PCML
Attendees	GLWA staff (as required) Contractor (and subcontractors as required) Project Construction Management Team members Project Design Lead Technical staff (as required)
Agenda Items	See PMP Chapter 14 – Construction Management
Deliverables (typical)	Contractor's Progress Report (monthly), including updated cost-loaded schedule Recovery schedule, if applicable 4-week Look-ahead schedule Submittal Log Change Log Issues Log Inputs to Risk Register Safety report

CIP Satellite Team (CIPST) Meetings	
Purpose	The CIPST is one of the teams that comprise the Asset Management Leadership Team (AMLT). The CIPST's primary responsibility is to consult on and approve standard processes used by the CIP Delivery Team, with a focus on continuous improvement.
Frequency	Monthly on first Monday
Chair	Capital Improvement Planning Director
Agenda/Minutes	Capital Improvement Planning PAA
Attendees	GLWA staff (as required) Contractor (and subcontractors as required) Project Construction Management Team members Project Design Lead Technical staff (as required)
Agenda Items	• Status updates on process change initiatives • Review and approve Program procedures definition or changes • Discuss best practices across all phases of the asset management lifecycle • Implement and monitor Sprint teams if required
Deliverables (typical)	Reports to AMLT meetings Approved PMP and documented changes as needed

CIP Work Group Meetings	
Purpose	The CIP Work Group is a forum for GLWA to update the broader vendor community on the progress of the CIP
Frequency	Quarterly
Chair	Chief Public Affairs Officer with external consultant support
Agenda/Minutes	Developed collaboratively between Chief Public Affairs Officer and external consultant
Attendees	Vendor community GLWA staff (as required)
Agenda Items	CIP Program Updates
Deliverables (typical)	Minutes

In addition to the above meetings, there are a variety of meetings held throughout the year as a part of CIP Planning and Development. These meetings are documented in PMP Chapter 15 – CIP Planning and Development.

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Appendix B
Program Reports

Below are listed various standard Program reports. The Program Procedures define the formats and calendar for these reports. This list is not inclusive of all reports that may be required by various plans and requirements referenced in the PMP.

KPI Report	
Purpose	Report to the Executive Leadership Team (ELT) and Board on KPI results
Frequency	Monthly
Author	Capital Improvement Planning Director and Program Controls Manager
Distribution	GLWA Board and ELT
Format and Contents	<LINK>

Program Status Report	
Purpose	Overview of Program progress, KPIs, upcoming Program or project milestones, major variances and issues and plans to resolve, and actions needed from Program executive level
Frequency	Monthly
Author	Program Controls Manager
Distribution	GLWA ELT and CIP Delivery Team leadership
Format and Contents	See PMP Chapter 05 – Schedule and Budget Management

Project Progress Report	
Purpose	Update project and related contract status, KPIs, risks, issues, and next month plans and goals
Frequency	Monthly
Author	Project Manager
Distribution	CIP Director and Program Controls Manager, with broader CIP Delivery Team, including Manager of Lifecycle Project Managers, Business Unit and, and impacted project teams accessing via PMIS (once available)
Format and Contents	See PMP Chapter 05 – Schedule and Budget Management

Design Progress Report	
Purpose	Update status of design, including detailed status of design contract (also applicable to planning phase contracts)
Frequency	Monthly
Author	Project Design Team
Distribution	Project Manager and Program Controls Manager
Format and Contents	See PMP Chapter 05 – Schedule and Budget Management and PMP Chapter 09 – Engineering and Design Management

Construction Progress Report	
Purpose	Update status of construction, including status of construction contract(s).
Frequency	Monthly
Author	Project Construction Management Lead (PCML)
Distribution	Project Manager, Program Controls Manager, and project CM team
Format and Contents	See PMP Chapter 05 – Schedule and Budget Management and PMP Chapter 14 – Construction Management

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Great Lakes Water Authority

Capital Improvement Plan

Program Management Plan

Chapter 05 – Schedule and Budget Management

Prepared for

Great Lakes Water Authority

Prepared by

AECOM

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Revision history

Revision	Revision date	Details
1.0	February 2022	Initial chapter as approved following CIPST reviews
2.0	July 2023	Revised for new Appendix B - CIP Reporting Workflow
3.0	July 2024	"9.4 Risk Impacts/Cost Contingency" added

Table of Contents

Acronyms

See the Overview Chapter for list of acronyms used in the PMP.

1 Introduction

1.1 Purpose

The Great Lakes Water Authority (GLWA) Capital Improvement Plan (CIP) **Program Management Plan (PMP) Chapter 05 – Schedule and Budget Management** establishes standard processes for developing the program schedule and budget and explains how project schedule and budget detail is incorporated, and how schedules and budgets will be managed, monitored, analyzed, and reported throughout the delivery of the CIP Program. The objective is to ensure that all CIP participants use common schedule and budget management procedures, terminologies, forms, formats, management systems and software, and other program management tools. By adhering to the PMP, all users will have the same understanding of the CIP schedule and budget management requirements.

Key management principles include:

- Project Managers are responsible for the development, management, and forecasting of the cost and schedule of their respective projects and for the accuracy of the information in the CIP Portal.
- The CIP Delivery Team Controls and Assurances team members, including the Program Controls Manager (PCM) and Schedule and Budget Management professionals, are responsible for assisting the Project Managers in the development, management, and forecasting of the cost and schedule of their projects.
- The CIP Program will use a standard Program Work Breakdown Structure (Program WBS) as the common basis and format for all schedules, budgets, contract scopes of work, invoicing, and reporting.
- The Program WBS will be aligned to the CIP delivery approach, and methods and phases of the CIP Plan, in a standard and consistent manner.
- CIP Program contracts will specify contract schedule and budget detail Work Breakdown Structures, reporting requirements, and software for consultants and contractors to integrate with the Program WBS to ensure input from contract schedules and cost are consistent and will interface with the Project Management Information System (PMIS).
- Program procedures provide for timely review and analysis of project schedule and cost updates, including standards for forecasting and reporting.
- GLWA and contractor/consultant responsibility for cost and schedule is assigned at the cost account and schedule activity level for accountability and transparency.
- The Master Program Schedule and Budget, and the detailed Project Schedules and Budgets, will provide visibility of forecast variances to current schedules and budgets.

2 Program Work Breakdown Structure

2.1 CIP Plan Development and Management

PMP Chapter 15 – CIP Planning and Development details how projects are prioritized and added to the CIP to create the CIP Program, including the supporting processes and procedures for management and approval by GLWA's Board of the CIP.

2.2 Program Work Breakdown Structure

The CIP's Master Program Schedule and Budget, including each of the project and contract schedules and budgets that make it up are to be based on the Program WBS general structure shown in **Appendix A – Program Work Breakdown Structure.** The Program WBS provides a structured framework, with common task and activity naming conventions, for estimating, budgeting, scheduling, scoping and invoicing, and reporting the status and performance of the projects and the various contracts within the CIP Program.

The Program WBS is to be structured such that the scopes, schedule, budget, progress measurement, and costs of contracts align accurately within a project. Therefore, while there may be some variation between projects and contracts, any Project WBS is required to conform to the Program WBS to the extent possible.

Project Managers are to work collaboratively with the Program Controls Manager when developing a contract scope and Project WBS to define a WBS and cost account structure (see Section 2.3 below) that is consistent with the capabilities of the financial reporting software, as well as meeting each of the reporting needs of the Finance and Program teams, thereby enabling the Program Controls Manager and Project Manager to track project progress.

The Project WBS is structured to incorporate more detail as projects are further defined and progress through the lifecycle. The Project WBS is also structured to accommodate unique project requirements without requiring major reconfiguration. A properly developed and maintained Project WBS helps ensure each project scope is fully accounted for and planned, and that scheduled activities and budgeted tasks are well defined and measurable.

The overall Program WBS levels are:

- Level 0 – CIP Program
- Level 1 – Portfolio or Sub-program (Water & Sewer)
- Level 2 – Programs or Collections of Projects that may need to be reported on together
- Level 3 – Project (CIP Number Level)
- Level 4 – Project Phase (to align with General Ledger [GL] Strings, Design [includes Study], Construction, GLWA Costs)
- Level 5 – Contract (Active or Planned)
- Level 6 – Schedule of Values (Grouping) – Task
- Level 7 – Schedule of Values (Sub Grouping) – Subtask
- Level 8 – Schedule of Values Line Item – Cost Account
- Level 9 – Activity (as needed)

The Master Program Budget and Schedule level of detail stops at Level 6. Activities for procurement of a contract in the Master Schedule are included at Level 5. Contractor's or consultant's schedules and Schedule of Values starts at Level 6, and depending on the complexity, may go directly to Level 9 as specified in each contract.

2.3 Cost Accounts (Contracts)

The lowest level of tracking within the cost system is the Cost Account. The cost accounts for all projects must align to the Program WBS. The Cost Account is the level at which cost is paid on a contract, usually referred to as the Line Item of the Schedule of Values (SOV). Depending on the complexity of the

contract, the Cost Account may be at Level 8, for complex contracts, or Level 6 or 7 for simpler contracts. Again, the Project Manager and Program Controls Manager are to work collaboratively when developing a cost account structure to ensure that it is consistent with the capabilities of the financial reporting software, as well as meeting each of the reporting needs of the Finance and Program teams, as well as the ability for the Program Controls Manager and Project Manager to track project progress.

A typical Cost Account on a complex contract may include:

123456.PH.C01T03S05L35

123456 = CIP# (Level 3)

PH = Phase (Level 4)

C01 = Contract (Level 5)

T03 = Task (Level 6)

S05 = Subtask (Level 7)

L35 = Line Item (Level 8)

In this example, contractors and consultants will only see T03S05L35 in their contract, but the prefix of 123456.PH.C01 will be in the background identifying the cost account so it fits in the Program WBS.

The Project Manager is responsible, with support from the Project Construction Management Lead for construction contracts, for verifying that the consultant or contractor provides accurate cost and schedule information on the cost account, consistent with the progress payment procedures described in PMP Chapter 09 – Engineering and Design Management and PMP Chapter 14 – Construction Management. By the Project Manager consistently tracking progress at the lowest level of the Program WBS, the Program reporting can be consistent in detail across projects and over time.

For each Cost Account on a contract, or Line Item in the SOV, the following are tracked:

- Original price as defined within the Contract Price
- Approved Changes
- (Approved Changes + Original Budget = Revised Budget)
- Percent Complete (for Lump Sum line items, the Percent Complete times the Revised Budget will equal the Accrued to Date. For Time and Material line items, the Percent Complete will be based on physical progress of the line item and will not be used to determine the Accrued to Date)
- Accrued to Date (the Accrued to Date becomes Actual to Date once GLWA's Construction Accounting & Financial Reporting [CAR] team approves the invoice for the period)
- Remaining Budget = Revised Budget – Accrued to Date
- Estimate to Complete (ETC)
- Estimate at Completion (EAC) = Actual to Date + ETC
- EAC Variance = Revised Budget – EAC
- Original Start and Finish Dates as defined in the Baseline Schedule
- Revised Start and Finish Dates (As modified by any Approved Time Extension. Initially the same as the Original Start and Finish dates.)

- Actual Start and Finish Dates (As approved during the monthly reporting cycle)
- Current Start and Finish Dates (From the monthly update of the schedule)
- Finish Variance = Revised Finish Date – Current Finish Date

Cost Accounts are created at Level 5 (Contract) for GLWA CIP Program staff costs and other GLWA costs including GLWA salaries, non-GLWA staff costs, etc., which are allocated to each CIP project. The actual costs for these accounts are provided monthly by the GWLA CAR team as GL Strings. Cost Accounts may also include additional coding to map to items such as Construction Specifications Institute's (CSI's) Master Format divisions, or other areas as needed.

2.4 Schedule Activities

The lowest level at which a schedule is controlled for a contract is the Schedule Activity, which is also the lowest level of the schedule to align with the Program WBS. When the contract requires a cost-loaded schedule, then there must be a Cost Account for each and every Schedule Activity.

To support consistent reporting across projects within the Program Master Schedule, contracts must be detailed in the Master Program Schedule at the Schedule of Values (Grouping) Level 6. Typically this should be just a few line items including: Mobilization, Project Execution (Design or Construction), Construction Assistance, Closeout (from Substantial Completion to Final Completion), Startup and Commissioning, and Allowances.

Tasks and subtasks/activities are organized and coded so they can be sorted by contract, which facilitates management and reporting of individual contracts. Consultant scopes of work and contract schedules and budgets will be developed to the Subtask level (Level 7), and subtasks can be broken down further for large contracts for more schedule control. Construction schedules and budgets will adhere to the SOV specified by the construction contracts with a summary level schedule and standard program milestones reported in the Master Program Schedule. Construction budgets in the Master Program Budget will be at the Task level (Level 6).

Separate tasks are established for each consultant providing services on a project to isolate their respective contracts for reporting. This would also include task orders developed from master contracts that are used for services on more than one project. Consultant contracts that address work for multiple projects ("one to many" relationship) will be structured so that budgets and costs can be readily allocated to the appropriate project phases and tasks, in accordance with the Program WBS.

The schedules and budgets for the program management contract, or any other contracts for engineering studies, environmental studies, public outreach, pilot projects, etc. not included in design contracts, will conform to the WBS for the individual contracts.

The following Schedule Activity is tracked for each contract:

- Baseline Start (Notice to Proceed [NTP]) and Finish Dates as baselined at contract inception
- Approved Time Extensions
- Approved Start and Finish Dates (As modified by any Approved Time Extension. Initially the same as the Original Start and Finish dates.)
- Physical Percent Complete – On cost-loaded schedules the Physical Percent Complete is used to calculate the Accrued to Date for payment purposes
- Original Duration (As Bid)

- Remaining Duration
- Actual Start and Finish Dates – Accepted by the Project Manager on a monthly basis
- Expected Finish – For activities that have started
- Forecast Start and Finish Dates (from the monthly update of the schedule)
- Finish Variance = Approved Finish Date – Forecast Finish Date
- Schedule relationships between activities
- Long lead items
- Critical path activities
- Relationships with other activities or projects

The Project Manager is responsible, with support from the Project Construction Management Lead for construction contracts, for verifying that the consultant or contractor provides accurate cost and schedule information for each activity, consistent with the progress payment procedures described in PMP Chapter 09 – Engineering and Design Management and PMP Chapter 14 – Construction Management.

2.5 Project Phases

The key tasks/activities listed below can be revised as needed for a specific project.

GLWA Costs

- GLWA Salaries – Direct Labor
- GLWA Salaries – Fringe
- Non-GLWA Costs not directly related to a phase below, such as program management consulting costs.

Design Phase includes:

Study:

- Developing the project description and scope of the project
- Conducting feasibility studies and alternative analysis evaluations
- Conducting engineering or technical studies, if required
- Developing the scope of work for design and Request for Proposals (RFP)
- Procuring a Project Design Team (if required)
- Negotiating and awarding the design contract (if required)
- Developing conceptual project cost opinions and schedule

Design (may overlap construction phase for design-build projects):

- Designer's work to produce the Preliminary Design Report
- Project cost and schedule baseline
- Design stage deliverables and construction bid documents
- Construction schedules and cost estimates evolving with each design stage
- Design deliverable reviews and other reviews (e.g., constructability and Value Engineering)
- Permitting activities
- Construction management pre-construction tasks (if the Project Construction Management Team is on-board during the design phase)
- Tasks and activities for bid assistance and to solicit and award bids for construction

- Tasks and activities as required to formulate separate contracts for long-lead materials and equipment
- Land and easement acquisition activities (if required)
- This phase also includes determination of GLWA procurement of pre-purchased long-lead materials or equipment. GLWA procurement costs would be captured in GLWA Costs under the Non-GLWA category.

Construction Phase includes:

- Engineering services during construction (as defined in PMP Chapter 09 – Engineering and Design Management)
- Construction management work
- Construction contracts – with further detail as defined per the Project WBS
- Pre-purchased materials or equipment contracts necessary to complete the construction of a project, including testing, commissioning, and startup
- Associated startup, commissioning and training
- Closeout including all of the work necessary to close out each of the professional services and construction contracts for the project

3 Project Initiation

The first step that commences the Study Phase is Project Description Approval. The Project Description Approval form is prepared by the Project Manager following Program Procedure 0501. The Project Description describes the need for the project, the project scope, a preliminary phase level project schedule and budget, a description of relationships to other projects in the CIP Program, and the proposed design stages. The Project Description Approval also includes a list of project-specific risks that the Project Design Team (internal or external) will consider in its concept development for each project.

The Project Description Approval will also address any project engineering planning or technical studies required to scope the design services, which entity will perform such studies, and the contracting plan for the design services (consultant contract or in-house design). The preliminary schedule must show task level detail for the Project Initiation (Study) Phase for any engineering planning or technical studies, and task level detail for the procurement of design services.

The Project Description Approval is reviewed and approved by the project's Business Unit Director and the CIP Director, with input from the Program Controls Manager and Construction Accounting & Financial Reporting Manager and other CIP Delivery Team members as needed, and constitutes the authorization to initiate the project by establishing a budget to perform the Study Phase. At this point the project is assigned a CIP Project Number following Program Procedure 0502. The information within the Project Description is used to develop the scope of work, and RFP if needed, for the engineering team, internal or consultant, that will perform the Planning Phase studies.

Project descriptions should be revised and re-approved if engineering planning or technical studies change the project scope significantly.

4 Master Program Schedule

The Master Program Schedule establishes the sequence of projects, tasks, subtasks, and activities to represent the work plan for implementing the overall CIP and the relationships among projects**.** PRISM will be the reservoir for all costs, including actual costs, and will import schedule data from the Master Program Schedule. This will facilitate cash flow forecasting of all budgeted work. The Program WBS in the Master Program Schedule will allow for reporting on an enterprise, program, project, or contract level. The Master Program Schedule includes Preliminary and Approved Project Schedules that collectively are the current Master Program Schedule.

The Master Program Schedule:

- Contains task level schedules of the projects, and other works that potentially could influence the scheduling of the Program
- Contract procurement data will be based on the Procurement SmartSheets Tracker maintained by GLWA
- Identifies and establishes project inter-relationships and links
- Establishes when projects start and when they are to be completed
- Is cost-loaded with budget information to develop cash flow projections. Actual costs will be maintained in PRISM.
- Contains the schedule data as defined by the format for Project Schedule

Outputs from the Master Program Schedule include:

- Current start and finish dates with Gantt schedule (includes current forecast and baseline dates)
- Percent progress achieved
- Forecast start and finish dates (actualized) with Gantt schedule
- Finish variance in days
- Cash flow projections are developed in PRISM based on the cost-loaded schedule updates from consultants and contractors
- Schedule key performance indicators

The Master Program Schedule is maintained by the Program Controls Manager based on project schedule input provided by the Project Managers and Project Construction Management Leads.

5 Project Schedules

Project schedules collectively make up the Master Program Schedule and provide the sequence of tasks and activities required to complete deliverables and comply with the overall Program schedule objectives. For design, the schedule is based on the stages of the design, the design work scope requirements, and milestones of key deliverables. For construction, the schedule must meet the requirements of the contract, specifications, and the items below. Program Work Breakdown Structure provides the standard tasks, subtasks, activities, and milestones for project schedules. These can be modified for project-specific requirements with approval of the Project Manager and the PCM.

5.1 Standard Project Key Deliverables

The standard project development lifecycle and key deliverables generally reflected in a schedule for a project include the detail listed below. The project Manager is responsible for reporting the progress of the following items, even where the actual performance of the task is another entity or GLWA Team.

Design-Bid-Build Projects

5.1.1 Design

5.1.1.1 Project Initiation (Study) Key Deliverables

- Project Description
- Scope of Work for Design Services
- Preliminary Schedule
- Preliminary Budget
- Request for Proposal for Design Services
- Approved agreement for Design Services (e.g., Board Approval, Contract Execution)
- Engineering or Technical Studies, if required

5.1.1.2 Design Key Deliverables

- Design Work Plan
- Design Quality Plan
- Draft Preliminary Engineering Report
- Final Preliminary Engineering Report
- Baseline Schedule and Budget
- Project Risk Plan and Risk Register
- Geotechnical Report (if required)
- Survey (if required)
- Design Deliverables Submittals (30%, 60%, 90%, Final Bid Documents including technical specifications) as defined in the scope and PMP Chapter 09 – Engineering Design Management
- Construction Schedules and Estimates
- Environmental Compliance and Management Plan
- Permits
- Land and Easement Requirements
- Other deliverables as required by the Contract and PMP Chapter 09 – Engineering Design Management

5.1.2 Construction

5.1.2.1 Construction Key Deliverables

- Advertisement for Bids
- Pre-Bid Conference
- Recommendation for Award
- Agreement for Construction Contractor Services
- Procurement of Construction Contractor
- Agreement for Project Construction Management Services (if external)
- Procurement of Project Construction Management Services Contract

- Project Construction Management Plan
- Construction Management Quality Management Plan
- Construction Management Safety Plan
- Notice to Proceed
- Contractor's approved schedule
- Contractor's Construction Quality Plan
- Contractor's Safety Plan
- Other submittals as defined by the contract and PMP Chapter 14 – Construction Management
- Risk Register

5.1.2.2 Closeout, Start-Up, and Commissioning Key Deliverables

- Testing, Start-up, and Commissioning Plans
- Operations and Maintenance (O&M) Manuals and Training
- Substantial Completion Certificate and Punch List
- Certificate of Occupancy
- Final Inspection and Closeout Submittal
- Contractor Final Payment
- Warranties
- Final Record Drawings Including Building Information Management (BIM) Data
- BIM Information for Asset Management (as required)
- Closeout Documents for all Consulting Contracts

5.2 Project Schedule Report Format

Project schedules will be developed with the following format:

- Current Approved Start date
- Current Approved Finish date
- Forecast/Actual Start date
- Forecast/Actual Finish date
- Percent Complete
- Finish Variance in days (Forecast Finish – Current Finish)
- Gantt chart to show current schedule and forecast schedule
- Vertical line to show the data date

A cost-loaded updated contract schedules should be submitted by the consultant or contractor with their progress payment application, following the schedule defined in Section 10 below. Schedule updates will identify the project name and the reporting period (e.g., December 2019) and "Preliminary" or "Baseline" as appropriate defined in Section 6.1. If the Payment Requisition is not agreed to by the 10th working day of the month, at the latest, the Project Manager is responsible to provide the CAR team and the Program Controls Manager with their estimate of the accrual cost to date for the month.

6 Schedule Development

Schedule development begins with a preliminary project schedule that is further developed with more detail until it is baselined, typically after the Preliminary Design Report is complete in the Design Phase. While schedule re-baselining will occur at approved points throughout the project, changes are to for only for approved reasons that have been standardized across the program, as detailed below.

6.1 Project Schedule Development

The Preliminary Project Schedule is a deliverable during project Initiation, discussed in Section 3 above. The Preliminary Project Schedule is prepared to the Phase level, with task and activity detail, and milestones, and submitted in accordance with PMP Chapter 15 – CIP Planning and Development. The Project Design Team, whether internal or consultants, will prepare and submit activity level schedules for the complete project through construction, in hardcopy and electronic format using Primavera P6 Version 15.1, although the Project Manager may approve the use of Microsoft Project 2010 for smaller projects. The Program Controls Manager will assist internal Project Design Teams in preparing the schedule. The schedule will reflect the requirements of the contract and the program milestones and be developed to a detail agreed upon by the Project Manager.

The Planning Phase will result in project alternative decisions. The chosen alternative may require changes to the designer's scope of work for design and project schedule. The Project Design Lead will work with the Project Manager to update the Preliminary Project Schedule to reflect the final scope of work for the design services.

6.2 Schedule Requirements

Consultant and contractor schedules must, at a minimum:

- Be provided in Primavera P6, Version 15.1 or latest compatible, although the Project Manager may approve, in consultation with their Director, use of Microsoft Project 2010, or later, for smaller projects or the Design Phase as long as this is included in the scope development and defined in the contract.
- Include a Gantt chart with, as a minimum, activity number and code identification, description, duration, critical path, early start, early finish, late start, late finish, and total float.
- Have a Preliminary Project Schedule that establishes the proposed contract packages with activities for subconsultants or subcontractors.
- Assign reasonable durations to activities for permits and licenses from authorities, departments, and any other agency.
- Logically linked and sequenced activities with a minimum of lags
- Keeps imposed start and finish constraints to an absolute minimum and only use them when a logical constraint is not applicable.
- Show all contractual milestones including interim milestones.
- Show interface activities with other consultants, contractors, and third parties.
- Schedule and code activities in alignment with the accepted Program WBS.
- Use retained logic
- Avoid the use of negative lag and positive lead.
- Provide progress 'S' curve.
- GLWA retains ownership of schedule and budget contingencies.
- Project total float is a shared project resource that will be used by whoever reaches the activity first as long as there is no gross abuse in its usage.

6.3 Schedule Contingency

The consultant and contractor schedules will not include any schedule contingency unless the Project Manager, in consultation with the CIP Delivery Team Program Controls Manager, chooses to have the consultant or contractor include some contingency when dealing with hard deadlines, such as Equipment Shutdown Requests or deadlines with stipulated penalties, such as Consent Decree deadlines. The

Project Manager may include schedule contingency in the overall project schedule, with approval of his or her Business Unit Director and the Program Controls Manager.

6.4 Cost Loading Requirements

For consulting contracts, costs will be loaded at the task level, unless other level budgets have been negotiated for a particular contract. Contractors, including design-build (DB) contractors, will load costs and resources as required by the Construction Scheduling specification of the contract and must add up to the Schedule of Values. Activities in the schedule must be coded to the respective Schedule of Value line items in accordance with the Project WBS.

6.5 Review and Approval

Consultants will submit their schedules to the Project Manager for review and approval. Contactors will submit their schedules to the Project Construction Management Lead for review and approval following Program Procedure 0505.

Schedules are reviewed for compliance with program milestones, requirements of contracts, and this PMP. Schedules that do not comply with program milestones or contract requirements will be returned for further development.

Approved Project Design Team, consultant, and contractor schedules become the approve Project Schedule. A summary of the Project Schedule as modified by the Project Manager is the basis to track and report progress and to update the Master Program Schedule.

6.6 Baseline Project Schedules and Changes

Project schedules are considered to be Preliminary Project Schedules through completion of the Preliminary Design Report for design-bid-build (DBB) projects and Bridging Documents for DB projects. When the Project Manager approves the Preliminary Design Report and the associated updated Project Schedule, the Project Manager will submit the revised schedule for approval as the Baseline Project Schedule by his or her Business Unit Director, the CIP Director, and Program Controls Manager following Program Procedure 0503. The Program Controls Manager reviews the Baseline Project Schedule within the Master Program Schedule and provides the Project Manager with an analysis of any impacts to other “linked” projects.

At various stages of a project, changes to the baseline schedule may be needed to reflect a realistic current schedule plan and to reflect increased knowledge of the project schedule. Acceptable causes for changing a Baseline Project Schedule include the following:

- Key project milestones:
    - Design: Updated preliminary opinions of probable project schedule received at the key design milestones (as defined in PMP Chapter 09 – Engineering and Design Management)
    - Procurement: Actual contract schedules as defined at the time of contract award
    - Construction: Approved Change Orders for time.
- A significant change in project scope requiring redesign of major project elements and additional time to incorporate the changes, or that increase construction time.
- External constraints, such as land acquisition, or unforeseen budget constraints, result in placing the project on hold.

- The construction contract NTP date differs significantly from the construction NTP date at time of bidding.

Unacceptable causes include the following:

- Schedule variance due to consultant or contractor poor performance. In these cases such variances are to be addressed by the Project Manager through available contractual mechanisms, such as requiring the consultant or contractor to provide a recovery schedule. If all contractual mechanisms have been exhausted, and with appropriate approvals as defined below, a Baseline Change may be approved if the current baseline is no longer realistic.
- Review times of deliverables exceed the planned duration.

The Project Manager prepares a Project Baseline Revision Approval when seeking to revise the project schedule baseline, following Program Procedure 0504. The Project Baseline Revision Approval is reviewed by the Program Controls Manager and approved by the project's Business Unit Director and the CIP Director. The Program Controls Manager reviews the revised Baseline Project Schedule within the Master Program Schedule and provides the CIP Director with an analysis of any impacts to other "linked" projects. If approved, the Program Controls Manager updates the Project Schedule by revising Current Start and Current Finish dates as needed. If not approved, any variance to the approved schedule will continue to be reported and managed by the Project Manager.

7 Master Program Budget

The Master Program Budget reflects the budgets for the projects and program tasks. The Master Program Budget will allow for reporting on an enterprise, programs, project, or contract level. The Master Program Budget includes Preliminary and Baseline Project Budgets that collectively are the current Master Program Budget.

The Master Program Budget:

- Includes all program, project, and contract task budgets and cost data.
- Reflects the work scopes and contract budgets.
- Is updated each month to reflect actual costs and estimates at completion.

Outputs from the Master Program Budget include:

- Current budget
- Actual costs
- Percent progress achieved
- Cost forecasts at completion
- Forecast variances
- Budget key performance indicators

The Master Program Budget is maintained by the Program Controls Manager based on project actual costs provided by the CAR team and forecast input provided by the Project Managers through their updated project cost-loaded schedules.

8 Project Budgets

Project budgets are individually and collectively incorporated into the Master Program Budget. Program Work Breakdown Structure provides the standard tasks and subtasks for project budgets. These can be modified for project-specific requirements with approval of the Program Controls Manager.

8.1 Project Budget Report Format

Project Budget Reports are produced monthly by the Project Manager, with support from the CIP Group, based on updated monthly contract costs data and follow the following format:

- Original Budget
- Approved Changes
- Current Budget
- Cost to Date (includes costs paid and accrued costs. Accrued costs include costs invoiced but not paid and costs incurred but not invoiced.)
- Percent Spent
- Percent Complete
- Estimate to Complete (ETC)
- Estimate at Completion (EAC)
- Variance

Budgets are updated each month to the timeline detailed in CIP Reporting Workflow. Budget updates will identify the project name and the reporting period (e.g., December 2019) and “Preliminary” or “Baseline” as appropriate defined in Section 9.

9 Budget Development

9.1 Project Budget Development

The Preliminary Project Budget is a deliverable during Project Initiation. The Preliminary Project Budget is prepared by the Project Manager to the Phase level and submitted with the Project Description for approval by his or her Business Unit Director and the CIP Director in accordance with PMP Chapter 15 – CIP Planning and Development. The budget will reflect the requirements of the contract and the program milestones and be developed to a detail agreed upon by the Project Manager.

Preliminary Design will result in project alternative decisions. The chosen alternative may require a change to the Project Design Team’s scope of work for design and to the budget. The Project Design Team will work with the Project Manager to update the Preliminary Project Budget that incorporates the final scope of work for the Design Phase and other project phases, other consulting tasks (if required), according to the Program WBS requirements, and submits it with the Final Preliminary Design Report. The project budget is developed through the Design Phase following the processes detailed in PMP Chapter 09 – Engineering and Design Management and as defined by the Association for the Advancement of Cost Consulting International (AACE) Recommended Practice No. 18R 97: Cost Estimate Classification System – As Applied in Consulting, Procurement and Construction for the Process Industries.

9.2 Client Costs

Client-provided costs will be linked to PRISM software via GLWA GL Strings for the CIP project as provided by the CAR team.

9.3 Budget Guidelines

To provide consistency among projects for development of initial project budgets, the following general guidelines will be used. The percentages are based on the initial estimate of construction.

Design	12% (includes Engineering Services during Construction)
Construction Management	10%

9.4 Risk Impacts/Cost Contingency

The cost contingency memorandum outlines a consistent approach to applying contingency in GLWA contracts and recommending appropriate amounts.

Ideally, quantified risk cost impacts are used to establish contingency. The amount of risk impact will be generated through the risk evaluation process, described in PMP Chapter 08 – Risk Management.

9.5 Baseline Project Budgets and Changes

Project budgets are considered to be Preliminary Project Budgets through completion of the Preliminary Design Report for DBB projects and Bridging Documents for DB projects. When the Project Manager approves the Preliminary Design Report and the associated updated project budget, the Project Manager will submit the revised budget for approval as the Baseline Project Schedule by his or her Business Unit Director, the CIP Director, and Program Controls Manager following Program Procedure 0503. The Program Controls Manager reviews the Baseline Project Budget within the Master Program Budget and provides the Project Manager with an analysis of any impacts to the overall CIP budget.

At various stages of a project, changes to the baseline budget may be needed to reflect a realistic current budget. Acceptable causes for changing a Baseline Project Budget include the following:

- Key project milestones:
    - Design: Updated preliminary opinions of probable project cost received at the key design milestones (as defined in PMP Chapter 09 – Engineering and Design Management)
    - Procurement: Actual contract costs as defined at the time of contract award
    - Construction: Approved cost Change Orders.
- A significant change in project scope requiring redesign of major project elements and additional budget to incorporate the changes, or that increase project cost.
- External constraints, such as land acquisition, or unforeseen budget constraints, result in placing the project on hold.

Unacceptable causes include the following:

- Cost variances due to consultant or contractor poor performance or unapproved changes.

The Project Manager prepares a Project Baseline Revision Approval when seeking to revise the project budget baseline, following Program Procedure 0504. The Project Baseline Revision Approval is reviewed by the Program Controls Manager and approved by the project's Business Unit Director and the CIP

Director. The Program Controls Manager reviews the revised Baseline Project budget within the Master Program Budget and provides the CIP Director with an analysis of any impacts to other “linked” projects or impacts to overall CIP budget. If approved, the Program Controls Manager updates the Project budget. If not approved, any variance to the approved budget will continue to be reported and managed by the Project Manager.

10 Schedule and Cost Updates

10.1 Project Schedule Updates

Schedules are updated monthly by each consultant and contractor as appropriate for their portion of the project schedule. These updates include actual activity start and completion dates, percent progress complete, expected finish dates of all in-progress activities, and forecast start and/or completion dates of activities not yet started. The forecast dates of activities not yet started can be updated by the schedule logic if verified to be correct.

Designers, consultants, and contractors will provide updates to the approved schedules at the end of the reporting period and following the timeline detailed in CIP Reporting Workflow. The schedule is to be progressed (activity percent complete through the end of the reporting period and needs to be submitted as a PDF file format until it can be electronically entered via the PMIS. The Schedule Update must be attached to the Payment Requisition, which must be submitted following the timeline detailed in CIP Reporting Workflow. If the Payment Requisition is not agreed to following the timeline detailed in CIP Reporting Workflow, the Project Manager must provide the CAR team and the Program Controls Manager with the accrual cost to date for the month.

10.2 Project Schedule Reviews

Designer and consultant schedule updates will be reviewed by the Project Managers for progress and forecasts. Contractor schedules are reviewed by the Project Construction Management Team. The Project Managers will use consultant and contractor schedules, modified as necessary by the Project Manager to reflect the most accurate forecast, to update the project schedules in the Master Program Schedule. The Project Manager will update the construction duration through the Design Phase based on the construction schedule submitted with the latest design stage deliverable.

Once all project schedule updates have been provided, the Program Controls Manager updates all program tasks to generate the Master Program Schedule update for inclusion in the Program Status Report. The Program Controls Manager also drafts the program level schedule variance section of the Program Status Report for discussion with the Business Unit and CIP Directors. The Program Status Report should highlight the most significant project schedule variances and any schedule impacts to other projects whose schedules are linked to another project. The Program Controls Manager is accountable for analyzing the Master Program Schedule and identifying any consequential schedule impacts when producing the Master Program Schedule update. The Program Controls Manager will immediately notify affected Project Managers of any apparent schedule impacts to their respective projects caused by variances in linked projects.

10.3 Project Cost Updates

Consultants are to provide accrued costs (costs invoiced but not yet paid and costs incurred but not invoiced) at the end of the reporting period following the timeline detailed in CIP Reporting Workflow. Consultants will also provide an ETC for all budgeted tasks and subtasks (not required for

Lump Sum tasks). The Schedule Update must be attached to the Payment Requisition, which must be submitted following the timeline detailed in CIP Reporting Workflow. If the Payment Requisition is not agreed to following the timeline detailed in CIP Reporting Workflow, the Project Manager must provide the CAR team and the Program Controls Manager with the accrual cost to date for the month.

Each Project Construction Management Team provides accrued costs and an ETC for construction contracts and ETC for construction contingency. The Project Manager is to review the accrued to date and ETC information and forward the updates to the Program Controls Manager.

GLWA staff costs come from GL Strings provided by the CAR team monthly. The Project Managers are responsible for reviewing the actual costs for these accounts and provide ETC information to the Program Controls Manager.

When all project cost updates are provided, the Program Controls Manager is to update all program task costs and forecasts and produce the Master Program Budget for inclusion in the Program Status Report. The Program Controls Manager also drafts the program level budget variance section of the Program Status Report for discussion with the Business Unit and CIP Directors, highlighting the most significant project budget variances.

10.4 Timeline for Schedule and Cost Updates

The required timelines for monthly CIP reporting are detailed in CIP Reporting Workflow**.**

11 Schedule and Budget Management

Schedule and budget management includes processes and procedures for monitoring and controlling costs and schedules. These include:

- Identifying budget and schedule trends
- Measuring progress
- Updating actual costs
- Forecasting ETC
- Analyzing variances
- Managing changes

Managing schedules and budgets will be based on a system of review, analysis, and reporting that will summarize the historical position, at any point in time, but more importantly, will address the future environment into which the CIP Program is projected to progress. To enable a rational projection of the future schedule and cost environment, processes are defined for trending, measuring progress, forecasting, analyzing variances, and managing changes and contingencies.

11.1 Issues Management

An Issue is an event that is occurring that requires one or more actions to address. An Issue may result from a risk that has occurred, a Request for Information (RFI), a variance trend, external issues, or other significant event that is not yet a proposed change. It will often have a potential schedule and/or cost impact. Issues are documented by the Project Manager for consulting contracts, or Project Construction Management Team for construction contracts, in an Issues Log for the project and should be part of the

agenda for progress and status meetings. At the status meeting, the Issues Log is to be discussed, with potential impacts identified and plans for addressing the issues identified, what action is required, and who is responsible. The Issues Log tracks when an Issue was opened and how long it has been open. The Project Manager is responsible for proactively managing Issues to minimize the time they are open. Issues Logs are required to be submitted with the Project Progress Report and Construction Progress Report.

11.2 Cost and Schedule Trending

Cost and schedule trending is a technique used to quantify project Issues that have the potential to become Changes. The objectives of trending are to:

- Provide early warning of potential changes and the need for corrective action.
- Minimize unexpected cost and schedule fluctuations.
- Provide documentation for cost and schedule forecasting and project reports.
- Provide a history of cost and schedule evolution.

All stakeholders, members of the CIP Team, and project team members have a responsibility to identify cost and schedule trends. Trends may result from construction RFIs or value engineering (VE) proposals, analysis of the rate of expenditure of unit price items or allowance items vs. progress, actual vs. planned schedule progress, or quality issues; in short, any significant event that has been identified as an Issue that the Project Manager or Project Construction Management Lead believes has a high probability of becoming a proposed Change to a project budget or schedule or to a contract.

Initial identification should be in the form of an Issue that is included in the Issues Log with an estimated cost and/or schedule impact. Not all Issues will become Changes, but those that do mature to a reasonable degree of certainty with a quantifiable cost and/or schedule impact will be identified as a cost or schedule trend. Open trends are analyzed when reviewing cost and schedule updates, for forecasting contingency, and submitting project forecasts to the Program Controls Manager. When a cost or schedule trend reaches the stage of formal notification by a consultant or contractor through a Change Request, or receipt of a Work Change Directive, the Change Order Process begins and the trend (Issue) is closed.

Open risks are events that have not yet occurred, and are not trends, and should not be included with or duplicated by open Issues.

11.3 Measuring Progress

Progress is measured at the lowest level of the Program WBS that is scheduled at any point within the project life cycle. Progress is the percentage of the work achieved of an individual task or activity. Although the Project Manager is responsible for progress measured for his or her projects, there are various sources of progress measurement depending on the task or activity. Therefore, progress measurement and reporting is a collaborative effort of the consultants, Project Construction Management Team, and Project Manager. The Project Manager is responsible for reporting on progress for Program Tasks. For in-house Preliminary Design or Design, the Project Manager will work directly with the Project Design Leader to update progress.

The nature of a task or activity dictates which method is appropriate. The following methods are used to measure progress:

- **Duration** – Used for tasks/activities without definable deliverables. Progress is measured by the percentage of time spent relative to the current approved schedule duration. Examples include Construction Management tasks, Project Management, Design Services during Construction, design reviews, and procurement activities. Duration should not be used for design tasks or for construction. Activity % Complete = (Original Duration – Remaining Duration) / (Original Duration) For example, if an activity with 10 days Original Duration is updated to show that now it has a Remaining Duration of 8 days, then its percent complete = (10 – 8) / 10 = 20%.
- **Physical Percent Complete** – This type represents the actual work accomplished for the activity and is used when quantifiable deliverables are involved. In this case, the actual work done, the remaining duration, and the percent complete are all specifically entered. During Design, the designer defines the basis of progress measurement used for each task or activity in the Design Work Plan. Progress is then based on physical work completed, sheet counts, page counts, or combinations thereof. During Construction, the basis of progress measurement is defined in the contract. The percent complete of each line item in the Schedule of Values is jointly assessed with the contractor on a monthly basis.
- **Units Percent Complete** – This type is used when resources are assigned and progress is based on actual units performed. For example, cubic yards of fill.

Progress is updated as of the closing date of a reporting period (data date).

11.4 Forecasting

Forecasting is a “bottom-up” process that determines what the schedule and the costs will be at the completion of a project. The duration of a task or activity may be revised, or delays in one activity may affect the start and completion date of a successor activity, or possibly the entire project if it is on the critical path. Forecasting schedules requires determining when a task or activity is most likely to be completed, the Expected Finish Date. Forecasting costs requires estimating the ETC for remaining budgeted work. When the ETC is added to Actual Costs, the EAC is calculated. Schedule forecasting incorporates progress, schedule trends and Changes, and risk impacts to the schedule. Cost forecasting incorporates ETCs and Changes. Forecasting cost contingencies incorporates cost trends and remaining risks.

