



Municipal Water District of Orange County

REQUEST FOR PROPOSAL

For

Professional Services

For

Geographic Information System (GIS) Implementation Assistance

RFP ENG. 2025-03

November 21, 2025

Questions for clarification are due by 5:00 p.m. on December 18, 2025.

Answers Posted (Addendum) January 6, 2026

Proposals submission Deadline: 5:00 pm, January 20, 2026.

Electronic submittals only and must be less than 25 Megabytes (MB).

Professional Services for Geographic Information System (GIS) Implementation Assistance
REQUEST FOR PROPOSAL (RFP)

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Request for Proposal Information

1. About MWDOC & WEROC

The Municipal Water District of Orange County (MWDOC) is a public agency, formed by Orange County voters in 1951 under the Municipal Water District Act of 1911 to provide imported water to Orange County.

Today, MWDOC is the third-largest member agency of the Metropolitan Water District of Southern California (Metropolitan) by assessed property valuation. MWDOC is a regional water wholesaler and resource planning agency, supplying imported water supply to all of Orange County except for the cities of Anaheim, Fullerton, and Santa Ana. MWDOC's mission is *to provide reliable, high-quality water supplies from Metropolitan and other sources to meet present and future needs at an equitable and economical cost, and to promote water-use efficiency in Orange County*. While MWDOC does not own or operate its own water infrastructure, the District's efforts are focused on sound planning and appropriate investment in water supply reliability; regional coordination of delivery infrastructure with Metropolitan and retail water agencies; water-use efficiency and water loss control programs; and emergency preparedness and response. Headquartered in Fountain Valley, MWDOC is governed by a seven-member elected Board of Directors, with each Board member representing a specific MWDOC division in Orange County.

MWDOC purchases imported water from Northern California and the Colorado River – through Metropolitan and wholesales this water to 27 member agencies (Orange County water agencies and city water departments), which provide retail water services to a population of 2.4 million. MWDOC also sells untreated imported water to Orange County Water District for groundwater replenishment. MWDOC and the cities of Anaheim, Fullerton, and Santa Ana together serve approximately 3.1 million consumers across a 600-square-mile area of Orange County.

The Water Emergency Response Organization of Orange County (WEROC), which is administered by MWDOC, coordinates emergency response and mutual aid planning for all Orange County water and wastewater agencies (36 agencies), including Anaheim, Fullerton, and Santa Ana. WEROC provides its participating agencies and volunteer staff with planning support, emergency preparedness, and response training. In the event of a major emergency affecting Orange County, these volunteers would mobilize at the WEROC emergency operations centers to coordinate response. WEROC works closely with the County of Orange, the Orange County Fire Authority, the California State Water Resources Control Board, Division of Drinking Water, and other entities to ensure a holistic, well-coordinated emergency response.

2. Invitation for Proposals

MWDOC and WEROC invite qualified and experienced consulting firms to submit a proposal to assist with the implementation of a MWDOC GIS system. The aim is to leverage existing GIS technology and establish a governance structure for MWDOC to improve operational efficiency, data management, and decision-making across MWDOC's departments and between MWDOC and its member agencies and stakeholders. **Note: This RFP is not intended to be a prescriptive scope of work for planning and implementation of a GIS system for the District. The purpose of this RFP is to identify a consultant who**



will provide expert guidance, solutions, and a plan based on information documented in the MWDOC GIS Needs Assessment that includes:

- **Initial implementation of a GIS system to get MWDOC staff up and running with GIS,**
- **Produce ‘early wins’ to demonstrate the value of GIS to the organization and elected officials, and**
- **Lays out a comprehensive plan of integration that avoids rework toward a robust GIS system as the District’s future needs evolve.**

Included in the scope of work is an optional project, which respondents may include as part of their base proposal, OR split out into a separate scope of work if the optional project pushes the estimated budget well past the projected estimate for this work. Early indications are that portions of the optional project can be included as part of the base project. The purpose of including this optional project is to clarify the effort and cost involved so it can be scheduled as early as possible in the correct budget year (either this fiscal year's budget or next year's).

3. Project Background

MWDOC’s services focus on resource and reliability planning, policy advocacy on water supply development, water use efficiency, water loss control, legislative advocacy, emergency preparedness, public information, and water education for the MWDOC service area. While **MWDOC does not own or operate any water infrastructure and therefore does not need to manage assets**, MWDOC handles a multitude of data and databases related to the services, analyses, and programs MWDOC provides to its 27-member water agencies and 9 wastewater agencies through WEROC.

MWDOC offers GIS solutions, curating a limited amount of data in-house while leveraging data from multiple external sources. Much of the data handled by MWDOC originates from MWDOC’s (and WEROC’s) member agencies, Orange County cities, the County of Orange, and Metropolitan, or is generated through MWDOC’s Shared Services Programs (also known as Choice Programs). Shared Services Programs include ongoing duration programs carried out in-house by MWDOC staff on behalf of member agencies (e.g., leak detection program, water use efficiency programs,) and specific projects where MWDOC assists member agencies in the procurement and management of expert consultants to carry out projects (e.g., Urban Water Management Plans, Lead and Copper Rule Revisions Service Line Inventory assistance).

WEROC, which is administered by MWDOC, coordinates emergency response and mutual aid planning for all Orange County water and wastewater agencies (36 agencies), including Anaheim, Fullerton, and Santa Ana. WEROC also provides Shared Services Programs for its member agencies (such as assistance with the creation of Emergency Response Plans [ERPs] and Risk and Resilience Assessments [RRAs]). WEROC’s participating agencies and volunteer staff receive planning support, emergency preparedness, and response training. In the event of a major emergency affecting Orange County, these volunteers would mobilize at the WEROC emergency operations centers to coordinate response. A key component of WEROC’s work is compiling agency data, along with data from multiple stakeholders (Cal Fire, OC Fire Authority, the County of Orange, and Division of Drinking Water), to provide infrastructure datasets for



emergency response use, and to provide situational awareness for logistical support to OC water and wastewater agencies, including access to key data through electronic and paper maps.

In August 2025, MWDOC completed a GIS Needs Assessment with consultant FLO Analytics (See Attachment B), which provides an organizational evaluation from a GIS perspective and a prioritized summary of recommendations for the successful implementation of a GIS system.

The assessment findings included:

“The District operates in an inherently spatial environment and needs to be able to maintain a common operating picture of that environment, incorporating infrastructure, economic and political aspects. The District is currently underutilizing GIS across the organization.

To effectively deliver on the District’s goals, particularly in supporting member agencies and promoting water use efficiency, an enterprise-level GIS program approach is recommended. The development of a comprehensive GIS program at MWDOC will enable the improvement of internal operations, data collection and analysis, build staff skillsets to serve member agencies, and provide more effective emergency management coordination under the Water Emergency Response Organization of Orange County (WEROC). The program encompasses governance, software, and data management, supplemented by training and support from consultants. The software, a combination of Esri Enterprise and ArcGIS Online, is designed to securely host data and internal applications while also supporting members by providing data, facilitating direct collaboration, and simplifying the development of advocacy tools. This will enable MWDOC to securely and effectively host large aerial imagery and complex datasets and provide an opportunity for SQL database integration. The District will initially require the assistance of external consultants for the implementation, system management, and administration of the expanded GIS system, which is commensurate with its existing approach of using consultants for advanced GIS data manipulation and analysis. With training, it is feasible for District staff to be able to take on more of the day-to-day management of the GIS system and data analysis.”

4. Project Goals and Objectives

MWDOC is implementing its GIS initiative in phases. The Phase 1 Implementation Assistance concluded with the GIS Needs Assessment report, which evaluated the current MWDOC GIS environment, assessed organizational and departmental GIS needs, and recommended a strategy for successful GIS implementation. This Phase 2 Implementation is anticipated to begin in March 2026 and will extend for 1-2 years to establish GIS system architecture and governance frameworks from which to further develop specific GIS capabilities and enhance stakeholder data collaboration.

This project aims to establish a robust foundation for MWDOC’s GIS program, encompassing internal GIS governance and standards, GIS software planning and licensing review, implementation of an ESRI GIS system incorporating ArcGIS Online for emergency response and member collaboration opportunities, and data migration.

5. Scope of Work

5.1 Review of the MWD OC GIS Needs Assessment Hardware and Software Recommendations

Changed Requirements:

Since the completion of the GIS Needs Assessment, organizational GIS requirements have been modified. Specifically:

1. The need to host large aerial imagery datasets for the Water Use Efficiency Department has been re-evaluated and found to be no longer necessary.
2. WEROC is seeking to develop a GIS-based information sharing platform to enhance regional situational awareness, coordination, and operational readiness across its 36-member water and wastewater agencies. The goal is a cloud-based Esri platform that provides a Common Operating Picture (COP) by integrating real-time and static datasets from multiple sources, enabling water and wastewater utilities, emergency managers, and partner organizations to make informed, coordinated decisions during both routine and emergency operations.

The vision is for a platform that aggregates live data feeds, maps, features, tiles, vectors, Open Geospatial Consortium (OGC) services, raster layers, and applications via group sharing within ArcGIS Online or Portal environments to populate products such as Dashboards, Instant Apps, and Story Maps. WEROC is looking to the selected vendor to propose solutions, including but not limited to:

- Group sharing architectural design.
- Data sharing schema.
 - Display the various data sources listed below from NWS, Cal OES, CalFire, SCE, SDG&E, and other investor-owned utilities (IOUs);
 - Allow for limited Spatial Analysis of features;
 - Allow for field data collection during emergencies (specifically, Damage Assessment data);
- The proposed application suite(s) will need to provide the functionality to allow:
 - Data visualization;
 - Conglomerate data from National Weather Service (NWS) advisories, warnings, and hazard feature services;
 - Allow for spatial analysis of data from Cal OES, CalFire, and USGS situational awareness feeds;
 - Promote secure sharing of utility outage and infrastructure information from Southern California Edison (SCE), San Diego Gas & Electric (SDG&E), and other Orange County investor-owned utilities (IOUs), Critical infrastructure, service

area boundaries, and operational assets from WEROC member agencies and regional partners.

- **Activity:** Review the MWDOC GIS Needs Assessment and the changed requirements above.
- **Activity:** Evaluate the validity and applicability of the Needs Assessment recommendations for GIS system architecture, hardware, and software under the changed requirements and make a determination on whether the initial system architecture can provide the needed functionality under an AGO-only configuration or if a combined Enterprise/AGO configuration is still needed.
- **Activity:** Identify any impacts, risks, or conflicts arising from the changed requirements.
- **Activity:** Propose a revised recommendation or modified plan, if necessary, to meet the GIS Program objectives while incorporating the changed requirements.
- **Deliverables:**
 - Draft Technical Memorandum: A preliminary version for stakeholder review and feedback, which will also serve later as a chapter in the Implementation Plan.
 - Final Technical Memorandum: A finalized document incorporating feedback.

NOTE: The tasks and deliverables in this RFP are written to include two possible system design scenarios (one that includes both ESRI AGO and Enterprise, and one that only includes AGO).

5.2 GIS Governance Framework Design

Development of a GIS Governance Framework and Plan

The consultant will be responsible for developing and documenting a comprehensive GIS Program Governance Plan and Framework that aligns with MWDOC's mission, integrates internal departmental needs, and maximizes data collaboration among stakeholders. The work will be structured across strategic and operational levels, with the following key activities and deliverables:

- **Activity:** Meetings with representatives of (7) MWDOC departments, as well as representatives from the County of Orange, Cal State University Fullerton Center for Demographic Research (CDR), Metropolitan Water District, OC Fire Authority, and up to (8) MWDOC/WEROC member agencies. Proposals should allocate time for leading and documenting (12) 1-hour virtual meetings with representatives to discuss GIS governance issues.
- **Activity:** Design a formal organizational structure based upon MWDOC's existing staffing and management levels that includes stakeholder participation (e.g., Executive Steering Committee, GIS Coordinating Group, Operational Working Groups, Data Stewards) with clearly defined roles, responsibilities, and decision-making authority.
- **Activity:** Define the governance processes for key domains: Strategy, Platform, Data, Workforce, Delivery, and Investment.
- **Activity:** Propose recommendations for future staffing and consultant needs to ensure the long-term sustainability and functionality of the GIS system.

- **Deliverables:**
 - **GIS Governance Framework Document:** outlining the proposed organizational structure, roles, responsibilities, and decision-making processes, including an escalation path for issues for stakeholder review and feedback. The Governance framework will include a GIS Committee Charter that includes stakeholders from relevant MWDOC departments, as well as representatives of stakeholder organizations that share data with MWDOC to ensure organizational/stakeholder buy-in and maximize data collaboration.
 - Draft Framework Document: A preliminary document for stakeholder review and feedback.
 - Final Framework Document: A finalized document incorporating feedback

5.3 GIS Policy Document

Establish a clear, comprehensive, and approved initial policy framework for the use, management, and governance of Geographic Information Systems (GIS) and associated data within the organization. Outline the guiding principles and rules for data maintenance, security, user access rights, quality standards, and overall governance to ensure data integrity and consistency across the organization and between stakeholder organizations to the greatest extent practicable.

- **Activity:** Interview key users and decision-makers to document existing workflows and identify specific policy needs (e.g., data sharing, security, access).
- **Activity:** Review existing relevant organizational policies (e.g., IT security, data management) to ensure alignment.
- **Activity:** Draft the initial version of the GIS Policy Document based on the needs assessment and best practices. The core components will include data governance, data quality, security and access, process and procedures, systems management, quality management review, and updates to document user responsibilities and the processes for data collection, storage, access, use, and archiving.
- **Deliverables:**
 - Draft Policy Document: A preliminary document for stakeholder review and feedback.
 - Final Policy Document: A finalized document incorporating feedback

5.4 GIS Implementation Plan

The consultant will develop a comprehensive, phased GIS Implementation Plan that includes project goals, scope, deliverables, budget, timeline, and risk assessment, along with technical components such as data, software, hardware, and user requirements. It will also include operational aspects, such as staff roles and responsibilities, training, and maintenance strategies, in a phased approach that considers user needs throughout the project.

- **Activities:** Develop a multi-year plan with prioritized tasks, timelines, milestones, appropriate security controls, and resource requirements, leveraging the MWDOC GIS Needs Assessment Report and the findings of the Technical Memorandum on modified requirements.

- **Activities:** Develop a multi-year budget document that includes estimated costs for software, hardware, and training that are in line with the budget estimates of the Needs Assessment report.
- **Activities:** Establish a standard MWDOC ESRI main screen GIS user layout configuration to support staff's ability to be productive quickly for deployment to staff workstations.
- **Activities:** Develop a specific and detailed training plan for staff who are new to GIS. This activity includes identification of effective and efficient ESRI online classes and/or customized training curriculum needed to assist novice MWDOC GIS users, to get "up and running" within 8-12 hours of training time to a level of proficiency where staff can perform basic data management, maintenance, and map composition with working knowledge of core GIS concepts and practices including MWDOC's GIS governance structure. The training plan and curriculum will be documented in a manner that allows MWDOC department heads and/or selected MWDOC staff to supervise new MWDOC staff training.
- **Activities:** Develop Key Performance Indicators (KPIs) and a tool, such as a dashboard, to be used with the training plan to assess staff proficiency and GIS usage.
- **Deliverables:**
 - Draft GIS Implementation Plan (Phased Implementation Roadmap): Document the elements of the multi-year implementation plan, including the budget, standard user configuration, training plan, and training KPIs, into a preliminary document for stakeholder review and feedback.
 - Final GIS Implementation Plan (Phased Implementation Roadmap) incorporating comments.

5.5 Software License Review and Procurement Recommendations

The consultant will perform an objective review of MWDOC's existing and potential GIS software licensing options.

- **Activity:** Assess the current software license opportunities and review discount licensing programs offered by Esri to State, County, and local cities/agencies that MWDOC is eligible for, to establish a best value approach for MWDOC's Esri licensing needs. This effort will leverage the consultant's partnership with Esri and its independence as an expert third-party reviewer to determine a MWDOC best value licensing recommendation.
- **Activity:** Establish the requisite number of Professional/Creator licenses, additional Mobile Worker licenses for field staff, and Viewer licenses to allow access to tools for District and member agencies staff with two Administrators.
- **Activity:** Confirm and contrast the costs and benefits of the Esri Small Utility ELA program with other available licensing options to deliver software and sufficient user counts.
- **Activity:** Propose recommendations for a best value licensing and procurement strategy that aligns with the organization's budget and long-term goals.

- **Deliverables:**
 - **Report:** Document the analysis and strategy in a Technical Memorandum to serve as a reference for MWDOC's Board of Directors for purchasing approvals and to serve later as a reference in the Implementation Plan.

