City of Aurora

Integrated Water Master Plan (IWMP)

Project Execution Plan (PXP)

May 2014

Version 2

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Section 1

Purpose and Scope

1.1 PURPOSE

Aurora Water has prepared master plans for water resources, water treatment, water reuse, and water distribution in the past, and has developed analytical tools and models in each of these areas. The purpose of the Integrated Water Master Plan (IWMP) is to update the previous master plans by integrating key assumptions and analytical tools, bringing them all to the same timeframe, and developing an integrated CIP that assesses and ranks all water sector projects based on the same fundamental criteria. In addition, the IWMP will introduce uncertainty and risk management into each of the technical areas, recognizing that the future is unknown and Aurora Water must be prepared to meet its obligations to its customers under a wide range of possible future conditions.

The work is being completed under an agreement between the City of Aurora (Aurora) and MWH Americas, Inc. (MWH) dated March 14, 2014.

1.2 SCOPE

The detailed scope of work is included in **Appendix A**.

1.3 GOALS AND OBJECTIVES

The Scope of Services is based on achieving the following goals for the IWMP:

- A new science-based water demand forecast for water resources, facilities, and infrastructure alike.

- An actionable plan that meets the varied demands, that can be readily completed, and that customers and stakeholders understand and accept.

- A sustainable, flexible, and reusable planning document to respond to future uncertainties.

- A financially responsible IWMP and CIP so rates and tap fees are consistent with actual water system needs.

To achieve these goals the Scope of Service is based on the following principles:

- An assumed integration of the Aurora Water and MWH project teams to maximize efficiency.

- An end-to-end integration process that continuously assures that each technical discipline is relying on the same basic assumptions and data, using consistent study methods, and

aiming for the same target.

- A commitment to maximize utilization of previous master plans and other work while still providing a fresh look at the issues and solutions.

- A strategy of using databases and similar technology to facilitate the integration process.

Section 2
Project Team

The Project Team is comprised of MWH as the prime consultant and five subconsultants. The project team reports to the MWH Project Manager.

2.1 TEAM ORGANIZATION AND PROJECT RESPONSIBILITIES
This section presents the project organization and team members' responsibility for providing services during the project period.

2.1.1 Client
The Client is the City of Aurora (Aurora). The Project Manager for Aurora is Sarah Young.

2.1.2 Principal-in-Charge
The Principal-in-Charge for MWH is Chris Young. Chris will ensure the commitment of necessary resources to the project.

2.1.3 Project Director
The Project Director (PD) for MWH is Jason Mumm. Jason will oversee project activities and ensure disciplines are coordinated. In Jason's absence, Jenny Hartfelder is MWH's alternative point of contact.

2.1.4 Project Manager
The Project Manager (PM) for MWH is Jenny Hartfelder, P.E., PMP. Jenny will serve as the primary contact with Aurora, oversee daily project activities, and ensure schedule and budget compliance. In Jenny's absence, Jason Mumm is MWH's alternative point of contact.

2.1.5 Technical Advisory Committee
The Technical Advisory Committee will provide technical review and support to the project team. The committee members and their associated disciplines are:
- Bill Swanson, PE – Demand Planning, Water Resources, Watershed
- Charlie Bromley – Non-Pot/Reuse, Treatment
- GJ Schers – Treatment
- Russ Snow – Distribution
- Lynette Cardoch - CIP
- Darrin Punchard – Risk Framework

2.1.6 Technical Leads
An Aurora and MWH technical lead have been established for each discipline as follows:

Discipline	Aurora Lead	MWH Lead
Project Management	Sarah Young	Jenny Hartfelder
Risk Framework	Sarah Young	Brendan Nelson
Demand Forecast	Sarah Young	Doug Jeavons
Water Resources	Lisa Darling	Chip Paulson and Enrique Triana
Water Resources Modeling	Alfredo Rodriguez	Chip Paulson and Enrique Triana
Distribution	Sarah Young	Will Landin
Treatment	Elizabeth Carter	Jen Gelmini
Reuse & Non-Pot	Lisa Darling	Jeremy Meattey
Watershed	Mike McHugh	Chip Paulson
Integration/CIP	Lisa Darling	John Guilfoyle

2.1.7 Project Controls
Kalonga Siamwiza will serve as the Project Controls Specialist. Kalonga will provide support to Jenny Hartfelder for monitoring and reporting schedule and budget compliance.