Forecasting often results in variances from an approved budget and schedule. Knowing a variance gives the project teams and management insight to potential performance issues, and foresight as to the eventual outcome of a project’s cost and schedule. The nature and cause of a variance introduces an opportunity to plan for or reduce the eventual affects.

Forecasting is performed at the lowest (most detailed) level of the Program WBS that is budgeted or scheduled at any point within the project life cycle by the same person or entity providing monthly cost and schedule updates. The Project Manager has overall responsibility to ensure that forecasting is performed according to Program standards and procedures, and for the overall quality of cost and schedule forecasting for his or her projects, and the Program Manager is responsible for Program task forecasting.

11.4.1 Forecasting Schedules

Schedule forecast completion dates are determined based on the progress percent complete and the estimate of the amount of time to complete a task or activity. To estimate a completion date, the amount of remaining work must be determined along with the duration to complete the work. Relationships to other

tasks or activities, their forecast start, and/or completion are also considered, and those tasks and activities are forecast accordingly, or forecast adjustments to other activities are verified by the schedule logic. This process is repeated for all active and not yet started work each month projecting forward from the data date.

Factors affecting schedule forecasts include:

- Resources (people and person hours) to complete the work and their availability
- Productivity, as measured on completed activities
- Remaining activities and when they can be started and completed
- Effects of Changes not incorporated into the baseline
- Schedule trends
- Changes to work not yet initiated (e.g., construction schedules submitted and reviewed during Facility Planning and Design)
- Durations of tasks that are dependent on completion of other work (e.g., Construction Management tasks dependent on construction schedules)
- Forecast delays to the start of, or durations greater than approved durations, for a future task

11.4.2 Forecasting Costs

Costs are forecast from the data date (closing date of a reporting period) through completion of a budgeted task. The ETC includes the costs needed to complete the remainder of the original work, changes that have been approved if not included in a project baseline revision, and proposed and pending Changes. Any planned budget adjustments to a consultant's task budgets should be forecast when known until the task budgets are formally revised by an approved Change Order.

Construction estimates are refined and updated during the Design Phase, and the results used to forecast construction and construction management costs. The designer forecasts the latest construction cost estimate during the appropriate reporting cycle that corresponds to the month the latest construction estimate is submitted. The EAC for construction will also be increased between the 30%, 60%, and 90% completion stages if the designer is aware of a cost increase and can quantify the increase. The EAC for construction management contracts not yet awarded will also be increased if the value is based on a percentage of the construction estimate.

During construction, the EAC of the construction contract is the sum of the current contract amount plus the value of all Changes (Approved, Pending, and Potential). Cost trends should be used to forecast contingency needed at the CIP level.

11.5 Analyzing Variances

The value of project progress data and cost and schedule forecasts is in understanding the status and performance of projects. Analysis considers what has occurred (progress and actual costs), what is occurring (variances and variance trends), and what is expected to occur (forecasts), and provides the project teams with an objective view of the status of their projects.

Variances are differences between a forecast and an approved baseline. Variances can be positive (a forecast that is less than budget or ahead of approved schedule) or negative (a forecast that is more than budget or later than approved schedule). Schedule and cost variances require explanations of causes and effects. Cost forecasts will also generate updates to the budget contingency status that will be tracked and reported.

The Program Controls Manager provides CIP Delivery Team managers with cost and schedule variance reporting, identifying variances of which management must be aware. The analysis step becomes most beneficial when Program Controls works with the Project Managers to interpret the results of what is occurring.

The cost and schedule analytical process includes:

- Quality assurance review by the Project Manager of project updates reported by the Project Design and Construction Management Teams
- Validation by the Program Controls Manager, as needed, of progress, cost, and schedule data input to the Master Program Schedule and Budget
- Identification of variances between forecasts and baselines for the Master Program Schedule and Budget
- Determination of variance trends at the program level
- Identification of variance and variance trends
- Comparison of EAC with approved cost and schedule budgets

11.6 Management of Variances

11.6.1 Management of Variances at the CIP Program Level

If significant variances at the CIP Program level are identified per Section 11.5, the CIP Director will work with the impacted Business Unit Directors to identify proposed mitigation actions, potentially including:

- In the case of significant spending underruns, potentially advance other “shovel-ready” contracts to makeup cost underruns
- Delaying and/or cancelling lesser-priority contracts to make up for cost overruns

Proposed management actions will be submitted to the Chief Planning Officer and impacted Business Unit Chiefs for approval. Any changes to the configuration of the projects in the CIP Plan will be addressed during the Annual Alignment meeting, per PMP Chapter 15 – CIP Planning and Development.

11.6.2 Management of Variances at the Project Level

If significant variances at the project level are identified per Section 11.5, the Project Manager, with support from the Program Controls Manager, is to use mitigation actions, including schedule recovery, acceleration, scope adjustments, where available under the contract terms, to drive Contractor recovery. Proposed management actions will be submitted to the Project Manager’s Director for approval.

A key step, as supported by the Contract documents, is for the Project Manager to require the Contractor to submit a Recovery Schedule. A Recovery Schedule is prepared by the Contractor and clearly defines the means by which the Contractor intends to regain compliance with the schedule. The Recovery Schedule should clearly indicate changes to working hours, working days, crew sizes, equipment required to achieve compliance, and date by which recovery will be accomplished.

During the period when the contractor’s recovery to plan is being tracked, the Project Manager, with input from the Program Controls Manager, may require the contractor to implement daily production tracking for the activities / definable features of work (DFOW) which are driving the critical path. As part of this daily tracking, with key commodity quantities to be tracked daily, typically in an Excel tracker, the contractor should provide a graph/data set that defines their cumulative baseline production for each work day (demonstrating how they were planning to achieve original schedule), actual cumulative progress by day as

well, as well as a documented recovery schedule. This daily tracking of key commodity installation should continue until such time that the Contractor has demonstrated an ability to consistently complete work in accordance with their recovery schedule (or baseline in the case of critical work/shutdowns).

11.7 Variance Trend Analysis

On a monthly basis, the Program Controls Manager will compare the EAC of this period versus the EAC of the previous month to detect what occurred during the month. Similarly, the finish variance between the Revised Baseline and the Current Forecast Finish date will be compared against last month's variance to detect trends. This comparison will provide invaluable information on the history of the project and its improvement or decline during the period.

11.8 Change Management

PMP Chapter 06 – Change Management describes the processes for identifying, documenting, reviewing, and approving changes to approved contract scopes of work, and approved schedules and budgets.

11.9 Contingency Management

The required timelines for monthly CIP reporting are detailed in CIP Reporting Workflow.

12 Reporting

Program reports will summarize the results of monthly updates and analysis and present those results to various target audiences. Program reports include;

- Program Status Report
- Project Progress Report
- Design Progress Report
- Construction Progress Report

These reports are intended to build on each other in a sequential and hierarchical manner, from Design and Construction reports, to Project reports, to Program reports. The reports and schedule and budget updates highlight variances to approved contract dates or project baseline dates and key milestones as appropriate to the level of reporting. To ensure the data are received at the same time and to support timely production of the Program Status Report, standard templates for schedule and budget updates and project reports are defined in Program Procedure 0506.

The audiences for the above-listed reports include the Project Managers, their managers, directors, and chiefs, with the reports available from the PMIS and timed to be ready for use in the monthly Capital Projects Review meeting.

13 Schedule and Budget Management Procedures

The following program procedures, tools, and templates are related to this chapter of the PMP.

13.1 Procedures

- Program Procedure 0501 – Project Description Approval
- Program Procedure 0502 – Project CIP Number Definition
- Program Procedure 0503 – Project Baseline Approval

- Program Procedure 0504 – Project Baseline Revision Approval
- Program Procedure 0505 – Contractor's Schedule Review
- Program Procedure 0506 – Program and Project Reporting

13.2 Tools and Templates

- Included with the above procedures:
  - PMP Form 0500 - Issues Log Template
  - PMP Form 0501 - Project Description Approval Form
  - PMP Form 0502 - New CIP Program/Project Request & Reclassification
  - PMP Form 0503 - Project Baseline Approval Form
  - PMP Form 0504 - Project Baseline Revision Approval Form
  - PMP Form 0506a - Program Status Report Template
  - PMP Form 0506b - Project Progress Report Template
- Project Schedule Update Template
- Project Budget Report and Update Template
- Master Schedule Report Template
- Master Budget Report Template

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Program Management Plan (PMP)

Chapter 06 - Contract Change Management

Capital Improvement Plan (CIP) Delivery Team

Great Lakes Water Authority

Capital Improvement Plan (CIP) Delivery Team

Program Management Plan

Chapter 06 – Contract Change Management

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Revision	Revision date	Details
1.0	June 2021	Initial chapter as approved following CIPST reviews

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Acronyms

See the Overview Chapter for a list of acronyms and glossary of terms used in the PMP.

1 Introduction

This Great Lakes Water Authority (GLWA) Capital Improvement Plan (CIP) Delivery Team *Program Management Plan (PMP) Chapter 06 – Contract Change Management,* defines what constitutes a contract Change, establishes the requirements for early identification of potential contract Changes, and describes the processing and resolution of Changes to contracts utilized by the CIP.

Contract change management is the identification, definition, quantification, evaluation, resolution, and documentation of changes to approved contract terms, scopes of work, schedules, and budgets. A Change can have its genesis in a defined risk that occurs, or from an issue that is identified, or from a decision by GLWA to provide an immediate benefit through a particular contract.

Key management principles include:

- A Change can be initiated by Consultants, Contractors, or GLWA.
- Contract change management requirements are included in all Consultant and Construction contracts.
- A Change to a contract may have implications to the project scope, schedule, budget, and to other projects. Changes will be evaluated for impacts to approved project scopes and baseline budgets and schedules. Changes will also be evaluated for impacts against other factors such as commissioning, Operations and Maintenance (O&M), risks, quality, and community impacts.
- Timely response to, and processing of, contract Changes is a priority, and Change Logs are managed by the Project Manager in design, and the Project Construction Management Lead in construction with support from the CIP Delivery Team. The change processes defined by this PMP will be further defined by program procedures with time frames and responsibilities.
- Contract change management processes and procedures will be integrated with schedule and budget management to ensure revisions to schedule and budget baselines are incorporated when appropriate.
- Change Logs will be used to manage and report the status of all changes, whether they have been approved, denied, pending, or closed.

2 Change Management Processes

There are five primary processes for managing Changes to CIP contracts that can be further broken down into two categories.

2.1 Changes Not Requiring a Contract Modification

The majority of Changes are within the budget and schedule of the contract and can be processed fully by the GLWA Operating Area, such as the Water or Wastewater Operating Areas. Processes for making these changes are noted below.

- **Task Adjustment (TA):** Applies when the Change is initiated by a consultant to authorize reallocation of approved task budgets, including allowances, within a consultant contract that, if agreed and approved, does not change the total budget of the contract.

- **Field Order (FO):** Applies when a Change to a construction contract does not increase the approved cost or time of a contract; i.e., “no cost, no time” changes, including to authorize the use of construction allowances in the contract.

2.2 Changes Requiring a Contract Modification

Many Changes require a modification of the contract and therefore require the execution of a Change Order. These changes require review and authorization by GLWA’s Procurement Group and in some cases the Chief Executive Officer and/or the Board of Directors. Processes for making these changes are noted below. Figure 1 that follows provides a diagrammatic overview of how these five processes inter-relate.

- **Change Request (CR)**: Applies when the Change is ***requested*** by a consultant or contractor and will, if agreed and approved, increase or decrease the budget and/or schedule of a contract. A CR must always be accompanied by a Change Proposal (CP), prepared by the consultant/contractor.

- **Change Directive (CD):** Applies when a Change is ***directed*** by GLWA that will, if agreed and approved, increase or decrease the budget and/or schedule of a contract.

- **Change Order (CO)** is a formal process required by GLWA’s governing authority for obtaining Board review and approval of the contract cost and/or contract times as negotiated through Change Requests or Change Directives.

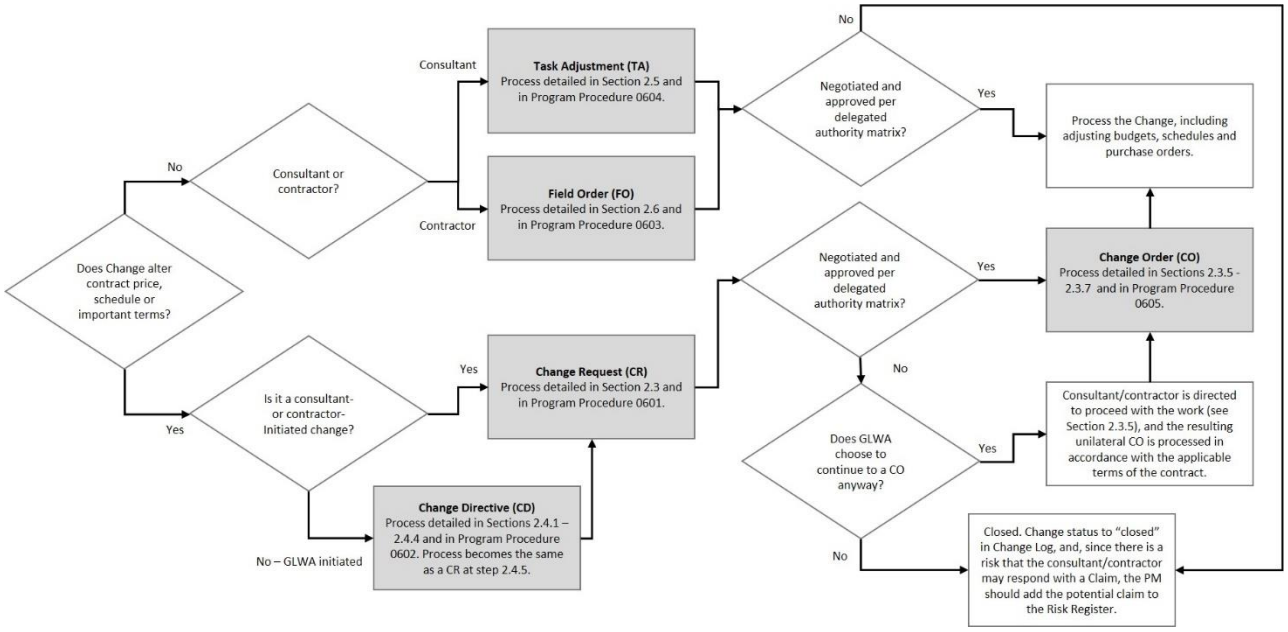

Figure 1*: *Diagrammatic overview of inter-relationship of Change processes

The five Change processes described above are discussed in more detail in the sections below, and further detailed in the Program Procedures appended to this chapter.

2.3 Change Request (CR)

This section describes the processes for implementing a Change Request (CR), which is a Change *requested* by a consultant or contractor that will increase or decrease the budget and/or schedule of a contract.

2.3.1 Description and Justification of Change

It is the responsibility of a consultant or contractor to provide notification of and fully define a CR, the justification for the CR, and the cost and/or schedule impact as documented in the Change Proposal, which is to be attached to the CR. The contents of the Change Proposal are discussed in more detail in Section 2.4.4. The following information must be provided with sufficient clarity and detail to enable GLWA to analyze and make an informed decision on the request:

- Description of the Change and justification, including reasons for the Change, relevant contract conditions and terms, and effects of not approving the Change
- Cost impacts as a result of the Change (documented in the Change Proposal attached to the CR)
- Schedule impacts as a result of the Change (documented in the Change Proposal attached to the CR)
- Impacts to other planned activities and future events
- Supporting documentation including cost estimates, schedule analysis, photos, etc.

Upon receiving a CR, including the related Change Proposal, the Project Manager or Project Construction Management Lead will add a new change entry in the project Change Log with a status of "Proposed."

2.3.2 Analysis and Evaluation of CR

The Project Manager for consultant contracts or Project Construction Management Lead for construction contracts and project team will evaluate the CR for:

- Clarity and completeness of information provided
- Justification and benefits of the CR
- Relationship to the contract scope of work and terms and conditions

- Cost and schedule impacts (including impacts to the construction budget for consultant CRs)
- Impacts or implications to the project scope or to other projects
- Impacts to permit conditions

Cost and schedule impacts are also to be evaluated by the Program Controls Team of the CIP Delivery Team for the entire project to ensure all impacts are identified.

The Project Manager or Project Construction Management Lead, in consultation with affected GLWA team members (typically including subject matter experts and approvers within the Delegated Authority matrix), and including the Project Design Team if technical impacts are involved, will determine whether the CR is justified and respond accordingly to the consultant or contractor. If the Change is rejected or denied, the CR process ends, and the Change status in the project Change Log is revised to "Closed." Because a rejected CR represents a risk of a Claim, this risk is to be added to the project's Risk Register per the processes described in Chapter 08 – Risk Management.

2.3.3 Negotiation of the Change

If the Change is justified/required, the Project Manager and/or Project Construction Management Lead, involving the Project Design Team as appropriate, will conduct negotiations with the consultant or contractor to finalize the scope of the Change, and the cost and schedule impacts. The Project Manager and/or Project Construction Management Lead must have thoroughly documented for approvers the ramifications of the proposed changes to both the project and overall program schedules, risks (see Chapter 08 – Risk Management), and budget, prior to engaging in negotiations. Changes may impact subsequent activities, contracts and projects, and client and regulatory deadlines, which will then frame the negotiation boundaries. An independent estimate may be developed for negotiations. When negotiations are completed to the agreement of both parties, the Change status in the project Change Log is revised to "Pending."

When negotiations cannot be completed to the agreement of both parties, the Project Manager may either close the CR or, as a last resort and with approvals per the Delegated Authority Matrix for a Change Order (Procedure 0605), the Project Manager and Project Construction Management Lead may direct the consultant/contractor to proceed with the work, with the resulting unilateral CO processed in accordance with the applicable terms of the contract. Since this unilateral CO may lead to a Claim by the consultant or contractor, this risk is to be added to the project Risk Register.

2.3.4 Change Approval/Rejection by Business Unit

If the CR is approved per the delegated authorities described in the Standard Operating Procedure, the Project Manager or Project Construction Management Lead will revise the category of the Change to "Approved by Business Unit" in the Change Log. If the Change is rejected for final approval, the Project Manager or Project Construction Management Lead will notify the consultant or contractor and update the status of the change in the Change Log to "Closed." The reasons for approving or not approving the CR are to be documented in a memorandum and attached to the CR form for filing, and, since rejection of a CR may result in a Claim by the consultant or contractor, this risk is to be added to the project Risk Register (see Chapter 08 – Risk Management).

2.3.5 Change Order (CO) Process Initiated

For CRs approved per 2.3.4 above, the Project Manager or Project Construction Management Lead will prepare a Change Order. Once the Change Order documentation is completed, approval is obtained within the Business Unit per the Delegated Authority listed in the Program Procedure 0605 before the Change Order is processed by the Procurement Group. An overview of the Change Order process is provided in Program Procedure 0605; however, since the Change Order process is not a CIP-specific process, it is defined and may be changed by others including GLWA's governing authority.

2.3.6 Change Order Approval

Following approval of the Change Order per the Delegated Authorities described in the Program Procedure 0605, the Project Manager or Project Construction Management Lead forwards the Change Order to the Procurement Group, who is responsible for obtaining the required approvals. Once the Change Order has been approved by the Board, the Project Manager or Project Construction Management Lead will update the status of the Change Order to "Approved" in the Change Log.

2.3.7 Revise Contract Work Breakdown Structure / Statement of Values and Project Schedule and Budget

Following approval of the Change Order, the Project Manager or Project Construction Management Lead will work with the consultant or contractor to revise the contract Work Breakdown Structure or Statement of Values, and with the Program Controls Manager to revise the project schedule and budget per the requirements listed in Chapter 05 – Schedule and Budget Management.

2.4 Change Directive (CD)

2.4.1 Description/Justification

GLWA team members or any member of the CIP Delivery Team (Originator) may initiate a CD after coordinating with the Project Manager in design or Project Construction Management Lead in construction. A CD does not apply to an in-house member of the Project Design Team requesting a change to their scope of work, which is documented via a Baseline Change as described in Chapter 05 – Schedule and Budget Management. The CD must clearly state the scope and justification for the request, with sufficient clarity and detail to enable the Project Manager and GLWA to analyze and make an informed decision on the request. Upon issuing a CD to the consultant or contractor, the Project Manager or Project Construction Management Lead will add the CD to the project Change Log with the status of "Potential."

2.4.2 Analysis and Evaluation

The Project Manager in design or Project Construction Management Lead in construction, with support from their project team and the CIP Delivery Team's Program Controls Team, will evaluate the CD for:

- Clarity and completeness of information provided
- Justification, and benefits, of the CD
- Relationship to the contract scope of work and terms and conditions
- Impacts or implications to the project scope or other projects
- Cost and schedule impacts
- Whether the CD has merit but can be deferred until the current project is completed without additional costs or operational impacts

The Project Manager or Project Construction Management Lead will develop an initial estimate of the cost and schedule impacts that address the entire project and program, as needed.

The Project Manager or Project Construction Management Lead, in consultation with GLWA team members (and the Project Design Team for construction CDs) will determine whether the CD is justified and respond accordingly to the Originator. If the Change is rejected or denied, the Change process ends, and the status of the CD is revised to "Closed."

2.4.3 Determination to Proceed

If the recommendation of the Project Manager or Project Construction Management Lead is to proceed with the CD, it will be forwarded to the appropriate approvers per the delegated authorities described in Program Procedure 0602 for approval to submit to the consultant or contractor. The delegated approvers may reject the CD, and if they do, the Project Manager or Project Construction Management Lead will notify the Originator and the status of the CD will be revised to "Closed." Also included in this approval step is the decision as to whether

to instruct the consultant or contractor to proceed immediately with the work. Directing the consultant or contractor to immediately proceed with the work may only be done in cases of imminent threat to essential GLWA services and with Chief approval.

2.4.4 Request for Change Proposal (CP)

If the determination is to proceed with the CD, the Project Manager or Project Construction Management Lead will forward the CD to the consultant or contractor. The CD describes the change, and requests a written response. The consultant or contractor's response to a CD will include:

- Cost impacts as a result of the Change (documented in a Change Proposal)
- Schedule impacts as a result of the Change (documented in a Change Proposal)
- Impacts to other planned activities and future events
- Supporting documentation including cost estimates, schedule analysis, photos, etc.

The Project Manager or Project Construction Management Lead should review the Change Proposal to ensure it accurately aligns with the related CD or Change Request and includes:

- Adequately detailed breakdown of labor, material, equipment, and tools
- Adequate cost details
- Unit cost details
- Unit costs aligned with approved contract amounts
- Accurate overhead, profit, and mark-ups
- Supporting product and equipment details/information
- Proposal exclusions reviewed, if applicable
- Proposal inclusions and assumptions reviewed, if applicable
- Installation costs and methods identified, if applicable

2.4.5 Analysis and Evaluation of CP and Completion of the CD Process

A response to a CD is processed as a Change Request with associated Change Proposal. Analysis and evaluation of the CR and associated Change Proposal will follow paragraphs 2.3.2 through 2.3.7, above.

2.5 Task Adjustment (TA)

A TA is an administrative change initiated by a consultant to authorize changes to approved task budgets within a consultant contract that do not change the total budget of the contract, including accessing allowances.

2.5.1 Description/Justification of the TA

The consultant may request that the Project Manager approve a TA to change approved task budgets within a consultant contract that do not change the total budget of the contract. The consultant must clearly state the scope and justification for the request in a Change Proposal, with sufficient clarity and detail to enable the Project Manager to analyze and make an informed decision on the request. TAs are not tracked on the Change Log.

2.5.2 Analysis and evaluation of the TA

The Project Manager is responsible for reviewing the TA request, and ensuring the proposed budget reallocations are justified.

2.5.3 Negotiation of the TA

If necessary, the Project Manager may negotiate changes to the TA proposed by the consultant.

2.5.4 TA Approval

A TA is approved by the Project Manager and the Director of the impacted Business Unit.

2.5.5 Revise Contract Work Breakdown Structure and Contract Budget

The Project Manager is responsible for revising the contract Work Breakdown Structure and contract budget details, with support from CIP Delivery Team program controls staff, to reflect the approved changes.

2.6 Field Order (FO) for Construction Contracts Only: Description/Justification

The Project Construction Management Lead may initiate an FO to document changes to a construction contract, defined as changes that do not change the approved cost or time of a contract, i.e., “no cost, no time” changes, or to authorize the use of construction allowances in the contract. The FO may limit the amount of an allowance that is authorized.

The FO must clearly state the scope and justification for the request in a Change Proposal with sufficient clarity and detail to enable the Project Manager, CIP Delivery Team, and approvers to analyze and make an informed decision on the request and process it appropriately, as detailed below. Upon issuing an FO to the Contractor, the FO will be added to the Change Log with the status of “Potential.”

Upon receipt of the FO, the contractor can either accept and execute the FO or the contractor may respond to the Project Construction Management Lead with a request for cost or time. The contract may define a period of time in which the contractor must respond to a request for cost or time. Failure of the contractor to respond in the time required by the contract constitutes acceptance of the FO and the zero cost or time assessment of the Project Construction Management Lead. If the contractor responds with a request for cost or time above the contract values or available budgets, the process follows the procedure described in Section 2.3 for a Change Request.

2.7 Project Scope Change Impacts

The project scope, or configuration, is initially defined by the Project Description, as defined in Chapter 05 – Schedule and Budget Management, and updated as needed through the Planning Phase and the development of the Preliminary Design Report. With approval of the Preliminary Design Report, the Project Manager submits a Project Baseline Approval, and the project scope, schedule, and budget are “base lined” as detailed in Chapter 05 – Schedule and Budget Management.

A Change to a contract may change the approved baseline of the project in phases beyond just the scope of the current contract. For example, changes in the design contract may have a greater impact on the construction scope of the project than the design scope. A design scope change may also materially impact the project configuration even if it is a no cost change to the design contract. Additionally, a Change may have impacts on another project’s approved baseline.

To ensure that a Change is not approved without understanding its full impacts beyond the immediately affected contract scope, the CIP Delivery Team and Project Construction Management Lead must be included in the change review process when the proposed Change will change the approved project baseline, or the approved baseline of another project or projects. The Project Manager indicates on the Change Request or Change Directive whether there is a project scope change impact, and if so, includes an assessment of any changes to the project scope with the Change Request or Change Directive as it is processed for review.

An assessment of changes to the project scope includes the estimated cost and/or schedule impacts to all phases of the project, or to another project. The CIP Delivery Team will evaluate a Change Request or Change Directive in the context of the overall impacts in meeting the functional requirements of the project using the following guidelines:

- The Change is not necessary but would provide some nominal project benefit for little cost

- The Change would be beneficial but can be deferred without significant additional cost
- The Change is necessary and critical to project success

If a Change Request or Change Directive that results in a project scope or schedule change is approved, the Project Manager will prepare a Project Baseline Revision Approval. See Chapter 05 – Schedule and Budget Management for the process and program procedure for Project Baseline Revision Approval.

2.8 Project Financial Updates

On approval of the Change, the Project Manager is to ensure that the revised Schedule of Values is provided to the Program Controls Manager and work with the Financial Services Area teams to ensure the Change is accurately reflected in the financial systems, including updating Purchase Orders (POs). Table 1 below summarizes when PO modification is required.

Table 1: Purchase Order Modification Requirements

Impacts	Task Adjustment	Field Order	Change Order	Change Directive	Change Request	Change Proposal
Changes Contract Time	NA	NA	Yes	*Process initiated by GLWA. Approved Change Directive with approved negotiations results in Change Order or unilateral Change Order if not agreed.*	*Process initiated by the vendor.* *Approved Change Request starts Change Order process.* *Unapproved Change Request may result in a Change Directive.*	*Document submitted by the vendor that provides data to any of the Change types.*
Modifies Basis of Entitlement [1]	Yes	Yes[2]/No	Yes			
Vendor Initiated	Yes	No	No			
GLWA Initiated	No	Yes	Yes			
PO Modification Required	Yes	Yes[2]/ No	Yes			

[1] The term “basis of entitlement” is used to describe that portion of the contract price that the contractor is approved to access, i.e., the contract price less allowances or contingencies that the contractor has not been approved to access.
[2] If time or basis of entitlement changes, the PO must be updated to reflect the Change.

3 Change Monitoring

The Project Manager in design and Project Construction Management Lead in construction are responsible for monitoring changes to the contracts under their management through the development and maintenance of a project Change Log. The Project Manager in design and Project Construction Management Lead in construction provide quality oversight of the use of Change Logs and the information contained in the Change Log. Each project will maintain a Change Log, sorted by contract, that includes the Change description, Change status, category of Change, estimate of cost, estimate of schedule impact, and current process step. The Change Log is updated each month and included with the Project Progress Report, defined in Chapter 05 – Schedule and Budget Management.

Responding to and processing changes in a timely manner is a CIP priority. The Change Management Procedures listed below in Section 5.0 will define the procedural steps, with time frames and responsibilities for each step identified. Change Logs will be vigorously monitored and managed. Change Status Reports will be developed by the CIP Delivery Team from the Change Logs to provide the current status of each open change, which process step is active, and days “aging.” The Project Manager or Project Construction Management Lead is responsible for following up on “Overdue” reports.

3.1 Change Status in Change Log

Changes will be identified by one of the four following status descriptions in the Change Log:

Proposed is a Change that has been submitted but not yet negotiated. Proposed Changes need to be given sufficient attention to resolve them by closing them if not required, or addressing them in a timely manner through the Change process. The cost estimate and/or schedule impact of a Proposed Change will usually change as it goes through the Change process. These changes in estimated impacts must be reflected in the Change Log as they occur and included in monthly cost and schedule forecasts of the project schedule or budget.

Pending is a Change that has been negotiated but has not yet received final approval by GLWA. These changes must be included in monthly cost and schedule forecasts of the project schedule or budget tasks.

Approved is a Change that has received all required approvals from GLWA and Board when applicable. The contract scope, budget, and/or schedule will be amended to include Approved Changes. Approved Changes will be included in monthly cost and schedule forecasts of the project schedule or budget tasks until a formal re-base-lining of the project schedule and/or budget is approved.

Closed is a Change that has been formally rejected and closed by the Project Manager or Project Construction Management Lead, or withdrawn by the Originator.

3.2 Category of Change in Change Log

Changes will be categorized as follows to enable tracking of the types of Changes that occur over the life of the Program:

- Owner Requests – any change initiated by GLWA or the CIP Delivery Team on behalf of GLWA.
- Differing Site Conditions – new information not reasonably available during design, or considered “unforeseeable” despite due diligence on the part of the contractor.
- Design Errors or Omissions – changes due to errors or deficiencies in the design.
- Regulatory Requirements – changes mandated by regulatory agencies that are different from approved permit conditions at the time of bid.
- New Technology – a change approved by GLWA to incorporate technology into the project that was not available at the time of construction bid.
- Other – changes required for all other reasons, including emergency work, adjustment of bid quantities, force majeure events, incentive payments, accepted substitutions, and value engineering.

4 Claims Management

Claims by consultants or contractors arise out of disputes concerning contractual rights. The objective of claims avoidance is to minimize the risk and potential impact of contractual claims, and to provide entitlement processes for prompt, fair, and equitable resolution. Processes for risk evaluation, monitoring, and resolution are described in Chapter 08 – Risk Management.

Claims management begins early in the project life cycle when initial work scopes are prepared and will continue through design and construction. The CIP Delivery Team will employ the following techniques for claims management that incorporates practices for the avoidance of claims:

- Identify the potential for claims as part of the initial risk assessments (see Chapter 08 and management processes and plan for potential claims.
- Revisit claims risks throughout the design process to mitigate or transfer the risks through development of the contract documents.
- Standardize the general terms, conditions, and scopes of professional services agreements and of construction contracts and specifications to improve consistent contract interpretation and management.
- Have clear procedures for managing, documenting, and processing Task Adjustments, Field Orders, Change Requests, Change Directives, and Change Orders in the contract and ensuring consultants and contractors understand the processes. Establish responsibilities and time goals for responses to each step in the process.
- Develop project-specific contract and scope of work requirements that clearly define contractual requirements and expectations.
- Proactively manage contract requirements while demonstrating responsiveness to consultant and contractor communications.
- Use technical, constructability, biddability, and safety reviews of engineering and design deliverables to verify their quality.
- Communicate contract requirements through industry workshops, preproposal and prebid meetings, and scope of work and post-award meetings.
- Perform evaluations of bid responsiveness, exceptions, clarifications, and the basis of bids before award.
- Respond to contractor Requests for Information (RFIs) and submittals within contractual timeframes.
- Promptly analyze change requests and negotiate fairly within the terms of the contract. Apply consistent interpretation of the contract.
- Address disputes in a prompt manner before they become claims.

The requirements for submitting a claim should be clearly defined in the General Conditions of all contracts. The CIP Delivery Team includes roles that are to be well-versed on the specific requirements for supporting the Project Manager and Project Construction Management Lead in identifying potential claims, managing risks, and claims processing.

5 Change Management Procedures

The following program procedures and/or standard forms and templates relate to and are appended to this chapter of the PMP.

5.1 Procedures

- Program Procedure 0601 – Change Request
- Program Procedure 0602 – Change Directive
- Program Procedure 0603 – Field Order
- Program Procedure 0604 – Task Adjustment
- Program Procedure 0605 – Change Order

5.2 Forms and Templates

- Included with the above procedures:
  - Change Request Form
  - Change Directive Form
  - Field Order Form
  - Task Adjustment Form
  - Change Order Form
- Delegated Authority Matrix
- Professional Services and Construction Change Log template
- Change Proposal template
- Cost and Budget Review Checklist

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GLWA
Great Lakes Water Authority

Submitted by:
AECOM
September 2022

Program Management Plan (PMP)
Chapter 07 - Quality Management

Capital Improvement Plan (CIP) Delivery Team

Great Lakes Water Authority

Capital Improvement Plan
Program Management Plan

Chapter 07 – Quality Management
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Prepared for

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1.0	September 2022	Initial chapter as approved following CIPST reviews
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Table of Contents

List of Appendices

Acronyms

See the Overview Chapter for list of acronyms used in the PMP

1 Introduction

1.1 Purpose

Great Lakes Water Authority (GLWA) Capital Improvement Plan (CIP) **Program Management Plan (PMP) 07 – Quality Management** defines the Quality Management System (QMS) for the CIP Program and establishes quality assurance (QA) and quality control (QC) standards, processes, and guidelines based on ISO 9001 requirements, to meet GLWA expectations, objectives, standards, and intended regulatory purposes. During the design and construction phases, this chapter should be used in conjunction with PMP Chapter 09 – Engineering and Design Management and PMP Chapter 14 – Construction Management.

Quality management is the process of planning, organizing, implementing, monitoring, and documenting a system of management practices that coordinate and direct relevant project resources and activities to achieve quality in an efficient, reliable, and consistent manner.

The requirements described in this chapter do not, in any way, relieve the Project Design Team (whether internal or consultant), the Project Construction Management Team (whether internal or consultant), consultants, contractors, and suppliers of fully implementing and taking accountability for their own internal quality control and quality assurance means, methods, and processes. This chapter is specific to GLWA's CIP Program, and it is the responsibility of GLWA Project Managers to ensure that the requirements of this chapter are incorporated into each contract used for their CIP projects.

The CIP Program Assurances Manager is assigned overall QA oversight responsibility for the CIP Program. The CIP Delivery Team, CIP Project Managers, Project Design Leads, and Project Construction Management Leads are responsible for applying relevant processes and procedures of the QMS to their project work activities. All Program personnel are responsible for implementing the QMS and have the authority and organizational freedom to identify problems, recommend solutions, and limit or control a service or further processing of an item until proper disposition of a non-conformance or an unsatisfactory condition has occurred.

1.2 Quality Management Objectives

The objectives of the QMS are to meet codes, GLWA expectations, objectives, standards, and intended regulatory purposes through the consistent implementation of the QMS processes and procedures, including:

- Verifying that work is performed in a technically competent and professional manner that is responsive to GLWA requirements, regulatory standards, and applicable industry standards.
- Verifying that program and project personnel are provided training appropriate for their function and that records are maintained for that training.
- Minimizing rework through quality reviews and inspections and continuous improvement efforts.
- Meeting or exceeding agreed-upon review timelines.

1.2.1 Quality Control

QC is carried out by consultants, contractors, or suppliers on a day-to-day basis. QC is achieved using a system of checks and reviews in which the plans, specifications, and calculations developed are confirmed through Design Quality Plans or Construction Quality Plans, defined later in this chapter. These plans will provide processes for checking to avoid or eliminate and resolve defects, non-

conformances, errors, and omissions; if these errors and omissions cannot be avoided or eliminated, then they must be mitigated. Quality Plans will identify the procedures and the collected records necessary to confirm and document the quality of the project. During construction, the construction contractor will develop and implement an approved Test and Inspection Plan to ensure all tests and inspections are performed according to specifications and requirements, including designated QA and QC hold points.

1.2.2 Quality Assurance

QA is the planned and systematic approach necessary to provide adequate confidence that a process, design, material, component, structure, system, or facility will perform satisfactorily in service. The basic QA elements include the following:

- Development and implementation of quality plans, procedures, and instructions
- Reviews by appropriately qualified personnel
- Design process control
- Review and control of contract drawings and text documents
- Monitoring implementation of QA by others (i.e., consultant and contractor firms)
- Procurement control
- Quality documented information and electronic data file control
- Orientation, training, and certification
- Verification of all quality requirements (to include reviews, audits, and surveillance)

1.2.3 Management Review

The Program Assurances Manager reviews the QMS at planned intervals to verify its continuing suitability, adequacy, and effectiveness. The Program Assurances Manager reviews and reports on the performance of the QMS to the CIP Director and Directors of Water and Wastewater Engineering (collectively referred to as the Business Unit Directors), including reporting audit results, the status of preventive and corrective actions, follow-up actions from previous management reviews, and recommendations for improvement affecting the QMS. Records of these reviews are to be maintained as part of the Program quality records.

2 Project Level Quality Plans

Quality plans are required from Project Design Teams (internal or external), Project Construction Management Teams (internal or external), contractors, and suppliers and require each to directly apply the requirements of this chapter to the management and delivery of their individual contracts.

Design Quality Plans describe how the Project Design Team will provide quality design deliverables and work products for its contract and scope of work. Design Quality Plans are discussed in more detail in Section 4 of this chapter.

Construction Management Quality Management Plans describe how the Project Construction Management Team organization will apply project specific quality processes and procedures, in addition to this PMP, that are required to verify construction quality for a particular construction scope of work. Construction Management Quality Plans are discussed in more detail in Section 5.1 of this chapter.

Construction Quality Plans describe how the construction contractor will control and delivery quality of construction for a construction contract and scope of work. Construction Quality Plans are discussed in

more detail in Section 5.2 of this chapter. Supplier Quality Plans describe how a supplier contracted by GLWA will control and deliver quality of fabrication and delivery for a supply contract and scope of work and are similar in content and structure to the Construction Quality Plans discussed in Section 5.2 of this chapter.

3 Training

The Program Assurances Manager will develop, schedule, and conduct QMS training sessions for CIP Delivery Team staff. This training will cover all aspects of the QMS, including the program procedures, workflows, and forms included in this chapter. This training will also present and discuss the review activities specified in Chapter 09 – Engineering and Design Management and Chapter 14 – Construction Management. The Program Assurances Manager will document attendance and course content for all training sessions. Annual refresher training may also be provided to CIP Delivery Team staff and for new staff.

The Project Manager, with support from the Program Assurances Manager, is responsible for verifying that the Project Construction Management Team members are familiar with the quality requirements of this chapter as each Project Construction Management Team is mobilized.

A Quality Management Training Certification Form is included in Program Procedure 0701 of this chapter to document personnel completing the required quality training. The Program Assurances Manager is responsible for maintaining the acknowledgement forms, including their storage in accordance with Program document management procedures documented in PMP Chapter 04 – Document Management.

CIP Delivery Team staff are responsible for being familiar with the requirements of this PMP and QMS and for knowing the procedures required by this plan and its application to their assigned tasks and responsibilities.

4 Quality Management of Design

The Project Manager provides quality oversight of the Project Design Team, whether internal or consultant. This section is also applicable to any internal or consultant teams providing facility planning studies, and preliminary design services, including all engineering design work provided by GLWA in-house engineering resources and any program management support.

Each Project Design Team is required to create a contract-specific Design Quality Plan that meets both the requirements of the Project Design Team's parent organization, if a contractor, and the quality requirements of this chapter. The purpose of the Design Quality Plan is to verify that the deliverables and final design work product meet the scope of work, comply with CIP Program standards and guidelines, and meet Program goals and project requirements, while maintaining the Project Design Team's sole responsibility for final work product and quality control.

The Project Design Team must include the Engineer of Record responsible for the final design and for quality control throughout the design process. The Project Design Team will retain complete responsibility for the quality of design, design calculations, drawings, and specifications, and is responsible for the sealing of the contract documents (or other engineering reports as required) prior to bidding and as required to accompany permit applications. The Project Design Team will also continue

to maintain a role in quality during construction by providing engineering services during construction as specified in the Project Design Team's scope of work.

4.1 Design Quality Plan

The Design Quality Plan is to include design control procedures, and includes the following requirements:

- Design work be performed by qualified personnel.
- Design control and review processes will be conducted to verify design integrity, reliability, safety, constructability, operability, and economic maintainability.
- Individuals of equal or higher qualification than that of the Project Design Team will perform an independent verification of all technical work, including technical memoranda and reports, calculations, including computer program-generated calculations and cost estimates, construction schedules, and design documents.
- The checking of computations will cover concepts, assumptions, and, to the degree considered necessary by the checker, mathematics. Rarely should it be necessary to check every calculation.
- All calculations will include a cover sheet with an index referring to page numbers and reference to a specific design component. Calculations will be clear, neat, orderly, in a logical sequence, legible, complete, and detailed commensurate with the design stage submittal. Cross-reference calculations in such a manner that allows each element of design to be readily identified.
- The signature and the initials of the discipline engineer who performed the calculations and the discipline engineer who checked the calculations will be included on the first page of the calculations, and each subsequent page will be initialed or signed by both the originator and the reviewer.
- All calculations will include purpose, data and references, assumptions, conclusions, calculations, and supporting data. Examples of supporting data are copies of technical email discussions, catalog information, and manufacturer's data.
- All design deliverables used for construction contract bidding will be signed and sealed by a design professional licensed in Michigan in the relevant discipline. The appropriate firm (Project Design Team or subconsultant) must provide documentation that the design professional that signed and sealed the documents is authorized to sign on behalf of the firm.