5.6 Hardware, Server, and Network Requirements

The consultant will review Recommendations 17-21 of the Needs Assessment and the modified requirements.

- **Activity:** Refine any needed server specifications and software architecture to ensure that these are accommodated within the IT infrastructure plan with capacity for vertical scaling in the future.
- **Activity:** Establish appropriate separate backup requirements, including (if Enterprise architecture is included) an Esri WEBGISDR disaster recovery backup file.
- **Activity:** Coordinate/Implement procurement of a MWDOC/WEROC-determined number of dedicated mobile devices for Emergency Response and Field Data Capture use, testing, and training.
- **Deliverables:**
 - Document final procurement recommendations in a Technical Memorandum (TM) that will also serve as a reference at the end of the project in the overall GIS Implementation Plan. Note: TM deliverables are to be forwarded to MWDOC on their own delivery schedule as the project progresses (i.e., the consultant is NOT to wait until the end to provide documentation).

5.7 Esri Software Installation and Configuration

Successfully install, configure, and verify the operation of the required Geographic Information System (GIS) software suite and its supporting components within MWDOC's designated IT infrastructure.

- **Activity:** Infrastructure Preparation: Verify that all necessary hardware (servers, workstations) and prerequisite software (Operating Systems, databases, web servers) are available and meet the minimum specifications.
- **Activity:** Software Installation: Install core GIS server software, database components, web adapters, and required desktop applications.
- **Activity:** System Configuration: Configure the installed software to align with the client's IT security policies, network architecture, and performance requirements (e.g., authentication, port configuration, security protocols).
 - Use MWDOC's existing Security Assertion Markup Language (SAML) logins to enable easy staff access to Esri systems.

- Configure the GIS system for base operation. Include access from other systems, such as Power BI, via Representational State Transfer (REST) services (if applicable), APIs, or a direct database connection. If necessary, set up a partnership with MWDOC’s existing AGO for data dissemination and use to support broader interagency collaboration, and provide the greatest flexibility in configuration.
- **Activity:** Integration: Configure connectivity between the GIS components and existing infrastructure.
- **Activity:** Testing and Verification: Conduct system tests to confirm all components are operational, accessible via the network, and communicating correctly.
- **Deliverables:**
 - Documentation: Provide summary documentation of the final configuration, including architecture diagrams, access credentials, and key configuration settings. Include documentation of required ESRI-supported GIS integration/data input/output capabilities for future software procurement.

5.8 Data Migration Strategy

The consultant will develop a plan for the inventory, review, and migration of existing GIS data (as appropriate) into the GIS environment, and will integrate new data as identified by MWDOC. MWDOC anticipates that data migration under this contract will be limited to the following:

Water Use Efficiency – ArcGIS Online hosted data and some non-spatial tabular data.

Water Loss Control – Existing ArcGIS Online hosted data, along with associated file geodatabases.

WEROC – ArcGIS Online hosted data and the modified requirements in Section 5.1.

- **Deliverables:**
 - **Data Assessment:** Inventory and analysis of current geospatial data sources, formats, and quality.
 - **Data Model Design:** Recommendations for a standardized data model to ensure consistency and usability of migrated data.
 - **Migration Plan:** A detailed plan outlining the process for data extraction, transformation, loading (ETL), quality control, and testing. Identify priority data migration to show an “early win”.
 - **Migrate data:** As detailed in the plan
 - **Metadata Management Plan:** A plan for the creation and maintenance of metadata to improve data discovery and governance.

5.9 Optional Project: WEROC Information-Sharing Platform

MWDOC and WEROC have identified the development of a WEROC Information-Sharing Platform as an 'early win' project—one that can quickly showcase the value of GIS implementation and related investments at MWDOC. **For this RFP, MWDOC is seeking a consultant to propose a project approach, scope of work, and a high-level estimate of project cost and timeline.** The proposal should clearly outline the assumptions underlying the proposed scope. This information will help MWDOC determine the appropriate timing for project execution, as the platform is considered an optional component of this RFP.

The primary objective of the WEROC Information-Sharing Platform is to develop a GIS-based information-sharing platform to enhance regional situational awareness, coordination, and operational readiness among WEROC's 36-member water and wastewater agencies. The platform will facilitate the aggregation and sharing of various data feeds and applications within an ArcGIS Online or Portal environment.

Note: The following is a Performance-Based Scope of Work, not a Prescriptive scope of work. As noted above in the Invitation for Proposals, portions of the Optional Project scope of work may already be included as part of the other tasks in this RFP, and therefore may not be needed as additional work tasks. MWDOC reserves the right to include this project in the current scope of work or defer it to a separate scope of work in the upcoming fiscal year budget.

Scope of Work

The consultant will propose solutions for a group-sharing architectural design and a data-sharing schema. The platform will aggregate and display data from various sources, support limited spatial analysis, and enable field data collection during emergencies. Key architectural components will include:

- **Platform Environment:** Utilizing ArcGIS Online or Portal to leverage existing infrastructure and expertise.
- **Data Aggregation:** Integrating live data feeds, maps, features, tiles, vector data, Open Geospatial Consortium (OGC) services, and raster layers.
- **Information Products:** Populating products such as Dashboards, Instant Apps, and Story Maps for enhanced visualization and communication.

Based on our preliminary understanding, MWDOC and WEROC envision the scope of work will include, but is not limited to, the following tasks:

1. **Discovery and Requirements Gathering:** Conduct detailed workshops with WEROC and selected member agencies to finalize functional and technical requirements for the platform.
2. **Group Sharing Architectural Design:** Design a scalable and secure architecture within the specified ArcGIS environment to manage access and sharing among 36 agencies.
3. **Data Sharing Schema Development:** Design and implement a robust data schema that accommodates the following features:
 - a. Display of various data sources (live feeds, OGC services, raster layers, etc.).
 - b. Functionality for limited spatial analysis of features.
 - c. Field data collection capabilities for emergency damage assessment.

4. **Platform Configuration and Development:** Configure the ArcGIS environment, integrate data feeds, and develop the specified information products (Dashboards, Instant Apps, Story Maps).
5. **Testing and Quality Assurance:** Conduct rigorous testing to ensure platform functionality, data accuracy, security, and user experience.
6. **Training and Documentation:** Develop user guides and administrator documentation, and provide training sessions for MWDOC/WEROC staff and agency representatives.
7. **Deployment and Support:** Assist with the platform's go-live and provide initial post-deployment support.

Based on the above tasks, the consultant will provide the following deliverables:

- **Architectural Design Document:** Detailed documentation of the proposed group sharing architecture and data schema.
- **Configured GIS Platform:** A fully functional WEROC Information-Sharing Platform within the agreed-upon ArcGIS environment.
- **Information Products:** Configured Dashboards, Instant Apps, and Story Maps.
- **Field Data Collection Tool:** Configured application (e.g., ArcGIS Field Maps) for damage assessment during emergencies.
- **Training Materials:** User manuals, administrator guides, and training session records.
- **Final Project Report:** Summary of development, testing results, and deployment details.

MWDOC will be responsible for:

- Providing timely access to necessary ArcGIS Online/Portal environments, existing data sources, and technical documentation.
- Ensuring key personnel from MWDOC/WEROC and member agencies are available for requirements gathering, feedback, and user acceptance testing (UAT).
- Prompt review and approval of deliverables.

The consultant shall provide a project schedule and estimated development time, and a detailed cost estimate for completing this project, broken down by task. The estimate should also include ongoing maintenance and licensing costs, if applicable.

6. Required Proposal Content

Proposals shall be **no more than 15 pages in length (11 pt. font 8.5" x 11")** excluding attachments (i.e., resumes and proposed revisions to the MWDOC Standard Professional Services Agreement). Proposals shall include the following sections as listed below:

A. Cover Letter

- a. Provide a cover letter that serves as the executive summary of the proposal.
- b. Acknowledge receipt of all addenda.



- c. Acknowledge review of MWDOC’s professional services agreement (**Attachment B**) and state your firm’s willingness to accept the agreement terms and conditions. If your firm requests any changes, please include any proposed modifications to the standard terms and conditions in your proposal. While MWDOC negotiates such changes with consultants, MWDOC will consider your proposed modifications during the consultant selection process and retains the right to reject any portion of your proposed modifications.
- d. Include a signature of the Consultant’s authorized representative.

B. Experience and Qualifications

- a. Describe your firm’s specific experience and the capabilities of the designated project manager, subject matter experts, technical staff, and support staff related to the outlined Scope of Work. Describe the capacities of your firm and all participating subconsultants to complete the Project within budget and on schedule.
- b. Key personnel assigned to the project shall not be reassigned without prior MWDOC contract manager approval.
- c. Disclose any proposed subcontract arrangements that would be utilized during this project.
- d. Provide an assurance of the firm’s ability, considering the firm’s current and planned workload, to begin and complete the work on time for the following milestones:
 - i. Completion of all reports, analyses, and supporting documentation for staff recommendations for software and hardware purchasing recommendations for MWDOC Board consideration by November 20, 2026.
 - ii. Implementation of software and hardware purchased within 90 days of MWDOC’s notification of receipt of all purchased software/hardware necessary to implement the GIS system.
- e. Document that personal or organizational conflicts of interest prohibited by law do not exist.

C. Record of Performance

- a. Describe the project team’s [not the firm’s] past record of performance on similar projects for which your firm has provided services. Include a discussion of such factors as project outcomes and accomplishments, quality of work, control of costs, ability to meet schedules, and innovative solutions brought to the project.
- b. Provide at least three public agency references that may be contacted by MWDOC, including name, title/role, phone number, and email.

D. Project Work Plan

- a. Propose a Project Work Plan consistent with the Scope of Work provided above.



- b. Your proposal shall, at a minimum, meet the Scope of Work, which is the general extent of the services needed by MWDOC and agencies. If you feel additional services may provide value, please add them separately as optional tasks.

E. Project Schedule

- a. Provide a project schedule showing key milestones, such as a timeline of completion of key deliverables prior to MWDOC staff recommendation to the Board for purchase of Esri software licensing and any hardware requirements estimated to occur at the Planning & Operations Committee Meeting in October 2026. The proposed schedule shall include all reports and documentation supporting software and hardware purchasing recommendations for agency review by August 7, 2026.

F. Project Fee Schedule

- a. Provide detailed budgets for completion of the project. The detailed services proposal shall include fee schedules and a breakdown of the fee by task, project team members, subconsultants, and other direct costs. If, during the project, the consultant determines that the level of effort will significantly exceed the agreed-upon level, the consultant will notify MWDOC immediately.
- b. Include a Rate Sheet for all project team members that remains valid through March 30, 2027.
- c. The estimated project budget is \$80,000.

G. Attachments

- a. Resumes (may be submitted as an attachment separate from the main proposal if needed in order to meet the file size and page limits).
- b. Proposed revisions to the MWDOC Standard Professional Services Agreement (if applicable).

7. Proposal Evaluation Criteria

A review panel consisting of MWDOC staff from various departments will review the proposals and select a preferred consultant based on the review criteria established. Criteria for evaluation of proposals and selection of consultant recommendation for Board consideration shall be based on, but not limited to, the following considerations. Proposals will be scored based on the guidelines outlined in Table 1.

- Proposal content and format are professional and responsive.
- Proposal demonstrates a clear understanding of the required scope of work.
- The work plan is thorough, sound, and demonstrates a clear path to complete the project on time and within budget.
- The overall project approach is well thought out.
- The firm and the project team's experience demonstrate the ability to effectively deliver the project.



- Fee will be considered after the qualifications of all firms have been evaluated.

Table 1: Proposal Evaluation and Scoring Criteria

Proposal Component	%
Cover Letter (Executive Summary)	10
Experience, Qualifications, and Record of Performance	35
Project Understanding and Approach	40
Interview Performance	10
Willingness to Accept Standard Agreement Terms	5
Total	100

Based upon this information, MWDOC staff will recommend consideration of an award of contract to MWDOC’s Board of Directors for award of a professional services agreement. MWDOC reserves the right to discuss proposals interview may or may not be requested depending on the outcome of the review of the proposals and their scores. The firm awarded this work will not be precluded from subsequent phases of GIS implementation.

8. Proposal Submittal

Proposals (including accompanying materials) will become the property of MWDOC. Proposals will be held in confidence to the extent permitted by law. After award of a contract or after rejection of all proposals, the proposals will be public records subject to disclosure under the California Public Records Act (Government Code Section 6250 et seq.)

MWDOC reserves the right to request additional information from prospective consultants prior to final selection, to meet with one or more respondents, and to consider information about a firm other than that submitted in the proposal.

Interested firms may submit questions in writing. All questions will be documented, and answers/clarifications will be provided in an addendum to the RFP. Questions will be accepted until **Thursday, December 18, 2025, at 5:00 pm** and should be submitted to Sarina Sriboonlue, Principal Engineer at ssriboonlue@mwdoc.com with the subject line: *Questions for MWDOC RFP ENG. 2025-03: GIS Implementation Assistance.*

Proposals will be accepted until **Tuesday, January 20, 2026, at 5:00 pm**. The electronic copy should be emailed to Sarina Sriboonlue, Principal Engineer at ssriboonlue@mwdoc.com with the subject line: **Proposal for MWDOC RFP ENG 2025-03: GIS Implementation Assistance.** No printed proposals are required.

PLEASE NOTE –ALL SUBMITTALS SHALL BE **LESS THAN 25 MEGABYTES** TO ALLOW EMAILING. FAILURE TO MEET THIS REQUIREMENT WILL BE GROUNDS FOR REJECTION OF YOUR PROPOSAL.



This request does not commit MWDOC to retain any consultants, to pay costs incurred in the preparation of proposals, or to proceed with the project. MWDOC reserves the right to reject any or all proposals and to negotiate with any qualified applicant.



Attachment A – Schedule of Events

Activities	Anticipated Dates
1. Issue RFP	November 18, 2025
2. Questions on RFP Due	December 18, 2025
3. Proposal Due	January 20, 2026
4. Consultant Interviews	January 26-30, 2026
5. MWDOC's Committee Recommendation	March 2, 2026
6. MWDOC's Board Consideration of Contract Award	March 18, 2026
7. Contract Execution and Authorization to Proceed	March 30, 2026
8. Contract Duration	1 year with a 1-year extension option



Attachment B – MWDOC GIS Needs Assessment Report – August 8, 2025.



MUNICIPAL WATER DISTRICT OF ORANGE COUNTY

GIS Needs Assessment

2025

Final

Prepared for:

Municipal Water District of Orange County

August 8, 2025

Project No. F2616.01.001



Prepared by:

FLO Analytics

www.flo-analytics.com

GIS Needs Assessment

2025

The material and data in this report were prepared under the supervision and direction of the undersigned.



A handwritten signature in black ink, appearing to read "Grant Herbert", is written over a horizontal line.

Grant Herbert
Principal GIS Analyst

A handwritten signature in black ink, appearing to read "K. Pote", is written over a horizontal line.

Kyle Pote
Project GIS Analyst

EXECUTIVE SUMMARY

From April through July 2025, FLO Analytics (FLO) conducted a Geographic Information System (GIS) Needs Assessment for the Municipal Water District of Orange County (MWDOC, or the District). The purpose of the study was to evaluate the use of GIS at MWDOC, identify future GIS needs, establish any changes in requirements or priorities, and develop a road map tied to District goals.

The District operates in an inherently spatial environment and needs to be able to maintain a common operating picture of that environment, incorporating infrastructure, economic and political aspects. The District is currently underutilizing GIS across the organization. With no GIS governance structures in place, there are no unified decision-making processes, or standards that relate to GIS data and its use. Along with inconsistent access to GIS software tools, this has resulted in “data silos” which are not searchable, visible, or accessible in a consistent manner across the organization. Staff reported frustration that they struggle to access their own data effectively and identified several areas where they felt they could deliver significant value to member agencies if they could easily view, combine or analyze this data. Data silos encourage data duplication and the use of outdated information, resulting in missed opportunities and a poorer understanding of the impacts of District programs. Existing GIS-related processes are poorly documented and at risk of knowledge loss. Staff that are using GIS to enhance and conduct their work often do not have the training or the capacity to make significant improvements in their workflows.

To effectively deliver on the District’s goals, particularly in supporting member agencies and promoting water use efficiency, an enterprise-level GIS program approach is recommended. The development of a comprehensive GIS program at MWDOC will enable the improvement of internal operations, data collection and analysis work, build staff skillsets to better serve member agencies, and provide more effective emergency management coordination under Water Emergency Response Organization of Orange County (WEROC). The program consists of governance, software and data management, with training and support from consultants. The software, a combination of Esri Enterprise and ArcGIS Online, is intended to securely host data and internal applications while also being able to support members through providing supporting data, enabling direct collaborations, and the ease of building advocacy tools. This will enable MWDOC to securely and effectively host large aerial imagery and complex datasets and provide an opportunity for SQL database integration. The District will initially require the assistance of external consultants for the implementation, system management and administration of the expanded GIS system, which is commensurate with its existing approach of using consultants for advanced GIS data manipulation and analysis. With training, it is feasible for District staff to be able to take on more of the day-to-day management of the GIS system and data analysis.