2.1.8 Subconsultant and Responsibilities
Five subconsultants have been identified to work on project deliverables. These individuals and their principal areas of activity during the project are listed below:
- Applegate Group – Water Resources
- BBC Research – Demand Forecast
- High Country Hydrology – Water Resources
- JW Associates – Watershed Management
- Maddaus Water Management – Water Conservation

Subcontracts are included in **Appendix B.**

2.1.9 Key Member Team List
An MWH IWMP Project Team Contact List is included in **Appendix C**. This list includes the names and contact numbers for the MWH Project Team and subconsultant firms. Updates to this list will be made continuously throughout the project. Please contact the Project Manager with any changes.

Section 3
Completion Plan and Schedule

3.1 OVERALL PROJECT SCHEDULE AND COMPLETION PLAN

The proposed work plan and schedule show the project starting on April 1, 2014 and reaching completion by January 5, 2016. The overall baseline schedule for the project is provided in **Appendix D**.

The completion plan for the IWMP has been divided into six major tasks to facilitate the expeditious completion of the project. These are Project Management, Future Demand Planning, Project Planning, Capital Improvement Plan, Processing of Results & Public Outreach, and Final Report. The scope of work for each of these tasks is provided in **Appendix A** and the work plan for each of these tasks is outlined below.

3.1.1 Project Management

The Project Management task will be used to provide routine monitoring of the project activities to ensure project budget and schedule compliance. Project status will be reported under this task to the Aurora PM and Leadership Team via monthly status/coordination meetings, submittal of monthly progress reports, and informal coordination conference calls.

In order to report progress on activities of the overall project, a monthly status report will be prepared and submitted by the MWH PM as described in Section 4.1. Monthly invoicing, performed under this task, will be submitted each month as described in Section 8.

3.1.2 Future Demand Planning

The MWH demand forecast team will develop new demand models for Aurora's retail demands, and consolidate forecasts for all water demands for use in updating and integrating the water resources, distribution, water treatment, and watershed management master plans.

The following workshops will be held with the Aurora IWMP team for this task:

- Workshop #DM-1: Water Use Data Review – To review the various ways in which Aurora Water has historically and currently uses future demand-related information and to ensure a full understanding of the specific data Aurora Water needs to obtain from the new demand forecasts.
- Workshop #DM-2: Demand Data and Model Design - To present the results of the available demand data and proposed forecast model design.
- Workshop #DM-3: Demand Model Development – To review the results of the historical demand analysis and model development, and the water conservation evaluation.

The following Technical Memorandums (TMs) and reports will be prepared under this task:

- Demand Model Development TM

- Water Conservation TM
- Potable System Demand Forecast Results TM
- Potable System Demand Forecast Model Documentation
- Maximum Daily Potable System Demand Forecast TM
- Non-Potable Demand TM
- Demand Forecast Technical Report (Draft and Final)

3.1.3 Project Planning

The Project Planning task includes a subtask to develop the overall planning framework to be used for all technical disciplines and five additional subtasks for each of the technical disciplines including water resources, watershed, non-pot/reuse, treatment, and distribution.

3.1.3.1 Planning Framework

The purpose of the Planning Framework is to provide the conceptual foundation and tools for integrating studies across all of the technical disciplines in the IWMP. It is focused on the, quantification, and application of key strategic risks that must be considered and addressed within the master planning analysis.