Additional detailed Design Quality Plan Requirements are included in Appendix A.

4.2 Review of Design Quality Plans

The Project Manager and the Program Assurances Manager review the Design Quality Plan to ensure it includes the QA/QC elements outlined in Appendix A. If any of these key elements are not addressed, the Design Quality Plan is to be returned requiring that the missing elements be addressed and that the Design Quality Plan be modified and resubmitted. Once a Design Quality Plan is approved, the Project Manager designates the Design Quality Plan as "Accepted" and retains a copy.

4.3 Design Coordination and Progress Meetings

During design execution, as detailed in PMP Chapter 09 – Engineering and Design Management, the Project Manager leads and conducts periodic design coordination and progress meetings with the Project Design Team. Quality management is to be an agenda item for these meetings. Quality management concerns or questions, if any, should be discussed and resolved. The Project Manager confirms that the Design Quality Plan is being carried out as a routine part of Project Design Team's

work activities, and that the Project Design Team is anticipating milestone deliverable submission dates and allowing for Project Design Team internal QC reviews to be completed prior to the submission of all deliverable documents.

4.4 Review of Design Deliverables Documents

The Project Manager's responsibilities for the review of design deliverables are documented in PMP Chapter 09 – Engineering and Design Management.

Construction schedules and cost estimates are typically part of the design deliverables, and the review process for these items is described more fully in PMP Chapter 05 – Schedule and Budget Management.

The Project Manager is responsible for verifying that documented information associated with each review are retained and filed correctly in the Program Management Information System in accordance with the program procedures in PMP Chapter 04 – Document Management.

5 Quality Management of Construction

QA and QC during construction are two distinct functions with separate roles for the contractor, Project Design Team, and the Project Construction Management Team, as further detailed below:

- Contractor – has sole responsibility for construction procedures, means and methods, processes, quality control, construction safety, and compliance with the contract documents.
- Project Design Team, as the Engineer of Record – retains responsibility for reviewing submittals for compliance with the specifications, responding to Requests for Information pertaining to the design, and reviewing changes that may impact the intent of the design.
- Project Construction Management Team – provides quality assurance during construction by monitoring the contractor's quality control programs and conducting field inspections for compliance with the construction contract requirements.

The CIP Delivery Team is responsible for the following:

- The Project Manager continues to provide overall quality oversight of the Project Design Team's work and monitoring Project Design Team compliance with its project-specific Design Quality Plan as it relates to Design Services during Construction.
- The Project Manager provides quality procedures and Construction Management Quality Management Plan requirements for use by the Project Construction Management Team.
- The Program Assurances Manager provides quality management oversight to verify that the Project Construction Management Team is providing services in compliance with the Construction Management Quality Management Plan.
- The Program Assurances Manager periodically observes the construction activities as a check that progress reporting of quality activities is consistent with site evidence.

5.1 Construction Management Quality Management Plan

Each Project Construction Management Team will prepare a Construction Management Quality Management Plan that references GLWA and CIP Program quality standards and procedures and describes any additional QA processes specific to the project and construction contract specifications

and requirements. PMP Chapter 14 – Construction Management describes the requirements for the Construction Management Quality Management Plan.

The Project Manager and the Program Assurances Manager review the Construction Management Quality Management Plan to confirm it includes the QA/QC requirements outlined in PMP Chapter 14 – Construction Management. If any of these key elements are not addressed, the Construction Management Quality Management Plan is returned to the Project Construction Management Team to be modified and resubmitted.

Once a Construction Management Quality Management Plan is determined to include the required elements, the Project Manager designates the Plan as “Accepted” and retains a copy.

5.2 Construction Quality Plan

Quality requirements for contractors and suppliers contracted with GLWA will be defined in the contract specifications, including requirements for a Construction Quality Plan or manufacturing quality plan. Additional Construction Quality Plan Requirements are provided in Appendix B.

The Project Construction Management Lead and the Program Assurances Manager review the Construction Quality Plan to ensure that it includes the minimum requirements. If any of the minimum requirements are not addressed, the Construction Quality Plan is returned to the contractor for revisions and resubmission. Once a Construction Quality Plan is determined to include the required elements, the Project Construction Management Lead designates the Plan as “Accepted” and retains a copy.

5.3 Quality Assurance of Construction

QA of the contractor’s work is the responsibility of the Project Construction Management Lead with assistance from the Program Assurances Manager. Supplier Quality Surveillance may be conducted on GLWA furnished equipment by third-party firm(s) or the GLWA staff and witnessed and reviewed by other project participants. The processes and requirements for construction QA management are described in Chapter 14 – Construction Management.

6 Quality Documentation

The Quality Management Plans discussed above are to require thorough documentation of each step of the QA and QC processes implemented by the consultant or contractor, including:

- Documented information from QA reviews of all Project Design Team design deliverables submitted to the CIP Delivery Team
- Documented information from QA reviews associated with compliance checking of CIP Delivery Team quality management activities, Project Design Team, contractor, and supplier quality activities and records, and Project Construction Management Team quality activities and documented information
- Evidence of completion of activities that ensure quality, such as review, checks and approvals, and audits
- Verifying the filing and storage of correspondence and other documented information potentially affecting project quality

All personnel generating quality documentation information are responsible for ensuring it is complete, legible, and accurate. The Project Design Lead, Project Construction Management Lead, and Project

Managers are responsible for submitting the quality documentation information to the documented information management system, as described in PMP Chapter 04 – Document Management.

Documented information must be legible and clearly identify the elements of work involved. Permanent records will be submitted to GLWA as specified in Program document management program procedures.

7 Quality Deficiency and Non-Conformance Management

Quality Deficiencies and Non-Conformances are defined as documentation, drawings, material, and equipment or work not conforming to the specified requirements or procedures. The CIP Program Quality Management System includes a three-tier non-conformance system as described below. The first two tiers of this system apply only to the construction contractor, while the third can apply to any consultant, contractor, or supplier, as follows:

- **Deficiencies –** The lowest level of non-conformance reporting is a deficiency. It documents the deficient condition noted of the construction work, and provides the contractor 2 working days, or before the work is covered, to correct the issue before it is elevated to the next level of reporting. Inspectors note deficiencies in Daily Inspection Reports (see PMP Chapter 14 – Construction Management).
- **Non-Conformance Notice (NCN) –** The second level is an NCN that documents deficient work that has not been corrected by the contractor, or that would require an engineering solution to remedy. NCNs must be answered in writing by the contractor within 3 working days. Any proposed solution must be approved by the Project Construction Management Lead before implementation and may need to be approved by the Project Design Team. Before covering or otherwise obscuring by subsequent work activities, the Inspector will re-inspect the work and report on compliance with the corrective plan. Typically, the contract does not allow payment for work with open NCNs. NCNs are also used by Operations to notify the contractor of defective work requiring correction during the warranty period.
- **Corrective Action Directive (CAD) –** The highest level of non-compliant reporting is a CAD. CADs can be issued to Project Design Teams, contractors, or suppliers for systemic repetitive non-compliant quality conditions. Examples of CADs would be a major finding from a quality audit, an NCN that is not responded to, if the proposed solution is not approved or is approved but not carried out, or a condition where the same type of work has multiple NCN issues over a short period of time (repetitive). CADs cannot be answered by the Project Design Team or contractor's field staff. They will be transmitted by the Project Manager to the Project Design Team's or contractor's senior management for response within 2 weeks of receipt.

Quality deficiencies, NCNs, and CADs are to be monitored and reported to obtain satisfactory results and to close backlogs. NCN and CAD log templates are provided with this chapter, and are maintained by the Project Construction Management Lead with periodic reviews by the Program Assurances Manager.

8 Quality Audit Reviews

Quality compliance audits will be periodically performed as discussed below. The Program Assurances Manager monitors, tracks, and reports on the status of quality audits for inclusion in the monthly Program Status Report (see Chapter 05 – Schedule and Budget Management).

8.1 Audits of PMP and Program Procedures

The Program Assurances Manager will implement periodic auditing to verify that the CIP Delivery Team is performing its services and developing work products in compliance with the requirements of the PMP and Program procedures and associated quality procedures.

The Program Assurances Manager assembles a Review Team comprised of GLWA team members from a variety of Business Units, Teams and functional roles. The Program Assurances Manager and reviewers review program documentation and note observations and any deficiencies or strengths in the CIP Delivery Team's compliance with the PMP and program procedures.

The resulting observations and findings, along with any non-conformance findings, will be identified in a PMP Audit Report submitted to the CIP Director and the responsible CIP Delivery Team members to respond to and take necessary action. The Program Assurances Manager will maintain a log of non-conformances and will work with the CIP Delivery Team to correct deficiencies. The Program Assurances Manager monitors completion of corrective actions until all items on the Non-Conformance Log are completed. Where findings of the audit recommend revisions to the PMP and program procedures, these changes are made following Program Procedure 0001 in PMP Chapter 00 – PMP Overview.

8.2 Audits of Project Design Team Quality Compliance

The Project Manager, with support from the Program Assurances Manager, will periodically audit Project Design Team QA/QC documentation to verify compliance with a project-specific Design Quality Plan. The Project Design Team will provide quality documentation information to the assigned reviewer for examination.

The Project Manager, with support from the Program Assurances Manager, establishes the frequency of audits based on:

- The completeness and quality of required QA/QC documented information submitted with each design review deliverable
- Progress of deliverables
- Quality as observed by the Project Manager and design review teams
- Findings and observations from the previous quality audit

The Project Manager assembles a Review Team comprised of GLWA team members from a variety of Business Units, Teams and functional roles. The audit team will develop an audit checklist based on the Design Quality Plan Requirements provided in Appendix A and the contents of the project-specific Design Quality Plan. The reviewers note observations and any deficiencies or weaknesses in the Project Design Team's compliance with its Quality Plan and will identify any specific deficiencies that are to be addressed and remedied. The completed audit checklist and a Quality Audit Report, with any recommended corrective actions, are submitted to the Project Manager. The Project Manager maintains a log of non-conformances and works with the Project Design Team to correct deficiencies. The Project Manager monitors completion of corrective actions until all items on the Non-Conformance Log are completed. The Project Manager may issue a Corrective Action Directive to Project Design Teams, per Program Procedure 0704, for the Project Design Team's failure to address a major finding from a quality audit.

8.3 Audits of Project Construction Management Team's Quality Compliance

The Project Manager, with support from the Program Assurances Manager, will periodically review and audit the Project Construction Management Team's QA/QC activities and documentation and performance against the Construction Management Quality Plan. The Project Construction Management Lead will provide documentation to the assigned reviewer for examination. The Project Manager and Program Assurances Manager establish the frequency of review according to duration of construction, and findings and observations from the previous quality audit.

The Project Manager assembles a Review Team comprised of GLWA team members from a variety of Business Units, Teams and functional roles. The audit team will develop an audit checklist based on the requirements of the project-specific Construction Management Quality Plan. The reviewers note observations and any deficiencies or weaknesses in the Project Construction Management Team's compliance with its Quality Plan and identify any specific deficiencies that are to be addressed and remedied. The completed audit review checklist and a Quality Audit Report with any recommended corrective actions are submitted to the Project Manager. The Project Manager maintains a log of non-conformances and works with the Project Construction Management Team to correct deficiencies. The Project Manager monitors completion of corrective actions until all items on the Non-Conformance Log are completed. The Project Manager may issue a Corrective Action Directive to Project Construction Management Teams, per Program Procedure 0704, for the Project Construction Management Team's failure to address a major finding from a quality audit.

8.4 Audits of Contractor Quality Compliance

In collaboration with the Project Manager and Project Construction Management Lead, the Program Assurances Manager may periodically audit the contractor's QA/QC activities and documentation to verify its compliance with its project-specific Construction Quality Plans. The contractor will provide documentation to the assigned reviewer(s) for examination. The Program Assurances Manager will work with the Project Manager and Project Construction Management Lead to establish a frequency of review according to duration of construction, and findings and observations from the previous quality audit. These reviews would be conducted at the contractor's field office where construction is being executed.

The audit team will develop an audit checklist based on the Construction Quality Plan Requirements provided in Appendix B and the contents of the project-specific Construction Quality Plan. The reviewers note observations and any deficiencies or weaknesses in the contractor's compliance with its Quality Plan and identify any specific deficiencies that are to be addressed and remedied. The completed audit review checklist and a Quality Audit Report with any recommended corrective actions are submitted to the Project Manager.

Quality audits of major suppliers of materials and equipment for construction may also be conducted as determined by the Program Assurances Manager and the Project Construction Management Lead and are similar in process to the Contractor Quality Plan audits described above.

9 Quality Management Procedures

The following program procedures and/or standard forms and templates are related to this section of the PMP:

9.1 Procedures

- Program Procedure 0701 – Quality Management System Training
- Program Procedure 0702 – Quality Audits
- Program Procedure 0703 – Non-Conformance Notice
- Program Procedure 0704 – Corrective Action Directive

9.2 Forms, Tools, and Templates

- Forms or templates included with the above Program Procedures:
  - PMP Form 0701 - Quality Management Plan Training Certification Form
  - PMP Form 0702 - Quality Audit Report Template
  - PMP Form 0703a - Non-Conformance Notice Form
  - PMP Form 0703b - Non-Conformance Notice Log
  - PMP Form 0704b - Corrective Action Directive Form
  - PMP Form 0704a - Corrective Action Directive Log

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GLWA
Great Lakes Water Authority

Submitted by:
AECOM
September 2022

Program Management Plan (PMP)
Chapter 08 - Risk Management

Capital Improvement Plan (CIP) Delivery Team

Great Lakes Water Authority

Capital Improvement Plan

Program Management Plan

Chapter 08 – Risk Management
Rev. 1.0

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1.0	September 2022	Initial chapter as approved following CIPST reviews
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Acronyms

See the Overview Chapter for list of acronyms used in the PMP.

1 Introduction

1.1 Purpose

This Great Lakes Water Authority (GLWA) Capital Improvement Plan (CIP) **Program Management Plan (PMP) Chapter 08 – Risk Management** describes the Risk Management Plan for the CIP; how risks are assessed, risk registers are established and how risks will be managed.

Key management principles include:

- Requiring a risk register at the Program level and for all projects
- Planning for and identifying both risks and opportunities
- Analyzing and evaluating risks and developing mitigation responses (actions)
- Monitoring, re-assessing and reporting risks.

1.2 Risk and Risk Management

A risk is any event, either good or bad, with less than 100% and more than 0% certainty of occurring that may impact a project or the overall program. Risks on a project have the potential to impact the project schedule, cost, and/or quality, cause negative environmental consequences, affect the ability of the finished project to perform as required, increase health and safety exposure, or negatively impact the public's perception of the project. The publication entitled "A Guide to the Project Management Body of Knowledge – Fourth Edition" from the Project Management Institute continues:

> *"Project risk is always in the future. Risk is an uncertain event or condition that, if it occurs, has an effect on at least one project objective. Objectives can include scope, schedule, cost, and quality. A risk may have one or more causes and, if it occurs, it may have one or more impacts. A cause may be a requirement, assumption, constraint, or condition that creates the possibility of negative or positive outcomes. For example, causes could include the requirement of an environmental permit to do work, or having limited personnel assigned to design the project. The risk event is that the permitting agency may take longer than planned to issue a permit, or, in the case of an opportunity, limited design personnel available and assigned may still be able to get the job done on time, thereby accomplishing work with less resource utilization. If either of these uncertain events occurs, there may be an impact on the project cost, schedule, or performance."*

Risk management is a methodical, pro-active effort to identify risks before they happen and to implement responses to reduce the probability of negative impacts or maximize the probability of positive impacts on a project. Risk management must occur on all phases of project delivery and throughout the program lifecycle and must involve participation from all stakeholders to be effective. Risk management process objectives are as follows:

- Increase probabilities for success while reducing the odds for negative events
- Increase Program and project participants' awareness of risks and generate a pro-active risk management culture
- Implement a formal process for identifying, assessing and evaluating risks
- Identify mitigation opportunities
- Provide project managers and program leaders with the means to decide where best to invest efforts to increase the probability of positive outcomes
- Prioritize risks for senior managers and decision makers.

2 CIP Program Risk Management

Program risks are those risks that may potentially impact multiple projects in the CIP portfolio, or the manner in which the Program implements its portfolio of projects, (e.g., delivery organization, local contractor capacity, funding, regulations, political, legislation, etc.). The CIP Program Assurances Manager, with support from the Risk Management Professional, leads the development and management of a programmatic Risk Register. The Risk Register characterizes identified project and program risks based on current information, documents the probability and severity of occurrence of these risks, establishes mitigation strategies and identifies ownership for risk mitigation. Risk mitigation actions will be monitored, reported and updated to allow timely implementation of mitigation strategies and accountability for accomplishing and potentially closing-out these mitigation actions and strategies.

The Program Assurances Manager convenes and maintains a Program Risk Team. The Program Risk Team should include key managers and leaders from the CIP Delivery team, including key business unit managers and key CIP Group members. Program risks will be reviewed and updated every 3 months to incorporate the latest status of identified risks and identify new potential risks. Some risks may be common to both the CIP program and to an individual project. Care should be taken not to compound the impacts of a risk that is assessed as a Program risk and a Project risk.

3 Project Risk Management

Project risks are those risks that are specific to a particular project (e.g., project schedule, interfaces and shutdowns, physical location, land ownership, geology, hydraulics, site-based public impacts, etc.). The Project Manager, with support from the Program Assurances Manager, leads the development a Project Risk Team and Project Risk Register. The initial project Risk Register is created during the initial study phase of the project, and further developed during the design phase. The Project Risk Team meets regularly to develop and maintain the Project Risk Register and characterize the risks on the register based on current information, determine the probability and severity of occurrence, quantify risks above a pre-determined threshold, establish mitigation strategies, potential impacts and identify ownership for risk mitigation. Risk mitigation actions will be monitored, reported and updated timely implementation of mitigation strategies. The Project Risk Team should include key GLWA team members, representatives from the Project Design Team (PDT), and the Project CM Team (PCMT).

4 The Risk Register

A risk register lists all risks identified through the risk management process, the results of analysis and evaluation, and the risk treatment plans as applicable. The risk register is a dynamic tool which is regularly updated through the risk review process. The risk register template is provided in Appendix A.

5 Risk Management Methodology

Risk management methodology involves identifying, analyzing and evaluating, treating and monitoring/reviewing risks which may occur during the overall CIP or project lifecycle. The process follows ISO 31000 “Risk Management-Principles and Guidelines on implementation”, show diagrammatically in Figure 1.

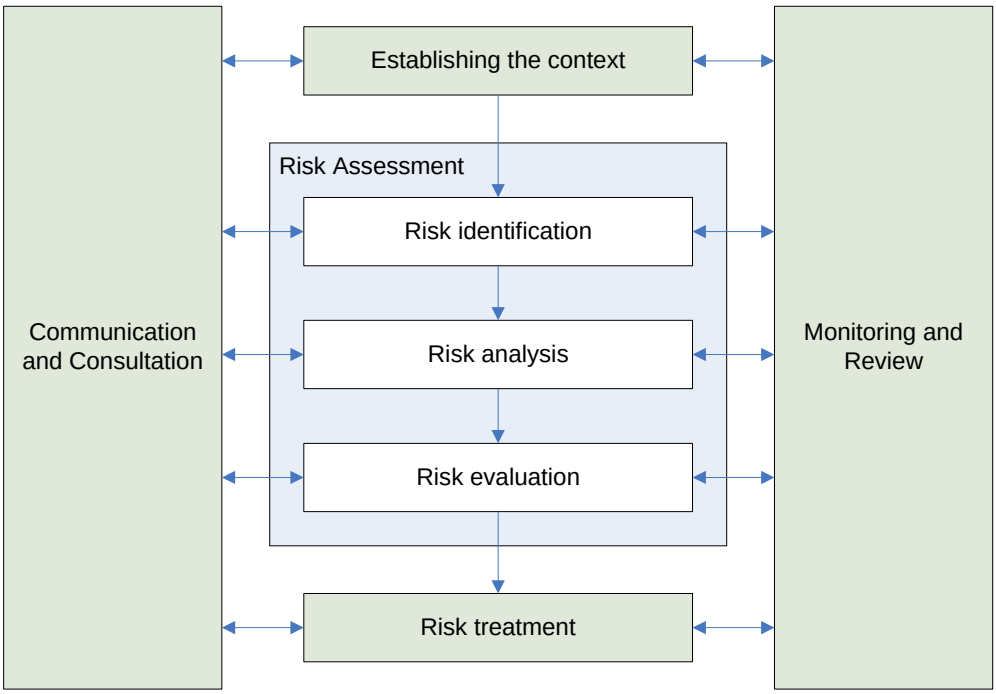

Figure 1: ISO 31000 Risk Management Process Flow Diagram

The process defines the items necessary to effectively support each fundamental activity and then identifies its respective risks. This approach achieves the following objectives:

- Provides a methodical and rational approach to the risk management process
- Identifies the full spectrum of program and project risks
- Reduces the possibility for missing significant risks
- Focuses the risk identification process
- Provides rational categorization for the identified risks

5.1 Establishing the Context

Establishing the context involves setting the framework in which risk management will operate within the CIP, and the definition of risk criteria in which risk management will take place. Establishing context enables the CIP Delivery Team to focus risk management efforts to suit the environment in which it operates, and defines the common taxonomy, criteria, and processes necessary to manage risks.

Understanding the environment in which the work is to be executed is critical towards defining the context in which decisions, activities and events are developed. The CIP Delivery Team must function in a dynamic environment where labor issues, the community organization level and their expectations, the large set of stakeholders and an ever-changing political climate demand special attention as they can affect successful project outcomes.

In addition, projects may be subject to requirements from several funding, regulatory, and jurisdictional agencies that have a certain amount of control over cash availability, permits, approach to the work, and/or construction processes. The Project Risk Team will identify and address these risks. To be

successful, projects must interface extensively with third parties who figure prominently in this environment. Risks to effective third-party interaction will be identified and managed.

5.2 Risk Identification

The purpose of 'Risk Identification' is to search for and to locate sources of risk exposure, termed Risk Events, before they are realized. Risks are identified through workshops and brainstorming sessions with key program and project personnel. Risk team members are encouraged to identify risks or suggest risk mitigations at any time and need not wait for a scheduled workshop. The risk team should strive to identify new risks as quickly as possible so that they can be proactively managed as early as possible.

A common mistake in risk identification is to identify issues rather than risks. An issue is a statement of fact or certainty whereas a risk is an uncertain event which may or may not happen. Risks should be identified using the cause-risk-effect framework that can be stated thus: *"Because of (CAUSE), (RISK) may occur which could/may lead to (EFFECT)".*

As risks are identified, they are categorized by risk type. A Risk Owner is assigned to manage and update each risk. This should be the individual "closest" to the risk in terms of knowledge of the risk and the ability to influence the management of a risk.

5.2.1 Risk Type

Risk types are defined as groupings that help organize and support consistent identification, assessment, measurement, and monitoring. Using consistent risk types across the Program enables risks to be aggregated to determine their overall impact on the Program.

Risk types include the following:

- Design/Technical (any aspect of the design or engineering solution)
- Management (organization, resources, process and procedures)
- Construction
- Quality
- Market (external market influences that can affect costs or schedule)
- Regulatory/Permits
- Environmental Health and Safety (EHS)
- Contractual
- Operations
- Political
- Community
- Security

5.2.2 Risk Status

Risk status identifies the current state of a risk and should be updated when the risk register is updated. Risk status includes:

- Active – a risk that has not expired or occurred. Risks that have been identified to occur in a project phase that has not yet started are considered active, and so active risks may include both currently active (in progress) phases and future active phases.

- Expired – a risk that did not occur and can no longer occur due to the current status of the project or has been fully mitigated. In other words, the risk probability can be reduced to zero.
- Occurred – a risk that has occurred. Risks that have occurred should be trackable as an Issue until it is resolved in some manner.

5.3 Risk Analysis

Risk analysis has two components; estimating the probability (likelihood) of the risk occurring, and the impact (severity) should it occur. When considered together, the impact and probability provide a risk rating. The primary purpose of the risk analysis is to determine which risks warrant a response and further evaluation based on their risk rating. Risk analysis therefore helps narrow the focus to the risks most detrimental to program or project success.

At this step, risk analysis is considered qualitative. Qualitative analysis is used as the first method of estimating the relative risk exposure and must be completed for all identified risks. Qualitative analysis is essentially a screening method that can be done to quickly rank risks and prioritizing for evaluation further and response. The qualitative analysis requires the risk team to make an assessment of the potential likelihood of occurrence and impact for each risk using a set of pre-defined probability levels and impact levels.

The Risk Register contains pre-defined levels and definitions of probability with a numeric value for each level (see tabs). For assessing the impact of a risk, the Risk Register also contains pre-defined levels and ranges of cost and schedule impacts with a numeric value for each level. For each level, the corresponding schedule and cost impact range is identified. When a risk has more than one level of impacts, the highest-impact category should be selected. For example, a risk that may cause a schedule delay of 4 months (moderate risk) and could increase the cost of the project by $1 million (significant risk) would be classified as a significant risk.

The numeric values of the cost impact ranges can be revised by the project team to reflect the relative size of a project.

5.3.1 Risk Rating

The qualitative risk rating of a risk will drive the level of effort that the risk team invests in evaluating and treating a risk. The matrix shown in Risk Register provides guidance to the team on next steps once a qualitative analysis is complete. Further quantification of risks is optional for program risks if difficult to quantify across the entire program.

High Risks - Quantify and Manage Risks: Where the results of qualitative analysis produce a high numerical rating, project risks are further analyzed to develop quantitative assessments of the potential cost or schedule impact to the project should the risk occur. Schedule and cost impacts should be based on sound data to produce a reliable impact assessment. These risks must also have identified risk mitigation actions to reduce the probability of occurrence and minimize impacts. Mitigation Actions are updated and reported each month with the Program Status Report or Project Progress Report.

Medium Risks – Manage Risks: A quantitative analysis is optional for Medium Risks. The risk team identifies and implements treatment mitigation measures. Mitigation Actions are updated and reported each month with the Project Status Report.

Low Risks - Track Risks: A quantitative analysis is not required for Low Risks. Risks are tracked and reviewed at quarterly risk workshops to determine if their probability or impact has changed. If relatively simple or cost-effective measures can be identified to control or eliminate a risk, these measures should be implemented.

5.4 Risk Evaluation

Quantitative analysis refines the probability as a percentage and quantifies the schedule and cost impact of a risk. For a quantitative analysis the impact is numerical with the probability being determined as a percentage.

A quantitative analysis results in the expected risk exposure. The risk exposure in terms of schedule and cost is the product of the probability of an occurrence and the numerical impacts of the schedule and cost impact. Once a more detailed quantitative analysis is complete, it may be necessary to adjust the qualitative analysis and re-rank the risk management priorities.

5.5 Risk Treatment

The objective of risk treatment is to minimize the impact of a risk on the CIP or project through the identification of mitigation measures, or actions. Appropriateness is defined by both the effectiveness of the response, as well as the cost of implementation.

Risk treatment is about answering the question, “What should we do about this particular risk?” The risk rating from the qualitative analysis and the risk exposure in the quantitative risk analysis should be used to guide the risk team on the appropriate level of effort that should be placed on treating risks. If the cost of risk treatment is less than the calculated risk exposure, it is prudent to implement mitigation actions to reduce or avoid a risk. Likewise, if the cost of mitigation is higher than the expected cost should the risk occur, mitigation may not be cost-effective. In general, there are three options that can be taken to manage risks:

- Do something to minimize the probability of or fully mitigate the risk before it happens.
- Do something so that if the risk happens the impact can be reduced.
- Evaluate transferring, or allocating a portion of the risk, to another party through contractual means.

To implement one of the above options, the risk team considers three distinct categories of risk responses:

- **Accepting** a risk means choosing to do nothing to affect either the probability or impact of the risk. It requires dealing with the risk if and when it arises. Sometimes a risk team should accept a risk because there simply are no strategies available to deal with it. With a risk that is rated as low, the risk team may accept a risk when the cost to reduce the exposure to an acceptable level is greater than the cost impact. Risk acceptance can be either active or passive.

  Passive acceptance requires no action and leaves the risk team to deal with risks if they occur. An active acceptance strategy establishes a Contingency Plan to address impacts from the risks should they occur. The program or project should not passively accept any high or medium risk.

- **Avoiding** a risk means eliminating the possibility of risk occurrence. Frequently this will involve added cost to the project which must be evaluated.
- **Mitigating** a risk means reducing the probability that the risk will occur and reducing its impact if it does occur through one or more discrete actions.

Transferring a risk is an additional form of risk treatment and is achieved by shifting the risk, or allocating portion of the risk, to another party. Transference almost invariably involves some sort of legal or contractual relationship. Transferring risks is an appropriate strategy when the party in control of the exposure is not the same as the party suffering damages if the risk occurs. By aligning control and responsibility there is an incentive to provide appropriate management attention to controlling the risk. Any residual risk after transference or allocation should be categorized and assessed. Risks should be allocated to the parties that are in the best position to control them and this allocation should be clearly stated in the appropriate Contract.

If the risk treatment that is selected is Avoid or Mitigate, the risk team will develop one or more discrete actions to manage the risk. Actions should include a start date and a completion date that correlates to when the action needs to be initiated and when it needs to be completed to avoid or reduce the risk (i.e.; before the risk occurs), respectively. A Risk Action Owner is assigned to each action and should be the individual with the most authority to execute the action.

5.6 Risk Monitoring and Review

The success of risk management is dependent on the effective implementation of the risk treatment actions. Risk monitoring and review is performed to ensure the implementation of the treatment, identify the requirement for additional treatment, determine impacts of any changes in the project's risk profile, and report on the status of open risks to management.

Risk treatment actions are reviewed during monthly progress meetings to update start and completion dates and current status of assigned mitigation actions. Follow up actions should be directed for critical, pending actions that the Business Unit and CIP Directors, PM or PCML do not feel are being implemented as they should be. Any unique and pending circumstances that may affect the probability or impacts of High rated risks, and any new risks, should also be addressed. New risks should be analyzed and evaluated as soon as possible after they are identified.

Risk workshops are held to update all risks and actions. A risk's probability and consequence can change; ideally as mitigation actions are completed, the probability and impact will decrease. New risks may be identified and existing risks may be affected by major project scope changes. Risk teams will review each active risk and update all aspects of the risk register at risk workshops.

Table 1 lists the schedule of risk workshops for Program Risk Assessments and Project Risk Assessments.

Schedule of Risk Assessments Workshops	
Program Assessments	**Project Assessments**
Initial Assessment	Completion of Preliminary Design Report
Every 6 months	Every 3 months during design
	Completion of design
	Every 3 months during construction
Additional as recommended by the Program Assurances Manager	Additional as determined by PM

Table 1: Schedule of Risk Assessment Workshops

5.7 Communication and Consultation

Communication and consultation start at the initial risk workshop and continue through completion of the risk management process. It also includes the processes for reporting on risk management for a project, and the overall program, on an ongoing basis.

Project Status Reports will include the Risk Register with an explanation of any significant changes to mitigation action completion dates and any new risks.

5.8 Closing Risk Registers and Lessons Learned

Closing risk registers involves documenting all mitigated risks and final impacts on the overall project. Impacts include, but are not limited to, impacts on project costs and schedule. Monitored but unmitigated risks will be similarly documented. This information will be available for use on future programs and projects and can be used to adjust severity and probability indices, better define risk tolerance levels and improve mitigation efforts.

The Project Manager will prepare a Lessons Learned Report when the risk register is closed. The primary focus will be to identify activities which were highly effective, effective, partially effective, or not effective, and to recommend ways to improve overall effectiveness for risk management activities. Issues that occurred that impacted the project but had not been foreseen as a risk should be described for future projects to consider.

5.9 Incorporating Risks in Budget and Schedule

The cumulative amount of risk exposure for a project may be incorporated into the project or program contingencies established for the Program. PMP Chapter 05 - Schedule and Budget Management, and associated Program Procedures, defines how risk exposure values for schedule and cost are included in contingencies and are used to manage contingencies.

6 Risk Management Procedures

The following program procedures and/or standard forms and templates related to this chapter of the PMP.

6.1 Procedures

- Program Procedure 0801 – Program and Project Risk Registers

6.2 Tools and Templates

- Risk Register Template

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GLWA
Great Lakes Water Authority

Submitted by:
AECOM
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Program Management Plan (PMP)

Chapter 09 - Engineering and Design Management

Capital Improvement Plan (CIP) Delivery Team

Great Lakes Water Authority

Capital Improvement Plan

Program Management Plan

Chapter 09 – Engineering and Design Management
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Revision	Revision date	Details
1.0	July 2021	Initial chapter as approved following CIPST reviews

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Acronyms

See the Overview chapter for a list of acronyms used in the PMP.

1 Introduction

This Great Lakes Water Authority (GLWA) Capital Improvement Plan (CIP) **Program Management Plan (PMP) Chapter 09 – Engineering and Design Management** describes the policies and processes used by the Project Manager to manage engineering and design work by the Project Design Team, and related contracts, for the CIP Delivery Team and how they are applied throughout each CIP project's lifecycle.

Throughout the PMP, it is assumed that project engineering and design work is performed by Project Design Teams that may comprise either external design consultants under contract to GLWA or in-house Project Design Teams if GLWA is self-performing the design. In either case, the leader of the Project Design Team is referred to as the Project Design Lead.

Design management includes planning, scoping, procuring, coordinating, and management of facility planning and design to meet scope, schedule, cost, and quality requirements as established by the Program and other project requirements. Design management is important to ensure that complete construction and purchasing documents are produced that meet the project and GLWA objectives, that projects are completed on schedule and within budget, that input from CIP partner teams within GLWA is incorporated, and to control the scope configuration. Project Managers' points of contact for the CIP partner teams, including Operations, Maintenance, Financial Services, Procurement, General Counsel, Information Technology, and Organizational Development, are included in PMP Chapter 02 – Program Organization and Governance.

Key management principles include the following:

- All designs will, as a minimum, satisfy the design and performance criteria, scope, and performance objectives required by GLWA and this PMP.
- Engineering reports, calculations, drawings, etc. will be sealed by the responsible engineer in accordance with the professional engineering rules and regulations of the state of Michigan or as required by the GLWA contract, making the Project Design Team the "Engineer of Record" (EOR) for the design.
- Project Design Teams will perform quality management in accordance with their internal quality management procedures and those established in their contracts with GLWA.
- The CIP Program Quality Lead, following procedures described in PMP Chapter 07 – Quality Management, will conduct audits of the Project Design Team's adherence to their quality procedures as detailed in their quality plan.

Figure 9-1, below, represents a general design process from design procurement and initiation of the design scope through to completion of final design for traditional design-bid-build (DBB) projects. It is important to recognize that all the steps shown may not be necessary or scoped for every project. Rehabilitation and small conveyance projects may, at the Project Manager's decision and as reflected in the contractual scope of work (SOW), not have all these elements. Design management for delivery methods other than DBB (Alternative Project Delivery) is discussed in Section 7 of this chapter.

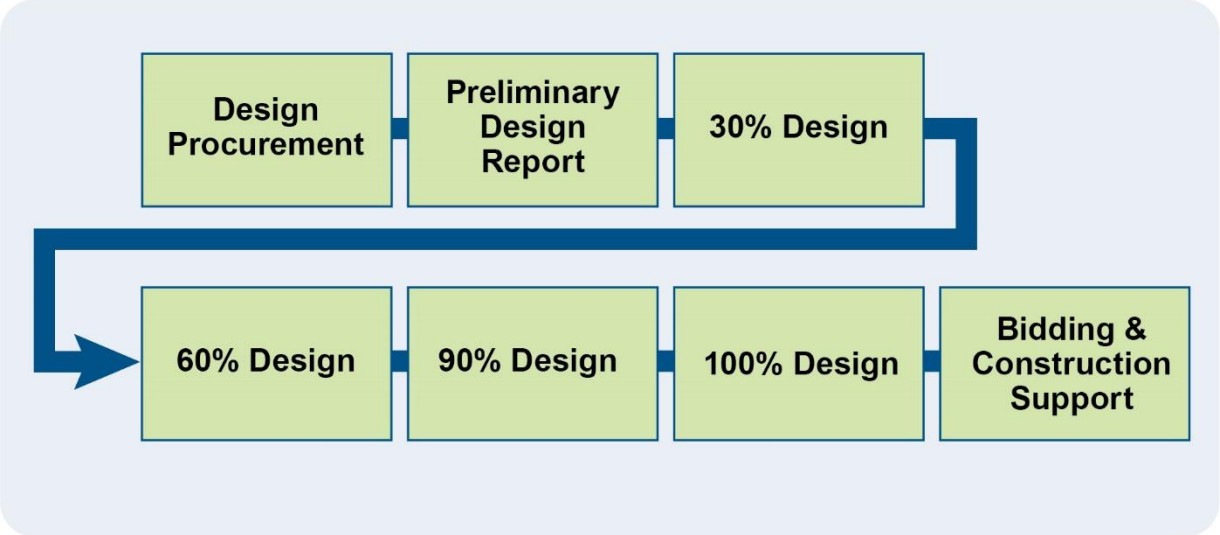

Figure 9-1: Design Stage Process

2 Design Procurement Support

If GLWA chooses to use an external Project Design Team, the Project Manager supports GLWA in the Project Design Team procurement process, including developing the Project Design Team's Scope of Work (SOW), schedule, and budget. If GLWA chooses to use an internal Project Design Team, the Project Manager develops and reviews the in-house Project Design Team's SOW, schedule, and budget (if appropriate) collaboratively with the in-house Project Design Lead.

When using an external Project Design Team, once the documents required for procurement of Design Services have been prepared, the Project Manager will coordinate with GLWA Procurement to initiate the procurement process for the external Project Design Team. The Project Manager will provide technical information and responses to questions during the Project Design Team procurement process, including reviewing the Project Design Team's fee proposal and contract schedule for reasonableness and for conformance to Program standards and requirements.

2.1 Design Scope Development

The Project Manager leads the development of the SOW for design, in coordination with the Project Design Lead if using an internal Project Design Team. This PMP includes (attached) Design Services SOW templates that conform to the Program standard for the Project Work Breakdown Structure (PWBS). The PWBS includes design and engineering tasks and activities and is used whether the Project Design Team is internal or external. The Design Services SOW, along with the PWBS, may be revised if tasks or activities are not required, if additional tasks or activities are required, or if proposals received from Project Design Teams result in revision of the scope as part of the contract negotiation process. The Project Manager prepares the Design Fee Proposal form for the procurement, which should be configured to the design SOW and PWBS, and used by the internal and external Project Design Teams to prepare and submit fee proposals. The design SOW and Design Fee Proposal are the basis for the Project Design Team's schedule and progress reports, and establish consistent scheduling, budgeting, and reporting across the Program.

3 Design Contract Administration

The Project Manager is responsible for the administration of the Project Design Team's contract, including:

- Review and recommendation of the Project Design Team's payment requests, if using an external Project Design Team, and review of the Project Design Team's hours worked if using an internal Project Design Team
- Review of the Project Design Team's progress reports, contract cost forecasts, and design schedule forecasts per requirements of PMP Chapter 05 – Schedule and Budget Management
- Review of and recommendations for contract changes through Change Requests (CRs), Change Directives (CDs), and Change Orders (COs), as defined in PMP Chapter 06 – Contract Change Management
- Management of Task Adjustments (TAs) and requests to access allowances in the contract as defined in PMP Chapter 06 – Contract Change Management
- Management of contract closeout
- Administer the Project Design Team's contract, if external, or scope if internal, during construction of the project, in coordination with the Project Construction Management Team (PCMT) who are responsible for the administration of the construction contract. The role of the PCMT is described in Chapter 14 of the PMP.

3.1 Professional Services Progress Payments and Contract Task Adjustments

Professional services Progress Payment Applications are made as specified in the design contract and according to Program procedures. A GLWA standard consultant payment summary form template is attached to this chapter, and the Project Manager coordinates with the Project Design Lead so that the Progress Payment Applications conform to this format. The Project Manager reviews each Progress Payment Application against the terms of the contract and current design progress and provides a recommendation to the GLWA approving authority for payment. The Project Manager is responsible for verifying the Project Design Team's progress toward milestones achieved per deliverable, and for verifying the Project Design Team's estimate to complete. Payment for final Design Services is made after the Project Manager accepts the final and sealed contract documents. Contract closeout and final payment occurs after construction and closeout services are completed per contract terms.

The Project Design Team is required to track and control the budgets established for each task or subtask. In the course of executing a project, additional effort may be needed for one task while less effort may be needed for another task. The Project Design Team is required to submit task/subtask forecasts at completion that identify variances from task budgets and the total contract cost at completion with explanations of significant cost variances. Per PMP Chapter 06 – Contract Change Management, the Project Manager may initiate a TA to approve adjustments to task budgets within the contract SOW and total approved contract budget.

The Project Manager is to require the Project Design Team to submit Design Progress Reports with Progress Payment Applications.

Design Progress Reports

The Designer submits a Design Progress Report each month to the PM. Program Procedures establish the format, and the due date for the report. The content of the Design Progress Report includes:

- Narrative on current status of deliverables
- Updated schedule and discussion of schedule variances
- Cost updates and Estimate-at-Completion (EAC) and discussion of budget variances
- Outstanding design issues
- Permit status
- Potential scope changes
- Status of pending contract amendments
- Status of assigned action items
- Other topics as determined by the PM

The PM may require the updated schedule and cost updates to be submitted on an expedited schedule before the Design Progress Report to support the timeline for program reporting.