This Enterprise approach will play a significant role in allowing the District to improve internal efficiency, analysis and decision-making, as well as providing the platform to operate as an effective data hub for member agencies. Internal efficiency opportunities come through improved access to data and tools, the ability to leverage other department’s work, and process and data automation, while the platform supports education and advocacy goals, providing supplementary data to member agencies, and direct collaboration. The use of ArcGIS Online and Enterprise, and the purchase of mobile devices for internal use will provide emergency response staff with the ability to easily practice deployments, train users, and test applications in advance.

The priorities for the first 1-2 years include developing internal GIS governance and standards, implementing an Enterprise GIS system incorporating ArcGIS Online for emergency response and member collaboration opportunities, and improving internal efficiencies through documentation, standardized data, workflow improvements, and training. Improved data storage is intended to support both GIS and other tools including PowerBI. It is expected that automation opportunities and increased ability for staff to “self-serve” the production of GIS data analysis and outputs (maps and applications) will further increase efficiency, freeing up staff resources and enabling analytics in a shorter timeframe. With a GIS program in place the District will be better positioned to securely collaborate and interact directly with both member and external agency GIS, provide flexible emergency response tools, and increase its overall value to members through analysis, data and advocacy.

KEY FINDINGS

Key findings from this update are summarized below:

- **Governance:** There are no current GIS or data governance structures in place, resulting in data silos and departments having issues accessing GIS data.
- **Software Technologies:** There is currently a mix of different GIS viewing software in use which requires data conversion for compatibility, making it difficult to easily incorporate data.
- **Hardware, Server, and Network Resources:** The District is well resourced and has sufficient capacity and capabilities for basic GIS editing and use.
- **Spatial Data Repositories:** Data is siloed, hard to find and access, heavily reliant on external parties to consolidate and prepare. Some very large and important datasets are not being used as they are difficult to work with in their current location or configuration.
- **Departmental/Personnel:** Departments want to do more with their data, and have access to a clean, consistent, and well-documented dataset to allow them to have trust and confidence in their analysis. Staff are generally feeling that they do not have the skillsets to make the best use of the data and tools they have.

KEY RECOMMENDATIONS

Key recommendations from this update are summarized below:

- **Governance:** Develop a governance structure with appropriate leadership, roles, processes, standards and key performance indicators. Developed in conjunction with member agencies, these can establish consistent GIS practices and provide guidance for member agencies and the organization and will be an important part of delivering a GIS Shared Services program and trusted data hub.
 - **Impacts:** Internal Efficiency, Compliance, Data Platform, Service Delivery.
- **Software Technologies:** Implement Esri Enterprise GIS in conjunction with ArcGIS Online for consistent and unified software experience, data management and analysis tools. With Enterprise as the internal tool, data can be synced with ArcGIS Online which will serve as the data hub and for external partner collaboration. A focus on service-based GIS data access will ensure compatibility across the two environments and enable better collaboration.
 - **Impacts:** Data Integrations; Data Platform; Internal Efficiency; Service Delivery

- **Hardware, Server, and Network Resources:** Establish new server requirements and deployment location to support Esri Enterprise. Purchasing and configuring mobile devices specifically for WEROC use is recommended for training and consistency.
 - **Impacts:** Data Integrations; Data Platform; Emergency Response; Internal Efficiency.
- **Spatial Data Repositories:** Consolidate and store core data within the Enterprise GIS environment, develop a consistent project data structure storage approach for analysis and mapping work, and use external web data services where applicable to reduce load and ensure data currency.
 - **Impacts:** Data Integrations; Data Platform; Infrastructure Planning; Internal Efficiency; Promoting Water Efficiency; Service Delivery
- **Departmental/Personnel:** Staff GIS training and improved documentation of departmental processes and procedures is needed. There are a number of potential automation opportunities (e.g., map atlases, data processing) along with internal applications and dashboards for decision-making and analysis purposes.
 - **Impacts:** Compliance; Emergency Response; Internal Efficiency; Promoting Water Efficiency.

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Appendix A

Table of Recommendations

Appendix B

Road Map and Timeline

ABBREVIATIONS AND ACRONYMS

AGO	ArcGIS Online
AWS	Amazon Web Services
CDR	Center for Demographic Research
Conservation Framework	Making Conservation a California Way of Life Framework
District	Municipal Water District of Orange County
ELA	Enterprise License Agreement
FLO	FLO Analytics
GPU	graphics processing unit
KML	Keyhole Markup Language
KPI	key performance indicator
LOE	level of effort
MWDOC	Municipal Water District of Orange County
NDA	Non-Disclosure Agreement
Portal	Municipal Water District of Orange County's Enterprise GIS
REST	Representational State Transfer
RDBMS	Relational Database Management System
SAML	Security Assertion Markup Language
WEROC	Water Emergency Response Organization of Orange County
WLC	Water Loss Control
WUE	Water Use Efficiency

1 INTRODUCTION

1.1 Background

From April through July 2025, FLO Analytics (FLO) conducted a GIS Needs Assessment for the Municipal Water District of Orange County (MWDOC, or the District). The purpose of the study was to evaluate the use of GIS at MWDOC, identify future GIS needs, establish any changes in requirements or priorities, and develop a road map tied to District goals with recommendations and cost estimates.

MWDOC is a wholesale water supplier and a regional resource planning agency serving nearly 3.2 million residents through 26 member agencies, including water agencies and cities. With a mission to provide high-quality water supplies to meet present and future Orange County needs, and to promote water efficiency, the District focuses its efforts on planning and investments in water supply development, water use efficiency, public information and education, legislative advocacy and emergency preparedness.

MWDOC staff interviewed are listed below their department name:

Planning & Engineering

- Charles Busslinger – District Engineer
- Sarina Sriboonlue – Principal Engineer

Emergency Management/Water Emergency Response Organization of Orange County

- Vicki Osborn – Director of Emergency Management
- Gabby Landeros – WEROC Specialist
- Janine Schunk – WEROC Coordinator

Water Use Efficiency

- Joe Berg – Director of Water Use Efficiency
- Rachel Waite-Harvey – WUE Program Supervisor
- Sam Fetter – WUE Analyst II

Water Loss Control Program

- Joe Berg – Director of WUE
- Rachel Davis – Water Loss Control Program Supervisor

Metropolitan Issues (Water Resources)

- Alex Heide – Senior Water Resources Specialist
- Kevin Hostert – Senior Water Resources Specialist

Information Technology

- Dave Anderson – IT System Analyst II

Informational interviews were also carried out with the following groups:

- Center for Demographic Research (CDR) at California State University Fullerton
- City of Fullerton
- El Toro Water District
- Irvine Ranch Water District
- Santa Margarita Water District
- Serrano Water District

2 ORGANIZATIONAL EVALUATION

2.1 Goals and Expectations

The District's mission is as follows:

Our mission is to provide reliable, high-quality supplies from The Metropolitan Water District of Southern California and other sources to meet present and future needs at an equitable and economical cost and to promote water use efficiency for all of Orange County.

The District's organizational goals and objectives include the following:

- Providing cost-effective, long-term water reliability and security for member agencies and Orange County constituents.
- Supporting member agencies through coordinating, leading planning, and investments in water supply development, water use efficiency, public information and education, legislative advocacy and emergency preparedness.
- Providing a platform for data dissemination and information of interest to member agencies.
- Effective emergency response.

GIS has been identified as a core component to assist the District in delivering services and information to member agencies, legislators, staff and the public, and in supporting organizational goals. Specific GIS-related goals and expectations are detailed below:

- Establishing a suitable and efficient GIS structure that encourages and enables future growth while being easy to run and manage with limited internal GIS resources.
- Supporting the consolidation and management of data from member agencies and encouraging data coordination between member agencies and MWDOC through industry best practice approaches.
- Developing MWDOC datasets of interest to member agencies and supporting the District's mission.
- Ability to provide access to data in easy-to-digest forms, such as dashboards and maps that can be used to communicate, educate, and inform.

- Supporting and enhancing member efficiency and compliance with legislation, such as the Making Conservation a California Way of Life Framework (Conservation Framework).
- Having GIS data management standards, processes, and methodologies, including those designed to support data sharing, interoperability between member agencies, and any requirements for member agencies to be able to participate in a potential GIS Shared Services program.
- To be able to provide GIS support to member agencies that have limited capacity themselves.

2.2 GIS Priorities

A list of GIS priorities identified include:

- Establish a baseline of accurate water infrastructure mapping in Orange County.
- Improve GIS use and data management to ensure efficiency and cost-effectiveness in data updates, data collection and aggregation, and use.
- Develop and enhance in-house GIS capabilities and capacity, with a focus on efficiency and accuracy.
- Conduct analysis on behalf of member agencies and long-term planning.
- Improve visibility of data and increase communication with member agencies and other entities.
- Reliability planning.
- Ensure appropriate staff capabilities.
- Improve response times to water quality issues.
- Supply accurate real-time data particularly during emergency events.
- Transition paper-based data to digital formats.
- Transfer existing digital data to spatial data.
- Establish capability for quick map creations.
- Establish comprehensive datasets.
- Enhance the manageability of GIS data and applications.
- Integrate connections between GIS and other systems such as PowerBI, AccuFund, and Laserfiche.

2.3 Gap Analysis

The District is currently underutilizing GIS across the organization. With no GIS governance structures in place, there are no unified decision-making processes or standards that relate to GIS data and its use. This has resulted in data silos (inability to access or know about the data another department holds), which risks data duplication and leads to GIS data not being searchable, visible or accessible in a consistent manner across the organization. This underutilization leads to inefficiencies and reduces the data's value to MWDOC and member agencies. It has also directly resulted in a mix of tools being used internally requiring data conversion to accommodate incompatibilities between the Esri and Google Earth software. A significant portion of critical data is not directly utilized by the District; instead, it is provided to consultants and contractors for analysis. While these external

services meet the District's specific requirements, the extra administrative procedures, the necessity for MWDOC to specify the desired deliverables without the benefit of their own preliminary investigation, and the delays in receiving the deliverables result in staff frustration that they cannot readily explore the raw data and a sense of not knowing what insights may be possible.

Staff are carrying out a variety of tasks using GIS software and data, but most staff reported that they felt their GIS skill levels are insufficient to allow them to do more. Staff identified several areas where they felt they could deliver significant value to member agencies if they could easily view, combine, or analyze data. There was a general sense that many staff were not sure what possibilities were available with respect to analysis and visualization of District data and unsure of how best to use the tools they have access to. Where staff have been able to put together effective processes incorporating GIS data and tools to support their work, without sufficient documentation and cross training the management and knowledge of these processes is at risk. The day-to-day management of a comprehensive GIS program that will enable the District to meet internal and external data management, visualization and collaboration requirements is not currently within the realm of existing resources. Until internal staff are fully trained, the District will require assistance from contractors/consultants for system management and advanced analysis.

The District operates in an inherently spatial environment and needs to be able to maintain a common operating picture of that environment, incorporating infrastructure, economic, and political aspects. To effectively deliver this, an enterprise-level GIS approach is required with consistency of governance, software, data storage, and data management. This will play a significant role in allowing the District to improve internal efficiency, analysis, and decision-making as well as operate as an effective data hub for member agencies.

2.4 Summary of Recommendations

A summary of recommendations is shown in Table 1, and a full version is included in Appendix A.

To ensure that the District's GIS program can deliver business value, a GIS governance structure should be put in place to ensure that decision-making and GIS technology are aligned with business needs, incorporate stakeholder feedback, and provide clear guidance on appropriate data management and requirements.

To effectively manage GIS datasets and build out its internal GIS program, it is recommended that the District implement Esri Enterprise GIS alongside the existing ArcGIS Online (AGO) environment. This recommendation is primarily driven by existing data requirements, and the desire to collaborate with multiple partners as necessary. Foremost, the size and nature of large current and anticipated datasets, such as Aerial Imagery and the landscape classification data associated with the Conservation Framework, can be more cost-effectively hosted on an internal Esri Enterprise environment than AGO. Esri Enterprise, as the District's internal GIS environment, will offer secure internal data hosting and consumption of aerial imagery while enabling future integrations with the Rebate database and other colocated SQL Server systems if required.

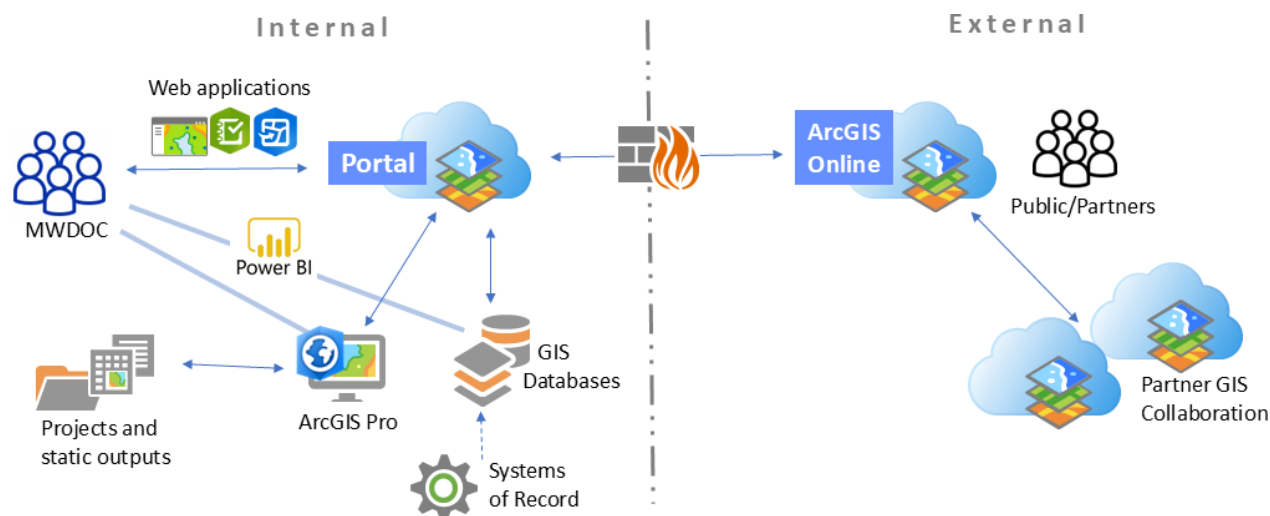
Although the District's current infrastructure data does not necessitate specific geodatabase functionality, a Relational Database Management System (RDBMS, e.g., SQL Server)-hosted enterprise geodatabase will be beneficial as many member agencies are moving to adopt the Esri Utility Network schema (a GIS data structure that models utility system components). This will allow the District to directly use the Utility Network model for planning and analysis, supporting emergency response through functionalities such as tracing and estimating shutoff impacts. The Enterprise Data Store (a system managed geodatabase) will be essential for managing users' self-hosted data and

analysis results. The system will make field data collection tools and data more accessible to internal users by bringing the current AGO-hosted fieldwork data in-house.

The internal Enterprise system will work closely with the District's existing AGO, allowing it to serve as a key data hub for member agencies and the public as well as supporting collaboration options with member AGO environments. Enterprise GIS datasets can be synced to AGO and made securely available to member agencies and support public-facing advocacy and education applications.

Figure 1 shows a conceptual diagram of the District's Enterprise GIS ("Portal"), with internal users (including field staff) accessing data via web applications and desktop tools including ArcGIS Pro and PowerBI, with public data dissemination and collaboration with partners via the AGO bridge. Synchronization between AGO and the Enterprise system provides data transfer if necessary. It should be noted that Water Emergency Response Organization of Orange County (WEROC) will still be operating out of AGO, but it is anticipated that testing and training environments can be set up in Enterprise for enhancing emergency readiness.

Figure 1. MWDOC Enterprise GIS Concept



Staff training will be a necessary component for successful implementation, use, and development of the District's GIS program. While staff with GIS responsibilities will be the key users and maintainers, other staff and management will be encouraged to use web maps, applications and dashboards to view and interact with data applicable to their needs. The use of external consultants and contractors will remain to provide supplemental capacity and specialized technical expertise for analysis and data consolidation tasks. However, equipping staff with the necessary tools and training to conduct initial analysis and generate data and mapping products will improve their efficiency and enable them to manage the problems and data independently.