The following workshops will be held with the Aurora IWMP team for this task:

- Workshop #RI-1 – Risk Identification Source
- Workshop #RI-2 – Risk Identification Storage
- Workshop #RI-3 – Risk Identification Treatment
- Workshop #RI-4 – Risk Identification Distribution
- Database Training Workshop

The following TMs and reports will be prepared under this task:

- Risk Management Plan
- Risk Report
- Analysis Framework TM
- Project Prioritization Framework TM
- IWMP Database electronic file

3.1.3.2 Water Resources and Supply Source Water

The objective of this subtask is to evaluate water supply scenarios to develop an estimate of Aurora's supply needs and the approximate timing for development of new water supplies.

The following workshops will be held with the Aurora IWMP team for this task:

- Workshop #WR-1 – Risk Evaluation
- Workshop #WR-2 – Water Resources Performance Metrics Definition
- Workshop #WR-3 – Water Resources Project Identification

- Workshop #WR-4 – Water Resources Project Screening
- Workshop #WR-5 – Preliminary Portfolio Formulation
- Workshop #WR-6 – Final Water Resources Portfolios
- Workshop #WR-7 – Preliminary Preferred Water Resources Projects

The following TMs and reports will be prepared under this task:

- Water Resources Modeling Approach and Methodology TM
- Water Resources Metrics TM
- Hydrologic and Risk Assessment Scenarios TM
- Risk and Vulnerability Technical Report
- Model and Modeling System Enhancements TM
- IWMP database for WRMP analyses and the customized IWMP DMS
- Baseline Conditions TM
- Emergency Storage Analysis TM
- Water Needs Technical Report
- Water Resources Project List TM
- Water Resources Project Evaluation TM
- Water Resources Projects Technical Report
- Water Resources Master Plan Report

3.1.3.3 Watershed Management

The objective of this task will be to prepare a watershed management plan that is integrated with the other water related plans of the IWMP and with other regional watershed protection plans.

The following workshops will be held with the Aurora IWMP team for this task:

- Workshop #WM-1 – Watershed Risk Assessment

The following TMs and reports will be prepared under this task:

- GIS files for watershed atlas for Aurora Water source water areas
- Watershed Risk and Management Issues TM
- Watershed Management Technical Report

3.1.3.4 Non-Potable / Reuse

The objective of the Non-Potable Irrigation / Reuse task is to provide a business case analysis comparing the potential water sources for non-potable irrigation. The analysis will include a long range and assessment of no more than three alternatives to provide Aurora the information required to determine the future direction of the non-potable/reuse program.

The following workshops will be held with the Aurora IWMP team for this task:

- Workshop #NPR-1 - Non-Potable Irrigation and Reuse Kickoff Meeting
- Workshop #NPR-2 – Objectives, Issues, and Constraints Development
- Workshops #NPR-3 and 4 – Alternative Evaluation

The following TMs and reports will be prepared under this task:

- Background Information TM
- Draft and Final Policy TM
- Cost-of-Services Report

3.1.3.5 Treatment

In this task, MWH will evaluate the range of potential impacts on existing water purification facilities in terms of capacity needs and the timing for the improvements noted in the Treatment Master Plan (TMP based on the updated demand projections and the risk scenarios.

The following workshops will be held with the Aurora IWMP team for this task:

- Workshop #WT-1 – Water Purification Facility Treatment Improvements

The following TMs and reports will be prepared under this task:

- Water Purification Facility Treatment Improvements TM
- Water Treatment Master Plan Update Technical Report

3.1.3.6 Distribution

In this task, the previous model and water distribution system master plan will be updated to incorporate the new demand forecast and to reflect the new risk analysis.

The following workshops will be held with the Aurora IWMP team for this task:

- Workshop #D-1 – Distribution System Evaluation Kickoff
- Workshop #D-2 – Distribution System Project Evaluation and Prioritization

The following reports will be prepared under this task:

- Distribution System Master Plan IWMP report section (Preliminary Draft and Final Draft)
- Dated InfoWater model

3.1.4 Capital Improvement Framework

The objective of this task is to develop a standardized decision-analysis framework for capital improvement planning and implementation. This standardized framework will provide the information and transparency needed to better align Aurora Water's utility and regional priorities. This framework will incorporate and integrate all projects evolving from the five

discipline studies (water resources, non-potable and reuse, treatment, distribution, and watershed management).