The Project Manager must work with the Project Design Team to ensure that design contract cost and schedule updates are submitted in order to meet the reporting timeline established in PMP Chapter 05 – Schedule and Budget Management, regardless of when the Project Design Team will submit the Progress Payment Application and Design Progress Report. The Project Design Team must provide explanations of all cost variances as a part of their progress reports and contract cost forecasts, along with their plan for recovering any cost variances.

3.2 Design Schedule

The Project Design Team is responsible for scheduling their work within the timeframes defined in their contract and updating their schedule each month. Prior to the design kickoff meeting, the Project Design Team provides an activity level design schedule with key deliverable milestones in a Gantt-chart format (also known as a Critical Path Method schedule) that conforms to the PWBS as established by the design SOW and the Project Manager. The schedule requirements are detailed in Chapter 05 – Schedule and Budget Management, and depict the duration, cost, and logic of each activity, including review periods for each design deliverable. The Project Manager reviews the schedule, and when accepted, it becomes the baseline design schedule for progress measurement.

Design schedule updates are submitted each month that show the work completed and the forecast completion date for each activity in order to meet the reporting timeline established by Chapter 05 – Schedule and Budget Management, regardless of when the Project Design Team will submit the Progress Payment Application and Design Progress Report. The Project Design Team must provide explanations of all schedule variances as a part of their progress reports and contract schedule forecasts, along with their plan for recovering any schedule variances.

3.3 Design Contract Changes

The Project Manager is responsible for managing any contractual changes to professional services contracts for their project. The requirements and procedures for managing such changes are detailed in Chapter 06 – Contract Change Management.

For in-house designs, the change management processes for CRs and CDs will be followed to the extent necessary to receive and document approval for any changes in the design SOW, approved design schedule, and design budget.

4 Design Oversight and Coordination

The Project Manager is to maintain a high degree of coordination between the work of the Project Design Team and other GLWA and Program functions, such as the broader CIP Delivery Team, Operations, Finance, asset management, risk management, public outreach and communication, permitting, etc. A listing of email contacts for each team within the CIP Delivery Team is included in PMP Chapter 02 – Program Organization and Governance. The Project Manager is to work with the CIP Delivery Team, particularly the Program Controls Manager and other Project Managers, for an extra degree of coordination when the project also has critical interfaces with other projects.

The Project Manager is responsible for guiding the overall coordination required during the project planning and design phases, including maintaining open communication lines with the Project Managers of other CIP projects not otherwise involved in this project, GLWA business units, the PCMT, regulatory agencies, and others to promote quality and consistency in the design effort, mitigate risks, and minimize construction conflicts and COs. The Project Manager is also responsible for ensuring that the requirements of PMP Chapter 07 – Quality Management and other Program processes, procedures, and requirements are applied throughout the design process.

4.1 Design Progress Meetings

The Project Manager, including other GLWA staff as appropriate, conducts project progress meetings with the Project Design Team each month to discuss the status of design according to the information submitted in the Design Progress Report. This meeting is an opportunity for clarification of status, providing the Project Design Team with needed decisions and direction, addressing open actions, and establishing new follow-up actions as required. The Project Manager is responsible for ensuring that the Project Design Team schedules the meetings, includes all required participants, and prepares agendas. If the Project Design Team's progress is not to the baseline schedule and/or budget, the Project Manager is responsible for ensuring corrective actions are put in place following processes described in PMP Chapter 05 – Schedule and Budget Management, and as defined in the contract (for an external Project Design Team).

Topics to address in the meetings include:

- Design progress, including the Project Design Team's schedule and budget status relative to the baseline schedule and budget, and corrective actions where progress is not to baseline budget and/or schedule, as well as the overall project budget and schedule versus baseline
- Pending or open technical/engineering decisions or information requests
- Recently resolved technical issues
- Status of open contract changes, through the CR, CD, or CO processes described in PMP Chapter 06 – Contract Change Management, or TAs, also described in PMP Chapter 06 – Contract Change Management.
- Status of open issues
- Coordination and interface requirements with other projects
- Outstanding contractual issues or concerns

The Project Manager produces meeting minutes with assigned action items.

5 Design Deliverable Reviews

Project Design Teams submit design deliverable documents as described in the Project Design Team's SOW. The submittal document review process includes a review covering all needed technical areas of expertise. Identification of potential impacts to project baselines, conformance with Program standards and guidance, and management actions are included as part of the review process. Reviews of documents, as described in the following subsections and in Program Procedure 0901 – Design Deliverable Reviews, are typically required for large or complex projects, but some smaller and less complex projects may require fewer or more limited design submittals, as defined by the Project Manager in the Project Design Team's SOW (for internal Project Design Teams) or contract (for external Project Design Teams).

The Project Design Team retains overall quality control responsibility for all design calculations, drawings, and supplemental project-specific specifications, schedules, and Opinion of Probable Construction Cost. Once the Project Manager has confirmed that the submittal meets the level of design development required for the planned review, the package is submitted for formal review. Formal reviews are coordinated by the Project Manager, who brings together a Design Review Team that consists of technical review staff, typically from the engineering and subject matter experts within GLWA, members of GLWA's Operations, Maintenance, and Asset Management staff, the CIP Delivery Team, and the PCMT as appropriate. The Project Manager should ensure there are reviewers with expertise in all needed fields, acknowledging that not all reviewers would be expected to review all items. Reviews evaluate and compare the design's progress for compliance with the predetermined project baselines, including scope, cost, quality, project objectives and schedule, and Program design criteria and standards. The team should include representatives of affected GLWA teams, including Operations, Maintenance, Safety, Security, Finance, and Asset Management. Operations and Maintenance staff included in the review should ensure the scope they requested is being covered and verify that equipment included in the design is what they require.

Design deliverables are reviewed for:

- Conformance to scope of services, basis of design, engineering and drawing/CAD standards, performance technical provisions, and other project requirements (see attachments)
- Agreement of specifications and drawings with scope requirements
- Conformance to documented GLWA requirements and industry standards
- Adequacy, clarity, and ease of interpretation
- Interface compatibility
- Errors and discrepancies
- Coordination between related design elements, between disciplines, and across related projects
- Cost effectiveness
- Design progress, scope growth, schedule deviations, and changes
- Incorporation of previous design review comments
- Constructability
- Where the design method allows, full use should be made of new technologies for reviews, such as virtual facility walk-through features
- Durability, sustainability, reliability, and low-impact (green) design
- Operability and maintainability
- Asset management list completeness

- Safety in design
- Adequacy of construction schedules and Opinions of Probable Construction Cost

The Project Design Team documents the review comments of the Design Review Team established by the Project Manager by creating a Design Deliverable Review Comments Log (example log appended to this chapter) for each separate design review. Comments are also documented by each reviewer by marking comments in red on printed hard copies of the milestone submission documents, and/or by use of "Track Changes" in electronic versions of the documents, and/or using electronic review software such as "Bluebeam," which allows both documents and drawings to be commented on in a virtual platform that allows all reviewers to see the comments of other reviewers. Regardless of the adopted review approach, the Project Manager should save the final review comments as an electronic pdf version to assist in the retention of comments.

A Design Deliverable Review Checklist by milestone review is appended to this chapter and can be used by the Project Manager and Design Review Team for ensuring thorough design reviews. The Design Review Team should also fully leverage any available GLWA design manuals, CAD or design standards into the design reviews.

Review comments are documented by the Project Manager in a time agreed upon or as specified in the contract, typically within 2 weeks of the submittal. The Project Manager compiles all internal responses to review comments and submits them to the Project Design Team, resolving any conflicting internal comments prior to submitting to the Project Design Team. The Project Design Team is required to respond to each review comment within 2 weeks, or as specified in the contract. The Project Manager will determine which reviews will include a face-to-face meeting with the Project Design Team to present the design deliverable to the Design Review Team and/or to discuss the review comments. In most cases, the Project Design Team proceeds with design during the review and incorporates accepted review comments into the next deliverable. The exceptions are the Preliminary Design Report and the 100% review. The Preliminary Design Report deliverable includes decisions on process alternatives, facility footprints, alignments, and preliminary construction costs that establish a project design baseline that must be agreed on before progressing design, and therefore the Project Design Team is required to resolve all review comments with the Project Manager before proceeding with the 30% design.

5.1 Project Scope Changes

It is important to remember that any changes to the scope of the overall project made during the design phase, while the change may not be a substantive change to the design contract cost or schedule, may result in a substantial increase to the construction cost. Therefore, changes to the scope (configuration) of any project during the design process from the established approved Preliminary Design Report must be formally documented and approved through the project baseline processes described in PMP Chapter 05 – Schedule and Budget Management, regardless of whether or not they impact the scope, schedule, or budget of the design contract itself. See PMP Chapter 05 – Schedule and Budget Management for project baseline changes and Chapter 06 – Change Management for the requirements for documenting design contract scope changes.

5.2 Design Work Plan Review

Where required by contract, the Project Design Team is required to produce a Design Work Plan that defines how the Design Services are executed and how compliance with contractual obligations is achieved. The Project Manager coordinates reviews of the Design Work Plan for compliance with the contract and alignment with Program objectives.

Design Work Plan

The Designer may be required to deliver a Design Work Plan at the Design Kickoff Meeting that defines how design services will be executed and how compliance with the scope of work and contractual obligations will be achieved. The PM reviews the Design Work Plan for compliance with the contract, this Program Design Manual, Program quality requirements, interfaces with other projects and Program activities, and for alignment with the Program's requirements. Review comments will be provided to the Designer and revisions provided to the Plan if directed by the PM.

The Design Work Plan is to be used by the Designer as baseline control of the design process and must include the following minimum requirements.

- Design scope of work
- Design schedule/key milestones
- Basis of progress measurement
- Design budget
- Sub-contracting plan
- Design deliverable list
- Communication Plan
- Designer's organization, discipline leads and coordination plan
- Designer's project management plan, including control of design schedule and budget, and verification of compliance with all applicable Program procedures
- Design Quality Plan (see PMP Chapter 07 – Quality Manual for detailed requirements)
- Designer's Safety Plan
- List of key issues and risks

5.3 Engineering Reports Review

The Project Design Team may be required to produce engineering reports (potentially including workshops or technical memoranda) that may be included as a part of the Preliminary Design Report or design submittals or submitted separately for review. Examples potentially include a Geotechnical Report or Building Assessment Report. The reviews will be coordinated by the Project Manager, who will assign one or more subject matter experts as reviewers. Review comments will be provided using the same process as for other design reviews.

5.4 Preliminary Design Report Review

When a Preliminary Design Report is required in the Project Design Team's SOW, the review of the report is coordinated by the Project Manager before acceptance. The Design Review Team members are from GLWA's engineers and technical experts, representatives from Operations and Maintenance, and other GLWA staff as appropriate. This deliverable is required to be first reviewed as a draft and resubmitted as a final report for approval coordinated by the Project Manager. Details about this design deliverable's requirements are provided in the Project Design Team's SOW.

5.5 30% Design Submittal Review

A formal design review, per Program Procedure 0901 – Design Deliverable Reviews, is scheduled for the 30% Design Submittal. This review point is critical because it represents the last opportunity to address significant changes to the design process or contract documents, if found to be necessary, before more detailed design is completed and the chances of changes requiring rework increase. Although documentation of the 30% review meeting is the responsibility of the Project Design Team, review of the 30% Design Submittal is coordinated and documented by the Project

Manager. Details about this design milestone's requirements are provided in the Project Design Team's SOW.

5.6 60% Design Submittal Review

A formal design review is again scheduled for the 60% Design Submittal. The requirements of this submittal are described in the Project Design Team's SOW, but it is intended that this submittal show ongoing progress toward completion of design, convey an understanding of the design guidance, and provide adequate information to assess potential impacts to the project schedule and budget with a reasonable degree of certainty. Although documentation of the 60% review meeting is the responsibility of the Project Design Team, review of the 60% Design Submittal is coordinated and documented by the Project Manager. Details about this design milestone's requirements are provided in the Project Design Team's SOW. As discussed in Section 5.9 below, the 60% design review is also the review at which a more formal and detailed constructability and operability review is performed, as well as being the first review where the Asset Management Team is invited to attend so they can begin to track the asset management impacts of the proposed design (see Section 5.13 below).

5.7 90% and 100% Design Submittals Reviews

The 90% design review essentially represents a review of the Project Design Team's completed design. Drawings and supplements to standard specifications are expected to be complete including final checks and final coordination. Detailed drawings, specifications, construction duration, Opinion of Probable Construction Cost, and a list of quantities are included in the 90% Design Submittal, as described in the Project Design Team's SOW.

The 100% Design Submittal is reviewed for satisfactory resolution of the 90% review comments. All documents including plans, specifications, Opinion of Probable Construction Cost, and construction schedule are to be provided in final form. Approval of the 100% Design Submittal represents the Construction Bid Documents for construction procurement.

5.8 Cost Estimate and Schedule Reviews

The Project Design Team is required to submit an Opinion of Probable Construction Cost and a construction schedule with each design stage deliverable. The Project Manager will coordinate and provide reviews of the Opinion of Probable Construction Cost and schedules. Comments will be documented for response by the Project Design Team, and subsequent submittals will incorporate accepted comments. If required, the Project Manager will schedule face-to face meetings with the Project Design Team to discuss review comments.

Unless otherwise defined by the contract, the Opinion of Probable Construction Cost should follow the processes defined by the Association for the Advancement of Cost Consulting International (AACE) *Recommended Practice No. 18R 97: Cost Estimate Classification System – As Applied in Consulting, Procurement and Construction for the Process Industries,* and *Skills & Knowledge of Cost Consulting*, 7th Edition, also published by AACE, with the following levels of Opinion of Probable Construction Cost prepared at the following design stages:

- Class 3 or 4 estimates during the Definition for the Preliminary Design Review. This estimate becomes the first baseline cost for the project per procedures in PMP Chapter 05 – Schedule and Budget Management
- Class 3 estimate at the 30% design stage

- Class 2 estimate at the 60% design stage
- Class 1 estimate at the 90%/Final Design stage

5.9 Constructability and Operability Reviews

Concurrent with, and as part of the technical design reviews, a specific emphasis is placed on constructability and operability of the project. While the Project Manager is encouraged to include representatives of construction and operations in each of the 30%, 60%, and 90% review levels, the Project Manager may also choose to have an added constructability review focus at the 60% design review. The Preliminary Design Report for large, complex projects may also be reviewed as determined by the Project Manager. Constructability and operability reviews ensure that all construction considerations have been incorporated by the Project Design Team into the design documents as appropriate. Operability and maintainability reviews are performed by GLWA Operations and Maintenance staff as part of the design reviews and identify functional and maintenance concerns regarding the equipment and layout being designed.

Constructability reviews include reviews of completeness of the documents, unusual difficulty in construction means and methods required by the design, ambiguity of specification requirements, potential conflicts between drawings and standard details, inter-system compatibility, potential Safety, Health and Environmental (SH&E) hazards, phasing, conflicts between disciplines, and field coordination issues. Field coordination issues may include consistency in addressing any potential impact on/from adjacent projects, traffic, neighborhood-specific issues, the location of contractor field offices, parking and materials/equipment lay-down areas, material and equipment delivery constraints, contractor parking, long lead procurement times, owner-furnished equipment, and other issues identified in the project phasing and logistics plans.

Constructability will also include elements of biddability, or how clear and complete the bid documents are to support efficient bids that minimize added contingencies.

See PMP Chapter 14 – Construction Management for additional information on constructability reviews.

5.10 Special Conditions and Specifications for Construction Contracts

Beginning at 60% design and continuing through completion of Final Bid Documents, the Project Design Team will coordinate with the Project Manager, PCMT, and Operations and Maintenance to develop special conditions and specifications required for a construction contract. These may include:

- Interim milestones
- System shutdowns and outages
- Interface and coordination for owner-furnished material and equipment
- Construction sequencing
- Interface or coordination with other projects
- Permits
- Traffic or business access or public outreach and notifications
- Surface restoration of streets or access
- Working hour restrictions
- Liquidated damages and/or incentives
- Temporary construction services, such as trailers, offices, and temporary utilities

- Laydown areas

It is the responsibility of the Project Manager to incorporate the specific special conditions into the design deliverable and constructability review checklists to ensure they are considered and reviewed as the design deliverables are developed.

5.11 Value Management

While a review to identify opportunities of cost, time, maintenance, and operational savings should be included in all of the above reviews, an additional, formal, Value Management review may be utilized by the Project Manager as a tool to assist the decision-making process in a project. Value Management exercises are carried out by a Value Engineering (VE) Review Team, in coordination with the Project Design Teams, to investigate opportunities of cost, time, maintenance, and operational savings. The VE Review Team is assembled by the Project Manager and may be composed of GLWA staff or consultants who are not on the Project Design Team. The VE Review Team identifies savings opportunities that may arise from major or minor changes in the design, specified materials, or performance requirements. Operations and maintenance needs are also considered, including evaluation of areas of existing facilities that can be taken out of service, where beneficial occupancy can occur, etc. The resulting findings are submitted to the Project Manager, who is responsible, with approvals from the engineering leadership of their Business Unit, to instruct the Project Design Team to revise the design to incorporate some or all of the recommended VE changes in the design, specified materials, or performance requirements for final decisions. If such changes result in scope changes to the Project Design Team's contract, then the Project Manager addresses the changes as detailed in Section 3.3 above.

Value Management is about:

1. Clarifying and satisfying customer needs (which may include the GLWA, Operations, stakeholders, and/or the wider community)
2. Creating ideas as to how a system can best fulfill its purpose
3. Challenging assumptions
4. Maximizing returns on investment
5. Participation of GLWA Operations staff, Project Design Teams, and stakeholders
6. Viewing the purpose of a system holistically
7. Seeking the lowest total cost of providing the customers' needs
8. Designing for reliability

VE is the formal systematic application of recognized techniques to review designs, products, or services and to identify and achieve improvements that will result in completed facilities that provide the established program functions at the lowest possible life cycle cost. The decision to use a VE review is decided on a project-specific basis by the Project Manager when the design scope is developed (see Section 2.1). Any modifications resulting from the VE process must be consistent with requirements for performance, maintainability, quality, SH&E, and community impacts.

As a cost control tool, VE is used to evaluate certain changes that may be suggested during the project as a necessary change, an unforeseen change, or a desired change. The VE process evaluates and analyzes cost in much the same way the normal estimating process does, with a significant difference. VE measures the cost based on cost of operations and maintenance, replacement cost, and capital cost to receive the best value for the money spent, without sacrificing quality or quantity.

Value Management also helps to develop an enthusiastic and cohesive team by providing a forum in which participants can express opinions and concerns freely, helping to achieve effective communication throughout the project. This process is proactive and ensures that decision-making is preventive rather than curative. It identifies problem areas and resolves them at an early stage, thus minimizing potential delays and conflicts.

5.11.1 Value Engineering – Design Phase

If scheduled for a project, VE workshops will be conducted by as early as the 30% design review, as decided by the Project Manager. The Project Manager chairs VE workshops and undertakes a leadership role including producing VE reports and recommendations. The VE Review Team identifies and analyzes proposed VE items and performs feasibility and cost studies for incorporation into a recommendation for action. The development of alternate solutions includes comparative Opinion of Probable Construction Cost.

Each element that progresses to the status of a study and development of alternate solutions is documented as a VE action and includes:

1. A statement of the problem or issue
2. The alternate solutions considered
3. The comparative estimates, including life cycle cost, where appropriate
4. Review of VE ideas with the Project Design Team to get feedback
5. A record of the acceptance, or rejection, of the value engineering proposal, with a discussion of the reasons for the action taken

5.12 Special Reviews

On certain projects, the Project Manager may determine that a special review is either appropriate or required due to circumstances such as management, major findings from a VE review, or operational concerns. Special reviews may also be considered if a design is observed as not proceeding as originally scoped, is over budget, or is behind schedule. This may initiate the use of special technical reviews and workshops to provide a second opinion and/or redirection of the project. Sometimes projects exceeding budget and schedule use the process to look at constructability improvements and value savings opportunities.

Special technical review workshops may be held, focused on technical adequacy and the design approach rather than cost unless specifically directed to reduce cost. Complex projects having state-of-the-art process technologies or areas of practice with limited technical design experience are triggers to require an independent team of experts to complete a peer review-type workshop. Projects with emerging rehabilitation or conveyance technology or unusual project conditions are also candidates for a special technical review.

5.13 Asset Management

GLWA's Asset Management Team has developed a variety of tools to support consistent asset management approaches across projects, including an Asset Onboarding Standard Operating Procedure, an Onboarding standard workflow, and various items for RFP and specification development, which can be found at <Add hyperlink when ready>. For the design, members of the Asset Management Team should be invited to attend the 60% and 90% design reviews.

5.14 Financial Reporting and Accounting Group Teams Design Invitation

GLWA Financial Reporting and Accounting Group teams have developed processes surrounding changes to financial assets resulting from either assets being placed in or removed from service. Members of these teams should be invited to 90% design review meetings to ensure communication of anticipated changes to GLWA financial assets are being shared with GLWA peer teams. Notification should be forwarded to ConstructionAccounting@glwater.org and FinancialReporting@glwater.org.

5.15 Engineering Services during Construction

As the Engineer of Record, the Project Design Team is responsible for verifying design integrity of the constructed works through reviewing construction submittals and providing engineering support and other pertinent services during construction. Pertinent services include reviewing testing data, start-up, and certification of constructed facilities. The Project Manager coordinates with the PCMT to monitor these Project Design Team activities to verify quality services and identify developing concerns.

Typical engineering services during construction include the Project Design Team, as the Engineer of Record, responding to requests for information (RFIs) when the RFI is of a technical nature, the review and approval of submittals and shop drawings, support in the CO process, periodic site visits, compiling or reviewing record drawings, supporting start-up, and attending meetings, all as requested by the Project Manager or PCMT leader. The PCMT responds to non-technical requests for information and reviews non-technical submittals. The PCMT may request assistance from the Project Design Team for design clarifications, product substitution reviews, technical submittal reviews, and project issues. These Project Design Team services are requested and provided on an as-needed basis. Additional detail on Engineering Services during Construction activities is provided in the Construction Management process-related procedures are defined in PMP Chapter 14 – Construction Management.

All communication to and from the contractor occurs through the PCMT or designee, who logs, tracks, and documents the communication.

6 Design Contract Closeout

At completion of the Project Design Team's contract SOW, the Project Manager is responsible for ensuring that the Project Design Team transfers to GLWA all of the work products required by the contract following procedures detailed in PMP Chapter 04 – Document Management. The Project Manager also coordinates with GLWA contracts staff to formally close, as required, the design contract by processing final payments and providing necessary documentation to GLWA for retention per the policies documented in PMP Chapter 04 – Document Management.

The Project Manager should coordinate with the Program Quality Manager (PQM) to convene a "Lessons Learned" meeting to evaluate what went well, or not, during the development of the design. This meeting should, at a minimum, include the Design and VE Review Teams. The PQM is responsible for ensuring actions from this meeting are followed up on by the appropriate GLWA personnel.

7 Adapting the PMP to Alternative Project Delivery

7.1 Overview and Purpose

This PMP has been developed with business processes for a DBB contracting methodology. However, the Business Unit Director based on a recommendation from the Project Manager, and in consultation with their Business Unit Chief Operating Officer (COO) and the CIP Director, may choose to contract using alternative project delivery types. There are a variety of alternative delivery methods currently used by GLWA, and the decision on which is selected for a particular project is a function of several factors, including project complexity, project risk, and the schedule to deliver the project.

Alternative project delivery types currently used by GLWA include:

- Design-Build (DB)
- Progressive DB (PDB)
- Construction Management at Risk (CMAR)

The purpose of this section of this chapter is to document variations of the design management processes described in Sections 1 through 6 of this chapter that would apply to these various alternative delivery methods. A broader discussion of how and when to use the alternative delivery methods listed above is included in PMP Chapter 01 – Program Description and Mission.

7.2 Design-Build

7.2.1 Method Overview

DB is a project delivery method that combines architectural and engineering design services with construction performance under one contract. The primary benefits of DB are the simplicity and time savings of having a single party responsible for executing the design and construction of the project along with the ability to obtain construction input during the design process. Under this method, GLWA contracts with a DB Contractor (DBC), which is usually a construction contractor and a design consultant who have entered a contractual relationship. For standard DB, the value of the contract is determined at the time of the procurement of the DBC through a lump sum price.

The DB team develops the design of the facility based on a preliminary or up to a 30% design prepared by GLWA. This preliminary design and other procurement documents are referred to as bridging documents. The level of scope and design definition to be completed before procuring the DBC is a decision that is made by the Business Unit Director, based on a recommendation from the Project Manager and in consultation with their Business Unit COO and the CIP Director. The bridging documents can be prepared by in-house GLWA engineering staff or through a consultant contract such as the Task Order Engineering Services contract, and typically involve progressing the design documents to somewhere between the 10% and 30% level of development. The decisions as to who should prepare the bridging documents and the level of design completion within the bridging documents is again made by the Business Unit Director based on a recommendation from the Project Manager, and in consultation with their Business Unit COO and the CIP Director. The purpose of the bridging documents is to specify key aspects of the design and specifications that are important to the owner, while leaving the prospective DB contractors with the opportunity to use their skills and capabilities to provide the owner with the best total price and time of completion proposals. The checklist of items for the Preliminary Design Report and 30% submittal listed in the

Design Review Checklist, included with Program Procedure 0901, can be used to define the contents of the bridging document.

7.2.2 Design Scope Development

As described earlier in Section 2 of this chapter, the Project Manager leads the development of the SOW for design. With DB, the requirements of the design consultant are defined as part of the bridging documents described above.

7.2.3 Contract Administration

As described in PMP Chapter 14 – Construction Management, the DBC submits Progress Payment Applications as specified in the contract. The Project Manager may work with the DBC to combine the requirements for Design Progress Reports described above with Construction Progress Reports described in Chapter 14 – Construction Management into a single report.

7.2.4 Design Oversight and Deliverables Review

Design schedule update information is provided with the schedule update for DB contracts based on the level of detail for design work negotiated with the DB contractor. For DB contracts, design progress meetings can be combined with construction status meetings as determined by the Project Manager.

Design reviews are administered as described in Section 5 of this chapter, except that the reviews are coordinated between the GLWA Project Manager and the DBC's Project Manager rather than through the Project Design Lead.

7.2.5 Engineering Services during Construction

Since the designer is part of the DB team, the Project Design Team's responsibilities during construction are as defined in their contract with the DBC. If GLWA requires technical input as to whether the DBC has complied with the requirements of the bridging documents, the Project Manager may elect to use the team that prepared the bridging documents to provide needed technical input during either design or construction phases.

7.3 Progressive Design-Build

7.3.1 Method Overview

PDB is a variation of the DB delivery method discussed above. The primary benefit of choosing PDB over DB is that the price of the project construction can be determined at the 60% design review based on an agreed Guaranteed Maximum Price (GMP). Delaying the point at which the contract price is agreed allows GLWA to better define the scope before pricing, but also results in the scope being agreed on at a time when there is less competitive tension than at the time of procurement, which may lead to a higher contract price. If GLWA and the DBC cannot agree on the GMP, GLWA has the option to take the 60% design and complete the project through a different contracting option, which is referred to as "using the off-ramp."

Like DB, for PDB the DBC performs the complete design of the facility based on bridging documents. The level of scope and design definition to be completed before procuring the DBC is a decision that is made by the Business Unit Director based on a recommendation from the Project Manager, and in consultation with their Business Unit COO and the CIP Director. The bridging

documents can be prepared by in-house GLWA engineering staff or through a design consultant, and typically involve progressing the design documents to between a 10% and 30% level of completion. The decisions as to who should prepare the bridging documents and the level of design completion within the bridging documents is again made by the Business Unit Director based on a recommendation from the Project Manager, and in consultation with their Business Unit COO and the CIP Director.

For PDB, the value of the contract to complete the design and construct is determined immediately following the 60% design review and is added to the costs for the development of the design by the DBC from the bridging documents to the 60% design. Design costs from the bridging documents to the 60% design is set at award and can be contracted as either time and materials or as a lump sum.

7.3.2 Design Scope Development

Same as for DB above.

7.3.3 Contract Administration, Design Oversight, Deliverables Review, Engineering Services during Construction, and Design Contract Closeout

Same as for DB above, except that a GMP is negotiated immediately after the 60% design review.

7.4 Construction Management at Risk

CMAR is a project delivery method in which the Construction Manager (CM) acts as a consultant to the owner in the development and design phases but assumes the risk for construction performance as the equivalent of a general contractor (GC) holding all trade subcontracts during the construction phase. This delivery method is also known as CM/GC.

CMAR is similar in many ways to DBB in that the Construction Manager acts as a general contractor during construction and holds the risk of construction performance and guarantees completion of the project for a GMP negotiated at the 60% design completion. However, with CMAR, the Construction Manager also provides advisory professional management assistance to the owner prior to construction, offering schedule, budget, and constructability advice during the project planning and design phases. Thus, instead of a traditional general contractor, the owner deals with a hybrid construction manager/general contractor. The biggest difference between DB and CMAR is that with the latter the owner contracts separately with the designer.

7.4.1 Contract Administration, Design Oversight, Deliverables Review, Engineering Services during Construction, and Design Contract Closeout

Since in CMAR the design consultant is contracted directly to GLWA, the contract administration, design oversight, deliverables review, engineering services during construction, and design contract closeout processes are all as described in Sections 1 through 6 of this chapter, with the exception that the Project Manager leads a process for agreeing on a GMP with the Construction Manager at Risk following the 60% design review.

8 Engineering and Design Management Procedures

The following are the Program procedures and standard forms and templates related to this section of the PMP.

8.1 Procedures

- Program Procedure 0901 – Design Deliverable Reviews

8.2 Tools and Templates

- Standard Request for Proposal and Design Services Scope of Work (to be provided separately)
- PMP Form 0901 - Consultant Payment Summary Form Template
- PMP Form 0902 - Design Deliverable Review Comments Log
- PMP Form 0903 - Design Review Checklist
- GLWA Engineering and Drawing/CAD Standards (to be provided separately)

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GLWA
Great Lakes Water Authority

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AECOM
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Program Management Plan (PMP)

Chapter 10 - Procurement and Contracts Management

Capital Improvement Plan (CIP) Delivery Team

Great Lakes Water Authority
Capital Improvement Plan
Program Management Plan

Chapter 10 – Procurement and Contracts Management
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1.0	April 2022	Initial chapter as approved following CIPST reviews
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Table of Contents

Acronyms

See the Overview Chapter for list of acronyms used in the PMP

1 Introduction

1.1 Purpose

This Great Lakes Water Authority (GLWA) Capital Improvement Plan (CIP) **Program Management Plan (PMP) Chapter 10 – Procurement and Contracts Management** describes the role of the CIP Delivery Team, particularly the Project Manager, in the procurement of professional (including engineering) or construction services for the CIP Program, and the management of these contracts. These contracts are procured by GLWA's Procurement Team, in collaboration with the Project Manager, using processes and procedures that have been documented by the Procurement Team and are available to the CIP Delivery Team as documented below. The Project Manager, with the support of the broader CIP Delivery Team, prepares key portions of the procurement package, monitors progress of the procurement throughout the procurement phase, and facilitates and manages the contract once awarded.

Key management principles include:

- GLWA utilizes standard contract forms for construction and professional services. Professional services scopes of work will conform to the standard Program Work Breakdown Structure (PWBS) described in PMP Chapter 05 – Schedule and Budget Management. Modifications to the standard contract forms are discouraged and require review and approval by the GLWA Legal Team.
- Contracts are procured and administered in accordance with established GLWA contracting and procurement policies.
- The Project Manager develops, using standard CIP Program formats where available, scopes of work and fee proposal formats for professional services contracts and special conditions, and specifications and drawings for construction contracts that become attachments to standard GLWA contracts. GLWA's Procurement Team reviews and approves all such documents prior to bidding and procurement.
- GLWA's Procurement Team has developed and documented in their Procurement Procedures Manual detailed business processes covering all stages of the procurement process. The Procurement Procedures Manual is located on the GLWA's Procurement SharePoint site on GLWA's One Water Connect at https://glwater.sharepoint.com/Areas/FS/Procurement/SitePages/Home.aspx.
- The procurement processes documented have been divided into four phases. To facilitate monitoring of progress during procurement, these four phases have been incorporated into the standard Project Work Breakdown Structure described in PMP Chapter 05 – Schedule and Budget Management.
- Expected timelines for the completion of each phase and subphase of the procurement process have been agreed upon by the Engineering, Procurement, and Legal teams, and are documented as discussed below.
- The Project Manager will work collaboratively with consultants and contractors to resolve contract administration issues.
- All Program participants will strive to properly administer changes to the contracted scope, schedule, and budget by applying the processes and procedures for change management described in PMP Chapter 06 – Contract Change Management.

2 Procurement Management

GLWA's Procurement Team has developed and documented in their Procurement Procedures Manual business processes detailing each stage of the procurement process. These work instructions, documents, and forms are located on GLWA's Procurement SharePoint site on GLWA's One Water Connect at https://glwater.sharepoint.com/Areas/FS/Procurement/SitePages/Home.aspx.

2.1 Procurement Timeline Agreements

GLWA's Engineering, Procurement, and Legal teams have agreed on and documented expected timelines for the completion of each phase and subphase of the procurement process. The agreed-upon timelines (sometimes referred to as Service Level Agreements or SLAs) are documented in Standard Operating Procedure (SOP) # FSA_PRO_REF_0014 located at the Procurement SharePoint site on GLWA's One Water Connect at https://glwater.sharepoint.com/Areas/FS/Procurement/SitePages/Home.aspx.

The purpose of the agreed-upon timelines is to define expected timeframes for completion of the procurement processes for contracts under normal circumstances. Individual contracts may be procured either more quickly or more slowly than the agreed-upon timelines based on circumstances specific to each procurement, which may be beyond the control of either the Procurement Team or the Project Manager. Where procurements are delayed beyond the agreed-upon timelines, the Procurement Team and the Project Manager work together to identify the cause of the delays and collaborate to resolve the issues. Where the issues are out of the control of the Project Manager or Procurement Team, then the Project Manager shall escalate the matter immediately to the Director of Engineering of the impacted Business Unit and copy the Program Controls Manager.

2.2 Responsibilities of the CIP Delivery Team in the Procurement Process

The CIP Delivery Team, and particularly the Project Manager, have key responsibilities in support of the Procurement Team in procuring professional services and construction contracts, as detailed below.

The Project Manager is responsible for monitoring and reporting to the CIP Delivery Team the progress of procurement tasks and activities for their project throughout the procurement phase. As such, it is recommended as a best practice that the Project Manager and assigned buyer meet at least once per week to discuss progress and next steps.

2.2.1 Pre-Procurement Phase

Before the procurement process can commence, as documented in the Procurement Procedures Manual discussed above, the Project Manager is responsible for:

- Coordinating with GLWA's Construction Accounting & Financial Reporting (CAR) team to receive approval of funds for the requested CIP procurement. The CAR team can be contacted at either ConstructionAccounting@glwater.org or FinancialReporting@glwater.org. If CAR approves the funding request, they provide the required procurement request form.
- Creating the requisition. The SOP for this step is detailed in the Procurement Procedures Manual described above.
- Completing and attaching to the requisition the procurement request form, also provided in the Procurement Procedures Manual described above.

- Completing and attaching to the requisition the finalized scope for a professional services contract procurement, or the scope and conformed bid documents (drawings and specifications) for construction contracts. Note: PMP Chapter 09 – Engineering and Design Management includes standard templates for scopes of work and fee proposals for design and construction management services that match the tasks, subtasks, and activities in the CIP Delivery Team's standard PWBS. The use of standard templates for scopes of work and fee proposals will ensure that scopes of work are consistent with respect to similar activities, and that the structure of scopes of work and fee proposals can be integrated into the PWBS and support program procedure requirements for schedule and budget management and reporting documented in PMP Chapter 05 – Schedule and Budget Management.
- Obtaining all required approvals of the requisition before reaching out to the Procurement Team to initiate their processes.

2.2.2 Procurement Phase 1 – Project Development

During Phase 1, the Project Manager is responsible for:

- Monitoring the progress of the Procurement Team's development of the draft contract documents and assisting in a timely manner when requested.
- Promptly responding to questions from the Procurement Team's buyer. If the number of questions is better handled in a meeting setting, the Project Manager is to coordinate with the buyer to set up a meeting with the buyer to resolve open questions.
- Promptly responding to questions from the assigned attorney. If the number of questions is better handled in a meeting setting, the Project Manager is to coordinate with Legal and the buyer to set up a meeting with the assigned attorney to resolve open questions.
- Reviewing for accuracy and approving draft solicitation documents for advertisement.

2.2.3 Procurement Phase 2 – Advertisement

During Phase 2, the Project Manager is responsible for:

- Checking the advertisement for accuracy and completeness immediately after its posting and notifying the Procurement Team immediately if there are any incorrect or missing items.
- Presenting on the technical aspects of the solicitation during any required pre-bid or proposal meetings and/or site tours.
- At least weekly from the start of, and throughout, the advertisement period, reviewing questions received to monitor whether the questions show consistent themes that may indicate a flaw in the bid documents, or require additional time to respond to. If issues are identified, they shall be escalated immediately to the Procurement Team, the Project Manager's manager, and the Program Controls Manager.
- Ensuring all inquiries about the solicitation from potential responders are directed to the Procurement Team; the Project Manager shall have NO discussion of the procurement with potential responders.
- Providing answers to the Procurement Team for technical questions received during the question period.

2.2.4 Procurement Phase 3 – Evaluation

During Phase 3, the Project Manager is responsible for:

- Liaising with the Procurement Team to determine the makeup of the evaluation committee.
- Participating on the evaluation committee.
- Determining the questions for the oral interview and the presentation format, including gaining approval for questions from his or her manager as appropriate.
- Approving the intended award, including completing the non-award determination form if the award is other than to the low bidder.
- Modifying the contract, including ensuring that any changes to the scope of work or fees from issues raised in addendum items are addressed.
- For projects over $1,000,000.00, drafting the Board letter.
- Helping to address Board questions.
- Reviewing the contract and confirming that it is correct and ready for submission to Legal.

2.2.5 Procurement Phase 4 – Execution

During Phase 4, the Project Manager is responsible for:

- Conducting the award meeting**.**

3 Contract Administration

Contract administration begins at contract award and continues through contract closeout. Contract administration includes implementing GLWA and Program policies and procedures to administer the contract to deliver the required goods and/or services.

The Project Manager serves as the Contract Administrator for professional services, and the Project Construction Management Lead serves as the Contract Administrator for construction contracts.

PMP Chapter 05 – Schedule and Budget Management, PMP Chapter 06 – Contract Change Management, PMP Chapter 09 – Engineering and Design Management, and PMP Chapter 14 – Construction Management describe contract administration processes and related Program procedures in more detail. Standard forms and templates for documentation of contract administration processes are included with the procedures. All contracts related to the Program will be administered in accordance with the PMP and Program procedures.

3.1 Contract Approvals

Approval by GLWA's Board of Directors is required for all contracts for which the total compensation or term exceeds the limits described in the GLWA Procurement Policy. Contracts are not to be purposefully divided to avoid Board approval. Where the contract compensation and duration are below the thresholds, the CEO, Chief Procurement Officer, or Procurement Manager may execute the contract or change to a contract in accordance with the monetary thresholds established by the GLWA Procurement Policy.

Where the construction contract between GLWA and a contractor defines a Contracting Officer, this PMP assumes that the Contracting Officer's rights and authorities from the contract are delegated to the

Project Manager. While the Project Manager may serve as the GLWA representative with various actions and recommendations defined by the Program procedures, the Chief Procurement Officer will serve as the final approver.

3.2 Initiation of Contracted Services

Upon issuance of Notice to Proceed by GLWA and initiation of contracted services, the Project Manager for professional services contracts, with support of the Project Construction Management Lead for construction contracts, will:

- Verify receipt of initial contract deliverables such as work plans, schedule, etc.
- Establish contract files in accordance with Program requirements (see PMP Chapter 04 – Document Management).
- Verify the contract schedule is submitted and is in conformance with the requirements of the contract specifications, PMP Chapter 05 – Schedule and Budget Management, scope of work, and Program Work Breakdown Structure.
- Conduct a design kickoff or pre-construction meeting.

3.3 Execution of Contracted Services

The Project Manager for professional services contracts and the Project Construction Management Lead for construction contracts administers the execution of the contracted services on behalf of GLWA, using the processes and procedures detailed in the other chapters of this PMP, including:

- Verifying that work performed or services provided are in conformance with the contract requirements
- Reviewing and processing interim or progress payments
- Evaluating and initiating contract changes
- Maintaining contract schedules and budgets with the contracted party
- Obtaining contract schedule and cost forecasts
- Reporting on progress, issues, and performance
- Managing contract documentation
- Verifying timely delivery of equipment and supplies critical to the schedule
- Being the point of contact between the consultant or contractor and other GLWA Operations, Program, or project team members
- With the support of the Program Assurances Manager (PAM), performing quality assurance (QA) to ensure deliverables and work meet Program and contract quality requirements as detailed in PMP Chapter 07 – Quality Management
- Distributing contract-related information as necessary
- Managing contract closeout activities

3.4 Monitoring and Controlling Contracted Services

The Project Manager for professional services contracts, with support of the Project Construction Management Lead for construction contracts, is responsible for monitoring and controlling the contracted services, which include:

- Conducting progress and coordination meetings throughout the contract term

- Tracking and analyzing contract schedule and budget performance, with the support of the Program Controls Manager, using the processes and procedures detailed in PMP Chapter 05 – Schedule and Budget Management
- Tracking, evaluating, and obtaining approvals following the processes in PMP Chapter 06 – Contract Change Management for required changes to contract scope
- Monitoring and mitigating contract risks where possible, with the support of the PAM, using the processes and procedures detailed in PMP Chapter 08 – Risk Management
- Coordinating interfaces with related contracts and Operations
- Managing and reporting on health and safety compliance to the PAM as required by PMP Chapter 12 – Environmental Health and Safety
- Working with the GLWA Procurement Team to verify all contract requirements have been met and deliverables are satisfactory, including checking at least annually to ensure required insurance is in place and current insurance certificates are submitted to Procurement
- Where the consultant or contractor is not performing as required by their contract, work with the Project Manager's Business Unit leadership, the CIP Group, and the Procurement Team to evaluate options for ensuring the schedule delays are corrected. Failure of the consultant/contractor to provide and adhere to an acceptable recovery schedule shall be escalated to CIP Delivery Team leadership for escalation to the consultant's/contractor's leadership, as persistent failure of the consultant/contractor to perform in accordance with their contract may be grounds for a variety of contractual recourses.