Table 1 includes a summary of the recommendations, ordered by priority and grouped by section (see also Appendix A). The ID value represents the specific recommendation in the document. The Impact Areas field associates each recommendation with the appropriate MWDOC objective. Priority ratings are based on both the importance of the recommendation in establishing effective GIS at the District and ensuring that necessary dependencies are addressed. A high-priority item is a necessary requirement and/or precursor to future recommendations, followed by medium-priority items. Low-priority items do not need to be deferred; however, in many cases they can be achieved in parallel with other recommendations. We recommend that priority ratings be reassessed after major tasks are completed to ensure that actionable deliverables are not delayed unnecessarily.

Table 1. Summary of Recommendations

Priority ^a	Recommendation	Impact Areas	Cost ^b	LOE ^c	Section	ID
High	Define GIS program roles and authority (GIS champion/steering committee)	Internal Efficiency	Low	Low	Governance	3
High	Identify departmental data stewards	Internal Efficiency	Low	Medium	Governance	4
High	Develop GIS data standards	Data Platform; Internal Efficiency; Service Delivery	Low	Medium	Governance	5
High	Document required GIS deliverables	Compliance; Data Integrations; Internal Efficiency	Low	Low	Governance	6
High	Identify and document appropriate security controls	Compliance; Internal Efficiency	Low	Low	Governance	7
High	Identify District GIS KPIs	Internal Efficiency	Low	Low	Governance	11
High	Plan and Implement Esri Enterprise GIS	Data Integrations; Data Platform; Internal Efficiency	Medium	Medium	Software	12
High	Establish appropriate staff GIS licenses	Data Platform; Internal Efficiency	Medium	Low	Software	13
High	Refine server specifications and Enterprise architecture	Data Platform	Low	Low	Hardware	17
Medium	Utilize Enterprise/AGO web applications for internal and public data communication	Emergency Response; Internal Efficiency; Public Information/ Education	NA	Low	General	2
Medium	Develop a standard data-sharing agreement template	Compliance; Data Integrations; Internal Efficiency	Low	Low	Governance	8
Medium	Establish a MWDOC-led regional GIS forum	Public Information/ Education; Service Delivery	Low	Medium	Governance	9
Medium	Use SAML logins for Esri systems	Internal Efficiency	NA	Low	Software	14
Medium	Publish aerial imagery to Esri Enterprise	Data Platform; Emergency Response; Service Delivery	Low	Low	Spatial Data	22
Medium	Evaluate Enterprise Geodatabase	Data Platform; Internal Efficiency	Low	Low	Spatial Data	23
Medium	Use Esri Data Store or network storage for GIS project files	Data Platform; Infrastructure Planning; Internal Efficiency; Promoting Water Efficiency	Low	Low	Spatial Data	24
Medium	Evaluate Flume data for hosting and analysis	Data Integrations; Data Platform	Low	Low	Spatial Data	27
Medium	Moasure capture documentation and training	Internal Efficiency	Low	Low	Spatial Data	28

Priority ^a	Recommendation	Impact Areas	Cost ^b	LOE ^c	Section	ID
Medium	WEROC data as the core organization data	Internal Efficiency; Infrastructure Planning	Low	Low	Spatial Data	29
Medium	Consolidate GIS data and publish	Data Integrations; Internal Efficiency	Low	Medium	Spatial Data	30
Medium	Evaluate specific data workflows to optimize and automate	Internal Efficiency	Low	Medium	Spatial Data	31
Medium	Evaluate migrating Rebate database to spatial format	Data Integrations; Data Platform	Low	Medium	Spatial Data	33
Medium	Document member data schemas	Internal Efficiency; Service Delivery	Low	Low	Spatial Data	34
Medium	Review AGO-hosted data, move to Enterprise	Data Integrations; Data Platform	Low	Medium	Spatial Data	37
Medium	Budget for mid-to-long-term on-call GIS consultant support	Internal Efficiency	Medium	Medium	Dept/ Personnel	38
Medium	Develop a training plan for staff	Internal Efficiency	Low	Medium	Dept/ Personnel	39
Medium	Document departmental data processes and procedures	Compliance; Internal Efficiency	Low	Medium	Dept/ Personnel	40
Medium	Establish standardized data schemas	Emergency Response; Internal Efficiency	Low	Medium	WEROC	43
Medium	Establish layout templates in ArcGIS Pro	Emergency Response; Internal Efficiency	Low	Low	WEROC	44
Medium	Train additional WLC staff to assist with key GIS tasks and workflows	Internal Efficiency; Promoting Water Efficiency	Low	Medium	WLC	48
Medium	IT training in GIS specific management	Internal Efficiency	Low	Low	IT	50
Medium	Executive dashboards and summary tool requirements	Advocacy; Infrastructure Planning; Internal Efficiency; Promoting Water Efficiency; Service Delivery	Low	Medium	Executive	51
Low	Establish required content and purpose of collaborative planning tools	Data Platform; Emergency Response; Service Delivery	Low	Low	General	1
Low	Establish GIS Shared Services program parameters	Service Delivery	Low	Medium	Governance	10
Low	Include GIS integration in RFPs	Data Integrations	NA	Low	Software	15
Low	Retire Google Earth in favor of web maps and applications hosted in AGO/Enterprise	Internal Efficiency; Data Platform	NA	NA	Software	16
Low	Establish Enterprise GIS backup	Data Platform	Low	Low	Hardware	18
Low	Dedicated mobile devices for Emergency Response and Field Data Capture	Emergency Response; Internal Efficiency	Low	Low	Hardware	21

Priority ^a	Recommendation	Impact Areas	Cost ^b	LOE ^c	Section	ID
Low	GIS REST Services for external data	Data Platform; Internal Efficiency; Service Delivery	Low	Low	Spatial Data	25
Low	Automate periodic data downloads from external sources	Data Platform; Internal Efficiency	Low	Low	Spatial Data	26
Low	Assess migration of PDFs and tabular data to GIS	Data Integrations	High	High	Spatial Data	32
Low	Agency data attribution for filtering	Internal Efficiency; Service Delivery	Low	Low	Spatial Data	35
Low	Connect spatial data to Laserfiche	Data Integrations	Low	Low	Spatial Data	36
Low	Attend Esri User Conference or Esri IMGIS Conference	Data Platform; Internal Efficiency	Low	Low	Dept/ Personnel	41
Low	Identify partners and options for a GIS Shared Services program	Service Delivery	Low	Medium	Dept/ Personnel	42
Low	Review departmental data and work planning	Internal Efficiency; Promoting Water Efficiency	Low	Medium	WLC	46
Low	Streamline and automate weekly reporting	Data Integrations; Internal Efficiency; Promoting Water Efficiency	Low	Medium	WLC	47
Low	Evaluate feasibility of new GIS focused services as needed	Service Delivery	Low	Medium	WLC	49
Low	Continue to host Emergency Response data in AGO	Emergency Response	Low	Low	WEROC	45
None	GPU recommended for ArcGIS Pro power users	Internal Efficiency	Low	Low	Hardware	19
None	Colocated virtual machines for GIS use are not required	Internal Efficiency	NA	NA	Hardware	20

Notes

AGO = ArcGIS Online.

GPU = graphics processing unit.

KPI = key performance indicator.

LOE = level of effort.

NA = not applicable.

MWDOC = Municipal Water District of Orange County.

^aPriority ratings reflect relative importance with respect to the planned timeline and order of implementation. Projects may be re-prioritized.^bCost categories: Low is < \$25,000, Medium is < \$60,000, High is >\$60,000.^cLOE categories: Low is < 3 months, Medium is < 6 months, High is > 6 months.

REST =Representational State Transfer.

RFP = request for proposal.

SAML = Security Assertion Markup Language.

WEROC = Water Emergency Response Organization of Orange County.

WLC = Water Loss Control.

2.5 Budget

Growth of the GIS program after Year 2 may impact the budget in one or more of the following ways:

- Data storage and server requirements may need to increase to handle increased data and usage.

- User licenses may need to be increased (assuming there is no ELA in place).
- Additional internal staff may be desired to provide in-house analysis and data management, and/or Enterprise GIS system management. Additional staff are not included in the budget estimates.

The implementation of a GIS Shared Services program, along with increased coordination and alignment between MWDOC and member agencies through a regional GIS forum, should deliver an increase in GIS capacity, data quality, and collaboration among all parties involved. This should reduce the cost of member data compilation over time.

The following 5-year budget is an estimate only. Some recommendations are not anticipated to have any budget impact while others are expected to reoccur each year (for example software licensing, conference attendance costs and training). The budget estimate is expected to be refined as projects are further scoped and implemented. Consulting costs include both the estimated consultant effort required for projects as well as a general consulting budget for on-call support and data requests.

Table 2. Estimated Budget for Planning Purposes.

	Year 1	Year 2	Year 3	Year 4	Year 5
Software/Hardware	\$30,000	\$35,000	\$30,000	\$30,000	\$30,000
Training	\$2,000	\$5,000	\$5,000	\$5,000	\$5,000
Consulting	\$122,000	\$100,000	\$75,000	\$45,000	\$65,000
Estimated Budget	\$154,000	\$140,000	\$110,000	\$80,000	\$100,000

2.6 Road Map and Timeline

A 5-year project road map with key recommendations is shown in Figure 2 (also attached as Appendix B). A red border indicates high-priority projects while an orange border indicates medium-priority projects. The timeline is estimated, with projects in dependency order as much as practicable in the space available. The size of the recommendation does not necessarily reflect how long it is expected to take.

The high-priority projects for Year 1 are to establish the governance basis for the management of the GIS program, refine the specific server and licensing requirements and plan and implement the internal Enterprise environment. Medium-priority projects—including a comprehensive data review, consolidation and publishing effort—will establish the core data and applications for internal use and set the stage for optimization and automation efforts aimed at improving efficiency and freeing up staff time. Comprehensive training will ensure that staff can make the best use of the systems.

From Year 2 onwards, the focus shifts to incremental improvements, the development of more communication tools, and MWDOC positioning itself as the guiding force behind a GIS forum designed to improve cooperation, knowledge-sharing and GIS best practices, and support among its member agencies. While many of the recommendations can be executed simultaneously, it is expected that the District will establish a timeframe that is appropriate for its internal capacity.

2.7 Findings and Recommendations

A recurring theme throughout the interviews was that department staff emphasized feeling they were not using GIS effectively and there was a need to establish a well-structured foundation with respect to the use of GIS, including developing GIS data management standards, processes, and methodologies for long-term implementation. There is encouragement for data coordination from and with member agencies, and staff emphasized the importance and usefulness of the District acting as a data hub for member agencies. This includes being the source of consolidated data, providing analysis, and offering a platform for data dissemination and information of interest.

There is a need to manage a large amount of aerial imagery and detailed landscape classification data internally, in addition to managing the agency data that is compiled to support emergency response. This data is intended to support several departments and activities across the District but is currently hard to access due to data silos between departments and lack of consistent data formats and software access.

Although GIS is seen as an important tool at the District, and staff have been using it to create maps and data (particularly to support the Leak Detection program), the current use of GIS technology is not sufficiently managed nor structured to support the District's goals. Particularly, there are opportunities for increasing internal efficiency through improved access to data and tools, supporting education and advocacy goals, providing data to member agencies in an effective manner, and empowering emergency response.

2.7.1 General Recommendations

1. Establish the required content and purpose of collaborative tools for planning and emergency scenarios, e.g., real-time field updates in the event of a main break or water quality incident, identifying impacted service areas, and planning temporary redirections.
2. Utilize web applications, Story Maps, and dashboards for both internal and public communication/information of data, e.g., communicating water restrictions, best practices, and emergency event updates.

2.7.2 Governance

Key characteristics of governance involve a formal structure for making and managing decisions about the long-term direction of a GIS program. It typically defines roles, responsibilities, policies and standards, and identifies key performance indicators suitable for helping the organization identify whether it is making progress. Governance should empower managers with oversight and authority as needed to ensure that the GIS program meets the business requirements. Governance aims to achieve the following:

- Aligning technology investments with business needs.
- Optimizing risk by considering small changes that deliver continuous value over time, leveraging existing capabilities, avoiding overlapping or redundant technologies where possible, and guiding technology choices.
- Maintaining stakeholder engagement with user representation.
- Assisting with decisions on resource optimization and getting the right people, skills, and capabilities to solve business problems.
- Ensuring that the business knows who is responsible for what.

The current state of the District’s GIS governance is almost nonexistent. There is little to no formal structure for GIS-related decision-making, with each department operating independently, and no existing organizational policies or standards that can assist staff in ensuring that they are managing their GIS tools and data in a consistent fashion. As a result, each department has developed its own approach independently with the consistency of GIS data and tool use dependent almost entirely on individual staff making decisions based on their experience and desired outcomes. There is minimal to no documentation for key tasks and processes, and data is stored in a variety of locations. This makes it difficult to onboard and train staff, work effectively with contractors and other departments, and find data that is needed.

2.7.2.1 Governance Recommendations

The recommendations in this section are designed to develop initial GIS governance policies with a focus on the following (data governance and delivery are likely to be key):

3. Define the roles and division of authority over the GIS program (strategy, technology, data, workforce, and budget). Having clear leadership, identified points of contact, and a decision structure is necessary for successful implementation and management. A “GIS champion” (often a steering committee) is important both for representing and communicating the GIS projects, and individual projects should have their own “champion” identified.
4. Identify data stewardship and responsibilities for District-created, -compiled, or -managed GIS data such as aerial imagery, WEROC, and Water Loss Control (WLC) leak detection. Each department should have at least one person identified as the data steward for data they create, manage, or are responsible for obtaining and storing.
5. Develop GIS data standards to document and establish MWDOC GIS data management, metadata, and best practices. Standards should focus on elements associated with data understanding and use, security, integrity, and quality control. These standards may be developed in partnership with member agencies for wider use across the region.
6. Develop documentation describing appropriate GIS deliverables for external parties and consultants to be compatible with MWDOC data standards, metadata, and preferred data formats. These should form a part of all GIS work requests made by the District.
7. Identify and document appropriate security controls and requirements for specific data, including Non-Disclosure Agreement (NDA) compliance and access limitations. As necessary, use software controls to limit sharing and access.
8. Develop a standard data-sharing agreement that can be used as a template for MWDOC member agency data sharing, or between member agencies as applicable. The purpose of the agreement is to formalize the approach and acceptable use of the data, which can be extended as necessary to accommodate specific requirements. As the bulk of the District’s data comes from member agencies with different data-sharing approaches, the default position of the District should be to not publicly share any member data without explicit authorization.
9. Establish a MWDOC-led regional water GIS forum, including member agencies and critical partners, where open discussion and presentations can be used to share and encourage consistent GIS practices and support. This group may be used to provide feedback on the adoption of MWDOC GIS standards.
10. Establish the parameters and requirements for a potential GIS Shared Services program, including the overall goals and vision of the program, any required technologies or inputs, and the intended outcomes for the member agencies along with internal responsibilities.
11. Identify appropriate District GIS KPIs that can be measured. Examples can include the number of staff using GIS, the number of users accessing a particular dataset or application, percentage of data with identified owner, percentage of data with metadata, etc.

2.7.3 Software Technologies

The list of software in this section is not exhaustive and is intended to highlight key systems for which GIS integration into the system is desired, or which may contain data that might be useful or have a potential spatial component.

2.7.3.1 Esri

AGO is Esri's Platform-as-a-Service GIS, used to host and publish District data, web maps, and applications. Current storage usage is forecast at 6,000 credits a year (approximately 500 credits a month) with another 1,000 to 2000 credits for analysis (primarily Rebate data geocoding work done by Water Use Efficiency (WUE) and Survey 123 feature reporting activity). The largest user of AGO is WLC, which manages leak detection activities through Feature Layer storage, Field Maps, and Survey123 applications.

The District has four Creator licenses and three Mobile Worker licenses. The existing AGO licenses renew on 9/11 each year. Each Creator licenses one ArcGIS Pro Professional Basic license (for a total of four) delivered through AGO. ArcGIS Pro usage was reported by WLC (one), WUE (one) and WEROC (one). Esri licenses are needed to create, edit, and view secured data in AGO.

The District has considered using an Esri Small Utilities Enterprise Licensing Agreement (ELA), which would allow extensive use of almost all Esri GIS software available, including AGO and Enterprise. This license is extensive in its scope and is expected to be more than sufficient to meet the District's GIS analysis, display, and field data collection needs for the foreseeable future.

2.7.3.2 Google Earth

Google Earth is used within MWD0C to access and interact with GIS data supplied by CDR in a Keyhole Markup Language (KML) format. While this has the advantage of being free, it does not allow for interaction with existing Esri format GIS data or data hosted in AGO to be brought in.