The following workshops will be held with the Aurora IWMP team for this task:

- Workshop #CP-1 – CIP Framework
- Workshop #CP-2 – Prioritization Criteria and Scenarios
- Workshop #CP-3 – Project Scoring

The following reports will be prepared under this task:

- Documentation of the prioritization process and summary of the results.
- ExpertChoice data, prioritization factors and macros for project scoring

3.1.5 Processing of Results
The purpose of this task is to processing the results of the IWMP into useable formats such that they are understandable.

The following reports will be prepared under this task:

- Presentation graphics summarizing the IWMP findings and CIP recommendations.

3.1.6 Final Report
The final report will document the entire IWMP process from conception to delivery. The report will meet the overall goal of integrating the long-term water planning of the water resources, transmission and distribution, treatment, non-potable, and watershed systems of the Aurora Water organization. The report will document all major assumptions and decision points made during the development of the IMWP and will document the rationale for each major assumption and decision point. MWH will assemble the draft IWMP report from summaries of the earlier project reports and TMs for review by the Aurora Water IWMP management team. A Final Report will be prepared which incorporates comments from the Draft Report.

3.2 INTERNAL QUALITY ASSURANCE/QUALITY CONTROL
To meet the internal QA/QC activities which are discussed in Section 7, MWH will engage the technical advisory committee (TAC) at the appropriate times for reviews of project deliverables.

3.3 RISK MANAGEMENT STRATEGY
An internal MWH risk register has been created that provides a tabulated summary of various risks associated with the project that will be regularly updated. The MWH Team will review the risk register on monthly basis to familiarize ourselves with the actual or potential risks already identified and to monitor the potential for new or expanded project risks as the work progresses. New risks or the perceived increase in an already identified risk will be reported to the PM using the risk register form. Any new or increased risk will be provided along with an assessment of the impact, likelihood and level of the risk, along with any proposed mitigation measures. Cost and schedule impacts and the probability of the risk

will also be included.

3.4 ASSUMPTIONS LOG

An assumptions log will be kept to track all assumptions the team is using in developing the IWMP. MWH will use factual data wherever possible, and not make assumptions, but there will be times when data is not available and where reasonable assumptions will have to be used.

An assumptions log has been set up on the Egnyte site at:

https://cityofaurora.egnyte.com/h-s/20140513/ASnfhlBV3W/Assumption%20Log.xlsx

Each assumption will be logged with the sponsor's name, a description of the assumption, the discipline it is associated with, a ranking of how difficult it is to eliminate the assumption, what the impact of the assumption may be, and the date. The executive committee for the IWMP will review all assumptions and will either approve their use, disapprove, or refer the issue back to the sponsor for further action. The log will become part of the IWMP final deliverable.

3.5 MAJOR MILESTONES

All major milestones including workshop dates and delivery of TMs and reports are provided in the schedule in **Appendix D**.

Section 4
Project Controls

This section discusses the procedures and methods, which will be utilized to control project schedules, budgets and estimates during the project period. The control system will be based upon a Work Breakdown Structure (WBS), which will serve as the foundation for both the schedule and budget control and reporting systems, discussed in this section.

4.1 WORK BREAKDOWN STRUCTURE

The WBS enables the project team to further identify and break down the project elements, tasks, and subtasks into manageable work activities suitable for loading, coding, categorizing, and organizing for input into the project control system. The WBS also provides the hierarchy and level codes for subsequent scheduling, linking and summarization of activities during the development and updating process. **Appendix D** defines the project WBS.

4.2 PROJECT WORK SCHEDULE

The Project Work Schedule shown in **Appendix D** identifies the start and end date of each task, and their relationships. The schedule has been created in Primavera P6®. The schedule has been resource-loaded with its associated budget. The estimated budget for each activity identified in the schedule is included in **Appendix E**.