3.5 Contract Closeout

The Project Manager for professional services contracts, with support of the Project Construction Management Lead for construction contracts, works with Procurement to verify all contract closeout requirements have been met and deliverables are satisfactory, following processes and procedures documented in the Procurement Procedures Manual, located at GLWA's One Water Connect at https://glwater.sharepoint.com/Areas/FS/Procurement/SitePages/Home.aspx.

4 Contract Reporting

The Project Manager is responsible for providing cost and schedule updates and forecasts for professional services contracts as part of the monthly reporting of project status and progress. This information is necessary to anticipate and mitigate impacts on project and Program budgets and schedules. Professional services consultants provide cost and schedule updates and forecasts to the Project Manager as described in PMP Chapter 09 – Engineering and Design Management. Construction contractors provide cost and schedule updates and forecasts to the Project Construction Management Lead who provides them to the Project Manager as described in PMP Chapter 14 – Construction Management. The Project Manager works with the Program Controls Manager to update program and project schedules and budgets. Project reporting procedures are addressed in PMP Chapter 05 – Schedule and Budget Management.

5 Payment of Invoices

Invoices are processed in accordance with GLWA and Program procedures detailed in PMP Chapter 09 – Engineering and Design Management and PMP Chapter 14 – Construction Management. The Project Manager is required to ensure that all parties involved in reviewing, approving, or processing invoices complete their role in a timely manner to ensure payments are processed promptly and within contract

requirements. Payment response times will be monitored in the Program Management Information System (PMIS).

6 Change Management

Changes in the contract scope, schedule, and/or budget will be processed in accordance with the contract requirements and Program policies and procedures as addressed in PMP Chapter 06 – Contract Change Management.

7 Documentation and Records

Contract documents will be maintained in the GLWA SharePoint (or future PMIS) and in accordance with the requirements and procedures addressed in PMP Chapter 04 – Document Management.

8 Procurement and Contract Administration Procedures

The following Program procedures and standard forms and templates are related to this section of the PMP.

8.1 Procedures

Refer to PMP Chapter 06 – Contract Change Management, PMP Chapter 09 – Engineering and Design Management, and PMP Chapter 14 – Construction Management.

8.2 Forms and Templates

- None.

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GLWA
Great Lakes Water Authority

Submitted by:
AECOM
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Program Management Plan (PMP)

Chapter 11 - Permitting and Regulatory Compliance Management

Capital Improvement Plan (CIP) Delivery Team

Great Lakes Water Authority

Capital Improvement Plan
Program Management Plan

Chapter 11 – Permitting and Regulatory Compliance Management
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1.0	January, 2023	Following CIPST review and approval
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List of Appendices

Acronyms

See the Overview Chapter for list of acronyms used in the PMP

1 Introduction

1.1 Purpose

This chapter of the Great Lakes Water Authority (GLWA) Capital Improvement Plan (CIP), **Program Management Plan (PMP) Section 11 – Permitting and Regulatory Compliance Management,** describes the processes for planning, managing, and tracking the activities required to obtain regulatory, environmental, and other agency permits and jurisdictional approvals for the projects that are part of the CIP Program, and verifying that the resulting compliance actions are completed. GLWA and the CIP Delivery Team are committed to minimizing potential impacts to the environment through the design and construction of the projects and complying with all environmental and regulatory requirements.

Key management principles:

- A primary objective of this chapter is to avoid delays in CIP project progress related to obtaining permit/environmental approvals.
- Identifying and planning for regulatory compliance begins during the Project Initiation step and continues throughout the project lifecycle.
- GLWA and the CIP Delivery Team will utilize an Environmental Compliance and Permits Plan, developed as described in this chapter, and the project schedule for monitoring and reviewing the environmental performance of each construction contractor to minimize adverse environmental impacts or environmental noncompliance.
- The Project Manager, with assistance from the Program Assurances Manager, is responsible for verifying that the Environmental Compliance and Permits Plan is executed and upheld by the relevant parties, including periodic audits by the Project Manager with the support of the Program Assurances Manager.
- Since many of the steps in project permitting are out of the control of the CIP Delivery Team, the Project Manager will verify permitting schedule risks are evaluated and understood beginning during the Project's Planning Phase and continuing throughout the project.
- The Project Manager also verifies that sufficient time contingencies are included in the project schedule based on the history of review and approvals with specific agencies, and that schedule risks are incorporated into each Project Risk Register.
- All permitting and environmental approval documents will be managed in accordance with PMP Chapter 04 – Document Management and captured in and managed through the Program Management Information System (PMIS) when available.

2 Environmental Compliance and Permits Plan

Each project will have an Environmental Compliance and Permits Plan (Appendix A). This plan is initiated by the Project Design Team during the Planning Phase of a project, and further developed through the Design Phase. The plan will document the permits and agency approvals required and provide a format for ensuring that permits required for construction are tracked through approval, identified in the contract documents, and compliance actions are identified and monitored.

Environmental Compliance and Permits Plans include the following components:

- A list of all permits and other agency approvals required or anticipated for the project.

- For each permit/approval, the permit name, the approving agency, agency key contact, when it is needed (before construction, during construction, or for operations), and the Program entity within the CIP Delivery Team responsible for obtaining the permit/approval.
- A list of the project schedule milestones that must be met before key project permits can be prepared and submitted for approval and the entity responsible for submission so the timely submission can be monitored.

The Environmental Compliance and Permits Plan is maintained and updated by the Project Design Team during the Design Phase to reflect new or changing requirements. During construction, the Project Construction Management Team maintains the Environmental Compliance and Permits Plan as necessary through completion of all permit approvals that are the responsibility of GLWA, including monitoring and reporting compliance actions. The Project Manager is responsible for verifying that the construction contractor's contract includes their responsibility for establishing a schedule that enables permits and approvals that are the construction contractor's responsibility to be obtained in a timely way that does not delay the construction schedule.

3 Permit and Approval Schedules

The activities to obtain a permit or approval are to be managed using the procedures in PMP Chapter 05 – Schedule and Budget Management. If a permit or approval is delayed, the variance to schedule must be immediately communicated by the consultant or contractor to the Project Manager, and immediately from the Project Manager to the Project Controls Manager. The consultant, contractor, Project Manager, and Project Controls Manager shall use the Permits Tracking Log section of the Environmental Compliance and Permits Plan to manage the steps to obtain individual pre-construction permits and approvals

4 Monitoring and Tracking

The Project Manager and Project Design Team use the Environmental Compliance and Permits Plan to plan, update, and forecast the dates for preparing and reviewing permit applications, submitting each permit application for review, documenting permit approval, and coordinating forecast dates with the project schedule.

The Project Design Team maintains the Environmental Compliance and Permits Plan through the Procurement Phase and updates it as part of status reporting. The Project Design Team tracks the steps required to obtain pre-construction permits, identifies who is responsible for obtaining a permit, and adds compliance actions in the Compliance Tracking Log (Tab 2 of the Environmental Compliance and Permits Plan) for each permit as it is approved.

The Project Design Team incorporates compliance requirements for permits into the bid documents. The Environmental Compliance and Permits Plan is used to track compliance requirements of pre-construction permits and permits that the contractor is contractually required to obtain.

Permit and compliance status are included in the agenda for Design Progress Meetings, Construction Status Meetings, and Project Progress Meetings as necessary to monitor permit and compliance action status with the responsible party or parties. Project Progress Reports and variance reports will identify forecasted overdue permits.

5 Permits Management and Agency Coordination

Project Design Teams and contractors will have primary responsibility for coordinating with agencies to obtain the permits they are responsible for, in accordance with the terms of their respective contract agreements, and following Program Procedure 1101 – Permit Application Development and Review. As detailed in Program Procedure 1101, the Project Manager reviews Environmental Compliance and Permits Plans to verify that they are consistent and current. The Project Design Team and contractors are responsible for understanding each permitting agency's requirements and key contact, establishing a working relationship between the agency and the project teams, and expediting agency reviews when required. The Project Manager verifies that the scopes of work for Project Design Teams and contractors include their responsibility to understand, manage, and consider in their scheduling the time required for GLWA staff to review and comment on permit applications, including legal review and check processing times.

The Project Manager, with the Program Controls Manager's assistance, monitors permit variance dates against the project schedule and works with the project teams to resolve variances.

5.1 Reimbursement of Member Agency Design Plan Review, Permit, and Inspection Fees

Where a component of the project is being constructed in an area where a GLWA member partner is the authority having jurisdiction (AHJ) and imposes fees for design plan reviews, permits or inspection fees, then the Project Manager is to approve reimbursement of the fees incurred using Program Procedure 1102 – Reimbursement of Member Agency Design Plan Review, Permit, and Inspection Fees. (Appendix B – Procedures)

6 Design Scope of Work and Construction Contract Review

Design scopes of work will include the requirement to maintain and update the Environmental Compliance and Permits Plan and a list of all permits the Project Design Team is responsible for obtaining. Construction contract specifications will define the permits and approvals required to be obtained by the contractor. Compliance conditions associated with any permits that include compliance conditions will be identified in construction specifications and/or applicable contract documents such as drawings, tables and notes. The Project Manager is responsible for verifying that design scopes of work and construction contract specifications include these requirements.

7 Regulatory Compliance Reporting

The Project Design Team will identify the reporting requirements that may be a condition of a permit's approval. The Project Manager will determine the project entity responsible for compliance reporting, monitor and track reporting compliance, and support GLWA reporting responsibilities.

Monitoring compliance, addressing compliance variances, and reporting to regulatory agencies is required during construction. This effort is incorporated into the processes and procedures for construction management of the Program.

8 Permitting and Regulatory Compliance Management Procedures

The following program procedures and standard forms and templates are related to this section of the PMP:

8.1 Procedures

- Program Procedure 1101 – Permit Application Development and Review
- Program Procedure 1102 – Reimbursement of Member Agency Design Plan Review, Permit, and Inspection Fees

8.2 Forms and Templates

- Environmental Compliance and Permits Plan

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Great Lakes Water Authority

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AECOM
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Program Management Plan (PMP)

Chapter 12 - Health and Safety

Capital Improvement Plan (CIP) Delivery Team

Great Lakes Water Authority

Capital Improvement Plan
Program Management Plan

Chapter 12 – Health & Safety
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1.0	September 2023	As approved by CIPST
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Acronyms

See the Overview Chapter for list of acronyms used in the PMP.

1 Introduction

1.1 Purpose

This Great Lakes Water Authority (GLWA) Capital Improvement Plan (CIP) **Program Management Plan (PMP) Section 12 – Health & Safety (H&S)** documents GLWA's approaches for managing H&S when delivering projects within the CIP Program. GLWA's H&S policies and procedures have been developed by GLWA's Risk Management and Safety Team and define the responsibilities of each participating entity in the CIP Program for H&S, the requirements for project team H&S management plans, and the processes and procedures for H&S reporting. The objective is to ensure that each consultant and contractor working on CIP Program projects is held fully accountable for project safety for their respective scope of services/work.

Key management principles include:

- Each consultant and contractor working on CIP Program projects is fully responsible for full and violation-free compliance with all applicable laws, rules, and regulations pertaining to job and project safety for their respective scope of services/work.
- Each consultant and contractor shall develop and implement a comprehensive project safety program and require each of their respective subconsultants/subcontractors to adhere to such safety program, including having a written H&S management plan.
- Consultant's and contractor's H&S management plans shall meet or exceed the most stringent of all applicable laws, rules, and regulations, GLWA's H&S policies and procedures, and the corporate policies of the consultant or contractor as appropriate to their respective services/work provided for the CIP Program.
- Consultant's and contractor's H&S management plans must be submitted in writing to GLWA's Project Manager prior to mobilization to perform any field work.
- Each consultant and contractor shall appoint a safety officer who is responsible for administering their respective comprehensive safety program.
- Each consultant's and contractor's H&S management plan will be maintained on the work site and be made available to GLWA and CIP Delivery Team members on request.
- If the Project Design Team or Project Construction Management Team roles on a project are performed by GLWA staff, these teams are similarly responsible to have a H&S management plan that meets or exceeds the most stringent of all applicable laws, rules, and regulations, and GLWA's H&S policies and procedures.
- All GLWA team members visiting a construction site are required to make themselves familiar with and abide by any applicable H&S management plan for the site.
- The GLWA Project Manager is responsible to ensure that the above requirements of consultants and contractors are written into the contract documents for each procurement.

1.2 Goals

The CIP Program fully supports and implements both GLWA's "Risk Management Policy Statement" and "Safety Policy", available from GLWA's Office of Risk Management, both of which including the Chief Executive Officer's (CEO) message on safety. These policies and statements are located at

Risk Management - Safety Procedures and Programs (sharepoint.com), and include the following primary H&S principles:

- We Value Our Employees.
- Effective Safety Culture.
- Manager, Supervisor, Team Leader Responsibilities.
- Consequences for Ignoring Safety Practices.
- Zero Tolerance or Substance-Free Workplace.

All GLWA personnel working on the CIP Program will be responsible for:

- Reading, and verifying they have read and understand, GLWA's Safety Policy and the CEO's message by signing the required employee acknowledgement.
- Conducting themselves in accordance with directives, requirements, and procedures established by GLWA's H&S management plans.
- Temporarily suspending their work activities and requesting guidance from their manager, supervisor, or team leader before continuing a task when they identify a condition or practice that may create a health or safety risk.
- Immediately reporting H&S incidents to their manager, supervisor, or team leader and GLWA's designated H&S representative, Project Manager, and CIP Program Assurances Manager.

2 Health and Safety Requirements

GLWA's Risk Management and Safety Team has developed GLWA's H&S requirements. For the CIP Program, the primary requirement is that each consultant and contractor must implement their own H&S management plan that meets or exceeds the requirements detailed below. GLWA's Risk Management and Safety Team has developed a variety of policies and procedures, located at Risk Management - Safety Procedures and Programs (sharepoint.com), that are available to project teams. While GLWA's H&S policies and procedures are available to consultants and contractors to assist them in developing their own plans, should they choose to use them, the use thereof does not, in any way, relieve each consultant and contractor from their absolute responsibility for health and safety for their respective scope of services/work.

2.1 Consultants and Contractors

Consultants and contractors working on the CIP Program are required to have formal, written, H&S management plans that address their respective scope of services/work. All H&S management plans are to be prepared in accordance with the consultant's or contractor's corporate policies and procedures; incorporate requirements of their respective scope of services/work on the CIP Program; incorporate requirements of GLWA's H&S policies and procedures; be appropriate for the intended services or work; and comply with all applicable local, state, and federal requirements. The requirement for a written H&S management plan applies to the Project Design Team, whether consultant or internal, the Project Construction Management Team, whether consultant or internal, the construction contractor, and all other consultants or contractors used on a CIP Program project.

2.1.1 CIP Program Consultant and Contractor Safety Verification

GLWA's Risk Management and Safety Team has developed a "GLWA Contractor Safety Evaluation Checklist," that the GLWA Project Manager is to provide to the consultant or contractor to complete at

the commencement of their contract. The completed “GLWA Contractor Safety Evaluation Checklist” is to be returned to the GLWA Project Manager by the consultant or contractor together with their H&S management plan for GLWA review. GLWA’s review is solely for the purpose of verifying that the consultant’s or contractor’s plans and capability meet or exceed the most stringent of all applicable laws, rules, and regulations; GLWA’s H&S policies and procedures; and the corporate policies of the consultant or contractor and does not in any way relieve each consultant and contractor from their absolute responsibility for health and safety for their respective scope of services/work.

2.2 Subconsultants and Subcontractors

Subconsultants and subcontractors will be covered by their prime consultant’s or contractor’s H&S management plan or incorporate the prime consultant’s or contractor’s H&S management plan requirements into their respective plans.

2.3 H&S Management Plan Availability

The H&S management plans developed and maintained by consultants and contractors shall be submitted for GLWA's records prior to the commencement of any billable work for consultants, and as a part of the contractor's “Prerequisite to Mobilization Submittal Package” (PMSP) (see PMP Chapter 14 - Construction Management). Throughout the construction phase the H&S management plans of consultants and contractors mobilized to the site will be available on request to GLWA’s Risk Management and Safety Team, Project Manager, and CIP Program Assurances Manager and will be maintained at the consultant’s or contractor’s primary work site.

2.4 Incident Reporting and Investigation

Major unplanned incidents can occur which may have adverse effects to, without limitation, public health and safety, the environment, local surface water use, or customer service. A non-exhaustive list of examples of major incidents include human-caused threats, natural disasters, and failures related to Program construction activities.

2.4.1 Incident Communication Plan

Each GLWA facility has a “Spill Prevention, Control, and Countermeasure Plan” (SPCC Plan) and “Pollution Incident Prevention Plan” (PIP Plan). The GLWA Project Manager is responsible for verifying that consultants and contractors working at GLWA facilities are aware of the SPCC and PIP Plans for that facility, and that their respective H&S management plans incorporate these requirements and are consistent with GLWA’s SPCC and PIP Plans.

For CIP Program projects being performed at locations other than a GLWA facility, the GLWA Project Manager is responsible for verifying that consultants’ and contractors’ H&S management plans incorporate requirements similar to GLWA’s SPCC and PIP Plans and detailing the consultants’ or contractors’ responsibility to promptly notify GLWA’s Safety Management Professional as the primary contact in any SPCC and PIP incident.

2.4.2 Incident Reporting

Consultants’ and contractors’ H&S management plans are required to include notification and communication procedures for reporting accidents and incidents while working on the CIP Program, including completing and submitting to GLWA’s Risk Management and Safety Team the required “Statement of Facts” form, and copying the Project Construction Management Lead (PCML), Project Manager, and CIP Program Assurances Manager.

Work-related injuries, illnesses, and near-miss incidents, including vehicular incidents or citation by a governing agency, must be immediately reported pursuant to the reporting procedures.

2.4.3 Incident Investigation

The consultant and contractor shall investigate incidents in accordance with the requirements of their respective H&S management plan to determine root cause and identify and report corrective actions to minimize recurrence. Consultants and contractors shall ensure corrective actions are completed in a timely manner and shall complete the required internal and external reports.

GLWA's Risk Management and Safety Team may perform an investigation into the incident, either jointly or separately with the consultant or contractor, and the consultant or contractor shall fully support GLWA in the investigation.

2.4.4 GLWA Team Members

Each GLWA team member visiting a CIP project site is encouraged to follow Program Procedure No. 1201 – Project Site Visits, including:

- Before visiting the project site:
  - Contact the GLWA Project Manager and/or Project Construction Management Lead to obtain a copy of the relevant contractor's H&S management plan and the name of the contractor's designated site-safety officer.
  - Read and understand GLWA's Risk Management - Safety Procedures and Programs (link in Section 2 above).
  - Read and understand the contractor's H&S management plan and the implications of the plan to the GLWA team member's behavior while on site, including:
    - Where to go to check in with the contractor's designated safety officer.
    - The personal protective equipment (PPE) required for the site visit.
    - The person from the contractor's team to contact when arriving at the site.
  - Read and understand the contractor's "Task Hazard Analysis" if available for any visit-specific site activities.

- On arrival at the site, where available:
  - Meet with the contractor's designated safety officer.
  - Sign in to document their presence on site.
  - Complete the site safety orientation or induction.
  - Discuss any dangers specific to the site and any current work activities with the safety officer.
  - Request an escort while on the site if site conditions so require and if available.
  - Become familiar with available safety items, including:
    - Locations of first aid kits, fire extinguishers, and automated external defibrillators (AEDs), if available.
    - Site maps, rally points, and evacuation zones.
    - Safety posters and emergency contact information.

- During the site visit:
  - Maintain situational awareness.
  - Follow directions.

- On leaving site:
  - If signed in, be sure to sign out.
  - Report to the GLWA Project Manager any safety issues, concerns, or other observations from the visit.

In any H&S situation, GLWA team members are responsible to abide by whichever is the higher of (1) GLWA safety standards or (2) the contractor's H&S management plan.

If a GLWA team member is injured on a CIP Project, their safety and potential treatment shall be pursuant to the contractor's H&S management plan, and the GLWA manager, supervisor, or team lead is to follow the workers' compensation procedures document in the "Workers' Compensation Flow Chart" developed by GLWA's Risk Management and Safety Team.

2.5 Communication and Participation

The CIP Program will strive to maintain effective communications relevant to the H&S program, both internally and externally, and will solicit and encourage input from CIP Program participants to improve H&S results for the CIP Program.

Each individual CIP Program participant is responsible for keeping safety at the forefront of their day-to-day actions and adopting a zero-accident culture of safety for the CIP Program. To drive acceptance and implementation of the CIP Program's culture of safety, senior management of GLWA, consultants, and contractors shall demonstrate continuous commitment and involvement in their respective H&S practices and execution.

2.5.1 Internal Program Communications

Internal CIP Program H&S Reporting, as described in Program Procedure No. 1202 – H&S Reporting, is structured to enhance communications throughout the CIP Delivery Team on H&S issues and outcomes, and to maintain awareness and understanding of the CIP Program goals and the importance of individual consultant/contractor H&S management plans. Project H&S reporting should include lessons learned, results of incident investigations, and revised and/or new H&S procedures. All CIP Program staff throughout the CIP Delivery Team are encouraged to participate in frequent and open H&S communications.

3 Health and Safety Procedures

GLWA's H&S policies and procedures are provided in Section 2 above.

The following program procedures and/or standard forms and templates are related to this section of the PMP.

3.1 Procedures

- Program Procedure 1201 – Project Site Visits
- Program Procedure 1202 - H&S Reporting

3.2 Tools and Templates

None.

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Great Lakes Water Authority

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Program Management Plan (PMP)

Chapter 13 - Public Information and Stakeholder Management

Capital Improvement Plan (CIP) Delivery Team

Great Lakes Water Authority

Capital Improvement Plan
Program Management Plan

Chapter 13 – Public Information and Stakeholder Management
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Acronyms

See the Overview Chapter for list of acronyms used in the PMP.

1 Introduction

1.1 Purpose

This Great Lakes Water Authority (GLWA) Capital Improvement Plan (CIP) **Program Management Plan (PMP) Chapter 13 – Public Information and Stakeholder Management** defines the framework and processes for managing and sharing information with stakeholders and the public about the CIP Program (Program). This chapter does not cover external communications required for permitting and regulatory compliance management (see PMP Chapter 11 – Permitting and Regulatory Compliance Management) or safety reporting (see PMP Chapter 12 – Health and Safety Management). It should also be noted that the consultants and contractors are subject to the terms in their respective contracts regarding information sharing and are not covered by this chapter.

Key management principles include:

- Information disseminated to the public and to Program or project stakeholders must be timely, accurate, and complete, as the credibility of GLWA and the Program may be judged on the quality and transparency of the information provided;
- Decisions to release public information and the methods for distribution of public information are primarily the responsibility of the Chief Public Affairs Officer and/or their designate working with the Project Manager of the CIP project;
- All communication documents are considered public records and will be managed in accordance with PMP Section 04 – Document Management;
- Requests for public information related to Program projects received by the CIP Delivery Team or GLWA team members will be forwarded to the Project Manager and the Chief Public Affairs Officer (or their designate), who will coordinate on approval of all records or information before distribution;
- Stakeholder engagement is primarily managed by the PM and the engaged consultant or contractor, with the Chief Public Affairs Officer having final approval authority for the agreed public outreach approach, in partnership with CIP Delivery Team;
- Consultants and contractors are subject to the terms in their contracts regarding information sharing and are not covered by this chapter;
- GLWA is a public body as that term is defined in the Michigan Freedom of information Act (FOIA) and is required by law to provide access to public records unless those records are exempt from disclosure by the Act, or some other statute. FOIA requests are not covered by this chapter and such requests must follow the request process described on GLWA's web site: https://www.glwater.org/freedom-of-information-act/.

2 Public Information

This chapter addresses any information about the Program or its projects that is disseminated to the public through formal or informal channels. Sharing of Program or project information is an element of stakeholder management, and involves organizing forums for controlled communications, listening, and responding to concerns, providing timely information, and managing expectations.

Public information includes:

- Communications with stakeholders and the general public;
- Responding to requests for public information;

- Formal communication including Program or project websites, reports, memorandums, etc. if intended for stakeholders or the general public; and
- Presentations, particularly in or for public forums.

It is essential that the CIP Delivery Team communicate in a timely, clear, concise, and effective manner. Listening is also part of effective communication with the public, with a best practice being to seek clarification when necessary to ensure that all questions and concerns are fully understood.

2.1 Planning for Communications

The Project Manager is responsible for working with the Chief Public Affairs Officer to identify stakeholders for their project, as well as identifying the optimal communication paths for the various stakeholder groups associated with their project. Prior to disseminating public information to stakeholders, project participants are to follow the approval processes detailed in Program Procedure 1301. Stakeholder management and public information procedures will be an agenda item in project planning and kickoff meetings to ensure the project teams take part in identifying stakeholders, are aware of the relevant stakeholder groups for their Projects, understand the Program's processes for release of public information, and know the approvals required for releasing information to the public. The Project Manager and Chief Public Affairs Officer will consider public records regulations and GLWA's procedures before releasing information, recognizing certain information may be bound by legal or regulatory policies. Public information requests received by the project team will be reviewed by the Project Manager. If the Project Manager believes an external communication is required, they draft such communication and forward to the CIP Director and Chief Public Affairs Officer for review and approval before release, as detailed in Program Procedure 1301.

2.2 Distributing Public Information

The Project Manager works collaboratively with the Chief Public Affairs Officer to define the communication's form, media, and frequency. This may include telephone conversations, information posted through websites, formal correspondence, presentations, etc.

External communication interfaces, such as public relations efforts, media contacts, conference/workshop presentations, etc., must be approved through the CIP Director and Chief Public Affairs Officer to ensure proper protocol and GLWA procedures are followed.

3 Stakeholder Management

Stakeholder management systematically identifies, analyzes, and plans for actions to communicate with and engage various stakeholder groups involved with a project. Stakeholders are groups or individuals with common interests external to GLWA or the CIP Delivery Team with a key role in judging the success of a project and influencing its outcome, and their interest and influence should not be overlooked. Stakeholders must be identified as early as possible in a project's development. Their interest level (positive or negative) and power to influence the project's success will be analyzed, which may result in the Project Manager and Chief Public Affairs Officer developing a proactive plan for their specific interests and needs.

3.1 Stakeholder Identification

The Project Manager, with support from the CIP Delivery Team and Chief Public Affairs Officer, is responsible for identifying individuals and organizations that may be involved with or affected by their Project. Potential stakeholders may include:

- GLWA member partners;
- Individuals or businesses affected by the project;
- Non-governmental organizations affected by the project;
- Statutory and regulatory bodies with jurisdiction over aspects of the Program;
- State and local agencies with jurisdiction over aspects of the Program;
- Resources needed for the project to execute the identified stakeholder outreach.

3.2 Stakeholder Analysis

The Project Manager, with support from the CIP Delivery Team and Chief Public Affairs Officer, will analyze stakeholders to determine their interests, ability to influence the project, and protocols for communicating and involving them in project activities. This analysis will be used to evaluate and determine the stakeholder's position in relation to the project activities, their interests and objectives, and the management approach needed to engage a stakeholder and elicit project support. Questions to consider include:

- What is the stakeholder's interest in the project's success and influence on the project outcomes?
- What specific factors or issues impact the stakeholder, or are perceived by the stakeholder to create an impact?
- Will the stakeholder support the project as it progresses or are there negative issues or perceptions that need to be overcome?
- Does the stakeholder support the project and is he or she an alliance of benefit to the project?
- What are the specific steps, timing, and protocols needed to engage the stakeholder?

Based on the stakeholder analysis results, the Project Manager, with support from the CIP Delivery Team and Chief Public Affairs Officer, will designate stakeholders critical to the project's success and work together to develop specific strategies and plans to successfully engage each key stakeholder group.

3.3 Stakeholder Expectations

Managing stakeholder expectations is a process to proactively communicate and work collaboratively with stakeholders to understand their needs on an ongoing basis and address their issues. Stakeholders must be engaged proactively to ensure their positive interest in the project is promoted and maintained, or their negative interests or opinions are addressed or otherwise minimized. Stakeholders who support the project and who have a broad-based influence position may be able to be leveraged and potentially be instrumental in influencing other stakeholders and the general public.

Actively managing stakeholder expectations decreases the risk that the project will fail to meet its goals and objectives due to unresolved stakeholder issues. Properly managing stakeholder expectations should not be underestimated as a critical element in project success.

3.4 Internal Stakeholders

Although the primary purpose of this chapter is to address external stakeholders, there are also stakeholders within the GLWA organization who are not a part of the CIP Delivery Team. These may include support departments, departments or individuals involved in the review or approval of a specific project's documents or work processes, or others involved in capital or strategic planning for the project. The Project Manager should identify internal stakeholders, their area of involvement or support, and use the communication paths and procedures described in the other chapters of the PMP to ensure that the CIP Delivery Team understands their role and that they understand how they will be engaged throughout the project.

4 Public Meetings and Stakeholder Presentations

Public meetings and presentations to stakeholder groups are an effective method to distribute project information, obtain stakeholder feedback, and, ideally, to forge a consensus to support the CIP Program or a specific project. Meetings and presentations should be well prepared and well documented to effectively transmit the required information. Meetings should have an agenda, sign-in sheet, meeting leader, and note taker and produce meeting minutes that include attendees, views expressed, key decisions (if any), and action items (if any). Any actions for the CIP Delivery Team should be responded to promptly, especially requests for additional information.

Procedures for public meetings and presentations are to be agreed upon with the Chief Public Affairs Officer, including meeting dates, speakers, and presentations. When scheduling public meetings and presentations the Project Manager should be cognizant of the time needed to prepare meeting materials, including the time required for review and potential revisions based on feedback from Public Affairs.

Meetings should be managed on the Project Management Information System (PMIS) site, once available, using calendar functionality for scheduling; document management for agendas, meeting minutes, and actions; and preferably using the system's "Lists" function to track issues for further discussion or actions within the GLWA organization and the CIP Delivery Team.

5 Program Webpage

GLWA's CIP is detailed for the public at the following website: https://www.glwater.org/cip/.

To keep the public and stakeholders informed about Program progress, status and upcoming and recent Program activities that may affect them, a Program website may be developed (future initiative). Once developed the vision is to update the site on a regular basis. The GLWA Public Affairs team will develop the web page, which will exist on GLWA's website. GLWA's Public Affairs Specialist-Digital Communications, will be responsible for building the page with GLWA Information Technology. The CIP Delivery Team will provide the copy, potentially including project descriptions, updates and photographs, required for the webpage.

6 Project Construction Outreach Activities

6.1 Project Strategic Communications Plan (SCP)

It is recommended that a Strategic Communications Plan (SCP) be developed for CIP projects that create significant impacts to the property of others, with the decision to develop a SCP being collaboratively between the Project Manager and Chief Public Affairs Officer. The SCP is a project-level document produced by the Project Manager, though the Project Manager may also choose to include the development of the SCP as a scope item for the project Design Team during the design phase of the project. The SCP is developed by the Project Manager, in collaboration with and with review and approval from, the Chief Public Affairs Officer. The SCP details plans for alerting local governments, property owners, tenants, business owners, schools, and the general public of upcoming construction and its anticipated impact. The tactics detailed in the SCP promote community outreach early in project development so that issues can be addressed before or as they arise. Specific SCP areas of concern typically include property access, service disruption, erosion control and drainage, noise, traffic maintenance and control, and construction scheduling.

The SCP may include plans for implementing all or some of the following, depending on project impacts:

- Adding specification sections during design development requiring the contractor to perform some or all of the notification activities required by the project;
- Implementing a project website, email address, and/or phone answering service (1-800 number) where citizens can voice concerns. Complaints received should be documented in a Citizen Complaint Log, which can be further used to allocate team members responsible for addressing complaints and monitoring their resolution;
- Erecting a project sign at the construction site;
- Meeting individually with, calling or sending mass mailings or letters (as appropriate) to affected community members;
- Preparing and distributing informational flyers/brochures, and conducting project information workshops to solicit comments and detail specific project impacts, such as impacts to services or traffic;
- Meeting with and sending notice to municipalities and other relevant local agencies;
- Presenting to municipalities, metropolitan planning organizations, local governments, legislators, civic and community groups, and other interested public regarding design, impacts, and construction status;
- Holding a pre-construction public information meeting/open house for interested members of the public to review plans, construction schedule, and traffic impacts, particularly dates of road or access closures;
- Publishing a news releases of project start date, pertinent project information, and specific traffic impact information;
- Publishing a regular cadence of news releases with specific traffic impact information, as warranted and as information changes;
- Sending mass mailings of project impacts and information flyers, mainly focused on any total closures.

The SCP should also detail actions required at the completion of the project, such as removing signage, sending out notifications, including notifying the public of phone number and/or web sites being discontinued.

6.2 Disruption and Notifications

If project construction activities disrupt water or sewer services or property access to residences and/or businesses, the Project Manager and the Chief Public Affairs Officer will collaborate to define the appropriate notice that will be given to property owners prior to such disruptions, including either a disruption of service or extended site access. Typically, a minimum of 72-hours' notice should be provided directly to affected property owners, in addition to other broader project notifications.

6.3 Outreach Templates

As part of the Chief Public Affairs Officer's review of the Strategic Communications Plan, the Chief Public Affairs Officer may recommend use of standardized communication templates, potentially including (some in development):

- Door Hanger Template;
- News Release Template;
- Right of Entry Permission Form;
- Property Access Notice Template;
- Road Closure Notice Template;
- Start of Construction Notification Letter Template;
- Service Disruption Notice Letter Template;
- Social Media Service Disruption Post Samples.

7 Public Information and Stakeholder Management Procedures

- Program Procedure 1301 – Release of Public Information

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GLWA
Great Lakes Water Authority

Submitted by:
AECOM
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Program Management Plan (PMP)

Chapter 14 - Construction Management

Capital Improvement Plan (CIP) Delivery Team

Great Lakes Water Authority

Capital Improvement Plan

Program Management Plan

Chapter 14 – Construction Management

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Revision	Revision date	Details
1.0	February 2022	Initial chapter as approved following CIPST reviews
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Figures

Acronyms

See the Overview Chapter for list of acronyms used in the PMP.

1 Introduction

1.1 Purpose

The Great Lakes Water Authority (GLWA) Capital Improvement Plan (CIP) **Program Management Plan (PMP) Chapter 14 – Construction Management** establishes the guidelines, business processes, and requirements for the CIP Delivery Team's management of the construction of CIP projects.

Throughout the PMP, it is assumed that:

- The construction of the project is performed by the Construction Contractor under contract to GLWA.
- The Construction Contractor's contract is managed and administered by the Project Construction Management Team (PCMT), which may be composed of external consultants under contract to GLWA or in-house staff if GLWA is self-performing the Construction Management work. In either case, the leader of the PCMT is referred to as the Project Construction Management Lead (PCML).
- Project engineering and design work is performed by Project Design Teams (PDTs), which may be composed of external Design Consultants (DCs) under contract to GLWA or in-house PDTs if GLWA is self-performing the design. In either case, the leader of the PDT is referred to as the Project Design Lead (PDL).
- The Project Manager (PM) manages the project from inception to completion, as detailed in the PMP, including being the manager of the contracts of the PDT and PCMT if performed by external consultants or manager of the scopes of work of the PDT and PCMT if performed by internal GLWA staff.
- The CIP Delivery Team (see PMP Chapter 02 – Program Organization and Governance for more detail) includes program controls and assurance management personnel who work with and support the PM following processes and procedures described in this and other chapters of the PMP.
- Where the contract between GLWA and the Construction Contractor defines a Contracting Officer, this PMP assumes that the Contracting Officer's rights and authorities from the contract are delegated to the PM.

Figure 1 below provides a diagrammatic overview of the relationships described above.

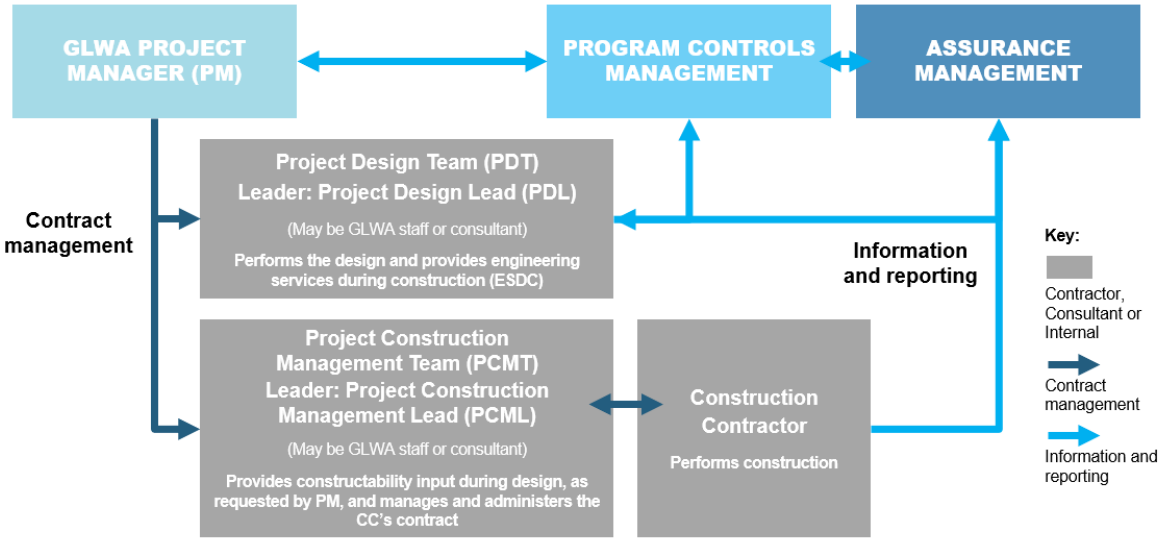

Figure 1: Diagrammatic overview of contract management roles.

Key management principles related to construction management include:

- GLWA, the CIP Delivery Team and PCMT will apply the business processes (and associated program procedures) to ensure consistency and uniformity across the CIP Program.
- The Program Management Information System (PMIS), to the extent currently available and as implemented in the future, will be used by all staff, consultants, and contractors for procedural collaboration.
- Oracle Primavera P6, Version 15.1 (Primavera P6) scheduling software will be used by all PDTs and Construction Contractors for contract schedules, unless the Project Manager accepts a lesser requirement for Microsoft Project schedules for smaller projects, per PMP Chapter 05 – Schedule and Budget Management. The latest version will be used at the outset of a project.
- The PCMT will develop Project Construction Management Plans to address the project-specific requirements that augment and reference the requirements of this PMP.

1.2 Roles and Responsibilities

Roles and responsibilities related to Construction Management for positions within the CIP Delivery Team and PCMT are summarized below. More specific responsibilities are defined in program procedures. Not all positions will be required to be full time on every project, and the Project Manager may choose for some projects to combine positions, depending on project size and complexity.

The roles and responsibilities for CIP delivery of other members of the CIP Delivery Team, such as the CIP Director, CIP Program Manager (PgM), and CIP Program Controls Manager (PCM), are further detailed in PMP Chapter 02 – Program Organization and Governance.

1.2.1 Project Manager (PM)

The Project Manager manages one or more CIP project(s) from inception through completion. During the construction and closeout phases, the Project Manager has the following contracts management roles and responsibilities:

- Manages the PCMT's contract (if external) or scope of work (if internal), including holding the PCMT accountable for the administration of the Construction Contractor's contract.
- Provides approvals or recommendations related to scope, budget, and schedule of all assigned projects.
- Manages all activities related to pre-purchase of material and equipment until hand-off to the PCMT.
- Manages the PDT contract if the PDT is external, or the PDT's scope of work if the PDT is internal, for Engineering Services During Construction (ESDC), including determining the scope and staffing levels of the PDT during the construction phase.

1.2.2 CIP Program Assurances Manager (PAM)

The Program Assurances Manager (PAM) is a member of the CIP Delivery Team, reporting to the CIP Group, with responsibility to support the Project Manager in implementing the quality, risk, and environmental, health and safety management processes described in PMP Chapters 07 – Quality Management, 08 – Risk Management, and 12 – Environmental, Health and Safety Management. The PAM's role is detailed in these PMP chapters, and the key construction phase roles and responsibilities are summarized below.

- Quality:
  - Monitors and audits compliance by the PCMT with quality assurance procedures and requirements and consistently enforces the contract terms related to quality.
  - Supports the Project Manager in ensuring the necessary quality requirements are included in the contract documents and are consistent with the scope of the project.
  - Reviews Construction Contractor's Quality Plans and PCMT's Quality Management Plans and leads compliance audits.
  - Provides input related to construction quality for program reporting.

- Risk:
  - Monitors and audits compliance by the PCMT and Construction Contractor with the risk management procedures and requirements detailed in PMP Chapter 08, and consistently enforces the contract terms related to risk.
  - Supports the Project Manager in ensuring the necessary risk requirements are included in the contract documents and are consistent with the scope of the project.
  - Reviews Construction Contractor Quality Plans and Construction Management Quality Management Plans and leads compliance audits.
  - Provides input related to construction quality for program reporting.

- Safety:
  - Oversees safety performance of the PCMT and their compliance with program procedures, the CIP Safety Plan, and their contract specifications related to safety.
  - Supports the Project Manager in ensuring the necessary safety requirements are in the contract documents and are consistent with the scope of the project.
  - Reviews the Construction Contractor's safety plan, as required.
  - Supports GLWA safety leadership and the PCMT when required to deal with safety incidents or issues.
  - Provides program-level reports related to safety.