2.7.3.3 AccuFund

The District's HR and Financial system, AccuFund, is slated to be replaced within a year with a new Enterprise Resource Planning system. This is not expected to require any GIS integration or data.

2.7.3.4 Microsoft Excel

Microsoft Office Excel is widely used by District staff for data analysis and reporting.

2.7.3.5 PowerBI

PowerBI is increasingly used by District staff, including the Metropolitan Issues department for analysis and reporting. Integration with GIS data is desired and currently under consideration; dashboards are a highly desired component. Planning and Engineering and WUE have been considering this tool as well. PowerBI can connect to SQL Server and PostgreSQL databases.

2.7.3.6 SharePoint

The District preferentially uses the Microsoft SharePoint environment and OneDrive libraries for document and file storage for all users with the default Documents folder directed to SharePoint. Official document archiving is the preserve of Laserfiche.

2.7.3.7 Laserfiche

Laserfiche is used for the official archive of documents and runs on a Hyper-V on-premises server. It has a thick client and a web client, both of which require the user to be on the network (on-site or via VPN) to access.

2.7.3.8 Microsoft SQL Server

The WUE department has an on-premises Rebate database containing nonspatial data stored in Microsoft SQL Server, which has a custom front-end application (FORTEC) running on the same machine. Data from the online Rebate programs is extracted and loaded to this database. No GIS data is currently hosted in SQL Server. The District is considering alternative options to the Rebate application.

2.7.3.9 Software Recommendations

12. With the requirement to securely store and manage its own, as well as member agency data, and the need to potentially collaborate and coordinate with a variety of external entities, including member agencies, it is recommended that the District implement an internal Esri Enterprise GIS in addition to expanding its current use of AGO. An Esri Enterprise geodatabase would support PowerBI connections to both the Representational State Transfer (REST) services (if applicable) and the raw database tables, along with for direct database integration with other databases in the same network. As Esri Enterprise can only collaborate with a single AGO organization, it is recommended that the District consider partnering with its own AGO for data dissemination and use AGO for broader interagency collaboration. Although there is a limit currently of 20 partnered organizations within AGO, this will provide the greatest flexibility in configuration.
13. GIS user licensing is currently insufficient to increase access to tools for staff. The District should consider establishing at least ten Professional/Creator licenses, evaluate additional Mobile Worker licenses for field staff, and 50 to 100 Viewer licenses to allow access to tools for District and member staff. Additional licenses at different levels may be warranted for consultants and other entities, including member representatives and field users during emergency response events. At least two Administrators are recommended in AGO and Portal. License levels may need to be adjusted to reflect changes in use as the GIS is developed. If the aerial imagery data supports analysis and this is desired, consider including an Esri Image Server license. Confirm the costs and benefits of the Esri Small Utility ELA program to deliver the software and user counts.
14. Use the District's existing Security Assertion Markup Language (SAML) logins for easy staff access to the Esri systems (this also allows for non-SAML administrator or other independent logins that may be required). This should be set up for both the Enterprise and AGO environments.
15. Include language required vendor-supported GIS integration/data input/output capabilities to future software procurement as applicable.
16. Retire the use of Google Earth in favor of web maps and applications hosted in AGO/Enterprise.

2.7.4 Hardware, Server, and Network Resources

The District has five physical on-premises servers running 12 virtual machines. The existing environment does not have backup power supplies. A server replacement program is being planned for the near future. Machines are structured to support specific applications and are well-specified. An in-house IIS environment is available. Most internal applications require the user to be on site or connected over VPN to access. There are no concerns about providing internet access to an on-premises GIS application if necessary. Microsoft Active Directory/Entra is used for authentication.

Data storage is currently being migrated from the local SMB to SharePoint and the preference is to look at cloud-hosted (Azure) servers first for future deployments.

The District has a Bring Your Own Device policy for cellphones, providing a stipend for business use. Personal smartphones are used in the field for the WLC leak detection data capture. Both iOS and Android devices are used by staff.

The District provides both desktops and laptops for staff and is moving to providing only laptops and a docking station. Laptops are i7 or i9 processors with 32 GB of RAM and 1 TB SSD storage. Graphics are generally handled by the built-in Intel graphics chips. The current machines are capable of running ArcGIS Pro for general data editing and simple analysis requirements but would benefit from a dedicated Graphics Card for more advanced tasks.

Internet bandwidth is currently symmetrical 200/200, with a planned move to 500/500. This is considered sufficient for supporting increased GIS web application and REST service use within the organization.

Moasure devices are used for field landscape measurement tasks to calculate the square footage of areas related to rebates.

2.7.4.1 Hardware, Server, and Network Recommendations

17. Refine server specifications and architecture for Esri Enterprise and ensure that these are accommodated within the IT infrastructure plan with capacity for vertical scaling in the future. The systems can be hosted on physical infrastructure or virtual machines hosted on a cloud provider, with the only requirement that colocation of all components is necessary, and a recommendation that colocation with other systems for which direct database integration is desired. A base Esri 11.3 two-or-three-machine deployment is recommended, with web adaptors installed on the existing IIS web server. General specifications for base deployment are Portal (4 CPU, 16 GB RAM, 200 GB HDD), Server + Data Store (4 CPU, 32 GB RAM). Storage for the Server and Data Store will need to be large enough to accommodate imagery tile caches (anticipated to be 1 TB+), which could grow significantly if historical versions are maintained. A separate RDBMS geodatabase (can be an existing SQL Server machine) is recommended for PowerBI access to GIS data.
18. Establish appropriate separate backup requirements for both the Esri Enterprise servers and an Esri WEBGISDR disaster recovery backup file.
19. Current i7 and i9 processors with four to eight cores and 32 GB RAM are sufficient for the expected GIS usage (light editing of services and basic map creation). ArcGIS Pro power users will benefit from a dedicated mid-range GPU supporting DirectX 12/OpenGL 4.5 with 2–4 GB of onboard memory. Web application users can be supported with an integrated GPU.
20. As core GIS data editing is expected to be service based, colocated virtual machines for GIS use are not expected to be needed at this time.
21. Purchase a small number of dedicated mobile devices for Emergency Response and Field Data Capture use, testing, and training.

2.7.5 Spatial Data Repositories and Management

Overall, GIS (and nonspatial) data at the District is siloed, difficult to access, and managed without consultation with other internal users. The majority of the GIS and associated data is generated outside of the District by member agencies, consultants, and other external partners. Member agencies create GIS data for their own purposes and share some or all of it with the District. The District primarily uses consultants to create or process data on behalf of the District and provide a

defined deliverable for use. Data updates are manually handled within departments upon receipt from member agencies.

CDR creates demographic data for the Engineering department's use in planning activities. CDR also conducts a yearly data aggregation project on behalf of MWDOC to compile member GIS asset infrastructure data into a coherent dataset for the WEROC department. This dataset represents a unique compilation of the infrastructure data of its member agencies to provide a common operating picture of the region. While this is extremely important for emergency response activities and regional cooperation with Metropolitan Water District, this data (or derivatives) is not widely available within MWDOC for use by other departments. The District also has a GIS-based hydraulic model of the regional backbone water system, obtained from Metropolitan Water District and maintained by a consultant. Most of the GIS data represents critical infrastructure and is sensitive data that needs to be kept secure.

Data is stored in a variety of locations on the network, predominantly stored on the shared MWDOC OneDrive/SharePoint location. GIS project data and associated documentation are generally stored in SharePoint, while ArcGIS Pro users usually use the Esri default of the Documents folder, which is redirected to a personal OneDrive. Data may be stored in a variety of formats, from KML files, shapefiles, and file geodatabases to CAD files and Excel spreadsheets. Nonspatial Rebate Program data from an external source is being stored within a SQL database, which is not readily matchable as the address field needs cleaning to be able to match it reliably.

Some GIS data is uploaded to AGO-hosted feature classes to support field data collection and web access. Approximately 2 GB of data is currently stored in AGO, consuming approximately 500 credits a month. Much of this may be old but still valuable for historical analysis, and there is no archiving or backup process in place.

Notable datasets include:

- **Water Leak Detection inspection data.** Using GIS data supplied by the agencies (representing the main pipes that are to be inspected), staff generate a map for use in the field as well as summarize the miles of pipe inspected. Data is split into sections of approximately a week's worth of work for one person and uploaded to AGO to support the field data capture.
- **Landscape classifications and delineation data**, which represent a detailed analysis of the ground cover for an agency. This dataset is very detailed and large.
- **Water Infrastructure Data.** WEROC has a dataset that summarizes the GIS data provided across all agencies, focused on main water transmission pipes and critical infrastructure. This data is used to support emergency response.
- **Conservation Framework Landscape Area Classification data** is very detailed vector data and important for WUE projects and meeting the California Conservation Framework regulations and reporting requirements. This dataset is very large, around 136 GB in size, and stored on SharePoint. It is currently not being used to its potential.
- **A store of aerial imagery**, approximately 1.5 TB in size, exists on an external hard drive. Currently this is only shared with consultants. These aerial images are purchased approximately every two to three years and are rarely being used internally.
- The District has started using a tool called Moasure to measure landscape areas in the field. Data is manually compiled and can be exported in DWG and CSV format. The data is not able to be brought into GIS and georeferenced without manual effort and the establishment of common reference points at the time of capture.

- **Flume aggregated water consumption data** is purchased to identify and incentivize water-efficient device installation. WUE consumes this data (which splits indoor and outdoor water usage) for water usage and demand projections. Engineering would like to use the data for demand projections and board communication.
- **Agency water consumption data** lives in Excel format and is being used intermittently. The data is collected and used at least monthly for analysis, billing, and reporting.
- **Rebate program data** is currently extracted from the online platform and loaded into an old SQL database. This is accessed through a FORTEC front end to blend the Rebate program datasets (e.g., turf removal, spray to drip, smart timer, rotating nozzles, and rain barrel) into one master database; additional programs may be incorporated. FORTEC is considered difficult to navigate and export from. The data is not spatial but contains site address information, this is occasionally geocoded in batches by WUE staff when needed.
- **Evapotranspiration and spatial weather data** provided by CIMIS contains estimates of the loss of water to the atmosphere and is desired to be used for analysis by WUE and Metropolitan Issues (Water Resources).
- **Nonspatial legal data and documents** pertaining to infrastructure currently exist in Laserfiche. This source was reported as being difficult for extracting information.

2.7.5.1 Spatial Data Recommendations

22. Imagery data storage: Publish the existing aerial imagery to Esri Enterprise as cached map services for use as basemaps across the organization. Consider imagery analysis services.
23. Core GIS data storage: Initially the Esri Data Store can be used to store and manage core GIS data. Further evaluation is recommended to identify whether establishing an Enterprise Geodatabase is required to provide cross-database integration opportunities or to store data for specific use cases. Specific use cases can include lidar and the Conservation Framework data.
24. GIS Project File storage: Use the Esri Data Store or network storage for GIS project files rather than SharePoint. Configure ArcGIS Pro to use a default folder that is not synchronized with OneDrive or SharePoint for the best performance and safest operation. As the expectation is for the District to focus on a service-based editing architecture using ArcGIS Pro, this will primarily affect users conducting local data analysis and generating temporary data. Note that ArcGIS Pro does not natively support connecting to cloud storage services via a URL and it is recommended that OneDrive be set to keep files always on the device to minimize synchronization and performance issues.
25. External GIS Data Services: Establish a preference to use GIS REST Services to bring in external data (e.g., parcels, roads) for viewing purposes.
26. External GIS Data Sources: If necessary, establish automated periodic data downloads from external sources to store up-to-date versions on the server. This may be required if the District needs to maintain consistent data structures from disparate external sources, if there is a need to process the data (e.g., Census data) or integrate the data with other systems, or for offline use in the field.
27. Flume data: Evaluate data hosting and use for analysis, dashboards, and generating data visuals for communication of demand projections to the board.
28. Establish and document internal Moasure data capture standards, guidelines, and recommended procedures for exporting, georeferencing, and compiling the data. Establish training for internal staff, agencies, and contractors.

29. Use the WEROC data as the core infrastructure for the organization and make it available more widely available within MWDOC. Data views can be used to restrict access to sensitive information or features if necessary.
30. Consolidate existing GIS data as applicable, apply metadata, and make it available internally (and externally with appropriate controls as necessary).
31. Evaluate specific data workflows (spatial and nonspatial) for opportunities to optimize and automate.
32. Migrate existing and historical static datasets currently in PDFs and tabular format into GIS datasets where applicable.
33. Establish the feasibility of migrating the Rebate program database into a spatial format and storing it within Enterprise GIS. Explore potential to auto-geocode Rebate data and/or match to address as it comes in prior to data loading.
34. Document member data schemas to establish appropriate data conversion and consolidation approaches.
35. For datasets desired to be split/restricted per agency, include attributed information with agency details to allow data filtering/querying.
36. Establish a connection between spatial infrastructure data to agreement documents stored in Laserfiche. This may involve developing a dedicated GIS layer representing areas of document coverage, setting up a search, or making direct links from existing features.
37. Review existing AGO-hosted data and identify datasets that will be delivered from Enterprise or applications that should be hosted in Enterprise over AGO.

2.8 Departmental/Personnel Resources and Responsibilities

This section contains findings and recommendations for each of the departments interviewed at the District, along with a summary of the findings from member interviews. Recommendations that are applicable to all departments are given in the recommendation section immediately below. Each department may have additional recommendations specific to them.

The District has approximately 40 staff, with a mix of in-person and hybrid remote workers. Of these, two or three are regular GIS desktop users, with three field GIS users. Departmental responsibilities and personnel resources are detailed in the named sections below, with specific recommendations following each section where applicable. General departmental and personnel recommendations are consolidated in Section 2.8.1 below.

Overall, there is a desire to be able to do more GIS and data work in-house to speed up production time for mapping and data products. However, the District prefers not to have to increase full-time equivalent positions initially and works with consultants instead to obtain GIS resources but will consider hiring specialist GIS or data management staff when this can be justified. Overall, most MWDOC staff do not consider themselves GIS specialists.

CDR currently provides GIS analysis and data management capacity to MWDOC, predominantly the WEROC, Metropolitan Issues, and Engineering departments. The District requests an estimate for the work and formalizes it through a work order. While this has been working, there is a desire to do more work in-house to accelerate timelines. GIS-related work performed includes updating and developing political and agency boundaries and redistricting work, making maps for websites and communications, updating WEROC data and maps, generating graphics for reports, and conducting analyses including those for housing, land, population, infrastructure siting, and scenarios. Currently CDR provides a significant amount of the resources used for GIS within MWDOC.

The District operates a number of Shared Services programs, such as consumer confidence reports, leak detection, Conservation Framework compliance assistance, and Urban Water Management Plans. These programs are important to MWDOC member agencies as many have limited staff and technical resources to do this work internally. The District operates some of its programs through consultants, serving as the contract and program or project administrator, allowing the member to focus on providing data and working directly with the consultant. This framework has worked well to allow member agencies to take advantage of specialist expertise and resources at a reduced cost through the benefits of economies of scale.

2.8.1 Departmental/Personnel Recommendations

38. Capacity: Given the existing personnel resources, it is recommended to budget for mid-to-long-term on-call GIS consultant support to supply both technical expertise and capacity as required. The consultant should be able to provide Enterprise and AGO support, along with data processing, and technical assistance. This will be especially valuable for work that happens infrequently or requires advanced GIS knowledge.
39. Skill sets: To accelerate the ability to do work in-house, a GIS training plan with documentation should be developed for staff. This will help ensure that staff are able to operate effectively and provide a pathway to increased internal management of GIS data and analysis. Crosstrain specialist skills where possible.
40. Each department creating or managing data should document their processes and procedures in accordance with MWDOC data standards.
41. Consider having staff attend the annual Esri User Conference, Esri IMGIS Conference and/or the Esri SoCal Water Forum events for exposure to new ideas and technology, and as a training tool to broaden understanding of GIS use cases and advancements.
42. Identify appropriate partners and options for developing, administering and delivering a GIS Shared Services program, with the goal of providing GIS specialist capacity to member agencies.

2.8.2 Planning and Engineering

The department is responsible for long-term regional planning, including water demand forecasting and economic impacts. The department does not currently do its own GIS analysis and outsources map creation and data updates—including water infrastructure mapping, maintaining and updating service area boundaries, analysis and demographics—to CDR. The department primarily receives spatial data in KML format and uses Google Earth for viewing the data, which has limited functionality. Microsoft Excel is used for analysis.

Goals and expectations of the department include:

- Establish a baseline of accurate water infrastructure mapping for the county, including various department dependent layers (regional pipelines, service connects, water structures, member agency boundaries).
- Have in-house ability to update the Our Service Area webpage map.
- Ability to maintain geospatially accurate boundary data, especially for political and service area boundaries.
- Have the capability to manipulate and represent data effectively and accurately.
- Establish a connection between Laserfiche infrastructure information and the spatial data.
- Perform analysis of project demand forecasting and demand curve.