4.2.1 Revised Work Schedule

If unanticipated delays or the sequence of tasks changed, the MWH PM will notify Aurora's PM in writing of the reasons for the delay or the change, and submit a request for a change using the change management procedure described in Section 4.3. Upon approval of the change, a revised Work Schedule will be prepared and submitted to the Aurora PM.

4.3 CHANGE CONTROL REGISTER

A change control register will be maintained by the MWH PM to track changes from the original scope of work and schedule, the potential impact on budget and schedule, and the status of the change. A copy of the change control register can be found in **Appendix F**.

4.4 PROGRESS REPORTING

MWH will generate, and submit electronically, a monthly status report. The monthly status report will include the following:
- List of accomplishments of past month;
- Narrative of the work progress per activity;
- Description of any problem areas;
- Progress relative to schedule and other project or scheduling concerns;
- Current and anticipated delays, cause, corrective action to be taken, and impact of the delay on other activities, on milestones, and on completion dates;
- Progress relative to budget and other budget concerns; and
- Status of pending items such as contract modifications and time extensions.

4.5 BUDGET AND SCHEDULE MANAGEMENT

4.5.1 Budget Control Plan

The budget control plan involves the monitoring and tracking of project costs relative to the baseline project budget. Each month, project-related expenditures will be compiled from multiple sources, including MWH's subconsultants, and entered into Primavera P6, which will compare anticipated and actual expenditures both in timing and amount. The MWH PM also will review project budget status weekly using MWH's Ecosys cost tracking system.

Cost performance will be measured and reported using Earned Value Management (EVM) applied to each activity. A Projected Budget/Planned Value has been assigned to each activity in the WBS. Progress will be analyzed against these established budgets. As described in Section 3 of the PXP, management of costs using earned value requires that the following items of cost and budget be compared to quantify progress:

- Planned Value (PV) – the approved budget that has been allocated to complete a specific task during a specific time period.
- Earned Value (EV) – the budgeted cost of the work performed for a specific task during the same specific time period.
- Actual Cost (AC) – the actual costs for the work performed for the same specific task during the same time period.

Each project element will be evaluated using the following EVM performance indicators:

- **Schedule Performance Index (SPI) –** calculated as EV/PV. If the SPI is equal to 1, then the project is tracking on schedule. With an SPI greater than 1 the project is ahead of schedule, and an SPI less than 1 the project is behind schedule. If the SPI is less than 0.95 a variance explanation will be developed identifying reasons for the variances and a recovery plan created identifying action items that will align the project back to the established baseline.
- **Cost Performance Index (CPI) –** calculated as EV/AC. If the CPI is equal to 1, then the project is tracking on budget. With a CPI greater than 1, the cost of completing the project is higher than planned, and with a CPI less than 1, the cost of the completing project is less than planned. If the CPI is estimated to have a value or 1.1 or more, a detailed Estimate to Complete will be created to analyze the full impact on the particular WBS budget. If the CPI is less than 0.95, then a variance explanation will be developed identifying reasons for variances and a recovery plan developed identifying action items that will align the project back to the established baseline.

Section 5
Communications Plan

5.1 PLAN SUMMARY

5.1.1 Overview
The Communications Plan section describes the communication procedures for correspondence, information sharing, and information retention. The communications plan is intended to identify the procedures and distribution of project information.

5.1.2 Objectives
The general objectives of the plan are to:
- Keep Aurora staff aware of the project status;
- Keep MWH Team members informed of each other's efforts;
- Identify communication protocols and links between entities involved with the project;
- Provide for defined communications procedure; and
- Document project activities.

5.2 COMMUNICATION TECHNIQUES
All MWH Team members are to communicate with their discipline lead and/or the MWH PM or PD prior to contacting Aurora. All communication from Aurora should be to the MWH PD, PM, and/or discipline leads. Copies of all project communications will be maintained in the project files located on Egnyte and in MWH's office. The following paragraphs describe the MWH protocols established for written, verbal and electronic communications relating to the Aurora IWMP.