1.2.3 Operations and Maintenance Representative(s)

The Project Manager of each CIP project works with Operations and Maintenance departments to identify Operations and Maintenance Representatives to be involved with the project throughout the project lifecycle, including, if needed, representatives of specialty groups such as metering, information technology (IT)/ supervisory control and data acquisition (SCADA), etc. The Operations and Maintenance Representatives are part-time roles assigned to members of the GLWA Operations and Maintenance departments, and have the following roles and responsibilities relative to construction management:

- Provide operations coordination from GLWA Operations and Maintenance departments during all project phases, including during Equipment Shutdown Requests as detailed in Program Procedure 1405.
- Coordinate through the PCML with Construction Contractors to manage system shutdowns, including ensuring Operations resources execute their duties in support of each system shutdown.
- Provide input for the development and review of Construction Contractors' Test and Commissioning Plans and provide input to the review of submittals, as-built drawings, potential contract changes (per PMP Chapter 06), and Value Engineering proposals.
- Participate in inspections for Substantial and Final Completion.
- Review Operations and Maintenance Plans for new facilities, prepared by the PDT as a part of its scope of work, prior to Final Completion and turnover.
- Assist the PCML in turnover of completed facilities to GLWA for operation.

1.2.4 Project Construction Management Lead

The PCML is the leader of the PCMT, which includes Construction Inspectors, and has the following key roles and responsibilities during the construction phase:

- Manages and administers one or more construction contracts:
    - Implements quality plans to ensure all construction work is completed in conformance with contract documents and as detailed in PMP Chapter 07 – Quality Management;
    - Implements environmental compliance requirements and procedures as detailed in PMP Chapter 11 – Permitting and Regulatory Management;
    - Manages schedule, cost, and payment application review processes, as described in PMP Chapter 05 – Schedule and Budget Management, and contract changes as detailed in PMP Chapter 06 – Contract Change Management;
    - Assists with public outreach efforts as detailed in PMP Chapter 13 – Public Information & Stakeholder Management; and
    - Maintains all construction documentation and records in accordance with PMP Chapter 04 – Document Management.
- Supervises and directs performance of the PCMT, including Construction Inspectors, and confirms conformance with established policies and procedures for management of the project.
    - Determines and recommends when contractual action is necessary with a Construction Contractor and elevates all such issues to the Project Manager.

- Leads PCMT review of schedule submittals, updates, and revisions.
- Prepares monthly Construction Status Updates.
- Supports and assists the Program Assurances Manager in holding the Construction Contractor accountable to its safety plan, as required by PMP Chapter 12 – Environmental, Health and Safety Management.
- Reviews the Construction Contractor's Test and Commissioning Plans and coordinates with the Operations Representative to minimize impacts on existing operating systems and facilities, and with Operations support as required to support the Construction Contractor.
- Leads the PCMT, including Inspectors, in inspecting and documenting construction activities to verify compliance with environmental conditions and requirements.
- Coordinates with the Construction Contractor and Operations Representative for GLWA training and turnover.
- Maintains records of testing and startup, vendor training, and turnover.
- Manages day-to-day use of the PDT to support construction.

1.2.5 Inspector

Inspectors are part of the PCMT and have the following roles and responsibilities:

- Verify Construction Contractor's compliance with contract documents through surveillance and inspection of construction work, monitor the Construction Contractor's quality process, and observe field sampling and testing for verification of quality results.
- Prepare daily inspection reports (DIRs) and other quality documents as required by PMP Chapter 07 – Quality Management.
- Prepare Non-Conformance Reports (NCRs) for the PCML and monitor and document Construction Contractor responses to NCRs.
- Inspect and document GLWA-furnished materials and equipment arriving on site or designated storage location(s) and turnover to the Construction Contractor.
- Participate in Substantial Completion and Final Completion inspections and prepare and update the punch list through completion.
- Support the PCML in monitoring and documenting the Construction Contractor's progress on the schedule, including reviewing payment applications and monitoring hours and quantities for any time-and-material portions of the contract.
- Review submittals and requests for information (RFIs) when requested by the PCML.
- Perform wage interviews when required by the contract.
- Communicate with residents and project stakeholders as required by the contract and following the procedures defined in PMP Chapter 13 – Public Information and Stakeholder Management.

On each project, if there is more than one Inspector, one Inspector may be designated a Lead Inspector responsible for planning and coordinating inspection activities, reviewing and collating daily inspection records, reviewing field construction-related submittals, monitoring resolution of all quality issues, and leading the Substantial Completion and Final Completion inspections.

1.2.6 Program Schedule Management, Budget Management, and Document Control Leads

The Program Schedule Management, Budget Management, and Document Control Leads are members of the CIP Delivery Team and the CIP Group. The Program Schedule Management and Budget Management Leads' roles are detailed in PMP Chapter 05 – Schedule and Budget

Management, and the Program Document Management Lead's role is detailed in PMP Chapter 04 – Document Management. The Program Schedule Management, Budget Management, and Document Control Leads' key roles and responsibilities in the construction phase include:

- Schedule Management Lead:
    - Supports the Project Manager as a subject matter expert in program and project scheduling.
    - Reviews the Construction Contractor's baseline schedule and monthly schedule updates and advises the Project Manager as to their acceptability.
    - Supports the Project Manager and PCML with time impact analysis for Change Orders and related schedule claims analyses.
    - Analyzes the Construction Contractor's progress schedule updates and compares them to the approved schedule and reported monthly progress. Provides the Project Manager with an independent assessment of progress and forecast at completion of schedule and cost.
    - Assists the PCML with preparing construction schedule and cost updates and progress reports.

- Budget Management Lead:
    - Supports the Project Manager as a subject matter expert in project and program budget management.
    - Reviews the Construction Contractor's baseline cost-loaded schedule and monthly budget updates and advises the Project Manager as to accuracy and acceptability.
    - Provides the Project Manager with budget impact analyses for change orders and schedule claims, including reviewing Construction Contractor's budget impact analysis, independently checking cost estimates submitted as part of a Change Proposal associated with a Change Request by the Construction Contractor.
    - Analyzes the Construction Contractor's progress schedule updates and compares them to the approved schedule and reported monthly progress. Provides the Project Manager with an independent assessment of progress, labor hours, quantities, dates and forecast at completion of schedule and cost.
    - Assists the PCML with preparing construction schedule and cost updates and progress reports.

- Document Control Lead:
    - Supports the Project Manager as a subject matter expert in project and program scheduling.
    - Reviews the Construction Contractor's baseline schedule and monthly schedule updates and advises the Project Manager as to whether to acceptability of these.
    - Provides the Project Manager with time impact analyses for change orders and schedule claims analyses.
    - Analyzes the Construction Contractor's progress schedule updates and compares them to the approved schedule and reported monthly progress. Provides the Project Manager with an independent assessment of progress and forecast at completion of schedule and cost.

- Assists the PCML with preparing construction schedule and cost updates and progress reports.

1.3 Communication Policies and Organizational Procedures

Communication plays a vital role in the success of the CIP Program. It is very important to develop and maintain agreed channels of communications between all program stakeholders. The construction management staff must be fully integrated into the CIP Delivery Team and maintain strong relationships and open communications with the various project team members as well as with project consultants. Open channels of communications are of critical importance in matters such as engineering, contracts, legal issues, environmental issues, safety, health, quality, system shutdowns, construction operations, risk management, closeout, and turnover to the operating department.

Generally, lines of communication will follow the lines of the organization. The PCMT must direct any communications with outside agencies, if allowed under the Contract and the guidelines provided in PMP Chapter 03 – Communications Management, Construction Contractors, and Operations, through the PCML to ensure a single and consistent message. Informal and ongoing communication between the PCML and Project Manager are necessary, as these positions form the nucleus of the daily management of the projects during construction. Coordination and communication with the Project Design Lead and the Operations Representative will be required to ensure technical and operations support is obtained in a timely manner.

Additionally, PMIS is a vital communications and collaboration tool. The business processes necessary to ensure the input of accurate and timely data must be followed to maximize the use and value of the PMIS as a tool for communicating throughout the CIP Delivery Team.

Open communication and coordination with Construction Contractors must be extensive throughout the construction phase. Weekly meetings will be scheduled to review short- and long-range plans, resolve potential problems, and coordinate activities of all project participants with the construction schedule. It is important that written communication be relevant and clearly address an issue or decision so there are no misunderstandings that cause delays.

Refer to PMP Chapter 03 – Communications Management for more detailed information on the overall communications plan and requirements for the CIP Program.

2 Pre-Construction

Planning for construction begins during design. The Business Unit Director, based on a recommendation from the Project Manager and in consultation with his or her Business Unit chief operating officer and the CIP Director, collectively determine the overall program delivery strategy, including contracting methods, contract packaging, and the construction management organizational approach (in-house versus consultant). The delivery strategy will also address program requirements to support project planning and design and preliminary construction contract packaging, sequencing, estimates, and schedules.

It is good practice that the PCMT, if external, be involved early enough that they can participate in the design phase. If not, the Project Manager should identify in-house construction management resources to perform these tasks or add these tasks to the PDT’s scope. The PCML works with the

CIP Delivery Team, including the PDT, to develop and refine construction schedules and budgets, contracting plans, system construction sequencing, and construction interfaces. The PCML also provides input to the CIP Delivery Team, including the PDT, in the development of construction contract requirements.

The PCML also participates and provides construction input for:

- Value Engineering Reviews (See PMP Chapter 09 – Engineering and Design Management)
- Constructability Reviews (See PMP Chapter 09 – Engineering and Design Management)
- Construction procurement strategy, bid packaging and biddability reviews
- Assistance with permits and easements
- Project Risk Assessments

2.1.1 Construction Procurement Strategies and Bid Packaging

The PCML supports the analysis of procurement strategies and bid packaging for construction. This may include opportunities for alternative project delivery methods and opportunities to package multiple design packages into one construction contract to reduce the risks associated with coordination of schedules between projects and potentially reduce project costs. If owner-furnished material or equipment is procured, the PCML assists the CIP Delivery Team, including the PDT, in developing specifications for schedule, delivery, Quality Assurance / Quality Control (QA/QC) requirements, and interface and coordination with the Construction Contractor.

2.1.2 Assistance with Permits and Easements

It is anticipated that pre-construction permits and lands and easements will be secured by the PDT before the Notice to Proceed date for any construction contract. The Project Manager and PCML assist in interpreting permit conditions, developing special condition clauses in construction contracts for permit conditions and advising on the extent of easements and temporary construction easement needs to be included in the respective construction contracts. It is the Construction Contractor’s responsibility to obtain and purchase any remaining permits required for construction. The PCML assists in reviewing contract documents before bidding for permit requirements and monitors the Construction Contractor’s schedules for obtaining permits.

2.1.3 Assistance with Contract Special Conditions and Specifications

Beginning at 60% design and continuing through completion of Final Bid Documents, the PCML works with the Project Manager, Operations, and the PDT to provide input on any special conditions and specifications required for the construction contract. These may include:

- Contract performance period and key milestones
- System shutdowns
- Interface and coordination for using owner-furnished material and equipment
- Construction sequencing
- Interface or coordination with other projects
- Permit or regulatory conditions
- Working hour restrictions
- Liquidated damages

It is the responsibility of the Project Manager to incorporate the specific special conditions into the design deliverable and constructability review checklists for the project to ensure these are considered and reviewed as the design deliverables are developed.

3 Construction Procurement Phase

Requirements of the CIP Delivery Team, Project Manager, and PCMT related to Construction Procurement are provided in PMP Chapter 10 – Procurement and Contract Management.

4 Construction Phase

The PCMT provides management oversight of the Construction Contractor during construction of a project. The PCMT reviews and reports on performance and compliance with the PMP and program procedures. The PCML provides oversight of construction, quality, and safety performance and reports on issues and schedule progress.

The Project Manager and CIP Delivery Team should work with the PCMT and Construction Contractor to ensure they are familiar with the PMP, program procedures, reporting requirements, and PMIS use and requirements.

4.1 Project Construction Management Plan

The Project Construction Management Plan is prepared by the PCMT and incorporates by reference the PMP and program procedures and addresses specific requirements unique to the project and/or PCMT organization. These Plans identify who will staff and perform each Construction Management function and role.

The Project Construction Management Plan includes the following topics as required for the project:

- PCMT organization, budget, and staffing plans
- Communication protocols and delegation of authorities
- Site security
- Coordination, management, acceptance, and turnover of Agency-furnished equipment and material, if applicable
- Project-specific stakeholder and communications requirements
- Project-specific testing, commissioning, and turnover procedures

The Project Manager and CIP Program Quality Manager review and approve the Project Construction Management Plan.

4.2 Environmental Health and Safety

See PMP Chapter 12 – Health and Safety.

5 Construction Administration

5.1 Field Office Mobilization/Demobilization

Construction Contractors may be responsible for providing and maintaining field offices for the PCMT. The Project Manager and PCML will define the requirements of those offices during the design phase and confirm that the requirements are included in the contract documents. Close coordination is required among the Construction Contractor and PCML to confirm logistics are fully planned and the office infrastructure is in place when needed.

5.2 Project Risk Management

A risk register is developed during the design phase of each project by the PDT and is brought forward into the construction phase by the Project Manager. Within 14 days of the Construction Contractor's notice to proceed (NTP) the Project Manager will convene a risk workshop with the PDT, PCMT, Program Assurances Manager, and other GLWA staff as identified by the Project Manager, to update the risk register and add new construction risks. The Construction Contractor should be encouraged to participate in the risk workshop and in the mitigation action plans. The Project Manager will manage the requirements defined by PMP Chapter 08 – Risk Management and the program procedures for monitoring, updating, and reporting risks throughout construction with support from the PCML. As defined in PMP Chapter 08, the Project Manager can tailor the level of risk management activities to the size and complexity of the project.

5.3 Pre-Construction Conference

After issuance of the Construction Contractor's NTP, but prior to commencement of work, a Pre-Construction Conference will be convened by the PCML. The PCML will conduct the conference with assistance from the Project Manager and the Project Design Lead. Other attendees should include the Program Assurances Manager, Cost/Schedule Specialist, Operations Representative, and any other program or GLWA staff considered essential to conducting the meeting. The Construction Contractor's attendees should include the Project Manager, Project Superintendent, Safety Manager, Quality Control Manager, Scheduler, and any other key personnel as determined by the Construction Contractor. An attendance list for the meeting must be recorded on a sign-in roster.

The following agenda should also be addressed at the Pre-Construction Conference. The discussion of each item should include identifying the parties within the CIP Delivery Team, PCMT, PDT, and Construction Contractor responsible for administrative and contractual requirements.

- Introduction of attendees; relationships, roles, and responsibilities, including points of contact
- Contract authority as it relates to the PCML, GLWA, and Construction Contractor
- Contract administration process requirements and workflow
- Subcontractor approval forms
- Communication protocols
- Submittal and RFI requirements
- Progress payment requirements
- Field Order, Change Request, Change Directive, and Change Order requirements and other commercial items
- Contract technical requirements

- Public outreach and media
- Schedule requirements
- Construction Contractor safety plan requirements
- Work and storage areas, including housekeeping
- QA/QC Plan requirements and handling of quality issues
- Environmental compliance requirements and permit conditions
- Coordination requirements with other projects.
- Security requirements
- System Shutdown Plans (as applicable to the project)
- Special conditions of the contract (e.g., value engineering change proposals, incentives, liquidated damages, formal partnering)
- Owner-furnished equipment (if applicable)
- Commissioning and commissioning requirements and interface with Operations
- Construction Contractor's presentation of its plans, methods, and schedules for accomplishing the work
- Construction Contractor's initial 90-day work schedule
- Initial submittals required from the Construction Contractor
- Dispute Review Committee/Board (if applicable)

The PCML is responsible for producing detailed minutes of the meeting. Feedback for corrections and clarifications is important to establish a clear record of the meeting.

5.4 Construction Status Meetings

Construction status meetings provide a forum for collaborative discussion and issue resolution as well as documented responses to issues discussed. These meetings are an important component of a proactive claims management strategy.

The Project Manager, PCML, and members of the PCMT meet with the Construction Contractor's project manager and/or Superintendent and other key members of the Construction Contractor's project leadership team on a weekly basis, unless the Project Manager decides less frequently is acceptable for smaller projects. The purpose of these meetings is to review short-term and long-range plans, progress achieved to date, resolution of potential problems, and coordination of the activities of all project participants with the construction schedule and Operations so that inspections, tests, and other items may be effectively scheduled.

The PCML has the primary responsibility for conducting status meetings. The PCML manages and sets the agenda for the meetings, has meeting minutes produced, and confirms distribution to attendees. The agenda for construction meetings should include, but not be limited to:

- Review of minutes of previous meetings and amend, if necessary
- Safety Report by Construction Contractor, which should include a review of all safety incidents and near misses that have occurred since the previous meeting. The Safety Report must also identify accidents and crafts involved, corrective methods to be initiated by the Construction Contractor, a review of the most frequent incidents, and the corrective actions selected by the Construction Contractor to eliminate their reoccurrence.
- Introduction of new attendees and their areas of responsibility
- Status of previous action items

- Update by Construction Contractor on project schedule and progress of work, and comparison with the current schedule
- Update by Construction Contractor on of work accomplished since previous meeting, off-site fabrication status and issues, material delivery status and issues, actual and potential schedule slippage, problems arising from proposed changes, and other factors that might affect the work
- Update by Construction Contractor on of upcoming work and the work sequence on the critical path and on the 4-week “window” schedule derived from the approved project schedule
- Update by Construction Contractor and PCML on the Quality Program, including observations, problems, and performance. The discussion will include QA/QC NCR (see PMP Chapter 07) status including plans for closing all open NCRs; any outstanding quality reports, test results, or submittals; and coordination for any factory source inspections or witness testing.
- Update by Construction Contractor on work coordination with other contracts, including actual and anticipated potential problems and delays
- Update by Construction Contractor on any potential changed conditions, time extensions, or contract Change Requests, including any potential claims
- Status of submittals and RFIs
- Status of commercial issues, including status of the Change Log
- Environmental compliance issues, including pre-construction surveys needed
- Construction Contractor’s payment status
- Interface requirements with GLWA Operations
- System shutdowns (minimum of 3-month lead time)
- Testing and commissioning (minimum of 6-month lead time)
- Project labor issues
- Status of follow-up to any partnering sessions (as applicable)
- Public outreach issues and plans
- Other business
- New action items

The PCML and Construction Contractor will be responsible for ensuring attendance at these meetings of any members of their respective project teams necessary for a full discussion of the items on the agenda. The PCMT is responsible for producing meeting minutes for timely distribution to all meeting attendees.

5.5 Prerequisites for Mobilization to Site to Begin Construction

After the kickoff meeting (i.e., Pre-Construction Conference), the Construction Contractor prepares the Prerequisite to Mobilization Submittal Package (PMSP) and submits it to the PCML along with a Request to Mobilize. The timing as to when the PMSP is to be provided by the Construction Contractor is as defined in the Contract. The Prerequisites for Start of Construction Program Procedure is attached to this chapter.

The PMSP includes the following documentation required by the contract to mobilize to the site and begin construction:

- Schedule of Values (SOV)

- Construction schedule
- Submittals that are required by the contract prior to mobilization
- Schedule of submittals
- Site logistics, including site layout, building locations, access, etc.

The Project Manager may approve the Contractor having limited access to the site for non-construction activities, potentially including locating a trailer for early office activities, as long as the Contractor's activities are covered by a safety plan.

The PCML is responsible for managing the PMSP review process, including coordinating review, verifying use of correct format, and tracking to confirm the PMSP is addressed in a timely manner.

A key initial submittal required of the Construction Contractor is a detailed SOV. The SOV provides the basis for the Construction Contractor's progress measurement and must present all bid items in sufficient detail to allow accurate progress measurement and payment. The total of all items on the SOV must equal the award amount of the contract and must correlate directly to the manner in which the construction schedule is organized and presented.

The PCML processes, reviews, and responds to the PMSP. If the submittal does not conform with contractual requirements, it is returned to the Construction Contractor with reasons for resubmittal. When the PCML approves the PMSP, the PCML transmits the approved Request to Mobilize to the Construction Contractor to mobilize to the construction site.

5.6 Progress Payment Application and Monthly Progress Report

Progress Payment Applications (PPAs), including the Construction Contractor's Monthly Progress Report, will be reviewed and processed in a timely manner (as defined in the Contract and in PMP Chapter 05 – Schedule and Budget Management), using acceptable cost control practices in accordance with contract requirements. The Construction Progress Payment Applications Program Procedure is attached to this chapter.

In accordance with the timeline defined in the contract documents and PMP Chapter 05 – Schedule and Budget Management, the Construction Contractor reviews with the PCML, with input from Inspectors as required, a pencil copy of the PPA. With agreement of the Construction Contractor and the PCML, the Construction Contractor submits to the Project Manager a PPA for each pay period, accompanied by an updated Construction Schedule and Summary Schedule to reflect the agreed-upon percentage of work completed and the Construction Contractor's Monthly Progress Report. The Construction Contractor's Monthly Progress Report will include*:*

- A narrative of work completed and achieved during the reporting period, including photos of key work
- Progress to date, measured as a percent complete, of each work activity and in total
- A plot of the planned and actual earned value curves for each schedule level specified in the contract documents and in total along with a written analysis of budget, cost, and schedule status
- A listing of work activities behind schedule, work activities due to start within the next report period, critical path items, items causing schedule delays or slippage, and the remedial measures proposed to be taken to improve, maintain, or recover the schedule
- Summary of safety incidents and near misses and actions taken

- Status of open RFIs, submittals, changes (including claims), issues, Quality NCRs, and corrective action requests
- A narrative of any actions taken by the Construction Contractor to address any current or projected problems related to the information contained in the report
- As-built “red-line” drawings

The PPA must indicate the percentages of completion and materials in storage for the payments that are requested. Appropriate supporting documentation must be included by the Construction Contractor, and all documentation maintained by the PCML must be accurate and comprehensive to provide an audit trail at all times throughout the project, including DIRs and pay quantities records.

The PCML has primary responsibility for verifying the accuracy and completeness of PPAs submitted by the Construction Contractor, negotiating agreement with the Construction Contractor for quantities contained in the PPA, and forwarding the PPA to the Project Manager to process for approval along with a recommendation for payment. As detailed in PMP Chapter 05 – Schedule and Budget Management, the Contractor’s PPA should include an estimate of cost to complete.

The CIP Delivery Team Schedule and Budget Leads assist the PCML and Project Manager with the review of PPAs by reviewing the schedule update and comparing it to the SOV and verifying that approved changes are incorporated accurately in the SOV and the PPA. The PCML is responsible for the monthly review of the Construction Contractor’s “red-line” as-built drawings, which may be a condition of payment. If the PCML and Construction Contractor cannot agree the PPA, then the PCML should, with Project Manager approval, process the undisputed portions of the PPA, or resolve as directed by the contract.

The Project Manager is responsible for deciding the appropriate payments for General Conditions or overhead contractor costs. The Project Manager releases payments as defined by the contract. If the contract does not prescribe an approach, the Project Manager should release the PPA by a method of his or her choosing, as long as the following are adhered to:

1. The method is consistent with the contract payment terms for the project.
2. The Project Manager can verify that the items to be included within the General Conditions are per the contract and specifications.
3. The Project Manager ensures General Conditions payments do not exceed actual verified work in place or work performed as a pro-rata percent of contract value.
4. The Project Manager works with the PCMT to ensure their confirmation of the Contractor’s General Conditions payment request.

The PM, with support from the Program Controls Manager, monitors the PPA process and resolves any payment conflicts that may arise between Construction Contractors and PCML.

5.7 Submittal Management

A submittal is any item required by the contract documents to be submitted or offered by the Construction Contractor in accomplishing the work. A submittal consists of a Submittal Transmittal cover from the Construction Contractor and the data submitted for review. The Project Manager and/or PDT is responsible for defining the required submittals in the construction documents before advertising for bid. The PCML will assist the Project Manager in developing the submittal requirements. The Submittals Program Procedure 1403 is attached to this chapter.

Submittals may include, but are not limited to, the following:

- Design drawings
- Calculations
- Shop and working drawings
- Certificates
- Installation or erection drawings
- Lists of material
- Operating instructions
- Catalog cuts
- Data sheets
- Brochures
- Samples
- Mockups
- Installation instructions
- Plans to accomplish certain portions of work
- Schedules
- Quality plans
- Safety/security management plans
- Geotechnical information and monitoring plans
- Safety plans
- System shutdown plans
- Traffic control plans
- Utilities relocation and support
- Test schedules, plans, and reports
- Operations and maintenance manuals
- Training plans
- Permits
- Environmental, hazardous waste, and pollution control plans
- Progress reports
- Spare parts lists
- Operations and Maintenance (O&M) manuals
- Vehicle and engine lists and maintenance logs
- Pre-construction surveys
- Species relocation plan
- Construction water discharge plan
- Noise and vibration plan
- Re-vegetation plan
- Stormwater Pollution Prevention Plan
- Cultural resource monitoring and protection plans
- Neighborhood notification and community communication plans
- Nighttime lighting plans
- Warranties
- Other items used to administer construction or perform the work

The standard GLWA contract, Article 4.8, and General Conditions of the contract, Section 01 33 23 Project Submittals, describe detailed requirements for submittals. All submittals are processed

through the PCML. The program procedure for submittals describes the detailed processing requirements. The PCML performs an initial review for completeness and conformance with submittal requirements and determines who should perform the review. If the submittal does not conform with contractual requirements, it is returned to the Construction Contractor as Not Approved with reasons for review status noted and documented in the Submittal Log.

The PDT reviews technical submittals that affect the design. Non-technical submittals may be reviewed by the PCML, or other members of the PCMT or GLWA staff, as appropriate. Submittals returned to a Construction Contractor with a status other than Approved or Approved as Noted must include the reasons for revisions or rejection so that the Construction Contractor knows what is required for approval and can shorten the number of cycles and the time required for approval of each submittal.

The Construction Contractor prepares complete submittal packages in accordance with the contract documents. As part of the PMSP, the Construction Contractor prepares a preliminary Submittal Log. The Construction Contractor designates appropriate submission dates for all submittals, taking into account the submittal review times specified in the contract documents. These dates will allow the work to be accomplished in accordance with the accepted construction schedule. Each submittal is required to be included in the Construction Contractor's construction schedule submittal.

Submittal responses will be coded in only one of the following ways:

- Approved
- Approved as Noted
- Revise and Resubmit
- Not Approved
- Receipt Acknowledged

Submittals returned with Approved as Noted will be considered as acceptable submittals provided the Construction Contractor complies with the corrections noted. Any coding other than Approved or Approved as Noted requires action by the Construction Contractor to provide an acceptable submittal before any work is fabricated, manufactured, or constructed.

The PCML will oversee the submittal process and confirm that each submittal is reviewed, appropriately commented upon, and returned to the Construction Contractor within the time set forth in the contract documents. Program procedures and contract documents define the required turn-around time for responding to submittals. After the preliminary Submittal Log is prepared by the Construction Contractor and approved, the Submittal Log is maintained by the PCML, and reports will be generated that highlight pending and overdue submittals. These reports will be monitored by the CIP Director and Program Controls Manager and action initiated as necessary.

5.8 Request for Information Management

An RFI is a document submitted to the PCML by the Construction Contractor that requests clarification, interpretation, information, or guidance concerning an aspect of the contract documents. The RFI Program Procedure 1404 is attached to this chapter.

The PCML is responsible for managing Construction Contractor RFIs, coordinating review, verifying use of correct format, and for tracking to confirm the RFI is addressed in a timely manner.

The PCML processes and responds to RFIs. The PCML performs an initial review for completeness and conformance with submittal requirements. If the submittal does not conform with contractual requirements, it is returned to the Construction Contractor with reasons noted.

The PDT reviews RFIs relating to the technical plans or specifications. Other RFIs may be reviewed by the PCML, or other members of the PCMT or GLWA staff, as appropriate.

Requirements for documenting RFIs will be specified in the contract documents, and include:

- Address only one issue. Unrelated or multiple items should not be included in the same RFI.
- Identify the item of concern in a clear manner. Provide reference to a drawing number, specification section, equipment nomenclature, referenced submittal, etc. to allow a complete understanding of the question.
- Specifically state what information is required and identify any concurrent delay or impact to the schedule pending receipt of response to the RFI.

Timely and complete responses to RFIs are important components of pro-active change and claims management. Program procedures define the required turn-around time for responding to RFIs. The PCML monitors response times for RFIs and follow-up as needed to confirm that the RFIs are addressed as expeditiously as possible. RFI Logs will be maintained by the PCML, and reports will be generated that highlight pending and overdue responses. These reports will be monitored by the Project Manager and CIP Delivery Team members and action initiated as necessary.

5.9 Contract Drawing, Specification, and Record Drawing Control

A copy of the contract documents will be maintained by the PCML and constantly annotated to reflect all changes that have been approved. As-built “red-line” drawings will be required to be maintained by the Construction Contractor and audited monthly by the PCML team as part of the review of PPAs. The PDT or Construction Contractor, as defined by the Contract, will produce a final set of record drawings after the completion of construction and before project closeout.

5.10 Construction Claims Management

A claim is a demand for adjustment of the contract price, the contract times, or both, based on assertions that the work required to be performed is different from work described by the contract documents. Claims can be made in any phase of a project and are primarily discussed in PMP Chapter 06 – Contract Change Management, with the discussion below focusing solely on construction claims management.

During construction, the PCML and the Construction Contractor partner in addressing disagreements regarding contractual requirements before they escalate them to a claim. Typically, the Construction Contractor should submit a Change Request, as defined in PMP Chapter 06 – Contract Change Management, if the Construction Contractor believes it is entitled to adjustment of the contract price, the contract times, or both. If the Change Request and associated discussion and negotiation efforts are not successful, the Construction Contractor may submit a claim for equitable adjustment to the contract. The contract describes the process and the time required to file a claim and the form and content of a formal claim submittal.

The entire program organization must work together to avoid claims. Claims management includes “avoidance” that must start during the design phase and be continued through construction.

The principal means of avoiding claims is developing properly conceived contractual terms that clearly assign risks to the parties best suited to deal with them, and complete, well-coordinated design drawings and specifications detailing the technical and operational requirements of the contract documents. During contract document reviews, the PDT will focus on these issues to begin claims avoidance measures before the inception of each contract.

The following actions are components of a pro-active claims management program during construction:

- Confirm detailed planning and scheduling of the work is accomplished by both the Construction Contractor and the PCMT, including a baseline schedule that will help discourage submittal of frivolous or spurious time-related claims by accurately identifying the right logic to sequencing the work, critical work items, and quantifying resource requirements planned for each item of work. The baseline schedule will also be used for monitoring concurrent delays and identifying problem areas for quick resolution. While the Construction Contractor retains responsibility for means and methods, including how the work is scheduled, identifying deficiencies in the schedule, and carefully documenting those deficiencies, can prove useful in countering a claim at a later time.
- Carefully monitor and rapidly respond to correspondence, submittals, RFIs, and Change Requests to identify potential problems and minimize the Construction Contractor’s opportunities to claim delays.
- Pro-actively manage the procurement, fabrication, quality assurance, and delivery of GLWA pre-purchased equipment and material.
- Maintain open communication and an open mind when listening to the Construction Contractor’s ideas or complaints, and work with the Construction Contractor to solve problems early.
- For larger contracts, the GLWA Project Manager may choose to participate pro-actively in partnering with the Construction Contractor during the term of the contract. During a partnering session, a “dispute resolution ladder” should be developed to organize and empower staff settlement of problems or disagreements at the lowest organizational level possible.
- Maintain a firm but fair attitude with the Construction Contractor such that GLWA’s interests are preserved and the Construction Contractor is treated fairly, particularly on contract change issues. Ensure contract changes are processed in an expedited manner so potential delays or re-sequencing of the Construction Contractor’s work can be prevented.
- Maintain constant job presence at the worksite and in the offices to allow constant observation of the work, continuing communication, and quick response to problems. Be as knowledgeable as the Construction Contractor as to the history of the project, and maintain thorough and comprehensive records to display a true picture of events or facts in order to fairly discuss and resolve potentially emerging disputes.
- Maintain contractual deadlines for responding to the Construction Contractor, while confirming the response is complete and adequate to protect the interests of the GLWA.

Management of the claims by the PCML must be conducted in accordance with contract documents. The PCML is responsible for initial management of claims. The PCML’s first duty is to make all reasonable attempts to resolve issues with the Construction Contractor to avoid a formal claim. Should a formal claim be submitted, the PCML reviews the claim for conformance to the requirements of the contract documents, and notifies the Project Manager, Business Unit Director, CIP Director, and Program Controls Manager to initiate discussions for responding to the claim. The

Program Schedule and Budget Management Leads, Inspectors, and PDT may provide support analyzing a claim and preparing a negotiation plan. The formal claim, along with a draft response and negotiation plan, is presented to the Project Manager's Business Unit Director, the CIP Director, and the Program Controls Manager. Upon finalization of the negotiation plan, the claims negotiating team (as determined by the negotiation plan) will meet with the Construction Contractor to discuss the claim.

The PCML is responsible for documenting claims negotiations and maintaining record files as part of the contract files.

5.11 Project Status Reporting

The PCML measures the progress of the Construction Contractor at least monthly. The PCML submits Project Status Reports to the Project Manager each month during construction. A reporting calendar is documented in PMP Chapter 05 – Schedule and Budget Management and monitored by the Program Controls Manager to confirm reporting is completed at the same time for all projects to support overall CIP Program reporting. The Project Manager reviews Project Status Reports and forwards them to his or her Business Unit Director, CIP Director, and Program Controls Manager for use in preparing the Capital Progress Review Report.

Project Status Reports are intended to summarize the progress and major issues of a construction project; they are not intended to be a voluminous document. A standard format with required schedule and budget attachments will be established by the Project Manager and Program Controls Manager to include:

- Current status of project safety
- Progress planned and achieved as defined in PMP Chapter 05 – Schedule and Budget Management
- Schedule issues and forecast at completion of summary
- Cost and forecast of contract and construction phase at completion
- Summary of quality issues
- Status of submittals and RFIs, and their logs
- Change Log
- Summary of environmental compliance efforts
- Public outreach activities
- Outstanding issues
- Photographs of key activities

See PMP Chapter 05 – Schedule and Budget Management for the program procedure for project status reporting.

The PCML administers the contract requirements on daily reporting by the Contractor, including receiving and appropriately storing (per PMP Chapter 04 – Document Management) these daily reports. Typically, the Contractor is required to maintain daily field reports recording the labor force and equipment employed by the Contractor and subcontractors, materials and equipment received at the project site or another location, visits by suppliers, significant progress in the work and completed trade work within the major work areas, and other pertinent information.

5.12 Operations and Maintenance Coordination

Coordination with GLWA Operations is an ongoing activity prior to construction, during construction, and during closeout. The Operations Representative is the primary point of initial contact with GLWA Operations. Operations will be involved in system shutdown planning and execution, submittals and changes that affect the specifications or maintenance requirements of equipment, design changes to system or facility configurations, and schedule variances and recovery plans that impact system shutdowns of facility operations. Operations may also be requested to review certain submittals and spare parts lists and will participate in the Substantial Completion and Final Completion inspections.

The PCML works closely with the GLWA Operations Representative or any Operations or Maintenance staff assigned to assist or coordinate any part of the work. Operations must respond promptly to any requests by the Project Manager to facilitate decision making and avoid delay claims by the Construction Contractor. Operations will also be responsible for implementing post-construction environmental requirements and managing the warranties after Final Completion.

5.13 Equipment Shutdown Management and Coordination

Equipment or system shutdowns are on occasion required to accomplish construction. Some equipment shutdowns are stand-alone equipment shutdowns in the sense they can be completed without impact on operation of the overall system. Other shutdowns affect other parts of the operating system, as well as other concurrent planned shutdowns. Some can be accomplished at any time; other shutdowns may be restricted. All system shutdowns must be carefully planned and coordinated, and the requirements and constraints must be fully defined in the contract documents by the Project Design Lead and Project Manager. Detailed Lock-Out/Tag-Out (LOTO) procedures may be required and must be coordinated with Operations. The Equipment Shutdown Request Program Procedure 1405 is attached to this chapter.

The PCML monitors the Construction Contractor’s schedule for shutdown activities and reports the current planned dates for shutdowns each month in the Construction Progress Report. As soon as reasonable, but no later than 30 calendar days prior to each shutdown, the Construction Contractor is required to submit an Equipment Shutdown Request form, as included in Program Procedure 1405, to the PCML, identifying the exact dates for the shutdown, what work the Construction Contractor plans to perform, how the Construction Contractor will sequence its work, how the Construction Contractor will maintain the shutdown site, and how de-watering will be handled and disposed of. The PCML obtains review of the Equipment Shutdown Request from the Project Manager and GLWA Operations and completes the risk assessment checklist included in the above-referenced Program Procedure. The PCML may also schedule a pre-shutdown meeting with the Construction Contractor, Project Manager, and GLWA Operations to confirm the status of the shutdown plans and the schedule for the work.

All shutdown requests are to be a separate item of discussion on each weekly construction progress meeting, beginning at least 60 calendar days before the planned shutdown, to confirm timely and cooperative execution.

GLWA Operations has the responsibility for performing each shutdown of the system or facility and may receive assistance from the Construction Contractor as agreed prior to each shutdown. Once the system is shut down, GLWA Operations will inform the PCML, who will coordinate lock-out tag-out (if applicable) and inform the Construction Contractor to commence the work.

Upon completion of the Construction Contractor's work, the PCML conducts a walk-through with the Construction Contractor and GLWA Operations and completes the risk assessment checklist. Any deficiencies are documented by the PCML and corrected by the Construction Contractor before the PCML signs off on the completed Equipment Shutdown Request. The Construction Contractor, PCML, and GLWA Operations must all agree that the risk assessment checklist issues have been fully addressed before the equipment or system is returned to service.

5.14 Asset Management

GLWA's Asset Management Team has developed a variety of tools to support consistent asset management approaches across projects, including an Asset On-boarding Standard Operating Procedure (SOP), an On-boarding Standard workflow, and various items for contract and specification development. The Project Manager is responsible for ensuring that the Contractor complies with the requirements of these processes.

5.15 Financial Reporting & Accounting Group Teams Coordination

GLWA Financial Reporting & Accounting Group teams have developed processes concerning the start of construction and changes to financial assets resulting from either assets being placed into or removed from service as well as accounting month end close/invoicing. Members of these teams should be included in regular communication with the Project Manager/Contractor beginning with the Pre-Construction Conference (kickoff meeting) to understand timing of fixed asset disposal resulting from contract demolition work, planned commencement of work for invoicing/accruals, review SOV and scope of work for any costs not eligible for capitalization through progress meetings to understand timing for tagging of assets placed in service by the Fixed Assets Financial Management Professional. Notification of meetings should be forwarded to ConstructionAccounting@glwater.org and FinancialReporting@glwater.org.

5.16 Testing and Commissioning

Testing and commissioning are complex portions of construction projects and for functionality and satisfactory completion of the contract and, therefore, require thorough planning and proper execution. Testing and commissioning is defined to include all tests, initial operations, and other activities related to providing a complete, operational, and functional project as required for Substantial Completion, or for completion of interim milestones. Testing and commissioning includes all factory testing, functional testing, all performance testing, all commissioning and pre-commissioning activities, all manufacturers' services, certification of proper installation, and troubleshooting, checkout, and shakedown activities. Providing the specified documentation supporting the performance of these activities and the documentation required to report test results is also considered part of testing and commissioning.

Each project will require some level of testing and commissioning, although the requirements will vary by type of project and the facilities involved. The Project Manager and PDT collaborate with the Operations Representative to define the testing and commissioning requirements to be included in each construction contract during the design phase. The PCML reviews the contract documents for testing and commissioning, and depending on the complexity of the project, may provide a Testing and Commissioning Manager as part of the PCMT. Depending on the extent of the work, the Construction Contractor may be required to provide a fulltime Commissioning Manager as necessary to prepare testing and commissioning plans and accomplish the work. The contract documents must include lead time requirements for these plans, typically at least 60 days, to

confirm adequate time for development and review. The PCML coordinates with the Construction Contractor and Operations Representative to develop and review Testing and Commissioning Plans, ensuring the appropriate support staff is available from the PCML team and GLWA Operations.

Testing and Commissioning can have a profound influence on the planning, sequencing, scheduling and coordination of construction work. Therefore, early engagement and attention to this is strongly encouraged.

5.16.1 In-Factory Witness Tests and Source Inspections

In-factory testing and source inspections or certified tests are the verification that specific equipment components conform to the required performance specified by the contract documents before the equipment is delivered to the construction site.

5.16.2 Functional Testing

Functional testing consists of component testing and check-out to verify that each component is in compliance with the contract documents and is ready to perform its intended function. This is often referred to as “Operational Readiness Testing” and confirms that the installed components will function as intended. Sub-system testing and startup is the verification that a discrete group of related components is functioning as intended and is ready to perform its intended function as part of the overall system. System testing and startup is the operation and verification that all related components and subsystems are functioning as intended and are ready for performance testing, final commissioning, and operation.

5.16.3 Performance Testing

Performance testing is the verification step that the complete work functions on an extended basis as defined by the contract documents. Successful performance testing is a requirement of Substantial Completion. State and local agencies may have stringent and extensive performance testing requirements for treated water or effluent quality. Such requirements should be identified early and planned for.

5.17 Spare Parts and Warranties

There are two types of spare parts usually required in every contract. The first type is required to be supplied by the manufacturer when any equipment is purchased. These are standard types of spare parts that are generally included in the equipment purchased price. The second type is required by some contracts to be purchased to cover a certain number of years of usage. The spare parts required by the contract are to be received before Certificate of Substantial Completion is issued. All spare parts are to have a shelf-life expectancy to exceed the time required by the contract. The PCML will coordinate with GLWA Operations to ensure that the spare parts are labeled and input into the inventory control system.

As discussed below, the Financial Reporting & Accounting Group teams require the Project Closeout form at project completion, to be completed by the Project Manager with the assistance of the PCML. One field of this form requires the Project Manager/PCML to indicate whether spare parts are required by the contract. If yes, then the Project Manager and PCML are required to complete the Stock Add-Change form and follow the Spare Parts Standard Operating Procedure Located on One Water Connect and work with the Financial Reporting &

Accounting Group teams to ensure spare parts are correctly logged into the stock management system.