- Have the ability to analyze data using multiple programs.
- Ensure that the organization can maintain data integrity and quality control.
- Transition from Google Earth to Esri products.
- Streamline and increase efficiency of day-to-day tasks.
- Enhance communication with elected officials and member agencies via visuals and analysis results.
- Act as a data hub for member agencies lacking GIS tools.
- Fill gaps within missing map data.
- Improve response time to water quality issues by enhancing speed of data and figure updates.
- Establish a common platform for departmental data visibility and access, incorporating data ownership.
- Establish data-sharing agreements.
- Having the internal capability to create quick maps for alternative scenario discussions with member agencies.
- Improve operational management communications and coordination among wholesale and retail water agencies.
- Establish a Water Quality Data Platform to serve as a central hub for communicating timely water quality data between Metropolitan Water District and MWDOC member agencies.
- Serve as an information resource for Engineering staff for spatial and temporal information regarding water infrastructure and agreements including pipeline capacity rights, service connection agreements, operating agreements, operating bulletins, pipeline Operations & Maintenance features (i.e., blow-off locations, pressure control structures, hydraulic high/low points, residual parcel ownership along the Allen McColloch Pipeline, etc.)

Primary issues identified include:

- Extracting information from Laserfiche is difficult.
- It is difficult to maintain geospatially accurate boundary data, particularly political and service area boundaries.
- Outsourcing data and map work to CDR is a slow process and internal capabilities are important to develop.
- It is difficult to know of and access data in other departments.
- Google Earth data incompatibilities are inhibiting the capability for using and sharing data with the rest of the organization.
- Many maps, such as the Metropolitan Water District pipeline map, contain gaps in infrastructure.
- There is a need to improve response times to water quality issues by promptly updating data and figures.

Personnel

The Planning and Engineering department has two GIS users, primarily using Google Earth and a copy of the data provided in a KML format by CDR to view and explore. Users do not use ArcGIS Pro

or AGO, and do not edit the data. Google Earth is primarily used for referencing data provided by CDR and the creation of quick screen captures for discussion.

Data

The department does not create spatial or spatial-adjacent data. It primarily uses demographic data including historical population and housing estimates, water infrastructure and water projection data, political/agency boundaries and water provider service areas.

2.8.2.1 Engineering Recommendations

There are no separate departmental recommendations.

2.8.3 Water Use Efficiency

WUE develops, implements, and evaluates water use efficiency programs designed to improve water supply reliability for Orange County. The department manages water-savings rebate programs and offers incentives for turf replacement, high-efficiency irrigation retrofits, high-efficiency indoor water fixtures and appliances, industrial assistance, and potable-to-recycled water conversions. Additionally, the department offers programs to its member agencies to help support compliance with various legislation and other topical matters. The department applies for and manages state and federal funding to support its efforts, with additional tasks including invoicing funding sources, marketing, and reporting.

WUE acquires aerial imagery every two or three years and oversees Conservation Framework data being used by consultants for classifying and measuring mapped landscape areas, as well as Flume data for insights on water usage in home for indoor compared to outdoor usage. Member agencies conduct field data capture for landscape measurements, consisting of nonspatial measurements and photographs. The department uses AGO for geocoding address data and ArcGIS Pro for creating maps.

Goals and expectations of the department include:

- Expand their use of analytics and visualization tools including GIS, PowerBI, and data APIs.
- Develop internal analytical capabilities and ability to produce reports and maps for each agency to communicate efficiency program reach and impacts.
- Visualize and analyze benefits achieved through water use efficiency implementation (e.g., water savings, trees planted, etc.)
- Establish a way to consistently and reliably map the existing (or new) Rebate SQL database for use in analysis and marketing efforts to increase participation in the Rebate program.
- Incorporate GIS, the rebate programs, and their public interaction points more effectively.
- Better use spatial and reference data—such as aerial imagery, Conservation Framework data, and lidar data—for viewing and analysis internally.
- Ability to manage agency and external data (such as consumption data) and support data partitioning to control data access per agency.
- The ability to import, connect, and use external data sources (such as evapotranspiration rates, weather patterns, landscape change) for analysis. This may include live data feeds.
- Have an oversight of tree health for plantings in part of southern California's xeriscape initiatives.
- Convert Moasure landscape measurement data into spatial GIS data.

- Share rebate program information for internal agency statistical analysis.
- Establish a framework to view and analyze commercial, industrial, and institutional customer classifications.

Primary issues identified include:

- Limited GIS experience and outdated GIS skills among staff.
- Transitioning to Moasure device for calculating landscape areas. However, the Moasure data created is not geolocated by default.
- Rebate data is housed in an old SQL database format and not spatially enabled. The existing web interface is somewhat clunky, and the department has developed a PowerBI interface for reports and data exports. The database contains a user-entered address that may not be accurate or standardized. The existing website used to capture rebate applications may be changing within six to 12 months.
- Difficulty in accessing or consuming external data appropriately.
- Overall, the department has very large data storage requirements including aerial imagery and the Conservation Framework data stored in file geodatabases.
- Underutilization of Conservation Framework data in decision-making and reporting, currently have consultants using the data.
- The department would like to be able to do more analysis and visualization of the data to share with member agencies and assist with internal decision-making.

Personnel

The department has one primary GIS user who uses ArcGIS Pro and AGO to create basic maps for reports. Two WUE staff members have AGO logins, however one login is not being used. The department has interns who handle simple GIS tasks that require minimal guidance. In the future, two, or potentially three, GIS users will be responsible for editing and modifications to GIS data.

Data

The department periodically creates geocoded datasets from selected rebate data to display on a map. The majority of the department's data is currently handled in a tabular form.

2.8.3.1 Water Use Efficiency Recommendations

There are no separate departmental recommendations.

2.8.4 Emergency Management/WEROC

WEROC supports planning and emergency responses for 36 water and wastewater agencies in Orange County. The department facilitates multiagency coordination with its member agencies who may delegate authority to WEROC in case of emergencies. This agreement has been effective since the 1980s. A key component of this work is compiling agency data to provide a single infrastructure dataset for emergency response use. The department also provides logistical support to agencies, as well as situational awareness tools and access to key data through electronic and paper maps. The department is entirely dependent on outside data sources (including the agencies with which the department has agreements) and consultants to compile data. The department currently uses AGO to host data and maps.

Goals and expectations of the department include:

- Maintain accurate and comprehensive water and wastewater infrastructure data to support emergency response and provide enhanced situational awareness.
- Provide emergency response assistance for member agencies (e.g., coordination, data, tools).
- Increased access to data from external agencies and partners including county, health-care agencies, power, telecommunications, transportation, etc.
- Incorporation of regulatory oversight data (identifying who has authority in specific areas, i.e., Fish & Wildlife, EPA, Water Conservation Authority, etc.).
- The establishment of a defined data digitization process enhancing validation and accuracy.
- The ability to incorporate additional attributes to existing data.
- The ability to provide field tools to view infrastructure and related data, capture initial damage estimates and assessments, manage real-time data from the field, and enable agency feedback.
- Capability to quickly and easily produce map products, including infrastructure maps, map books and atlases, and scenario maps.
- Establish dashboards for internal and agency usage (e.g., weather, fire watch, flood).
- Create a comprehensive dashboard providing various partner data for emergencies (e.g., Do Not Drink, Boil Water).
- Ability for quick scenario sketching.
- Establish a firewall for different agency data to reflect specified datasets with WEROC as an admin user over common operating picture and collective data capture. Access to data must comply with existing NDAs.

Overall, a number of geospatial tools and resources are desired:

- Staff-specific applications such as structural assessments. GIS tools for mitigation, preparedness, and response.
- Automation to generate physical map books.
- External and in-house support for various GIS tasks.
- An application that pulls all relevant data into one spot. The ability to run queries on and visualize critical areas, hazards, demographics, socioeconomic, vulnerability data, etc. A lot of this data will need to be pre-built and maintained regularly or pulled in from external sources.
- The ability to pull up asset information and associated system data such as CityWorks, maintenance records, photos, and history.
- Incorporating real-time weather (radar) and air quality data from external sources.
- The ability to print in various formats and sizes.
- Provide public-facing data for communication.
- Provide simple emergency response data collection forms with the ability to quickly manage and publish this data in a crisis.
- In-field access to infrastructure data and emergency maps.

Primary issues identified include:

- Lack of general GIS knowledge and skills has delayed deployment of existing dashboards.
- Data accuracy is a concern.
- Desire additional attributes and data, particularly for hazardous materials.
- Workflow for fast map-making.
- Data portability is a concern due to GIS staff turnover at CDR.
- Data is digitized from scanned documents, which impacts accuracy.
- Agencies supply data in various ways (such as geodatabases, paper copies), which require compilation.

Personnel

The department has three staff members with varying levels of proficiency with GIS. Although they do not want to be GIS power users, they currently require additional training and support to effectively use tools such as existing dashboards. Staff have Survey123 experience through windshield surveys. GIS data work is currently outsourced to CDR, although the department would prefer to have a dedicated MWDOC GIS staff member to ensure data integrity and facilitate prompt updates to maps and data. There is a high level of reliance on CDR staff for GIS assistance. A primary concern for WEROC is to ensure access to water infrastructure data in the field and to provide informative maps and dashboards during emergencies. There are concerns about the accuracy of existing data, particularly regarding correct georeferencing of agency PDF data. Current maps lack detail and information due to the limited space available compared to electronic formats.

GIS is primarily used as a communication tool for the department. Staff create real-time information dashboards through CDR via Survey123 but not directly through MWDOC.

Data

The department has a Survey123 form and data is currently hosted in AGO.

2.8.4.1 Emergency Management/WEROC Recommendations

43. Establish standardized data schemas for existing and future datasets, particularly hazardous materials data.
44. Establish workflow and training using layout templates in ArcGIS Pro for quick map production.
45. Continue to host WEROC Emergency Response data and applications securely in AGO for resiliency. Test and training versions may be hosted in Enterprise.

2.8.5 Water Loss Control

WLC is the newest department to MWDOC, performing acoustic leak detections with three field technicians as part of a Shared Services Program. The department works closely with 25 different agencies by collecting file geodatabases and shapefiles. The department primarily uses ArcGIS Pro to prepare and publish data to AGO. Data is processed for planning and assigning fieldwork and is accessed by staff via Esri's Field Maps. Data in the field is collected using Esri's Survey123. MWDOC reports data collected to the agencies via Excel, Survey123, and dashboards. Esri Field Maps is also used to locate hydrants when performing pressure surveys using loggers.

Goals and expectations of the department include:

- Improving the sharing of statistical leak detection survey data with member agencies.

- The ability to offer GIS data capture capabilities to member agencies.
- Live feed of maps and data between field staff displaying progress.
- Improved visibility and easier reporting of weekly results to agency staff.
- Improving GIS data management and dashboards.
- Establish standardized processes and procedures and implement automation to reduce repetitive manual workflows.
- GIS training for staff to allocate key resources efficiently.

The department receives file geodatabases and GIS data from member agencies along with an indication of the work locations. The data is partitioned by staff to establish the weekly work list and uploaded to AGO. Field staff perform acoustic leak detection and collect data using Survey123 against the AGO-hosted datasets. MWDOC staff generate reports using a mixture of Microsoft Excel and Survey123, sending reports to the agency each week. An internal Excel dashboard detailing water savings from the program has been created for MWDOC executive use. A GIS dashboard has been recently developed to allow agencies to view live findings during leak detection operations; however, there has been a lack of interest in the dashboard by agencies due to login requirements.

As the group is out in the field and interacting with agency assets, the department is considering its capacity and ability to offer potential GIS-related field verification and update services; however, staff were concerned this may negatively impact their current leak detection pace.

Primary issues identified include:

- A new survey is created for each project from a template. Currently there is only one staff member who knows how to do this.
- Increased capacity to set up surveys and data collection.
- A lack of process and procedure documentation.
- Additional GIS training to better use the tools that they have.
- Lack of ability to see each other's fieldwork and coordinate progress.
- Concerns over staff safety as they work alone and there is little visibility in their locations.
- Staff often use temporary paper records and submit form data at the end of a session, which may make location less reliable.

Personnel

The department has one primary GIS user, and three field staff who use AGO, Field Maps, and Survey123 to conduct their Leak Detection program work. Five years' worth of leak detection data is being stored on AGO. No other personnel besides the primary GIS user are trained or capable of setting up GIS projects. Currently, there is reluctance for the primary user to play an administrative role for GIS in the department due to lack of time and higher priority tasks. There is also a lack of capacity to explore and improve processes or develop new analysis such as trends over time.

Data

Water loss detection data is collected in the field using Esri's Survey123 and stored on AGO. Data collected from member agencies is published and managed on AGO for use in Field Maps to assign and conduct fieldwork.

2.8.5.1 Water Loss Control Recommendations

46. Undertake a project to review departmental data and work planning for potential efficiency gains.
47. Undertake a project to streamline and automate weekly reporting of Leak Detection activity and results in conjunction with the dashboard.
48. Train additional staff to assist with key GIS tasks and workflows, especially setting up the data and Survey123 forms for each project.
49. Evaluate potential benefits and costs to developing new GIS focused services for member agencies (as requested or identified as suitable opportunities).

2.8.6 Metropolitan Issues (Water Resources)

Water Resources oversees water usage tracking for all MWDOC member agencies and three cities. The department implements water management plans and policies and processes meter reading data from Metropolitan Water District for monthly member agency invoices. The department currently outsources GIS analysis, map creation, and data updates to CDR. Data manipulation and analysis are primarily done using Microsoft Excel, with occasional use of Google Earth.

Goals and expectations of the department include:

- Display existing information with better data visualization and connection to geographic areas and projects.
- Ability to compare project effectiveness.
- Enhance communication with external parties.
- Transition paper data to digital.
- Create reports for member agencies, particularly invoicing for imported water. Eventually switching to shared web services with PowerBI.
- Ability to create simple maps displaying service areas, member agency locations, and infographics.
- Location-based mapping for meter locations with visuals of water flow between agencies.
- Ability to create high-level maps, interactive maps, and data for other agency use.
- Convert existing PDF master utility plan to a large GIS dataset that includes all member agency details for emergency response usage.
- Connect user and producer of water (e.g., link WUE and Water Resources data together).
- Display Local Resources Project, monthly production, and project life cycle data.
- Convert geographically referenced data into spatial data.
- Overlay data to display, measure, and compare program effectiveness.
- Convert the meter split process into a GIS format and include self-service components for member agencies contributions.
- Optimize and streamline invoices to member agencies to meet deadlines.

Primary issues identified include:

- Fieldwork entails meter reading, which presents a significant challenge regarding timing. Meter data is managed in Excel and split monthly by a single staff member to meet a tight invoice

deadline. The process of performing meter splits for shared service connections is complex and time-consuming.

- The timing of meter readings presents significant challenges, particularly from MWDOC's funding perspective. The department needs to optimize and streamline invoice processes to ensure timely payments to Metropolitan Water District.
- Inability to combine cross-departmental data hampers the full view of the resource.
- Additional GIS/data requests are forwarded to CDR for evaluation and can be a lengthy process if there is insufficient capacity to commence the work.
- The use of paper-based data is inefficient.
- There is heavy reliance on Excel spreadsheets for task and project tracking purposes.
- Metropolitan Water District connection data is accessed through Google Earth and is rarely being used.

Personnel

Staff are viewing and consuming GIS data rather than creating or updating it. GIS services are outsourced to CDR, mainly for map requests. One staff member reports foundational GIS knowledge and being comfortable making basic maps in the AGO environment. Staff also consume GIS data through Google Earth for service connections and mains. Most data-intensive tasks are conducted through Excel instead.

Data

All external data used is tabular rather than spatial.

2.8.6.1 Metropolitan Issues (Water Resources) Recommendations

There are no separate departmental recommendations.

2.8.7 Information Technology

IT staff are responsible for managing the network, servers, and computing resources for the organization. The department oversees security, documentation of authority, and responsibilities.

Goals and expectations of the department include:

- Identifying and addressing anticipated and required infrastructural needs.
- Providing sufficient computing power, storage displays, and other requirements to meet business needs.
- Reviewing and hardening cyber- and data security.
- Consolidation of hardware where needed.
- Hosting within Amazon Web Services (AWS) or Azure environment if possible.

With an upcoming server refresh, the department is currently evaluating infrastructure or hardware requirements and needs to know the likely GIS impacts. The department is responsible for cybersecurity and wants to ensure that documentation of authority, responsibilities, and system requirements are met. The department prefers using cloud providers, such as AWS or Azure, for computing needs and to reduce its on-premises and hardware footprint where practicable.