5.2.1 Internal Project Meetings
Good communication is the cornerstone to a successful project. Internal team meetings will start with a project kickoff meeting, followed by monthly status/discussion meetings. The team discipline leads (including some of the subconsultants) will be involved in these meetings. The team discipline leads will communicate with their respective team members (including the respective subconsultants) to keep the team informed and foster team cohesion and communication.

5.2.2 External Project Meetings/Workshops
Numerous workshops and meetings have been provided in the project to facilitate the sharing of information and receipt of input from Aurora. All of the meetings and workshops are identified in the project schedule provided in **Appendix D**.

All meetings, except the most informal meetings, either face-to-face or via alternative meeting methods, shall have an agenda and meeting summary prepared. Agendas shall be distributed prior to the meeting. Meeting summaries will be completed by the meeting organizer and posted to Egnyte within one week of the meeting.

5.2.3 Electronic Mail

All electronic transmissions between the MWH Team and Aurora should be sent to the discipline specific contacts listed below.

Discipline	Aurora Lead	Aurora copy	MWH Lead	MWH copy
Project Management	Sarah Young	Matt Becker and Lisa Darling	Jenny Hartfelder	Jason Mumm
Risk Framework	Sarah Young	Matt Becker	Brendan Nelson	Jenny Hartfelder and Jason Mumm
Demand Forecast	Sarah Young	Matt Becker	Doug Jeavons	Jenny Hartfelder and Jason Mumm
Water Resources	Lisa Darling	Matt Becker	Chip Paulson and Enrique Triana	Jenny Hartfelder and Jason Mumm
WR Modeling	Alfredo Rodriguez	Matt Becker	Chip Paulson and Enrique Triana	Jenny Hartfelder and Jason Mumm
Distribution	Sarah Young	Ted Wiedeman	Will Landin	Jenny Hartfelder and Jason Mumm
Treatment	Elizabeth Carter	Sarah Young	Jen Gelmini	Jenny Hartfelder and Jason Mumm
Reuse & Non-Pot	Lisa Darling	Sarah Young	Jeremy Meattey	Jenny Hartfelder and Jason Mumm
Watershed	Mike McHugh	Matt Becker and Sean Lieske	Chip Paulson	Jenny Hartfelder and Jason Mumm
Integration/CIP	Lisa Darling	Sarah Young	John Guilfoyle	Jenny Hartfelder and Jason Mumm

5.2.4 Memoranda

Memoranda may contain various subject matter that is considered formal or informal, depending on the content. Memoranda may be used to relay information internally or externally between project team members. Procedures for handling memoranda will be determined on a case-by-case basis, depending on the content of the memoranda. Memoranda containing project-specific information will be copied to the project files both on Egnyte and the MWH internal project files and to the MWH PM.

5.2.5 Technical Memoranda

Included in the IWMP are the submission of several TMs to document the evaluation and results of some of the tasks. TMs will go through the internal MWH QA/QC process described in Section 7 prior to submittal to the Aurora.

5.2.6 Verbal Communications

Verbal communication is vital to the success of the project and is invited any time, via telephone or in person. Any verbal communication considered significant to the project must be documented by written notes, with a copy given to the MWH PM, responsible party, and maintained in the project files.

5.2.7 Work Product Submissions to Aurora

All contractual work products will be submitted electronically by upload to Egnyte. Work product uploaded to Egnyte also will be accompanied by an email which describes uploaded files and their locations.

Section 6
Document Control

6.1 PROJECT ELECTONIC DOCUMENT CONTROL SYSTEM

Egnyte has been selected as the electronic collaboration and document storage/retrieval tool for the IMWP. Project documentation will be stored and transferred at the following link: https://cityofaurora.egnyte.com/SimpleUI/home.do?txtSearchHidden=%2FShared%2FAurora+Water%2FIntegrated+Water+Master+Plan&contentSourceType=WebDriveContentSource&viewType=summary#Files/0/Shared/Aurora%20Water/Integrated%20Water%20Master%20Plan

All draft and final documentation, important record keeping, and raw data should be stored in the project folder. The project folder is broken down by major task. With the exception of Project Management, each task includes the following set of standard subfolders which should be utilized for the following:

- 01 Correspondence: Memos, agendas, minutes, phone logs, and additional correspondence related to that task which needs permanent project documentation. Over-arching communication documentation should be stored in the Project Management folder under communication.
- 02 Reference Documents: Reference documents provided by Aurora or MWH for the major task. Reference documents may include reports, data, GIS information, and anything else in a final or final draft format that will inform the team for that major task. Working documents should not be saved to this folder.
- 03 Data: All data generated by this task through the duration of this project. Data may include spreadsheets, databases, GIS data, GIS maps, and/or other task specific datasets. Working GIS maps and datasets should be saved in this folder on an iterative basis.
- 04 Models and Output: Models developed or used for the purpose of the major task. Working models may be saved locally but should be saved on an incremental basis into the project folder. Data that is developed to support the models but is not data developed by the model itself, should be stored in the data folder.
- 05 Draft Documents: Draft technical memorandums and reports.
- 06 Final Deliverables: Final technical memorandums and reports.

Each Aurora and MWH team member should have viewing privileges to all the project folders. If you have not received viewing permissions, or need edit permissions to a certain folder where required, please contact Lwhited@auroragov.org. Additional folders may be added by contacting the Aurora PM, Sarah Young, or Matt Becker.

Your notifications/email alerts in Egnyte can be modified by clicking on your name in the upper right hand corner of Egnyte, clicking on My Profile, and changing settings on Email folder notifications.

MWH will upload deliverables and other documents to Egnyte. For formal TM and report submittals, the MWH PM or discipline lead also will send an email to the Aurora PM and the MWH PD and PM notifying them that the document has been uploaded to the system. All team members will be provided access to Egnyte.

6.2 MWH FILING SYSTEM
The Project Administrator at MWH maintains a project filing system. All documentation developed for the project (including correspondence, memos, etc.) will have the correct file number noted on it prior to its distribution to the relevant parties and project files.

6.3 MWH ELECTONIC FILING SYSTEM
In addition to the Egnyte project electronic filing system, MWH will maintain an internal electronic filing system on the DEN-1 office server for internal working documents. Electronic files developed by team members shall be posted to the correct folder for the work being performed using the file outline shown in **Appendix G.** Electronic files shall not be stored or maintained on individual's laptop computers. Project file names shall consist of an activity descriptor (e.g. summary report, Jan-Feb Performance Report, etc.) followed by the version number (i.e., v1, v2).

Section 7
Quality Assurance/Quality Control

7.1 PLAN SUMMARY
7.1.1 Overview
The Quality Management Plan (QMP) describes review procedures to be used in order to achieve technical accuracy and a consistently high level of quality. It also describes the utilization of a Technical Advisory Committee (TAC) consisting of highly experienced MWH personnel and independent parties that provide input on the approach used by the team to implement the project. The TAC also reviews proposed deliverables prior to submittal to Aurora. The QMP is intended to establish project-related policies, standards, guidelines, and systems necessary to produce quality deliverables.

Quality is defined as a planned approach that results in product meeting established project requirements. In engineering terms, quality may be defined as the totality of features, attributes, and characteristics of facility, product, process, component, service, or workmanship that bear on its ability to satisfy a given need. It is usually referenced to and measured by the degree of conformance to a predetermined standard of performance.

In terms of this Plan, Quality Assurance and Quality Control are defined as follows:
- **Quality Assurance** "QA" – A program covering activities necessary to provide quality in the work to meet the project's requirements.
- **Quality Control** "QC" – The specific implementation of the QA Program, including checking and reviewing engineering activities.

The purpose of the QMP is to provide a consistent approach to ensure that the quality of all work products generated by the MWH Project Team for the project meets internal project, Aurora, and regulatory agency requirements. Implementation of the QMP will reduce the possibility of changes, mistakes and omissions, which in turn minimizes cost overruns, change orders, disputes, and possible litigation.