Similarly, project warranties are to be submitted before contract completion or beneficial occupancy. The Construction Contractor must provide all manufacturer warranties for the equipment supplied and the Construction Contractor certificate of warranty for the project.

5.18 Acceptance and Closeout

5.18.1 Substantial Completion and Interim Milestones

Requirements to achieve Substantial Completion are specified in the contract documents. The Substantial Completion Program Procedure 1407 is attached to this chapter.

In general, Substantial Completion will be defined to include:

- Completion of all work, or designated portion thereof, required by the contract documents
- Full operation of all components and systems of the work, including acceptance of all testing and commissioning requirements
- Completion of all surface restoration
- Closeout of all quality deficiencies and non-conformances
- Delivery and acceptance of required spare parts, O&M manuals, and vendor documentation
- Completion of all required owner training
- Approvals from authorities having jurisdiction
- Punch list

The contract may include more than one Substantial Completion contractual milestone, and in these cases the contract documents will include the requirements necessary to achieve each Substantial Completion milestone. When Substantial Completion of a portion of the project is required by the contract, the Project Manager and PCML should work with the contractor to ensure that any interfaces between completed and ongoing contractual requirements are closely managed to provide clear delineation between portions of the site that are under contractor or Operations control. Contractual interim milestones may be enforceable with liquidated damages, and if so the PCML should document costs incurred by GLWA due to delayed Substantial Completion(s). Incentives for early completion can be considered if there is a clear and definable benefit to the GLWA.

Contractual milestone completion and Substantial Completion must be formally requested by the Construction Contractor to the PCML in accordance with the procedures set in the contract documents. Upon receipt of a Request for Substantial Completion, the PCML will, within the timelines allowed by the contract, mobilize staff necessary to perform a formal inspection of the work, potentially including, as agreed by the Project Manager and PCML, select members of the PDT, PCMT, CIP Delivery Team, and GLWA Operations and Maintenance. The inspection must be documented and include a description of any required work or submittals necessary for the PCML to recommend acceptance.

If the PCML determines that sufficient work has been completed to consider Substantial (or interim milestone) Completion, the PCML will provide the Construction Contractor with a Certificate of Substantial Completion for signature with the revised punch list of all items of work that are required

to be addressed by the Construction Contractor before Final Completion will be granted. The Construction Contractor returns the executed Certificate of Substantial Completion to the PCML, who provides copies to the Project Manager.

The PCML monitors and documents the completion of punch list work items pending submittal of the Notice of Final Completion and Request for Final Inspection from the Construction Contractor and notifies the Project Manager when complete.

5.18.2 Final Completion

After Substantial Completion of the final portion of the work, the Construction Contractor must meet additional requirements for Final Completion and release of final payment. These requirements are defined in the contract documents to include satisfactory completion of all punch list items, delivery of spare parts, demobilization from the project site, submittal of all required warranties, release of any Construction Contractor or vendor liens, and turnover of all remaining project documents required by the contract, including final as-built drawings. The Final Completion Program Procedure 1408 is attached to this chapter.

The PCML convenes the Substantial Completion inspection team to conduct a final inspection of the work and verify that all requirements have been met by the Construction Contractor for Final Completion. If all requirements are met, the Construction Contractor submits the final PPA, including request for release of retainage and proof of release of liens to the PCML for processing and approval. The Project Manager then processes a Final Change Order.

The PCML will assist the Project Manager in managing Final Completion of the contract.

5.19 Project Administrative Closeout and Turnover

5.19.1 Project File Transfer

Project files maintained by the PCMT or other project staff will be reviewed, duplicates removed, indexed and delivered to the Project Manager in electronic form for archiving consistent with the requirements of PMP Chapter 04 – Document Management.

5.19.2 Warranty Turnover to GLWA

Contract documents will specify warranties required to be provided by the Construction Contractor. The PCML is responsible for monitoring the turnover of warranties and coordinating with the Construction Contractor for the receipt of all warranties. Warranties will be formally submitted by the PCML to the Project Manager for turnover to Operations.

5.19.3 Project Closeout

The Financial Reporting & Accounting Group teams requires the completion of the Project Closeout form at project completion, to be completed by the Project Manager with the assistance of the PCML. One field of this form requires the Project Manager/PCML to indicate whether spare parts are required by the contract. If yes, then the Project Manager and PCML are required to complete the Stock Add-Change form and follow the Spare Parts Standard Operating Procedure discussed above under Spare Parts and Warranties.

6 Construction Quality Assurance/Quality Control

The Quality Management System (QMS) is defined in PMP Chapter 07 – Quality Management and is to be used with this PMP chapter. This section describes additional QA/QC processes specific to construction. In all cases, the Construction Contractor must manage and ensure the quality delivery of work of all subcontractors to the Construction Contractor.

6.1 Inspections

Unless Inspectors are provided by GLWA, as determined by the Project Manager, the PCML is responsible for providing resources for inspection of the Construction Contractor's work. Inspections will be conducted as defined by this PMP and program procedures, augmented as needed in the Construction Management Quality Management Plan commensurate with the type and sequencing of the work. The Inspector observes the work and verifies the Construction Contractor is complying with its Construction Quality Plan and the requirements of the contract documents. Inspectors provide DIRs, document and inform the Construction Contractor of quality deficiencies observed, and prepare NCRs when required. On larger or more complex projects that require multiple Inspectors, as determined by the PCMT scope of work defined by the Project Manager, one Inspector will be designated as the "Lead Inspector," whose duties, in addition to performing inspection, will include assisting the PCML with planning for inspections and resources, coordinating with third-party independent test laboratory personnel for testing/special inspections, reviewing and compiling individual DIRs, and monitoring the resolution and closeout of deficiencies and non-conformances.

The Daily Inspection Report Program Procedure is attached to this chapter.

6.1.1 Quality Management for GLWA-Purchased Material and Equipment

Quality requirements for vendors providing GLWA-purchased material and equipment will be defined by the Project Manager and PDT in each purchase order. The Project Manager is responsible for identifying the quality assurance approach and resources to perform quality assurance activities. The PDT is also responsible for defining the requirements for site storage, and acceptance inspection and verification by the Contractor in the contract documents.

6.1.2 In-Factory Witness Testing and Source Inspections

In-Factory Witness Testing and Source Inspections may be required for GLWA-purchased equipment and for Contractor-furnished equipment. The Project Manager and PDT are responsible for determining the extent of in-factory witness testing and source inspections required for a project, inspection and testing requirements, and required quality documented information. In-Factory Witness Testing and Source Inspections may be performed by the PDT, GLWA, or the PCMT, and must be defined in the Construction Management Quality Management Plan. Factory source inspections are described in more detail in program procedures. Witness testing and source inspection quality documented information are included in the project construction files, regardless of when they originate or who within the overall project team is responsible for performing the witness testing or inspection.

6.1.3 Material Testing Inspection

Material testing for items such as earthwork compaction tests, concrete compressive strength tests, and concrete reinforcing steel tensile strength tests, etc., as well as special inspections (see below)

for items such as structural steel inspection, coatings, etc., will be performed as required by the Contractor. The types and frequencies of testing should be included in the Construction Contractor's Construction Quality Plan. The Construction Contractor submits a Testing Procedure Package to the PCML for review and approval. The Quality Assurance Inspector witnesses the test. The Construction Contractor documents the test results and includes them in the Construction Contractor's Daily Quality Report that is submitted to the PCML for information each day.

6.1.4 Special Inspections

Certain jurisdictions may require special inspections that require special procedures acceptable to the jurisdiction and performed by qualified inspectors, and/or the Project Manager may define that certain work requires special inspection, testing, or approval beyond the testing listed as standard testing in the contract documents. Such testing is arranged for by the Construction Contractor and paid for either by GLWA through use of allowances or by the Construction Contractor as defined by the contract. Contract documents must note where special inspection is required. Generally, special inspections are those covered by Chapter 17 of the International Building Code (IBC) and are limited to structural and ventilation systems, unless otherwise required by the PDT, who includes such requirements in the contract documents.

6.1.5 Survey Control

The Construction Contractor is required to perform survey control during construction and provide records of all surveys to the PCML. The PCML will establish control monuments and may conduct surveys to verify the results by the Construction Contractor in consultation with the PDT.

6.2 Quality Records and Documentation

6.2.1 Construction Contractor's Construction Quality Plan

The Construction Contractor's Construction Quality Plan and implementing procedures define the quality control measures, standards, and processes required to confirm that all performed work meets specified quality requirements. The Construction Quality Plan is required to demonstrate application of a four-phase inspection system:

- Preparatory Phase
- Initial Inspection
- Follow-up Inspection
- Final Inspection

The Construction Quality Plan will address the Quality organization and its relation with the project organization, the qualifications of the Quality team, reporting structure within the Construction Contractor's organization, requirements for control by the Construction Contractor, names of Construction Contractors and testing laboratories, receipt and control of vendor and Construction Contractor data, preparation and use of inspection and test plans, quality assurance testing, acceptance inspections and tests, subsystem tests, integrated systems tests, use of measuring and test equipment, special processes, non-conformances and deviations, notification of hold points and witness tests, certified material test reports, and daily inspection reports. The manager of the Construction Contractor's Quality organization should not report to the Construction Contractor's project manager nor to the Project Superintendent, but to a principal in the Construction Contractor's

home office. The Construction Contractor's quality manager should be given a letter of authority from a principal in the company to stop the work at any time necessary to correct quality defects.

Inspection and test plans will include references to the specification or standard requiring the inspection or tests, frequency of inspections or tests, and acceptance criteria. These plans will reference a test procedure or spell out the test procedure to be used and define who is to perform the inspection or test.

The Construction Contractor is required to prepare a Daily Quality Report. This report will be issued each day to the PCML with a record of daily progress with the following details:

- Acceptance status of work in progress
- Applicable inspection phase and verification inspections performed
- List of measuring and testing equipment used for the QC inspection
- Material received on the site
- Compliance with environmental requirements
- Non-conforming items
- Personnel and subcontractors on the site
- Special Inspection Reports
- Tests conducted with reports
- Other relevant information

PMP Chapter 07 – Quality Management provides guidance for requirements for the Construction Quality Plan, and the Construction Quality Plan should be included in the contract documents as a required submittal.

6.2.2 Review of Construction Quality Plan

The PCML and the Program Assurances Manager review the Construction Quality Plan for evidence that it includes the required elements. If any of these key elements are not addressed, the Plan is returned with a request that the Construction Contractor's standard QMS be modified and enhanced to incorporate these key elements for their program work, and that the Construction Quality Plan be modified and resubmitted.

6.2.3 Construction Management Quality Management Plan

Construction Management Quality Management Plans will incorporate by reference the PMP and program procedures and include any project-specific requirements. Typical items to be addressed by the Construction Management Quality Management Plan include the following as required for the project:

- PCMT organization, roles, and authorities
- Construction Contractor interface and coordination for quality
- Controls of any special processes required by the specifications
- Independent testing firms' work scope and qualifications (if applicable)
- Type and frequency of materials testing verification
- Control of measuring and testing equipment (if applicable)
- Supplier quality surveillance plans for equipment and material (if applicable)

The Construction Management Quality Management Plan is reviewed by the Project Manager and Program Assurances Manager and others as required.

6.2.4 Daily Inspection Reports

Each Inspector is required to record daily inspections and observations on a DIR. Recording information on a DIR establishes facts that may not otherwise be recalled and reconstructed later and provides recorded evidence regarding the Construction Contractor's compliance with quality requirements. It also serves as a record of daily work progress. The Daily Inspection Report Program Procedure is attached to this chapter.

A DIR is prepared for each day of work the Inspector is at a fabrication facility or on the construction site. DIRs record the weather for the day, Construction Contractor equipment and labor resources observed to be working, all inspections performed, observations, significant daily events, problems, and communications pertaining to the quality of the work. All entries will be clear, concise, and factual. Personal opinions are not to be recorded.

DIRs include the following information:

- Project name, contract number, date, and Inspector's name
- Weather conditions
- Construction Contractor's name and resources (labor and equipment on each item of work inspected)
- Work being performed
- Schedule activity for each item of work inspected
- Hold or witness points inspected
- Observations of inspections and time of inspection, including out-of-sequence schedule activities observed
- Environmental/permit compliance activities
- Description of deficiencies recorded and/or corrected
- Re-inspections of work resulting in closeout of non-conformances
- Force-account, unit price, or allowance work performed
- Photos and videos documenting the work or issues related to the work

Inspectors must complete and submit their DIR to the PCML before the end of his/her daily work shift.

6.2.5 Quality Deficiency and Non-Conformance Documentation

Quality deficiencies and non-conformances are defined as documentation, drawings, material, and equipment or work not conforming to the specified requirements or procedures. The PCMT will implement a three-tier non-conformance system as described in PMP Chapter 07 – Quality Management.

The PCML works with the Program Assurances Manager to ensure deficiencies, non-conformances, and corrective actions are reported, tracked, and monitored to ensure they are closed out as required by the contract.

6.3 Warranty Period

Operations manages the warranty period. If any of the work is found to be defective, meaning not in accordance with the contract documents, Operations works with the Contracting Officer to issue a Non-Conformance Notice (NCN) to the Construction Contractor, copying the PM. The Construction Contractor responds to Operations with a proposed remedy that is reviewed with the PCML and approved by Operations. If the Construction Contractor does not respond or the Construction Contractor disputes the NCN, GLWA may self-perform the work and charge the Construction Contractor for the cost or accept the defective work and request a credit from the Construction Contractor, if the contract so supports.

When the Construction Contractor corrects the defective work, Operations and the PCML inspect the work. Operations notifies the Construction Contractor of the results of the inspection. If the work is accepted, the NCN is closed by Operations.

Approximately 3 months before the expiration of the warranty period, the Project Manager evaluates the performance of the Construction Contractor and whether or not warranty claims may be needed.

7 Construction Change Management

Change management is a process used to formalize the documentation, and evaluate, negotiate, and approve or reject changes to the contract. The PCML is responsible for managing the change management process in conformance with the requirements in the contract documents, leading the negotiation of cost and/or time impacts, and providing recommendations for the disposition of change orders that result from these change processes. Refer to PMP Chapter 06 – Contract Change Management for the process requirements and program procedures for contract changes.

7.1 Cost and Schedule Trending

Cost and schedule trending are techniques used to identify project issues that have the potential to become changes. Cost and schedule trending are discussed in more detail in PMP Chapter 05 – Schedule and Budget Management. The objectives of trending are to:

- Provide early warning of potential changes and the need for corrective action
- Minimize unexpected cost and schedule fluctuations
- Provide documentation for cost and schedule forecasting and project reports
- Provide a history of cost and schedule evolution

All members of the PCMT have a responsibility to identify cost and schedule trends. Trends may result from construction RFIs, analysis of the rate of expenditure of unit price items or allowance items vs. progress, potential liquidated damages, actual vs. planned schedule progress, quality issues, or anything that has been identified as an issue, but is not yet a Proposed Change (as defined in PMP Chapter 06 – Contract Change Management), that the PCML believes has a high probability of becoming a change to a project budget, schedule, or to a contract.

Initial identification should be in the form of an issue that is defined and included in the Issues Log (see PMP Chapter 05 – Schedule and Budget Management) with an estimated cost and/or schedule impact. Not all issues will become Changes, but those that do mature to a reasonable degree of certainty with a quantifiable cost and/or schedule impact should be identified as a cost or schedule

trend. The PCML monitors that the PCMT is aware of the need to identify issues, maintain the Issues Log, and follow the procedures in PMP Chapter 05 – Schedule and Budget Management to update trends on a regular basis.

The PCML analyzes trends and determines whether they should be included when forecasting schedule completion or cost to complete. When a cost or schedule trend reaches the stage of formal notification by a Construction Contractor through a Change Request, or issuance of a Change Directive by GLWA, the trend/issue is closed on the Issues Log. Open risks are not trends and should not be included or duplicated by open issues or trends.

8 Construction Project Controls

Construction project controls are integrated with and support schedule and budget management processes for the overall program. The PCML and the Project Manager work closely with the Program Controls Manager to implement and manage construction project controls.

8.1 Document Controls and Records Management

Document management requirements and program procedures are described in PMP Chapter 04 – Document Management.

8.2 GLWA Purchased Equipment and Material Schedules

The Project Manager is responsible for developing the schedule for pre-purchase of equipment and material. These schedules begin with activities during the design phase to produce the procurement plans and specifications, continue through procurement, and include sufficient schedule detail for fabrication, testing and delivery. Pre-purchased material and equipment schedules are a part of, and must be fully integrated with, the Project Schedule to confirm the design schedule supports the lead time requirements for the pre-purchased equipment and material, and the equipment and material will be delivered when needed by the Contractor.

After construction contract NTP, the Construction Management Lead monitors the schedules for GLWA purchased equipment and material, incorporates reporting of progress into the Construction Progress Report, and provides assistance requested by the Project Manager to expedite, inspect, witness test and manage the delivery and turnover to the Contractor.

8.3 Schedule Management

How well the schedule is monitored, enforced, and documented is critical to claims avoidance and management. The PCMT, with assistance from the Program Controls Manager and Program Schedule and Budget Leads, is responsible for all aspects of schedule management. The Construction Contractor’s schedule is used to establish the plan for the work, to monitor the Construction Contractor’s progress, and to plan and identify upcoming activities so that the project team can handle issues that may impede the Construction Contractor’s progress. The Construction Contractor “owns” the schedule, including the means and methods to execute the work. In addition to the prescribed requirements in the contract documents, schedule management will follow these general guidelines:

- The PCML approves the format of the Construction Contractor’s schedule but does not approve the means and methods by which a Construction Contractor sequences and schedules the work. Format approval includes checking that the submittal meets the

requirements of the contract documents, that all contractual milestones and shutdown requirements are met with reasonable durations for work activities, that all activities have predecessors and successors, that activities are reasonably resource loaded, and that the construction critical path is free floating without any artificially constrained activities. Observations regarding any work that appears have been omitted, scheduled out of sequence, or loaded with insufficient resources should be noted for the Construction Contractor's response.

- Changes to the baseline schedule are only allowed as detailed in PMP Chapter 05 – Schedule and Budget Management.
- The Construction Contractor updates completion percentages and activity durations using mutually agreed-upon information.
- Changes to contract schedule milestones can only be authorized according to the Change Order Matrix of Approval.
- The PCML verifies that the Construction Contractor is maintaining accurate as-built information for schedule activities. DIRs note the actual start and finish of activities and the observation of any out-of-sequence work. Actual starts and completions must be noted on the PCML's copy of the schedule to provide information for an as-built schedule.
- The PCML must spend sufficient time at each weekly construction progress meeting to thoroughly discuss the 4-week look-ahead schedule, the status of each planned activity, out-of-sequence work, schedule recovery, and concerns regarding sufficient resources to meet the schedule. Schedule Specialists from the CIP Delivery Team provide analysis of the 4-week look-ahead schedule for conformance with the current approved schedule.
- The PMCL should be alert to schedule changes that could impact other, connected, GLWA projects and/or impact the Master Program Schedule, and inform the Program Controls Manager if such impacts are identified.

8.3.1 Construction Contractor's Schedule Requirements

The contract documents include the requirements for an acceptable construction baseline schedule, Summary Schedule, monthly updates, 4-week look-ahead schedules, recovery schedules, and for incorporating changes. These items should be submitted each month with the Construction Contractor' PPA. The specifications also identify the parameters of any contractual milestones, work constraints, and system shutdown limitations that must be included in the Construction Contractor's schedule. The PCML must enforce all the requirements of the schedule specifications.

The Construction Contractor is required to use Critical Path Method (CPM) scheduling software. For detailed construction schedules, Oracle Primavera P6®, Version 8.3.1 or later, scheduling software will be used by Construction Contractors on projects, although the Project Manager may approve the Construction Contractor to use other scheduling software, such as Microsoft Project, with the approval of the PCM. The latest version of the scheduling software will be used at the outset of the project.

Where applicable, the activities in the schedule must correspond to the Construction Specification Institute's standard code of accounts. Supplemental coding should include area, responsibility, phase, and any other criteria that would enhance progress reporting. Generally, each schedule activity will describe a rational and specific work activity to allow effective control of the work in progress.

All activities on the schedule must be accurately cost loaded with a maximum monetary and time limit, and will match, on an item-by-item basis, the SOV. The sum of the activities in the schedule will equal the total contract value as bid. The cost loading of the schedule will be balanced and not front-end loaded. Sufficient funds must also be available for the backend of the project for commissioning, startup, and closeout.

Major equipment items to be purchased by the Construction Contractor will have activities and/or milestones in the schedule indicating the delivery of individual items. These activities will be loaded with the cost of the equipment only. The cost of installation will be in separate activities.

Additional requirements include ownership of schedule float and contingency, scheduling of all contractual milestones and work restrictions, system shutdowns, Construction Contractor-required permits, and major submittals.

A cost-loaded Summary Schedule of approximately 6 to 12 key activities, that also includes the key contractual milestones defined in the contract, including system shutdown activities, will be required from the Construction Contractor monthly. This Summary Schedule will be derived from the approved baseline schedule, and any approved updates and revisions will be tied to the SOV. The Project Manager includes the Construction Contractor’s summary schedule in the construction phase of the project schedule.

The PCML is responsible for ensuring timely reporting for schedule updates.

8.3.2 Construction Contractor’s Schedule Review and Approval

The Construction Contractor submits its baseline schedule as part of the PMSP. The PCML, with the assistance of the Program Schedule and Budget Management Leads, reviews and comments for the Construction Contractor’s response. Timely review by the PCML is required to avoid delay claims or the potential for the work proceeding without an approved schedule. Review and approval of the Construction Contractor’s schedule (or any updates) by the PCML will not relieve the Construction Contractor of responsibility for complying with the contract time requirements, adhering to those sequences of work indicated in or required by the contract scope of work, or from completing any work within the durations specified in the contract documents.

8.3.3 Monthly Schedule Updates

The Construction Contractor is required to submit updates to the approved schedule, along with the Summary Schedule, each month with the PPA. The PCML should not accept a PPA if it is not accompanied by an acceptable schedule update. The PCML and Cost/Schedule Specialist review the monthly schedule update for accurate representation of progress of each activity, out-of-sequence work performed or planned, incorporation of approved changes, avoidance of any logic changes to improve the Construction Contractor’s claims negotiating position, and “recovery” schedules, if necessary.

8.3.4 Recovery Schedules

If the Construction Contractor falls behind the approved schedule by more than is allowed by the contract terms, or if the accepted schedule no longer represents the actual execution of the work, the PCML, in consultation with the Project Manager, is to require the Construction Contractor to submit, in writing, a recovery schedule supported by a narrative explaining the work plan intended to recover the lost time within the contract performance period or interim milestone period. The PCML,

with the assistance of the CIP Delivery Team schedule and budget specialists, reviews the proposed recovery schedule, and if the recovery schedule is accepted, the Construction Contractor must incorporate the revisions into the approved schedule. When a recovery schedule is required, it is important to document to the Construction Contractor that the recovery schedule is not a request for acceleration.

The Project Manager should immediately document in writing to the Construction Contractor any failure by the Contractor to maintain the recovery schedule. Such documentation should continue until the schedule delays are corrected. Failure of the Contractor to provide and adhere to an acceptable recovery schedule should be escalated to CIP Delivery Team leadership for escalation to the Contractor's leadership. Persistent failure of the Construction Contractor to perform the work in accordance with the contract documents may be grounds for a variety of contractual recourses, potentially including increased retainage, scope reductions, involvement of surety, or even potentially termination for cause.

With a recovery schedule, the Project Manager, with input from the Program Controls Manager, may require the contractor to implement daily production tracking for the activities / definable features of work which are driving the critical path and concern exists that the contractor is not going to be able to meet their schedule, as discussed in more detail in PMP Chapter 05 – Schedule and Budget Management.

8.3.5 4-Week Look-Ahead Schedules

The Construction Contractor is required to submit 4-week look-ahead schedules prior to the weekly progress meetings. These schedules are "fragnets" of the approved schedule that include all activities from the past week and the upcoming 4 weeks. Look-ahead schedules are reviewed by the Cost/Schedule Specialist to ensure they match the approved schedule and include all the necessary work activities from the approved schedule. The look-ahead schedule is discussed at the weekly progress meetings to confirm the PCMT and the Construction Contractor have the same expectations regarding the work plan for the upcoming 4-week period.

8.3.6 Revisions to Approved Schedule

Any variance or deviation from the approved schedule requires a recovery schedule from the Construction Contractor or Change Request for more contract time, either of which must be documented in a revised schedule and a revised Summary Schedule from the Construction Contractor. The PCMT, with the assistance of the Program Schedule and Budget Management Leads, reviews the recovery schedule and responds to the Construction Contractor. If required to support the understanding of a complex value engineering proposal or Change Request, the Construction Contractor submits a mini fragnet project schedule demonstrating the effect on the near-term and overall schedule.

8.3.7 Schedule Analysis and Variance Reporting

As part of the Construction Contractor progress report and schedule updates, the Construction Contractor must submit variance analyses identifying the source and cause of any significant schedule variance and the Construction Contractor's plan to recover any significant impact to the schedule activity completion dates. Significant variances are those that impact the critical path, or delay a system shutdown, completion of an interim milestone, or Substantial Completion.

8.4 Construction Cost Control

The PCML monitors the costs of project construction, identifies and tracks cost trends, and forecasts costs to complete, as discussed in Section 7.1 above and PMP Chapter 05 – Schedule and Budget Management. The initial basis for tracking and controlling the contract costs is the Construction Contractor's SOV. The contract documents specify the requirements for the SOV, and the PCML reviews it for completeness, conformance to the requirements, integration with the Construction Contractor's approved schedule, and that it adds up to the total contract amount. Ongoing cost control includes a review and assessment of the Construction Contractor's PPA against the progress achieved to avoid recommending overpayment for work not yet completed, as discussed in Section 5.6 above.

8.5 Forecasting of Cost and Schedule

Cost and schedule of the construction is forecasted each month by the PCML for updates to the project schedule and budget. Cost forecasting incorporates proposed and pending Changes, as defined in PMP Chapter 06 – Contract Change Management, and an estimate of remaining contingency required to complete the project that incorporates cost trends. Trends and Changes form the basis for forecasting both schedule and cost to complete. The PCML is responsible for determining which trends to include in the forecast and their value. Significant variances are required to be fully explained in the Project Status Report.

Schedule forecasts are determined by the PCML and Cost/Schedule Specialist based on current progress, time adjustment proposals included in proposed and pending Changes, schedule trends, and any unresolved schedule recovery requests. It is important that the PCML work with the Construction Contractor as needed to obtain schedule and cost updates and other information required for the PCML to provide cost and schedule updates to meet the monthly timeline for project and program reporting as defined in Chapter 05 – Schedule and Budget Management.

9 Environmental Compliance and Permits Management

9.1 Construction Environmental Compliance Inspection and Monitoring

The Construction Contractor is responsible for complying with all federal, state, and local rules, regulations, requirements in the environmental review document, and resource agency permit conditions related to environmental protection. Inspectors monitor and report environmental compliance; they ensure that the Construction Contractor is in compliance with all environmental and regulatory requirements and work with the Construction Contractor to prevent delays in construction due to non-compliance violations. The Inspector's Daily Inspection Reports include recording the Construction Contractor's progress in complying with environmental requirements. Monitoring is conducted to confirm permit conditions are met and that all daily environmental restrictions are complied with including, but not limited to:

- Dust control and odor control mitigation measures are being implemented
- Construction activities are in compliance with the Erosion Control Plan and Stormwater Pollution Prevention Plan requirements
- Construction noise and lighting levels are minimized
- Sensitive habitats, wetlands, and surface waters are fenced and protected from construction activities

- Wildlife is protected from construction activities, including being relocated, if necessary
- Dewatering is managed to avoid adverse impacts to surface waters
- Critical creek flows and surface and groundwater quality are maintained
- Hazardous spills are minimized and reported, if spills occur
- Cultural or paleontology resources are protected during construction
- Traffic controls reduce construction impacts on traffic in the affected area
- Revegetation and restoration measures are implemented to stabilize the construction area and restore the area to the pre-construction condition

9.2 Post-Construction Activities

During the warranty period, GLWA will monitor restored/revegetated areas to confirm that the success criteria identified in the construction specifications are met and to identify and implement any necessary remedial actions. After the warranty period, post-construction monitoring and maintenance is the responsibility of GLWA Operations to confirm the success criteria in the project permits are met and to identify and implement any necessary remedial actions.

9.3 Regulatory Agencies Inspections

Regulatory agencies will have oversight of GLWA's compliance with permit requirements. Regulators from these agencies may periodically conduct site visits to inspect for compliance. To the extent feasible, GLWA will coordinate these site visits with the regulators and the PCML.

10 Construction Management Procedures

The following program procedures and/or standard forms and templates are related to this section of the PMP.

10.1 Procedures

- Program Procedure 1401 - Prerequisite for Start of Construction
- Program Procedure 1402 - Construction Progress Payment Applications
- Program Procedure 1403 - Submittals
- Program Procedure 1404 - Requests for Information
- Program Procedure 1405 - Equipment Shutdown Requests
- Program Procedure 1406 - Daily Inspection Reports
- Program Procedure 1407 - Substantial Completion
- Program Procedure 1408 - Final Completion

10.2 Tools and Templates

- PMP Form 1403a - Submittal Log
- PMP Form 1404b - RFI Log
- PMP Form 1402 - Contractor Pay Application Template
- PMP Form 1407c - Punch List Log

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Rev: v.09.01.24

GLWA
Great Lakes Water Authority

Submitted by:
AECOM
July 2024

Program Management Plan (PMP)

Chapter 15 - CIP Planning & Development

Capital Improvement Plan (CIP) Delivery Team

Great Lakes Water Authority

Capital Improvement Plan

Program Management Plan

Chapter 15 – CIP Planning and Development
Rev. 1.0

Prepared for

Great Lakes Water Authority

Prepared by

AECOM

July 2024

Approvals

GLWA's Asset Management Leadership Team (AMLT) provides overall leadership to GLWA's asset management process. The CIP Satellite Team (CIPST) is one of the teams that comprise the AMLT, with responsibility for consulting on and approving standard processes used by the CIP Delivery Team. As part of this role, the CIPST has reviewed and approved for use each initially published chapter of the Program Management Plan (PMP) prior to their uploading to OneWaterConnect for use by the CIP Delivery Team.

Revision History

Revision	Details	Date of CIPST Meeting Approving Chapter
1.0	Initial CIPST Approval	Monday June 3, 2024

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CIP_PMP_1505 - CIP Approval Processes

CIP_PMP_1506 - CIP Portal User Guide

CIP_PMP_FORM_1502 - Lessons Learned Template

CIP_PMP_FORM_1503 - Project Schedule Template

CIP_PMP_FORM_1504 - PM Scoring Presentation Template

CIP_PMP_FORM_1505 - Scoring Presentation 36-inch Condition Assessment

Acronyms

See the Overview Chapter for list of acronyms used in the PMP.

1 Introduction

This chapter of the Great Lakes Water Authority (GLWA) Capital Improvement Plan (CIP), **Program Management Plan (PMP), Chapter 15 – CIP Planning & Development,** establishes the guidelines, business processes, and requirements for the CIP Delivery Team's development and annual approval by GLWA's Board of Directors of its 5-year CIP Program with a 10-year outlook.

This chapter describes the processes for: 1) identifying potential CIP Program projects, 2) planning these projects to a level of detail that supports scoring these projects for their criticality, 3) prioritizing projects for delivery through the CIP Program, 4) documenting new CIP Program projects for Board of Directors approval, and 5) maintaining a 10-year CIP outlook.

Key management principles include:

- Each CIP project is to be planned such that its scope, schedule, budget, need, and priority are well understood, with this planning phase work completed at least 1 year before the project's design phase commences.
- CIP projects are prioritized using a multi-criteria decision analysis tool that allows multiple, potentially competing factors to be balanced and scored in a documented process with weightings and scoring developed both individually by the Project Manager and through a group-based process allowing broad input from operational staff, engineers, project managers, asset managers, and other sources such as public input.
- The CIP Delivery Team works with the Finance Team to determine the CIP Program spending limits for the upcoming 10 years.
- The CIP Delivery Team manages an annual process documenting a new CIP each year for the next 5-years for Board of Director approval.

Note: GLWA's CIP Delivery Team is planning to implement a Program Management Information System (PMIS) in fiscal years (FYs) 2024 and 2025. The implementation of the PMIS will require substantial changes to many of the processes described in this chapter, and this chapter will be re-written following PMIS implementation.

2 Identification and Initiation of Projects

2.1 Definition of a Project

A capital project for investment in GLWA's water or wastewater infrastructure is a significant undertaking aimed at improving, expanding, or maintaining GLWA's infrastructure, facilities, or systems. Capital projects are typically complex endeavors with multiple phases, stakeholders, and dependencies, and as such require careful planning, coordination, and execution to ensure successful implementation within budget and schedule constraints.

When defining a new potential project, the Project Manager makes an initial recommendation as to whether to keep related components together as a single project, or to make them separate projects. Related components may be delivered as separate projects for reasons such as phasing and funding constraints; however, components should never be separated to multiple projects to avoid delegated authority reviews or approvals. The project definition is approved by the Project Manager's Business

Unit Director and the CIP Director as part of the Planning Phase Report development process described in Section 3.3 below.

2.2 Identification of Projects

Potential CIP projects may be identified from a variety of sources. The need the project meets should be in alignment with GLWA vision and goals. Project may be identified from sources such as:

- Through Water or Wastewater Master Plan development or other strategic planning initiatives
- By GLWA's operations team from system failures, citizen complaints, or changes in regulatory requirements
- By the Business Unit Engineering Teams
- Via the asset management processes
- Other sources, such as deferred projects, Intergovernmental Agreement (IGA) changes, or new initiatives

These sources of projects are discussed in more detail below.

2.2.1 Master Plans or Other Strategic Planning Initiatives

The primary source of projects for the CIP Program is from GLWA's Water and Wastewater Master Planning processes. GLWA has Master Plans in place for both its water and wastewater systems, as follows:

- **Water Master Plan Update of August 2015.** Prepared for Detroit Water and Sewerage Department (DWSD) prior to the formation of GLWA by CDM Smith, this effort updated the earlier Comprehensive Master Plan that covered the period 2000 to 2050 and covered a shorter planning period of 20 years through June 2034.
- **Wastewater Master Plan of June 2020.** Prepared for GLWA by CDM Smith, this Master Plan covered the period 2020 through 2060.

The purpose of the Master Plans is to define a roadmap for projects over a 30- to 50-year lookahead. The CIP Program is then defined over a 5- to 10-year lookahead, with the CIP Program projects guided by the Master Plan lookahead. As such, Master Planning should always be the primary source of projects for a CIP.

2.2.2 Projects from Operations or Asset Management

Ideally, the Master Planning work described above will identify all CIP projects that become needed as components of GLWA's water or wastewater systems age; however, GLWA operations, asset management, and metering team members may indicate that there are key system replacement projects that are required but were not identified by the Master Planning processes because the systems or equipment involved did not live up to typical planning expectations.

GLWA maintains component maintenance and replacement information in a computerized maintenance management system (CMMS) as well as records of failures of and repairs to system components. The CMMS uses a Linear System Integrity Program that takes a risk-based approach to defining water delivery system condition assessment and renewal requirements. This information,

combined with information collected in the Master Planning process, can result in CIP projects being identified.

2.2.3 Projects from Other Sources

Projects may also be identified from other sources, such as projects that have been deferred in previous years; projects that result from new GLWA initiatives; unexpected changes in regulations, member partner requirements, new IGAs; or application of integrated asset management plans and/or scheduled replacement plans.

2.3 Project Initiation

Not all projects identified through the processes discussed above will qualify as CIP projects. The most common reason that a project might not be accepted as a CIP project is that GLWA might deem it to be an operational cost. The process for evaluating whether a project should be a CIP project and moved forward for CIP project initiation is documented in PMP Chapter 05 – Schedule and Budget Management; see Section 3 and Program Procedure 0501, Project Description Approval.

The objective of Program Procedure 0501 is to document a description of a proposed new CIP project as well as a preliminary project scope, schedule, and budget to support the planning phase (described below), prepared to a task-level detail. The project description includes identification of required engineering planning or technical studies, those responsible for these studies, and the contracting plan for the design services (consultant or in-house design). The project description also includes a list of project-specific risks that will be considered during concept development.

The approval of the Project Description Approval Form 0501 is the start of the planning phase, detailed further below, for the proposed CIP project.

3 CIP Project Planning

3.1 Interim Project Validation Process

Some projects already in the CIP that have not been fully planned to the level of detail described in this chapter may require further evaluation or validation as a temporary process until they are compliant with the PMP procedures.

For projects that are in the CIP but have not yet followed the processes in this chapter, before moving to the CIP development processes described in Section 4 below, the Project Managers should update the project's scope, cost, schedule, and risk estimates, at a minimum. If additional designer or consultant resources are needed beyond those available through existing contracts, the Project Manager should discuss with both their Business Unit Director and the CIP Director whether available task order-style contracts can be used to perform this update. Updates should reflect the latest understanding of project need and scope, and draw on lessons learned on similar projects completed since the project was initially conceived.

When this update is required for an existing project, the Project Manager should begin this process early enough that the update is available prior to the budget and schedule update process described in Section 4 below.

3.2 Project Planning Team

CIP project planning is assumed to be performed by the Project Planning Team (PPT), which can be either a consultant or an internal GLWA team. The Project Manager selects the type of PPT for their project, in consultation with and approval of their Business Unit Director, the CIP Director, and the potential Project Planning Lead if an internal PPT is being considered.

If a consultant PPT is chosen by the Business Unit, the Project Manager, in consultation with their Business Unit Director, chooses the appropriate contract vehicle for this work. Typical contracting options, together with their general pros and cons, are summarized in CIP 1501 - Project Planning Team Contracting Options. In each of these cases, the scope, schedule, and budget for the planning phase is developed by the Project Manager and reviewed and approved by the PM's Business Unit Director and CIP Director, and the scope of work must result in a completed Planning Phase Report.

If the Project Manager recommends using a consultant PPT, he/she should also recommend, for the approval of the Business Unit Director, CIP Director and Chief Procurement Officer, whether the consultant should be precluded from later design phase services.

Regardless of the PPT used, the Project Manager is responsible for notifying the CIP Team when the planning phase work begins, and for providing schedule and budget updates monthly per PMP Chapter 05 – Schedule and Budget Management.

3.3 Planning Phase Report

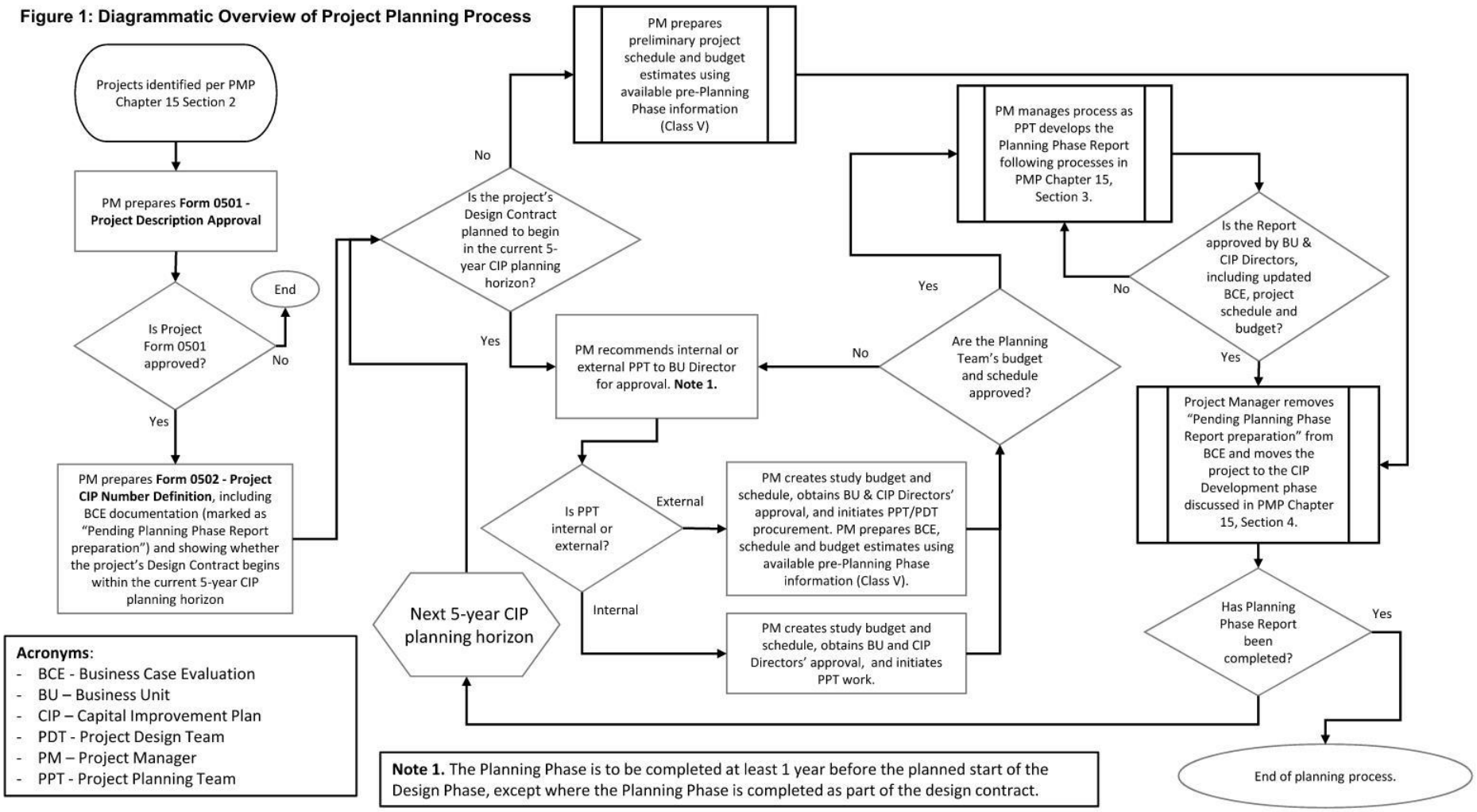
The key deliverable of Planning is the Planning Phase Report. The Planning Phase Report documents the studies and findings that will be used in the CIP development process described in Section 4.