Primary issues identified include:

- Understanding the impact of any proposed GIS architecture on the IT plan to accommodate it successfully.

Personnel

Although IT staff are familiar with ArcGIS Pro and AGO, they do not regularly create or edit GIS data as part of their normal workflows. IT support is expected to primarily provide appropriate computing power and storage.

2.8.7.1 IT Recommendations

50. Training in GIS specific backups and system management as well as user administration if necessary.

2.8.8 Executive

The Executive group (management and the board) are particularly concerned with managing the overall direction and efficiency of the District and services offered to member agencies. No executives or board members were interviewed.

Personnel

The executives and directors do not have any GIS-related personnel resources and responsibilities. It is expected that MWDOC will replace or augment static PDF files with dashboards and other tools to provide key information in a user-friendly and interactive manner for improved communication, observability, and monitoring.

2.8.8.1 Executive Recommendations

51. Establish requirements for dashboards and summary tools for providing at-a-glance key data to executives and directors. These may be map-based or not, depending on the context, and include internal and external data as needed.

2.8.9 Member Agencies and Partners

A series of interviews were held with a set of the existing MWDOC member agencies and key partners, including CDR. The goal of the interviews was to establish a representative sample of member agency GIS capabilities, gather their opinions on priority factors and issues important to them, and identify key GIS-related factors that they felt MWDOC could provide a regional role in supporting. Member agency capabilities ranged from those that had an existing GIS program and were actively using GIS and advanced tools (such as the Utility Network) and those who had limited GIS capabilities or resources. While no recommendations are for the use of member agencies in this document, their feedback has been incorporated into the recommendations provided in the rest of the document.

The key insight is that extending MWDOC's existing regional leadership role to include GIS with a focus on interagency planning, collaboration and communication, and the establishment of a GIS Shared Services program, would be generally welcomed by member agencies.

A common theme heard throughout the interviews was:

- Member agencies are very appreciative of existing MWDOC programs (non-GIS) and assistance and value these highly.

- MWDOC is seen as a vital part of keeping member agencies up to date on regional issues and regulatory reporting requirements.
- MWDOC is seen as being a logical choice to play an important regional leadership role in technology and GIS.
- Access to demographic and community data was important to assist with grant applications.
- Many member agencies have limited GIS resources, and these may be further restricted by having part-time GIS responsibilities. Interviewees in general reported a lack of time and resources to do more with their GIS. GIS staff may be spread across different internal departments or consolidated in an organization-wide group such as IT. While some interviewees reported they are adding GIS resources, others mentioned that this would be difficult for them.
- Member agencies would like to have a clear description of the benefits and advantages of GIS associated projects, tools, and technology to get buy-in from board members.
- Infrastructure data security is a concern and consideration for member agencies, with differing opinions on the degree and importance.
- MWDOC data representing the interconnection between agencies is extremely valuable for the region as a whole.
- Asset management is the primary focus of each agency, with different degrees of sophistication. Agencies with asset management systems in place do use their GIS data, although agencies may be considering changing software in order to better use GIS and address shortcomings.
- GIS data is generally in a semi-standard format, such as an Esri Geometric network, and there is growing interest in migrating to the Esri Utility Network, with some member agencies already undergoing or planning a migration in the short-to-medium-term (i.e., one to two years).
- Member agencies have largely migrated to using newer Esri tools, such as ArcGIS Pro, with differing levels of comfort with the software reported. Some member agencies are using ArcGIS Enterprise and/or AGO.
- Data accuracy improvements are an important element of maintaining the current GIS data and improving its usefulness.
- Member agencies expressed the importance of documentation, data standards, and best practices, recognizing that they may need assistance developing these.
- Member agencies are often focused on creating map books and printed products for use in the field and emergency situations.
- Member agencies often use consultants for specific GIS projects.
- Member agencies currently work closely with county, city, and neighboring agencies with respect to GIS data and assistance.
- Member agencies expressed interest in secure data-sharing with MWDOC and are often sharing data directly with each other on request.
- Larger more sophisticated member agencies are currently supporting neighboring agencies with GIS and other tools where they have capacity to do so.

LIMITATIONS

The services undertaken in completing this report were performed consistent with generally accepted professional consulting principles and practices. No other warranty, express or implied, is made. These services were performed consistent with our agreement with our client. This report is solely for the use and information of our client unless otherwise noted. Any reliance on this report by a third party is at such party's sole risk.

Opinions and recommendations contained in this report apply to conditions existing when services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. We do not warrant the accuracy of information supplied by others, or the use of segregated portions of this report.

APPENDIX A

Table of Recommendations

Provided as a supplemental Excel document.

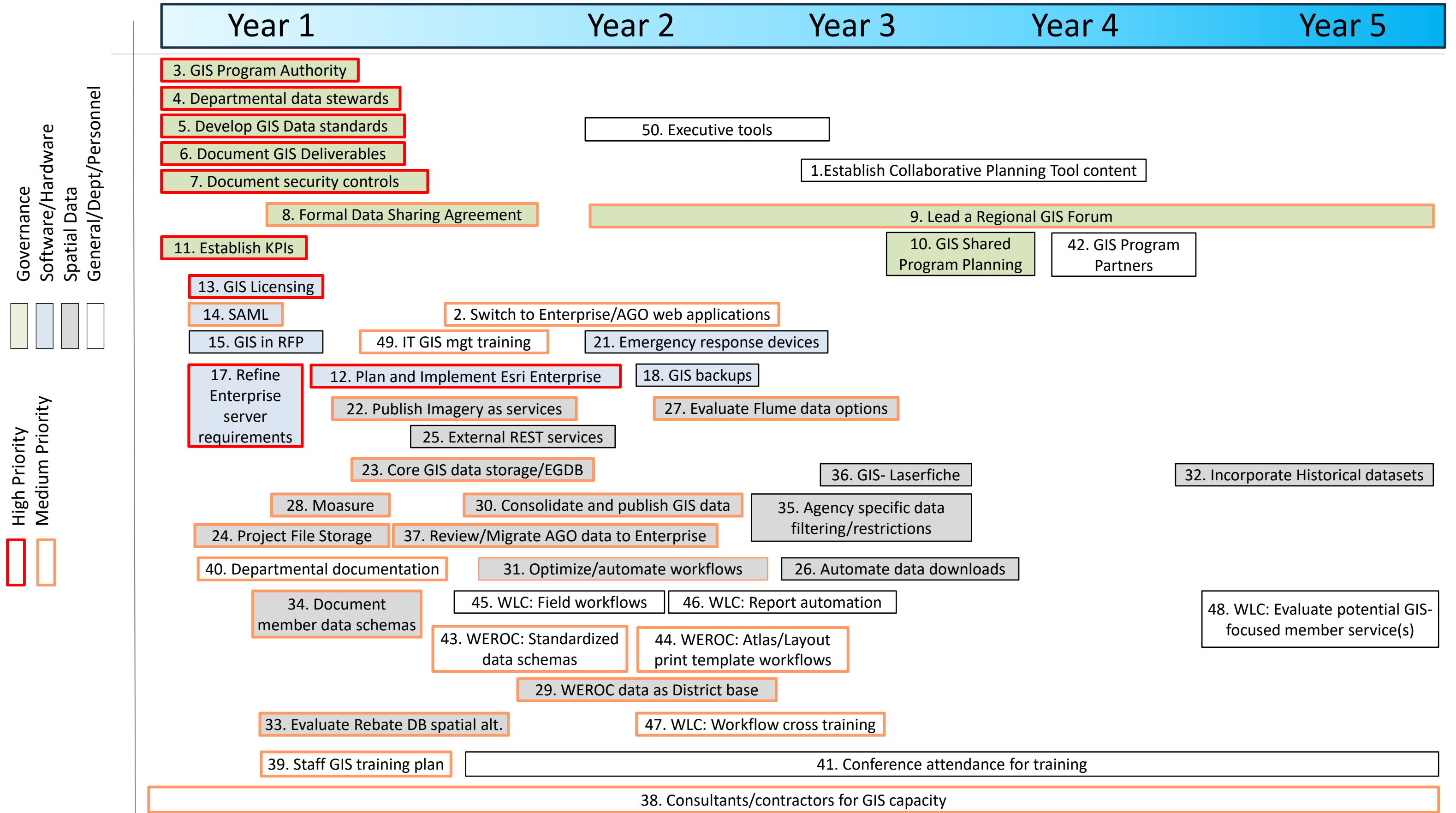


APPENDIX B

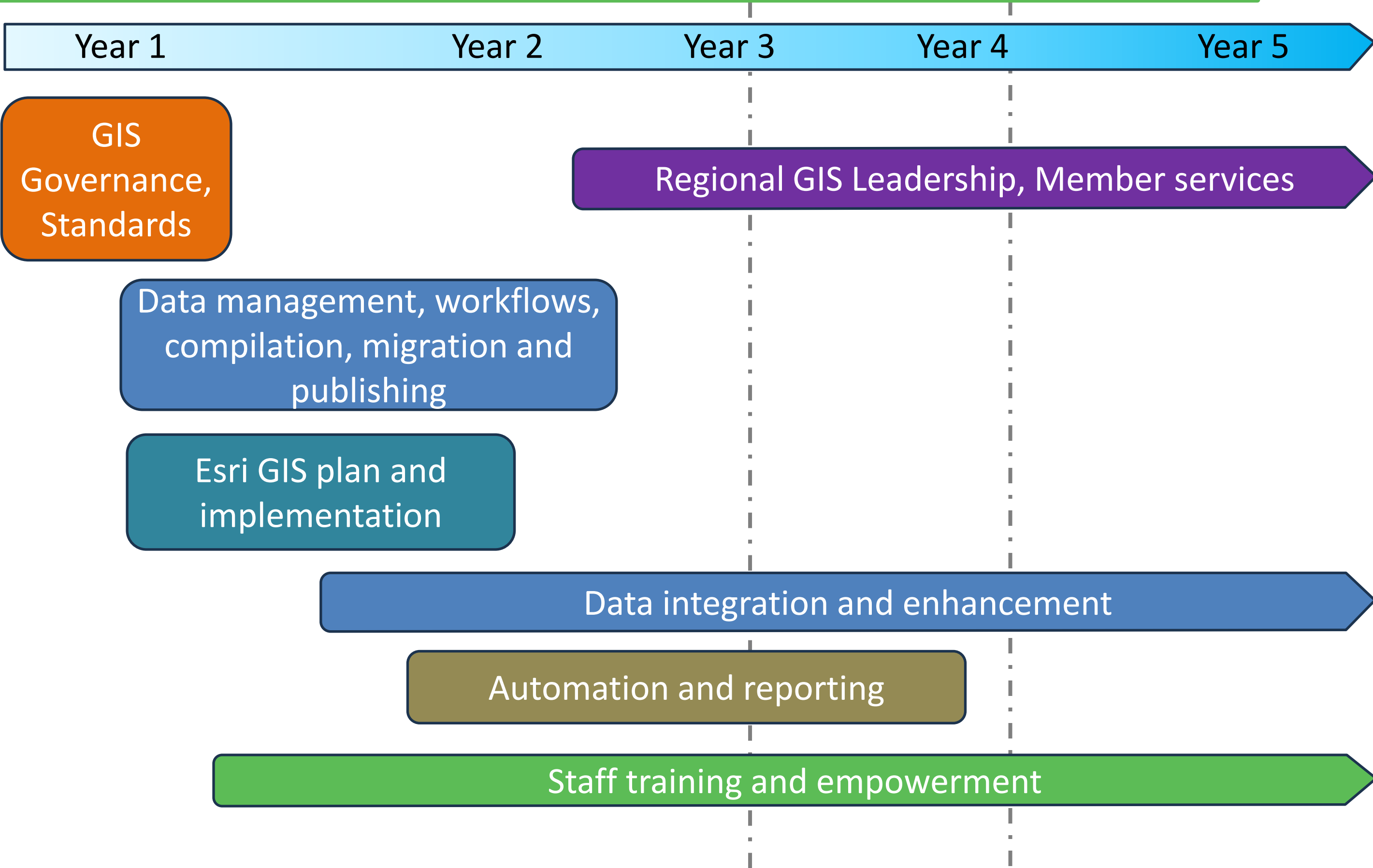
Road Map and Timeline



MWDOC 5-Year Road Map



MWDOC 5-Year Road Map





Attachment C – Standard MWDOC Professional Services Agreement

STANDARD AGREEMENT FOR CONSULTANT SERVICES

This **AGREEMENT** for consulting services dated [DATE], which includes all exhibits and attachments hereto, "**AGREEMENT**" is made on the last day executed below by and between **MUNICIPAL WATER DISTRICT OF ORANGE COUNTY**, hereinafter referred to as "**DISTRICT**," and [CONSULTANT] hereinafter referred to as "**CONSULTANT**" for [SCOPE], hereinafter referred to as "**SERVICES**."¹ **DISTRICT** and **CONSULTANT** are also referred to collectively herein as the "**PARTIES**" and individually as "**PARTY**". The **PARTIES** agree as follows:

I **PURPOSE AND SCOPE OF WORK**

A. Consulting Work

DISTRICT hereby contracts with **CONSULTANT** to provide general or special **SERVICES**, as more specifically set forth in **Exhibit "B"** attached hereto and incorporated herein, and in coordination with "**PARTICIPATING AGENCIES**", as more specifically defined by the List of Participating Agencies, attached as **Exhibit "C"**². Tasks other than those specifically described therein shall not be performed without prior written approval of **DISTRICT's** General Manager.

B. Independent Contractor

CONSULTANT is retained as an independent contractor for the sole purpose of rendering professional and/or special **SERVICES** described herein and is not an agent or employee of **DISTRICT**. **CONSULTANT** shall be solely responsible for the payment of all federal, state and local income tax, social security tax, Workers' Compensation insurance, state disability insurance, and any other taxes or insurance **CONSULTANT**, as an independent contractor, is responsible for paying under federal, state or local law. **CONSULTANT** is thus not eligible to receive workers' compensation, medical, indemnity or retirement benefits, including but not limited to enrollment in CalPERS. Unless, expressly provided herein, **CONSULTANT** is not eligible to receive overtime, vacation or sick pay. **CONSULTANT** shall not represent or otherwise hold out itself or any of its directors, officers, partners, employees, or agents to be an agent or employee of **DISTRICT**. **CONSULTANT** shall have the sole and absolute discretion in determining the methods, details and means of performing the **SERVICES** required by **DISTRICT**. **CONSULTANT** shall furnish, at his/her own expense, all labor, materials, equipment and transportation necessary for the successful completion of the **SERVICES** to be performed under this **AGREEMENT**. **DISTRICT** shall not have any right to direct the methods, details and means of the **SERVICES**; however, **CONSULTANT** must receive prior written approval from **DISTRICT** before using any sub-consultants for **SERVICES** under this **AGREEMENT**. **CONSULTANT** will determine whether **SERVICES** implicate prevailing wage and if so, pay the applicable prevailing wage rate for all work and comply with all other requirements of the prevailing wage law.

CONSULTANT represents and warrants that in the process of hiring **CONSULTANT's** employees who participate in the performance of **SERVICES**, **CONSULTANT** conducts such lawful screening of those employees (including, but not limited to, background checks and Megan's Law reviews) as are appropriate and standard for employees who provide **SERVICES** of the type contemplated by this Agreement.

¹ Pursuant to Section 8002 of the District's Administrative Code, the District's "Ethics Policy" set forth at sections 7100-7111 of the Administrative Code is attached hereto as Exhibit "A" and incorporated herein by this reference.

² The **PARTIES** acknowledge that the list of **PARTICIPATING AGENCIES** as set forth in **Exhibit "C"** is subject to modification.

C. **Changes in Scope of Work**

If **DISTRICT** requires changes in the tasks or scope of work shown in **Exhibit "B"** or additional work not specified therein, **DISTRICT** shall prepare a written change order. If **CONSULTANT** believes work or materials are required outside the tasks or scope of work described in **Exhibit "B,"** it shall submit a written request for a change order to the **DISTRICT**. A change order must be approved and signed by the **PARTIES** before **CONSULTANT** performs any work outside the scope of work shown in **Exhibit "B."** **DISTRICT** shall have no responsibility to compensate **CONSULTANT** for such work without an approved and signed change order. Change orders shall specify the change in the budgeted amount for **SERVICES**.

II **TERM**

This **AGREEMENT** shall commence upon the date of its execution and shall extend thereafter for the period specified in **Exhibit "B"** or, if no time is specified, until terminated on thirty (30) days notice as provided herein.