7.1.2 Scheduled Internal Reviews
Key deliverables will be submitted for internal review prior to submittal to Aurora for Client review. All deliverables should go to internal review a minimum of five days prior to the client delivery date. A list of deliverables and client delivery dates is provided in the schedule in **Appendix D**. This list will be updated and defined throughout the project as new milestones are established.

7.1.3 Scheduled Aurora Reviews
Key deliverables will be submitted to the Aurora for review on the dates presented in the schedule in **Appendix D**. This list will be updated and refined throughout the project as new milestones are established. The final TMs will be summarized in their respective report section and included in the Final Report appendices. Comments received on the draft TMs will be addressed and the subsequent revisions incorporated into the Final Report.

Section 8
Project Invoicing

8.1 INVOICING PROCEDURES

The MWH Project Team will submit final invoices to the Aurora PM each month by the 14th day of the month for the services provided during the previous month.

8.1.1 Responsibilities and Schedules

MWH should receive subconsultant invoices no later than the 2nd day of each month. Invoices received after the 2nd day will be processed in the next calendar month.

8.1.2 Invoice Format

Invoices submitted to Aurora's PM will be in an agreed format. The submitted invoice will also include back-up documentation including receipts for all expenses over $25.

Section 9
Health and Safety Plan

The Aurora IMWP will not require any field investigative work be performed. The MWH Denver Office Health and Safety Plan (HASP) will be used as the primary HASP for this project for activities inside an office environment. Additionally, HASPs from the MWH Ft. Collins Office, Colorado Springs Office, and subconsultants offices may also be utilized. If activities outside the office will be performed as part of the supplemental services, an addendum to the MWH Denver Office HASP will be prepared.

Section 10
Revision Log

Revision No.	Date	Revision Description
1	4/14/14	Draft for internal review
2	5/20/14	Second draft

APPENDIX A
SCOPE OF WORK

https://cityofaurora.egnyte.com/h-s/20140521/FhAkEYvFRF
Aurora_IWMP_SOW_v15_020314.pdf

APPENDIX B
SUBCONTRACTS

https://cityofaurora.egnyte.com/publicController.do?folderName=20140521&fileName=rcqlk8CDDg

APPENDIX C
CONTACT LIST

https://cityofaurora.egnyte.com/h-s/20140521/MjzCdBNhno
Aurora IWMP MWH Team Contacts 043014.xlsx

And

https://cityofaurora.egnyte.com/publicController.do?folderName=20140
521&fileName=EPgnA2Q07I

APPENDIX D
SCHEDULE

https://cityofaurora.egnyte.com/publicController.do?folderName=20140
521&fileName=bCBm8Jhm5C

APPENDIX E
BUDGET

https://cityofaurora.egnyte.com/publicController.do?folderName=20140521&fileName=1WIXeeTutL

APPENDIX F
CHANGE CONTROL REGISTER

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PROJECT EXECUTION PLAN
Change Control Register

PROJECT TITLE	Integrated Water Master Plan		
JOB No.	10504803	PROJECT MANAGER	Jenny Hartfelder
CLIENT	Aurora, City of	TECHNICAL LEAD	Enrique Triana / Jason Mumm

No.	Date Logged	Originator	Description	Project Impact			Change Order Status	Client Approval Status	Claim Situation?
				Cost	Time	Quality	Est/Final		

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APPENDIX G
FILE STRUCTURE

MWH File Numbering Structure

00 Proposal and Negotiations

    0.1 Proposal

    0.2 Stage2-SOW-Interview

    0.3 Negotiations

01 Project Management

    1.1 Client Contract

    1.2 Subconsultants

    1.3 General Communications

    1.4 PXP

    1.5 Schedule P6 Reources

    1.6 Budget

    1.7 Invoices

    1.8 Monthly Reports

02 Future Demand Planning

03.1 Planning Framework

3.1.1 Risk Framework

03.2 Water Resources

3.2.1 Reference Materials

03.3 Watershed Management

03.4 Non-Pot Reuse

3.4.1 Reference Materials

03.5 Treatment

03.6 Distribution

04 CIP Framework

05 Processing of Results

06 Final Report