The Planning Phase Report is produced in three parts as detailed this section, shown diagrammatically in Figure 1 below, and detailed in SOP 1501 – Project Planning. An annotated typical table of contents for the Planning Phase Report and a checklist of Planning Phase Report key steps are included as CIP PMP Form 1501 - Planning Phase Checklist and CIP 1503 - Annotated TOC.

The purpose of the Planning Phase Report is to document that each of the steps in Planning has been completed, and that the results are both defensible and reproducible, defined as follows:

- **Defensible** means that both the evaluation and quantification of, and proposed solution to, a given project need has been documented in sufficient detail that the decision can be defended to senior leadership and the Board.
- **Reproducible** means that the planning process used was sufficiently documented such that reasonable people, faced with the same facts, would come to the same conclusion.

Figure 1: Diagrammatic Overview of Project Planning Process



The level of complexity justified for the Planning Phase Report varies considerably by project type and size. By way of example, options evaluations for pipeline routes will be different in number, makeup, size and complexity than options for addressing an in-the-fence equipment project.

3.3.1 Steps

CIP Project Planning is to be delivered through the following three planning stage gates:

1. Planning Stage Gate 1: Identification Step
2. Planning Stage Gate 2: Feasibility/Alternatives Evaluation
3. Planning Stage Gate 3: Definition

Each of these steps is described in greater detail below.

3.3.1.1 Planning Stage Gate 1: Identification Step

There are typically multiple ways of satisfying a project need. The purpose of this activity is to document that a broad range of alternatives has been considered, and that a systematic process was used to identify the most desirable alternatives.

As the Project Manager goes through the process of identifying project alternatives, they are to obtain input and feedback from GLWA's Asset Management Team. To support Asset Management's input, the Project Manager must provide the following to the Asset Management Team:

- A listing of all assets in, or impacted by, the project
- The most recent condition rating of impacted assets, including their criticality and risks
- A write-up describing the sources of information used by the Project Manager for the above
- A discussion of which assets in the project are in an existing Asset Management Plan (AMP), and when the last condition assessment was completed
- A link to relevant AMPs
- The process used to estimate replacement costs for affected assets

As there may be many alternatives to consider, at least initially, project data developed at this step is preliminary in nature. Typically, Opinions of Probable Construction Cost (OPCC) should follow the processes defined by the Association for the Advancement of Cost Engineering International (AACEI) ***Recommended Practice No. 18R 97: Cost Estimate Classification System – As Applied in Consulting, Procurement and Construction for the Process Industries, and Skills & Knowledge of Cost Consulting*, 7th Edition**, herein referred to as the AACEI process. The AACEI definitions for the guidance relevant at the time of publishing of this chapter are summarized below in Table 1. The Project Manager should confirm at the link above whether there have been revisions to the guidance before relying on the summary below.

Table 1: Summary of AACEI's Cost Estimate Classification Matrix

Estimate Class	Degree of Project Definition as Percent of Complete	End Usage	Typical Estimating Method	Expected Accuracy Range
5	0% to 2%	Concept Screening	Capacity factored, parametric models, judgment, or analogy	L: -20% to -50% H: +30% to +100%
4	1% to 15%	Study of Feasibility	Equipment factored or parametric models	L: -15% to -30% H: +20% to +50%
3	10% to 40%	Budget Authorization	Semi-detailed unit costs with assembly level line items	L: -10% to -20% H: +10% to +30%
2	30% to 70%	Bid/Tender	Detailed unit cost with forced detailed take-off	L: -5% to -15% H: +5% to +20%
1	70% to 100%	Check Estimate or Bid/Tender	Detailed unit cost with detailed take-off	L: -3% to -10% H: +3% to +15%

While the data is preliminary at this stage, initial evaluations should include:

- Cost
  - OPCC, including contingency typical for selected AACEI class
  - Allowances for design and construction management, typically as a percent of OPCC
  - Lifecycle operating costs
- Construction schedule
- Permit requirements
- Land acquisition
- Risk/Fatal Flaw analysis

The final outcome of the Identification Step is to reduce the number of alternative solutions to two to four preferred solutions to carry into the next step, the Feasibility/Alternatives Evaluation portion of the Planning Phase Report. Factors evaluated should include cost and schedule, permitting requirements, land acquisition, and risk. The evaluation of benefits and costs should include the potential social, environmental, ecological, constructability, funding, and public relations impacts and benefits, in addition to the technical and financial aspects of the project.

The Project Manager, with their Business Unit Director's, CIP Director's, and Program Assurances Manager's support, is responsible for selecting a systematic and defensible process for making this reduction in the number of alternatives. The preferred alternatives should be selected using a multi-criteria decision analysis tool that allows multiple, potentially competing factors to be balanced and scored in a process documented in the Planning Phase Report. This process should include weightings and scoring developed through a group-based process allowing broad input from operational staff, engineers, project managers, and even potentially other sources such as public input. For small, simple projects, a simple spreadsheet-based pros/cons evaluation with mostly qualitative scoring may be appropriate. For larger, more complex projects, more complex evaluation

tools using team-based multi-criteria scoring should be developed. Criteria selected should reflect scoring of key risks associated with various alternatives, including their consequence of failure and likelihood of failure. Typically, consultant teams with experience in such evaluations will be well versed in preparing such planning documents and will bring with them decision support tools suited to the project. If further examples of industry standard Project Planning Reports are needed, examples can be found at the following: 1) US EPA's "Planning for Sustainability: A Handbook for Water and Wastewater Utilities," 2) US EPA's "Making the Right Choices for Your Utility: Using Sustainability Criteria for Water Infrastructure Decision Making," and 3) World Bank's "The World Bank's "Infrastructure Prioritization Framework." Examples of decision support tools are also included in CIP PMP Form 1501 - Planning Phase Checklist and CIP 1503 - Annotated TOC.

The Project Manager may, if the data so supports, choose to recommend moving to a single preferred solution in a single step. This approach would only be supported in cases where the optimal solution is evident, and with the approval of the Project Manager's Business Unit Director and the CIP Director. If this is approved, the Feasibility/Alternatives Evaluation Step described below is skipped, and the Project Manager proceeds to the Definition Step.

After completion of the above, Part 1 of the Planning Phase Report is completed by the Project Planning Team, summarizing the methods, findings, and outcomes of the Identification Step. Part 1 of the Planning Phase Report must be approved by the Project Manager, then the Project Manager's Business Unit Director and the CIP Director, copying the Program Control Manager, before moving to the next step. Approval from the Business Unit and CIP Director will mean that the Planning Stage Gate 1 work has been evaluated; all reasonable alternatives, costs, and schedules have been soundly developed; and the selected options moving to Planning Stage Gate 2 represent the best options available.

3.3.1.2 Planning Stage Gate 2: Feasibility/Alternatives Evaluation Step

In the Feasibility/Alternatives Evaluation Step, the two to four preferred alternatives identified in the Identification Step are developed further, to approximately 5% design development, for use in the selection of the preferred alternative.

Typically, Opinions of Probable Construction Cost for this step are Class 4 estimates (AACEI process). AACEI defines Class 4 Opinions of Probable Construction Cost as follows:

- Degree of project definition (defined as a percent of complete definition): 1% to 15%
- OPCC's end usage (typical purpose of estimate): study or feasibility
- Typical estimating method: equipment factored or parametric models
- Expected Accuracy Range (typical variation in low and high ranges):
  - Low: -15% to -30%
  - High: +20% to +50%

Again, the Project Manager is responsible for working with the Project Planning Team to select the appropriate decision support tool. In this step, use of more complex decision support tools may be warranted, at the Project Manager's discretion, with scoring based on increasingly more quantitative criteria than qualitative as each Stage Gate is completed.

Part 2 of the Planning Phase Report is completed following the Feasibility/Alternatives Evaluation Step. The approval of the PM's Business Unit Director and the CIP Director is required before moving to the next step, and the Program Controls Manager should be copied on the Planning Phase Report Part 2. Approval from Business Unit and CIP Directors will mean that the Planning Stage Gate 2 alternatives, updated costs, and schedules have been thoroughly evaluated, and that the selected final option moving to Planning Stage Gate 3 represents the best option available.

3.3.1.3 Planning Stage Gate 3: Definition Step

In the Definition Step, the preferred alternative is further defined and developed to the point that the documents needed to engage the Project Design Team or Design-Build Contractor are complete and there is sufficient data on the project to allow it to be ranked and prioritized versus other CIP projects. The primary outcomes of the Definition Step are therefore:

1. There is sufficient project information for the Project Manager to complete the project's Business Case Evaluation (BCE), which is the tool used to convert the project data produced from the project planning process described above into a priority scoring for a project. The BCE process is described in more detail later in Section 4.9.
2. Project schedule and budget information has been developed to a level consistent with the requirements of PMP Chapter 05 – Schedule and Budget Management.

For Design-Bid-Build contracting, the Definition Step should target 10% design development. For Design-Build contracting, the definition efforts may target a higher level of design development, with around 15% design development being typical depending on project risk profile. With Design-Build delivery, the contractor assumes more risk and will price that risk into their bid price. In situations where project risk will impact the bid price, GLWA may choose to develop the Definition Step more fully to reduce the unknowns and therefore risk. Risks that may be better defined by further progressing designs include unknowns such as geotechnical and subsurface risks, or risks associated with complex technical solutions.

As discussed in the remainder of this section, evaluations should include cost and schedule, permit requirements, land acquisition, utility relocation requirements, and an evaluation of risk. Opinions of Probable Construction Costs at this point should be consistent with approximately 10% design development with Class 4 estimates performed, as defined by AACEI. Class 4 estimates (10% design) typically involve parametric modeling, end-product units, ratio/factor, GLWA Factors, and adjusted historical unit costs. Class 3 estimates (closer to 30% design) may be used, at the Project Manager discretion, for Design-Build contracts, and typically include some semi-detailed preliminary quantity takeoffs and equipment and unit cost estimates (see PMP Chapter 05 – Schedule and Budget Management).

The Definition Step should also define the resources and methods that will be required to deliver the project. As such, the contracting methodology recommendation and project delivery team organization chart should be developed during the Definition Step; see PMP Chapter 09 – Engineering and Design Management.

3.3.2 Further Investigations

The Planning Phase Report should also present a proposed plan for the field investigations, surveying, investigations of existing systems, and geotechnical investigations that are likely to be required during Design.

The Planning Phase Report should also present an assessment of existing systems interacting with the project, and present a plan for tying into, bypassing, or potentially demolishing existing systems.

3.4 Procurement and Contract Administration

If a consultant Project Planning Team is used that requires a new procurement, as opposed to use of an existing contract, the Project Manager works with the Procurement Team to procure the Project Planning Team. The Project Planning Team is procured, and their contract administered, consistent with the processes and procedures outlined in PMP Chapter 10 – Procurement and Contract Administration. The procurement of the Project Planning Team cannot commence until the Project Manager receives the approval of Project Description Approval Form 0501 and has received the project's CIP number from Program Controls.

3.5 Health and Safety (H&S)

There are typically fewer Health and Safety (H&S) issues during Planning compared to the later phases; however, Planning may include field activities that create some H&S risk. Whether Planning is executed by an internal GLWA team or an externally procured Project Design Team, an H&S plan must be completed and submitted to the Project Manager for approval.

If an externally procured Project Design Team is used in Planning, the requirement for the Project Design Team to develop and implement a GLWA-approved H&S plan should be included in their scope of work at the Request for Proposal (RFP) stage by the Project Manager.

Activities during Planning that present greater H&S risk potentially include field visits, initial surveys, and initial subsurface investigations. H&S should be administered in Planning consistent with the processes and procedures outlined in PMP Chapter 12 – Health and Safety Management.

3.6 Quality

Whether Planning is executed by an internal GLWA team or an externally procured Project Design Team, a Quality Plan should be completed and submitted to the Project Manager for approval.

If an externally procured Project Design Team is used in Planning, the requirement for the Project Design Team to develop and implement an approved Quality Plan should be included in their scope of work at the RFP stage by the Project Manager.

The principal quality issues in Planning are the consistent review of work products and maintenance, storage, and retention of documents. Quality should be administered in Planning consistent with the processes and procedures outlined in PMP Chapter 07 – Quality Management.

3.7 Risk

An initial Project Risk Register is a deliverable of Planning. If an externally procured Project Design Team is used in Planning, the requirement for the Project Design Team to perform an approved Risk Assessment should be included in their scope of work in the RFP by the Project Manager. Risk should be managed in Planning consistent with the processes and procedures outlined in PMP Chapter 08 – Risk Management.

3.8 Communications Management

Communications issues are usually minimal in Planning; however, the potential impacts to the public must be considered as part of the alternatives evaluation process, and an initial Project Communications Plan should be a deliverable of Planning and included by the Project Manager in the

planning scope of work. Communications issues should be evaluated, and the Project Communications Plan developed, consistent with the processes and procedures outlined in PMP Chapter 13 – Public Information and Stakeholder Management.

3.9 Schedule and Budget

The scope, schedule, and budget for the project are progressively developed to increasing accuracy at each of the planning stage gates described above throughout Planning to approximately the 10% to 15% level by the end of Planning after approval of Stage Gate 3. Each evolution of the proposed project scope, schedule, and budget developed should be submitted to the Program Controls team. The project schedule and budget are not considered “baselined” until the Design Consultant prepares their first baseline schedule and budget in the Preliminary Design Report (PDR) discussed in PMP Chapter 09 – Engineering and Design Management. Nevertheless, during Planning, the schedule and budget should be developed consistent with the Work Breakdown Structure (WBS) discussed in detail in PMP Chapter 05 – Schedule and Budget Management. While the PDR prepared by the Design Consultant is similarly a 10% to 15% level of design to the planning effort, the Design Consultant’s PDR is a further development of the Planning Phase Report looking at process in more detail, and if the Planning Phase Report and PDR vary, the PDR governs.

The Project Manager is responsible for reporting progress of the planning efforts against the established schedule and budget and incorporating the developed information into the timeline as detailed in PMP Chapter 05 – Schedule and Budget Management.

3.10 Document Control

The Document Control strategies and procedures outlined in PMP Chapter 04 – Document Management are to be followed throughout Planning.

4 CIP Development Process

On completion and approval of the Planning Phase Report per the processes described above, CIP projects then move forward into the CIP Development and project prioritization processes, as detailed below.

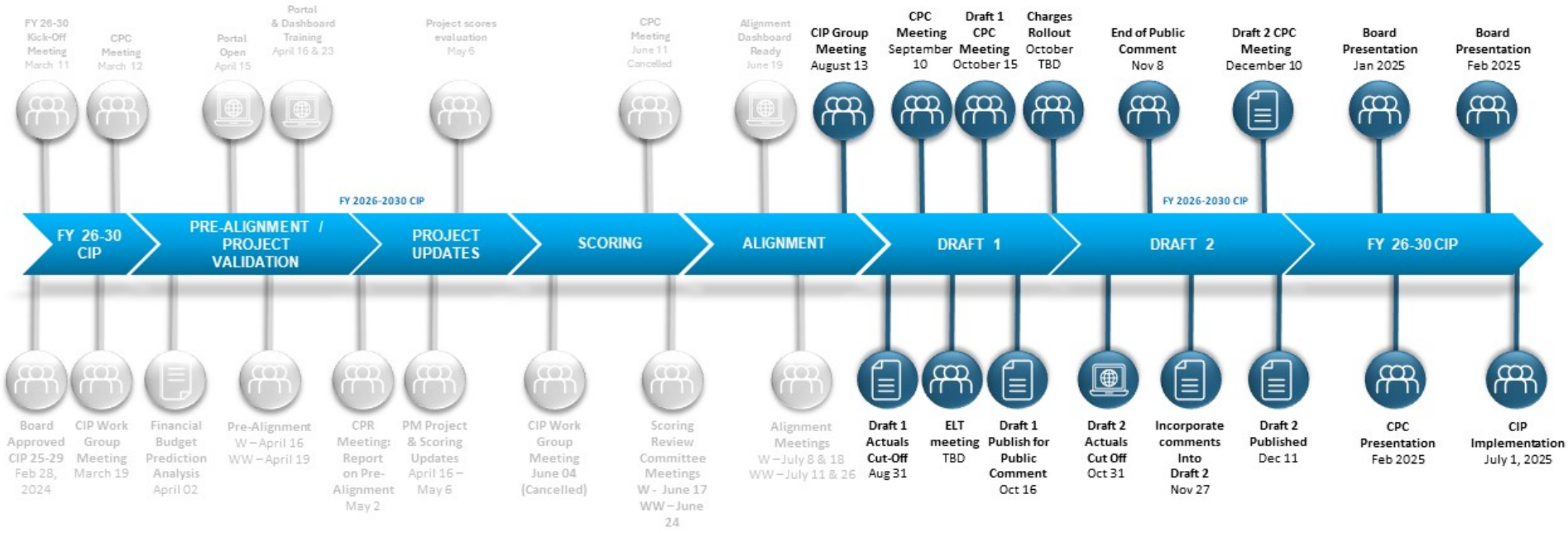
4.1 Background

GLWA's Articles of Incorporation, Article 9, c, requires that GLWA "establish and annually approve a five-year capital improvement program." This requirement is fulfilled through the processes described below and is based on the following guiding principles:

- The schedule and budget information used to score and prioritize CIP projects is developed and maintained using the processes detailed in PMP Chapter 05 – Schedule and Budget Management.
- The five-year plan provided to GLWA's Board of Directors each year as required above are based on the CIP Program Master Program Schedule and Master Program Budget, developed and maintained per the processes detailed in PMP Chapter 05 – Schedule and Budget Management.
- CIP projects are ranked by the Project Manager and then through a team-based, multi-criteria scoring approach that gets incorporated into the Business Case Evaluation described later in this chapter.
- The CIP Team is responsible for monitoring and maintaining the annual CIP development processes described in this section.

4.2 Process Overview

Figure 2 below presents an overview of the processes used for the CIP for years 2025 through 2029 to develop the five-year plan provided to GLWA's Board of Directors each year as required by GLWA's Articles of Incorporation. These processes are further detailed in CIP_PMP_1504 - BU CIP Preparation Processes and CIP_PMP_1505 - CIP Approval Processes, which describe the Business Unit (BU) CIP Preparation Process and the CIP Approval Process, and in the sections below.



CPC – Capital Planning Committee | **CIP** – Capital Improvement Plan | **CPR** – Capital Program Review
PM – Project Manager | **ELT** – Executive Leadership Team | **FY** – Fiscal Year

4.3 CIP Development Tools

4.3.1 Program Management Plan CIP Development Tools

This PMP has been developed such that in the future the CIP development process will become an annual “snapshot” of the ongoing Program Master Schedule and Program Master Budget processes described in PMP Chapter 05 – Schedule and Budget Management. When PMP Chapter 05 is fully implemented and the CIP Program’s PMIS is in place (see note in Section 1), the CIP will be developed as a cost-loaded Primavera P6 schedule that is updated monthly, with new CIP projects added throughout the year as their cost-loaded baseline schedules become available. Since this is a “snapshot,” any projects added each year after July 1 will be included in the next five-year plan cycle presented to the Board of Directors. For example, any projects added after July 2024 would first appear in the FY 2026–2030 CIP plan presented to the Board of Directors.

4.3.2 Interim CIP Development Tools

Until the processes in PMP Chapter 05 – Schedule and Budget Management are fully implemented and the CIP is developed as a cost-loaded Primavera P6 schedule that is updated monthly, the following interim tools will be used in the above-described annual process to develop the CIP.

4.3.2.1 Smartsheet

Smartsheet will be used as a data collection tool for program master summary cost-loaded schedule data. Smartsheet includes basic Critical Path Method scheduling features such as Gantt chart visualization and standard schedule predecessor/successor logic. Start dates, finish dates, and Estimate at Completion (EAC) costs are collected in Smartsheet to populate the project controls system of record (PRISM G2). Columns are built into Smartsheet to represent a rough estimate of future fiscal year spending as a linear distribution of the activity EACs between the start and finish dates. These rough estimates of future spending do not take into account actual costs to date and are for rough estimates only. The Smartsheet activity dates and EACs are then imported into the PRISM project controls software monthly by the CIP Group.

4.3.2.2 PRISM

Start and finish dates and EAC data are imported from the Smartsheet data collection sheets into ARES PRISM G2 project controls software monthly by the CIP Group. This schedule-level cost and schedule detail rolls up to control accounts in PRISM. Actual and accrued costs from GLWA Construction Accounting are updated monthly and are parsed out to the individual contract level of detail. These actual costs are applied to the appropriate PRISM control accounts to determine the Estimate to Complete (ETC) costs, which are forecasted and weighted based on the cost-loaded schedule data collected from Smartsheet.

4.3.2.3 Portal

To support the interim development of the CIP, the CIP Group has developed a CIP Portal, which is a web-based data entry portal. The “User Guide” for the CIP Portal is included as CIP_PMP_1506 - CIP Portal User Guide.

Currently the Portal is not being used directly by the Project Managers to input the cost and schedule data for each of their projects. The Project Managers input their project cost and schedule data into Smartsheet. This data is then mined to PRISM and then transferred to the Portal. To streamline the data input process and reduce potential errors, GLWA plans to consolidate all individual systems into a single PMIS in the future. For the time being, the responsibilities are outlined below.

1. Project Managers are responsible for ensuring that project cost and schedule data is accurately inputted into Smartsheet or the future PMIS
2. Project Managers also update other portal information, including any changes in Project Manager, project description, main drivers, scope, change to delivery method, project scoring, project/phase status, latest cost estimate date and class, etc.
3. The CIP Group is responsible for monitoring data quality to verify that data is entered into the PMIS portal accurately and on time.

4.4 CIP Annual Planning Process

In February of each year, on approval by the Board of the previous year's CIP, the new CIP development process restarts for the next 5-year planning period.

4.4.1 Lessons Learned from the Previous Capital Improvement Plan Cycle

The CIP Group holds a single 1-hour meeting at the end of each fiscal year to solicit feedback from Engineering teams as to what went well over the past year and improvements the CIP Group should work on. The lessons should be documented in the spreadsheet included as CIP_PMP_FORM_1502 - Lessons Learned Template The CIP Group is responsible for efforts to incorporate lessons learned from this process into the next CIP cycle. The meeting agenda is outlined below.

1. Discuss CIP Cycle Accomplishments *(5 min)*
2. Discuss Each Lesson Learned Documented in the Lessons Learned Template and Categorized by CIP Focus Area (Cost and Schedule, Portal, CIP Report, CIP PowerPoints, CIP Coordination, Process, QA/QC, and scoring) *(50 min)*
3. Meeting Close *(5 min)*

4.4.2 Capital Improvement Plan Cycle Schedule Development

At the beginning of each CIP cycle, the CIP Group creates a schedule for the upcoming year using the Gantt chart template included as CIP_PMP_FORM_1503 - Project Schedule Template The schedule incorporates activities occurring throughout the entire CIP cycle and includes deadlines, meetings, development periods, QA/QC review periods, Legistar (GLWA Board's calendar and document system) upload dates, and holidays. The CIP Group reviews the proposed schedule to ensure that the established timeline is attainable for the year. Based on the schedule, the CIP Group publishes a roadmap for the next CIP cycle that is shared with the CIP Delivery Team and partners, and schedules the pre-alignment, scoring, and alignment meetings for the CIP. The schedule is provided to support planning and coordination of resources and to support completion of tasks on time and within budget.

4.4.3 Recurring Meetings

The CIP Group is responsible for scheduling, attending, and/or presenting at the key meetings listed below, at a minimum. These meetings occur throughout the year, and the meetings scheduled by the CIP Group are scheduled at the beginning of the new planning process to provide ample notice to attendees.

1. Capital Planning Committee (CPC) meetings
2. CIP Work Group meetings
3. Asset Management Leadership Team (AMLT) meetings
4. **Executive Leadership Team (ELT) meetings**
5. Steering Committee meetings
6. Capital Program Review (CPR) meetings

7. **Board of Directors meetings**

The meetings in bold above are critical path, and their timing should be closely monitored and their preparation given high priority.

During these meetings, the CIP Group provides updates on the progress within the CIP development cycle. The CIP Group is not responsible for presenting at every occurrence of these meetings, but does have responsibility for scheduling the meetings and scheduling the presenters as required for each meeting. The attendance required from GLWA team members and consultants will vary, as will the roles in presentations and preparation required of attendees, and are determined by the agenda items for the meeting in question. The templates for these presentations can be found in the CIP Group's project folders on OneWaterConnect.

4.5 Financial Budget Prediction and Analysis

Budget prediction and analysis uses the following process:

1. The Finance Team provides its preliminary water and wastewater CIP spend projection information per the Financial Plan to the CIP Group as early as possible in February and March of each year.
2. The GLWA Board adopts budgets and member agency charges in June. At this time, the CIP Group confirms with the Finance Team whether there have been any changes to the CIP spend projections published in February for comment.
3. The CIP Group carries forward the defined CIP spend projection into the alignment process.
4. Financial budgets are reviewed and reconfirmed during and after alignment.
5. Based on the confirmed CIP cost, the CIP Group prepares various scenarios that can be combined to meet the allowable CIP cost.
6. Capital spending projections and new capital project requests are received by the CIP Group from requesting divisions.
7. The CIP Group integrates the expenditures into a prioritization process that supports financial objectives.
8. All capital spending projections are based on a data-driven, informed, decision-making process.

4.6 Cost and Schedule Data Review

4.6.1 Program Management Plan Cost and Schedule Data Updates

As discussed in Section 4.3.1 above, this PMP has been developed such that in the future the CIP development process will become an annual "snapshot" of the ongoing Program Master Schedule and Program Master Budget processes described in PMP Chapter 05 – Schedule and Budget Management. When PMP Chapter 05 is fully implemented and the CIP Program's PMIS is in place (see note in Section 1), the CIP will be developed as a cost-loaded Primavera P6 schedule that is updated monthly, with new CIP projects added throughout the year as their cost-loaded baseline schedules become available.

When these new processes and tools are fully implemented, each CIP project's cost and schedule information will be updated from cost-loaded P6 schedules monthly with the resulting Program Master Schedule and Program Master Budget representing the most recently available data. Until these new processes are fully implemented and the tools fully developed, the following interim processes are used.

4.6.2 Interim Cost and Schedule Updates

1. Cost and schedules are to be updated periodically; for existing projects, updates should occur in February/March of each year at a minimum for project cost and schedule validations. This update of project costs or schedules should reflect new stage gates, changes due to inflation, etc. Project cost estimates in the CIP for future projects are to be less than 2 years old.
2. In March/April, the CIP Director and the Program Controls Manager bring forward the latest and most current cost and schedule data for each project in the CIP into the CIP Portal.
3. The cost and schedule data in the Portal is evaluated for any changes since the Board-approved project based on cost and schedule data from October of the previous year and for additional actual expenditures or changes through February.
4. By mid-June, the Project Managers are responsible for reviewing project cost and schedule information in the CIP dashboard/forecast file and for reaching out to the Project Controls team to update the information revising the information in the Smartsheets described above. Any addition of new projects will follow the Baseline Initiation process described in PMP Chapter 05 – Schedule and Budget Management.
5. Cost and schedule updates are frozen as of August 30 and October 30 of each year to reflect Draft 1 and Draft 2 CIP data.
6. The CIP Group leads a review of the project information.
7. Phase cost and schedule updates by the Project Manager should include the latest phase status, OPCC, and opinion of probable construction schedule.

4.7 Pre-Alignment

4.7.1 Pre-Alignment Meetings (March/April)

The CIP Group conducts separate meetings with Water and Wastewater Business Unit Chiefs, Directors, Managers of Lifecycle Project Managers (Managers of LPMs), and their Project Managers in March and April. The purpose of these meetings is to ensure that the project cost and schedule information reflects the best available data, including updates to account for inflation or other baseline changes such as scope changes.

4.7.2 Pre-Alignment Scenario Planning (April/May)

During April and May, the CIP Group holds internal meetings to review the projects, costs, and schedule information for the entire portfolio, including existing and new projects. The purpose of these meetings is to determine how close the new project needs are to the available CIP spend projections (determined above). The CIP Group develops scenarios for bridging gaps and determines what projects may need to be pushed out.

4.7.3 Portal Updates for Scoring Process (May/June)

In May and June, the CIP Group invites Project Managers to update the Portal to reflect any changes as well as ensuring that all new projects and updated project information is in the Portal. Not all projects get updated. Only projects that fit the following criteria are updated:

- Significant changes in project description, scope, cost, or schedule
- Change in status
- Change in delivery method

At this point in the process, it is particularly important to update projects that have been consolidated, reclassified as to their priority, closed, or deferred.

4.7.4 Portal Training (May)

Each year the Portal is available from early January for Project Managers to continue to maintain the most recent data for their projects. In addition, to provide a refresher prior to the final steps in the CIP development process, the CIP Group schedules training on the use of the Portal for the Business Unit Directors, Managers of LPMs, and Project Managers. The training provides both an overview of the Portal for new PMs, as well as an overview of any changes to the Portal for Project Managers already familiar with the Portal from previous years.

The documents used for this Portal training are available at the link provided.

In the future, Project Managers and other relevant staff will receive training on the new PMIS once it is implemented to ensure that they are familiar with the system and can input data accurately and efficiently.

4.7.5 Project Schedule and Cost Updates

Project Managers are to provide monthly updates of their projects' costs and schedule projections throughout the year using the processes described in PMP Chapter 05 – Schedule and Budget Management; however, their last opportunity to update projects for this CIP is around the end of May each year.

4.8 Financial Budget Adopted (June)

GLWA's Board adopts the budgets and member agency charges for the upcoming fiscal year in or around June of each year. Then the CIP Group confirms with the Finance Team whether there have been any changes to the CIP spend projections preliminarily published in February (see Section 4.4 above) for comments and carries forward the defined CIP spend into the alignment process described below.

Based on the confirmed CIP spend, the CIP Group prepares various combinations of project scenarios to meet the allowable CIP spend and meets with the Business Unit Directors, Managers of LPMs, and key Project Managers to discuss and choose among the alternatives.

4.9 Scoring

The scoring method used to develop the CIP, also referred to as GLWA's BCE Scoring Process, is detailed in Appendix E of each CIP published by GLWA. Listed below are the steps in which the scoring process is applied.

4.9.1 Project Managers Score Their Projects (June)

4.9.1.1 Projects to Be Scored

In June, Project Managers are asked to log into the Portal and provide their recommendations on scoring for any projects requiring scoring. Projects that do get scored/rescored include:

- New Projects, including new projects from programs
- Future Planned

- Active / in Procurement
- Projects from Programs
- Project Execution Design & Project Delivery Method = Design-Bid-Build (DBB)

The following projects do not require scoring updates because they are expected to maintain their legacy score:

- Programs
- Project Phase Status
  - Project Execution - Construction
  - Project Execution - Pending Closeout
  - Project Execution - Design & Project Delivery Method = Construction Manager at Risk (CMAR), Design-Build (DB), Progressive Design-Build (PDB)

4.9.1.2 Project Manager Scoring in Portal

Projects are scored by the Project Manager in the Portal. The Portal User Guide, included as CIP_PMP_1506 - CIP Portal User Guide to this chapter, includes a detailed description of the scoring process. The equation used by the Portal to calculate the project score is described in detail in GLWA CIP Prioritization Project Scoring Equation technical memorandum included as Appendix E of each published CIP.

4.9.2 Review Committee Scoring (June)

Each year the CIP Group schedules at least two scoring committee review meetings, at least one for Water projects and at least one for Wastewater projects, after Project Managers complete project scoring as detailed in Section 4.9.1 above.

At these meetings, the Project Managers present their newly scored projects to the Review Committee and explain the reasoning behind their scores. The Review Committee, which includes GLWA Chiefs, Directors, Managers of LPMs, select LPMs, diverse GLWA representation (including from Operations, Asset Management, Field Services, etc.), and select representatives of the Member Agencies, approves or adjusts the scores for the projects, thus having final say of the BCE scores for prioritization during the alignment process. The CIP Director recommends members of the Scoring Committee and seeks CIP Steering Team approval of the Committee makeup.

A Project Scoring Video Training is available for Project Managers and Review Committee members. Project Managers are encouraged to use the standard scoring summary PowerPoint presentation format provided as CIP_PMP_FORM_1504 - PM Scoring Presentation Template. An example populated version of this presentation format is also provided at CIP_PMP_FORM_1505 - Scoring Presentation 36-inch Condition Assessment populated Template.

4.9.2.1 Project Tiers

Following the Review Committee scoring, the CIP Group summarizes the project scoring into tiers. The tiered approach categorizes projects by importance based on project scores of high, medium, and low. These tiers summarize the overall risk associated with implementing or deferring projects within that tier. The project prioritization is reviewed to confirm that the majority of projects fall into Tier 1 before moving to Tier 2 projects, then Tier 3 during alignment. Project tiers are shown in Table 2 below, and the tiers are further defined in the Portal Users Guide included as CIP_PMP_1506 - CIP Portal User Guide

Table 2: Project Tiers

	Project Score	
Tier	**Low**	**High**
1	75	100
2	45	75
3	20	45

4.10 Alignment

The following sub-processes constitute the Alignment portion of the CIP Development process.

4.10.1 Project Managers Refresh Cost and Schedule Updates (August)

In August, the Project Managers provide any changed cost and schedule information to the Project Controls Team so that the information in the Portal can be updated to reflect the latest project schedule and cost updates with actuals through August. The CIP Group leads a review of the project information shown in the Portal.

4.10.2 Alignment Meetings (August)

The CIP Group convenes meetings of the CIP Group, Business Unit Directors, Managers of Lifecycle Project Managers, and Project Managers in August to align the projects in the 5-Year CIP with the available funds. Based on the BCE scores of each project and feedback from Operations (typically provided by Engineering), more critical projects are brought forward, and less critical projects deferred such that the CIP spend matches the available funds.

Meetings are scheduled to achieve consensus among the CIP Group, Business Unit Directors, and Project Managers by the end of August.

Best practice includes adopting a PMIS for standardized and timely project updates. GLWA will be adopting a PMIS in upcoming years. Once the processes in PMP Chapter 05 – Schedule and Budget Management and the PMIS are both fully implemented, the CIP Program Master Schedule and Program Master Budget would both be maintained on a monthly basis for a 10-year look ahead, and the need for an annual alignment would be removed.

4.10.3 Alignment Guidelines and Project Prioritization

Shortly after its foundation, GLWA began to implement a standardized method for prioritizing projects in its CIP. The method was adapted from the City of Los Angeles Sanitation Department (LASan) framework. GLWA evaluated LASan's prioritization method and adjusted the scoring criteria and the weightings to align with GLWA's goals and objectives. This prioritization method was applied to all GLWA CIP projects, which include water transmission lines, sewer interceptors, storage facilities, pump stations, lift stations, water treatment plants, water resource recovery facilities, and combined sewer overflow facilities. See Appendix E of each CIP published by GLWA for more information on project prioritization.

4.11 Draft 1 of the Capital Improvement Plan

The following sub-processes constitute the review and comment processes for Draft 1 of the proposed CIP.

4.11.1 Capital Planning Committee Status Review (September)

In September, the CIP Group again convenes the CPC for a meeting where the CIP Group updates the committee on the status of the proposed CIP.

4.11.2 Executive Leadership Team Review (October)

After adjusting the CIP, if required following the September CPC review, the CIP Group prepares a presentation to GLWA's ELT and meets with the ELT to review the proposed CIP.

4.11.3 Draft 1 Capital Planning Committee Review (October)

In October, the CIP Group again convenes the CPC for a meeting to approve Draft 1 of the CIP for release to the public for review and comment. The October CPC and ELT presentations include the same information with updated data for the CPC meeting. Draft 1 reflects actuals as of August 31 and Project Manager's cost and schedule update for September.

4.11.4 Charges Rollout Meeting

Around October of each year, GLWA (other than the CIP Delivery Team) hosts a Charge Rollout Meeting. At this meeting, the BU Directors present their CIP projects in Draft 1 of the CIP.

4.11.5 Draft 1 of the CIP Published for Public Review (October/November)

After the CPC meeting, the CIP Group publishes Draft 1 of the CIP on the website to allow a comment period. During the comment period, the Board, member partners, and other stakeholders can provide comments, questions, or concerns that are considered for Draft 2.

The comment period is typically 3 to 4 weeks long. Once the CIP Group closes the comment period in November, they prepare a log of comments received and proposed actions to address any required changes to Draft 1 of the CIP.

4.11.6 CIP Workgroup Outreach Meeting

After Draft 1 is published, the CIP Group convenes a CIP Workgroup Outreach at which the BU Directors present their CIP projects.

4.12 Draft 2 of the Capital Improvement Plan

The CIP Group convenes teams of the CIP Group, Business Unit Directors, and Project Managers as necessary to address any changes to Draft 1 of the CIP from the public comments received. The CIP Group times these meetings to enable the publishing of the second draft of the CIP by December.

4.12.1 Capital Planning Committee Review (December)

In December, the CIP Group again convenes the CPC for a meeting to review the proposed Draft 2 CIP and approve it for release to the public.

4.12.2 Draft 2 of the CIP Is Published (December)

The CIP Group publishes Draft 2 of the CIP Report on the GLWA website. Next, the CIP Group will present the CIP to the Board of Directors for approval.

4.13 Board Consideration

On completing the processes described above, the new CIP is presented by the CIP Group to the Board for their consideration. At this time (January), the Board refers the CIP back to the CPC Committee for review, and the CIP is typically presented again for Board approval in February after the plan receives the recommendation of the CPC Committee. The CIP Document is immediately effective upon Board approval, and such approval impacts projections for the current fiscal year.

4.14 Process Repeats

On conclusion of the above, the process described above begins again.

5 Summary of Responsibilities

5.1 Business Unit-Level CIP Development

The following teams work together to perform the annual Business Unit-level CIP preparation process (see also CIP_PMP_1504 - BU CIP Preparation Processes for a workflow of this process):

- **CIP Group:** The CIP Group is responsible for maintaining, coordinating, scheduling, and facilitating the annual business unit level CIP preparation process. This process is initiated each year in March by the CIP Group, who begin the process by evaluating whether there are any lessons learned from the experiences of the previous year that would result in changes to the process, and if so, making such changes as required and scheduling training as required by changes or for staff who are new to the process.
- **Business Unit Project Managers:** BU PMs are the primary advocates for their projects during the Business Unit-level CIP preparation process. The PM develops and updates project information and maintains it in the portal using the processes defined in PMP Chapter 05 – Schedule and Budget Management, including project scope, delivery method, cost and schedule information, including class and date of estimate. The PMs use the project information developed through the Planning process described in Section 4.4 above and use the Portal as the mechanism through which the PM converts the project data from planning into a BCE score. The process and methodology for the BCE scoring is detailed in Section 4.9.
- **Business Unit Managers and Directors:** BU Managers/Directors are responsible for reviewing and approving the project information developed through the Planning process as well as the project's BCE score. BU Managers/Directors are also active participants in the alignment process.
- **GLWA Review Committees:** The Review Committees are groups of GLWA team members and partner community representatives that the CIP Team convenes each year to review projects and create its own project BCE score using the same planning-level information input by the PM. The purpose of the Review Committee's scoring is to check that the planning information has been appropriately documented, entered, and scored so that project BCE scores across all projects are consistently developed.

- **GLWA Alignment Team:** The Alignment Team is a group of GLWA team members that the CIP Team convenes each year to prioritize projects based on their BCE scores and combine projects in such a way as to meet available funding limits, also referred to as the "Alignment Process." The Alignment Process takes place during an annual Alignment Review Meeting, with additional meetings scheduled if needed. The factors considered include:
  - Predecessor Projects
  - Delivery Flexibility
  - Funding Source
  - Financial Plan
  - Proactive Planning
  - Constructability
  - Operational Considerations

The GLWA Alignment Team typically includes GLWA Chiefs, Directors, Managers of LPMs, and select LPMs.

On completion of this process, typically in August of each year, the CIP Team initiates the CIP Approval Process described below.

5.2 CIP Approval Process

The following teams work together to review, approve, and publish the CIP (see also CIP_PMP_1505 - CIP Approval Processes for a workflow of this process):

- **CIP Group:** The CIP Group is responsible for maintaining, coordinating, scheduling, and facilitating the annual CIP Draft Review and Publication process. This process is initiated each year in September by the CIP Team, who begin the process by exporting the draft CIP data from the CIP Portal after completion of the Alignment Process above. The process continues through February of the next year when the CIP approved by the Board of Directors is published.
- **Select Group of the Executive Leadership Team:** A select group of ELT members may be convened by the CIP Team to perform a review of the preliminary CIP data and provide feedback to the CIP Team, if they so desire.
- **Capital Planning Committee:** The Capital Planning Committee is convened by the CIP Group from members of GLWA's Board of Directors to perform a review of Draft 1 and provide feedback to the CIP Group.
- **CIP Outreach Workgroup:** The CIP Outreach Workgroup is convened by the CIP Group. This workgroup is a group of vendors and member partners who are invited by the CIP Group so that the draft CIP can be shared for community engagement and transparency.
- **Board of Directors:** GLWA's Board of Directors is the approval body of the plan.

After the CIP has been approved by the Board and published, the CIP Development process is complete.

6 Procedures

The following program procedures and standard forms and templates are related to this section of the PMP:

6.1 Attachments

- CIP 1501 - Project Planning Team Contracting Options
- CIP PMP Form 1501 – Project Planning Phase Completion Checklist
- CIP_PMP_1503 - Annotated Table of Contents for Planning Phase Report
- CIP_PMP_1504 - BU CIP Preparation Processes
- CIP_PMP_1505 - CIP Approval Processes
- CIP_PMP_1506 - CIP Portal User Guide
- CIP_PMP_FORM_1502 - Lessons Learned Template
- CIP_PMP_FORM_1503 - Project Schedule Template
- CIP_PMP_FORM_1504 - PM Scoring Presentation Template
- CIP_PMP_FORM_1505 - Scoring Presentation 36-inch Condition Assessment populated Template

6.2 Procedures

- 1501 – Project Planning SOP
- 1502 – Project Scoring SOP

6.3 Forms and Templates

Included with attachments.

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