III **BUDGET, FEES, COSTS, BILLING, PAYMENT AND RECORDS**

A. **Budgeted Amount for Services**

CONSULTANT is expected to complete all **SERVICES** within the Budgeted Amount set forth on **Exhibit "B."** The total compensation for the **SERVICES** to be performed under this **AGREEMENT** shall not exceed the Budgeted Amount unless modified as provided herein. Upon expending and invoicing the **DISTRICT 80%** of the Budgeted Amount, **CONSULTANT** shall prepare and provide to **DISTRICT** a "cost to complete" estimate for the remaining **SERVICES**. The **PARTIES** shall work together to complete the project within the agreed-upon Budgeted Amount, but the obligation to complete the **SERVICES** within the Budgeted Amount lies with the **CONSULTANT**.

B. **Fees**

Fees shall be billed per the terms and conditions and at the rates set forth on **Exhibit "B"** for the term of the **AGREEMENT**. Should the term of the **AGREEMENT** extend beyond the period for which the rates are effective, the rates specified in **Exhibit "B"** shall continue to apply unless and until modified by consent of the **PARTIES**.

C. **Notification Clause**

Formal notices, demands and communications to be given hereunder by either **PARTY** shall be made in writing and may be effected by personal delivery or by registered or certified mail, postage prepaid, return receipt requested and shall be deemed communicated as of the date of mailing. If the name or address of the person to whom notices, demands or communication shall be given changes, written notice of such change shall be given, in accordance with this section, within five (5) working days.

Notices shall be made as follows:

Municipal Water District of Orange County
Harvey De La Torre
General Manager
18700 Ward Street, P.O. Box 20895
Fountain Valley, CA 92708

D. Billing and Payment

CONSULTANT's fees shall be billed by the 25th day of the month for the previous month's activities. Invoices received by the 25th day of the month will be paid by **DISTRICT** by the end of the following month. Invoices shall reference the Purchase Order number from **DISTRICT**.

DISTRICT shall review and approve all invoices prior to payment. **CONSULTANT** agrees to submit additional supporting documentation to support the invoice if requested by **DISTRICT**. If **DISTRICT** does not approve an invoice, **DISTRICT** shall send a notice to **CONSULTANT** setting forth the reason(s) the invoice was not approved. **CONSULTANT** may re-invoice **DISTRICT** to cure the defects identified in the **DISTRICT** notice. The revised invoice will be treated as a new submittal. If **DISTRICT** contests all or any portion of an invoice, **DISTRICT** and **CONSULTANT** shall use their best efforts to resolve the contested portion of the invoice.

E. Billing Records

CONSULTANT shall keep records of all **SERVICES** and costs billed pursuant to this **AGREEMENT** for at least a period of seven (7) years and shall make them available for review and audit if requested by **DISTRICT**.

IV DOCUMENTS

All **MATERIALS** as defined in Paragraph XI below, related to **SERVICES** performed under this **AGREEMENT** shall be furnished to **DISTRICT** upon completion or termination of this **AGREEMENT**, or upon request by **DISTRICT**, and are the property of **DISTRICT**.

V TERMINATION

DISTRICT may terminate this **AGREEMENT** at any time upon thirty (30) days written notice to **CONSULTANT**, except as provided otherwise in **Exhibit "B."** In the event of termination: (1) all work product prepared by or in custody of **CONSULTANT** shall be promptly delivered to **DISTRICT**; (2) **DISTRICT** shall pay **CONSULTANT** all payments for services performed and due under this **AGREEMENT** on the effective date of termination; (3) **CONSULTANT** shall promptly submit a final invoice to the **DISTRICT**, which shall include any and all non-cancelable obligations owed by **CONSULTANT** at the time of termination, (4) neither **PARTY** waives any claim of any nature whatsoever against the other for any breach of this **AGREEMENT**; and; (5) **DISTRICT** may withhold 125 percent of the estimated value of any disputed amount pending resolution of the dispute, consistent with the provisions of section III D above, and; (6) **DISTRICT** and **CONSULTANT** agree to exert their best efforts to expeditiously resolve any dispute between the **PARTIES**.

VI INSURANCE REQUIREMENTS

CONSULTANT shall obtain prior to commencing work and maintain in force and effect throughout the term of this **AGREEMENT**, all insurance set forth below.

A. Workers' Compensation Insurance

By his/her signature hereunder, **CONSULTANT** certifies that he/she is aware of the provisions of Section 3700 of the California Labor Code, which requires every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that code, and that **CONSULTANT** will comply with such provisions before commencing the performance of the **SERVICES** under this **AGREEMENT**.

CONSULTANT and sub-consultant will keep workers' compensation insurance for their employees in effect during all work covered by this **AGREEMENT** in accordance with applicable law. An ACORD certificate of insurance or other certificate of insurance satisfactory to **DISTRICT**, evidencing such coverage must be provided (1) by **CONSULTANT** and (2) by sub-consultant's upon request by **DISTRICT**.

B. Professional Liability Insurance

CONSULTANT shall file with **DISTRICT**, before beginning professional **SERVICES**, an ACORD certificate of insurance, or any other certificate of insurance satisfactory to **DISTRICT**, evidencing professional liability coverage of not less than \$1,000,000 per claim and \$1,000,000 aggregate, requiring 30 days notice of cancellation (10 days for non-payment of premium) to **DISTRICT**.

Such coverage shall be placed with a carrier with an A.M. Best rating of no less than A: VII, or equivalent. The retroactive date (if any) of such insurance coverage shall be no later than the effective date of this **AGREEMENT**. In the event that the **CONSULTANT** employs sub-consultants as part of the **SERVICES** covered by this **AGREEMENT**, **CONSULTANT** shall be responsible for requiring and confirming that each sub-consultant meets the minimum insurance requirements specified herein.

C. Other Insurance

CONSULTANT will file with **DISTRICT**, before beginning professional **SERVICES**, ACORD certificates of insurance, or other certificates of insurance satisfactory to **DISTRICT**, evidencing general liability coverage of not less than \$1,000,000 per occurrence for bodily injury, personal injury and property damage; automobile liability (owned, scheduled, non-owned or hired) of at least \$1,000,000 for bodily injury and property damage each accident limit; workers' compensation (statutory limits) and employer's liability (\$1,000,000) (if applicable); requiring 30 days (10 days for non payment of premium) notice of cancellation to **DISTRICT**. For the coverage required under this paragraph, the insurer(s) shall waive all rights of subrogation against **DISTRICT**, its Directors, officers, agents, employees, attorneys, consultants or authorized volunteers, and the **PARTICIPATING AGENCIES**. **CONSULTANT's** insurance coverage shall be primary insurance as respects **DISTRICT**, its Directors, officers, agents, employees, attorneys, consultants and authorized volunteers, and the **PARTICIPATING AGENCIES**, for all liability arising out of the activities performed by or on behalf of the **CONSULTANT**. Any insurance pool coverage, or self-insurance maintained by **DISTRICT**, its Directors, officers, agents, employees, attorneys, consultants or volunteers, and the **PARTICIPATING AGENCIES**, shall be excess of the **CONSULTANT's** insurance and shall not contribute to it.

The general liability coverage shall give **DISTRICT**, its Directors, officers, agents, employees, attorneys, consultants and authorized volunteers, and the **PARTICIPATING AGENCIES** additional insured status using ISO endorsement CG2010, CG2033, or equivalent. Coverage shall be placed with a carrier with an A.M. Best rating of no less than A: VII, or equivalents. In the event that the **CONSULTANT** employs sub-consultant as part of the work covered by the **AGREEMENT**, it shall be the **CONSULTANT's** responsibility to require and confirm that each sub-consultant meets the minimum insurance requirements specified herein.

D. **Expiration of Coverage**

If any of the required coverages expire during the term of the **AGREEMENT**, **CONSULTANT** shall deliver the renewal certificate(s) including the general liability additional insured endorsement to **DISTRICT** at least ten (10) days prior to the expiration date.

VII **INDEMNIFICATION**

To the fullest extent permitted by applicable law, **CONSULTANT** shall indemnify, defend and hold harmless **DISTRICT**, its Directors, officers, agents, employees, attorneys, consultants and authorized volunteers, the **PARTICIPATING AGENCIES**, and each of them from and against all third party actions, proceedings, damages, costs, expenses, penalties or liabilities, in law or equity, of every kind or nature whatsoever, including reasonable legal fees and costs, arising out of, resulting from, or on account of **CONSULTANT's** or its officials, officers, employees, subcontractors, consultants, or agents' performance of **SERVICES** under this agreement, including but not limited to:

- a. Any and all actions, proceedings, damages, costs, expenses, penalties or liabilities, in law or equity, of every kind or nature whatsoever, arising out of, resulting from, or on account of the violation of any governmental law or regulation, compliance with which is the responsibility of **CONSULTANT**.
- b. Any and all losses, expenses, damages (including damages to the work itself), attorney's fees incurred by counsel of the **DISTRICT's** choice and other costs, including all costs of defense, which any of them may incur with respect to the failure, neglect, or refusal of **CONSULTANT** to faithfully perform the work and all of the **CONSULTANT's** obligations under the agreement. Such costs, expenses, and damages shall include all costs, including attorneys' fees, incurred by counsel of the **DISTRICT's** choice, incurred by the indemnified parties in any lawsuit to which they are a party.

When the law establishes a professional standard of care for the **CONSULTANT's** services, all claims and demands of all persons that arise out of, pertain to, or relate to the **CONSULTANT's** negligence, recklessness or willful misconduct in the performance (or actual or alleged non-performance) of the work under this agreement, **CONSULTANT** shall defend itself against any and all liabilities, claims, losses, damages, and costs arising out of or alleged to arise out of **CONSULTANT's** performance or non-performance of the **SERVICES** hereunder, and shall not tender such claims to **DISTRICT**, its Directors, officers, employees, attorneys, consultants or authorized volunteers, nor to any **PARTICIPATING AGENCY** in contract with **DISTRICT** for **CONSULTANT's SERVICES**, for defense or indemnity.

CONSULTANT shall immediately defend, at **CONSULTANT's** own cost, expense and risk, any and all such aforesaid suits, actions, or other legal proceedings of every kind that may be brought or instituted against **DISTRICT** or its Directors, officers, employees, attorneys, consultants, or authorized volunteers with legal counsel reasonably acceptable to **DISTRICT**, and shall not tender such claims to **DISTRICT** nor its directors, officers, employees, or authorized volunteers.

CONSULTANT shall immediately pay and satisfy any judgment, award or decree that may be rendered against **DISTRICT** or its Directors, officers, employees, attorneys, consultants, or authorized volunteers, in any and all such suits, actions, or other legal proceedings.

CONSULTANT shall immediately reimburse **DISTRICT** or its Directors, officers, employees, attorneys, consultants, or authorized volunteers, for any and all legal expenses and costs incurred by each of them in connection therewith or in enforcing indemnity herein provided.

CONSULTANT's obligation to indemnify shall survive the termination or completion of this agreement for the full period of time allowed by law and shall not be restricted to insurance proceeds, if any, received by **DISTRICT**, the **PARTICIPATING AGENCIES**, or its Directors, officers, employees, attorneys, consultants, or authorized volunteers.

Notwithstanding anything to the contrary in this Agreement, **CONSULTANT** is not obligated to indemnify, hold harmless, or defend **DISTRICT** or a **PARTICIPATING AGENCY** against any claim (whether direct or indirect) if such claim or corresponding loss arises out of or result from, **DISTRICT's**: (1) sole or active negligence or more culpable act or omission (including recklessness or willful misconduct); (2) bad faith failure to comply with any of its obligations set forth in this Agreement; or (3) use of the deliverables in any manner that does not materially conform with the usage instructions, or guidelines, or specifications.

VIII FINANCIAL DISCLOSURE AND CONFLICTS OF INTEREST

Although **CONSULTANT** is retained as an independent contractor, **CONSULTANT** may still be required, under the California Political Reform Act and **DISTRICT's** Administrative Code, to file annual disclosure reports. **CONSULTANT** agrees to file such financial disclosure reports upon request by **DISTRICT**. Further, **CONSULTANT** shall file the annual summary of gifts required by Section 7105 of the **DISTRICT's** Ethics Policy, attached hereto as **Exhibit "A."**

Failure to file financial disclosure reports upon request and failure to file the required gift summary are grounds for termination of this **AGREEMENT**. Any action by **CONSULTANT** that is inconsistent with **DISTRICT's** Ethics Policy current at the time of the action is grounds for termination of this **AGREEMENT**. The Ethics Policy as of the date of this **AGREEMENT** is attached hereto as **Exhibit "A."**

IX PERMITS AND LICENSES

CONSULTANT shall procure and maintain all permits, licenses and other government-required certification necessary for the performance of its **SERVICES**, all at the sole cost of **CONSULTANT**. None of the items referenced in this section shall be reimbursable to **CONSULTANT** under the **AGREEMENT**. **CONSULTANT** shall comply with any and all applicable local, state, and federal regulations and statutes including Cal/OSHA requirements.

X LABOR AND MATERIALS

CONSULTANT shall furnish, at its own expense, all labor, materials, equipment, tools, transportation and other items or services necessary for the successful completion of the **SERVICES** to be performed under this **AGREEMENT**. **CONSULTANT** shall give its full attention and supervision to the fulfillment of the provisions of this **AGREEMENT** by its employees and sub-consultant and shall be responsible for the timely performance of the **SERVICES** required by this **AGREEMENT**. All compensation for **CONSULTANT's** **SERVICES** under this **AGREEMENT** shall be pursuant to **Exhibit "B"** to the **AGREEMENT**.

Only those **SERVICES**, materials, administrative, overhead and travel expenses specifically listed in **Exhibit "B"** will be charged and paid. No other costs will be paid. **CONSULTANT** agrees not to invoice **DISTRICT** for any administrative expenses, overhead or

travel time in connection with the **SERVICES**, unless agreed upon and listed in Exhibit “B”.

XI CONFIDENTIALITY AND RESTRICTIONS ON DISCLOSURE

A. Confidential Nature of Materials

CONSULTANT understands that all documents, records, reports, data, or other materials (collectively “**MATERIALS**”) provided by **DISTRICT** and **PARTICIPATING AGENCIES** to **CONSULTANT** pursuant to the **AGREEMENT**, including but not limited to draft reports, final report(s) and all data, information, documents, graphic displays and other items that are not proprietary to **CONSULTANT** and that are utilized or produced by **CONSULTANT** pursuant to the **AGREEMENT** are to be considered confidential for all purposes.

B. No Disclosure of Confidential Materials

CONSULTANT shall be responsible for protecting the confidentiality and maintaining the security of **DISTRICT MATERIALS** and records in its possession. All **MATERIALS** shall be deemed confidential and shall remain the property of **DISTRICT** and **PARTICIPATING AGENCIES**. **CONSULTANT** understands the sensitive nature of the above and agrees that neither its officers, partners, employees, agents or sub-consultants will release, disseminate, or otherwise publish said reports or other such data, information, documents, graphic displays, or other materials except as provided herein or as authorized, in writing, by **DISTRICT’s** representative and the **PARTICIPATING AGENCY’s** representative. **CONSULTANT** agrees not to make use of such **MATERIALS** for any purpose not related to the performance of the **SERVICES** under the **AGREEMENT**. **CONSULTANT** shall not make written or oral disclosures thereof, other than as necessary for its performance of the **SERVICES** hereunder, without the prior written approval of **DISTRICT** and the **PARTICIPATING AGENCY**. Disclosure of confidential **MATERIALS** shall not be made to any individual, agency, or organization except as provided for in the **AGREEMENT** or as provided for by law.

C. Protections to Ensure Control Over Materials

All confidential **MATERIALS** saved or stored by **CONSULTANT** in an electronic form shall be protected by adequate security measures to ensure that such confidential **MATERIALS** are safe from theft, loss, destruction, erasure, alteration, and any unauthorized viewing, duplication, or use. Such security measures shall include, but not be limited to, the use of current virus protection software, firewalls, data backup, passwords, and internet controls.

The provisions of this section survive the termination or completion of the **AGREEMENT**.

XII OWNERSHIP OF DOCUMENTS AND DISPLAYS

All original written or recorded data, documents, graphic displays, reports or other **MATERIALS** which contain information relating to **CONSULTANT’s** performance hereunder and which are originated and prepared for **DISTRICT** and **PARTICIPATING AGENCIES** pursuant to the **AGREEMENT** are instruments of service and shall become the property of **DISTRICT** and **PARTICIPATING AGENCIES** upon completion or termination of the Project. **CONSULTANT** hereby assigns all of its right, title and interest therein to **DISTRICT** and **PARTICIPATING AGENCIES**, including but not limited to any copyright interest. In addition, **DISTRICT** and **PARTICIPATING AGENCIES** reserve the right to use, duplicate and disclose in whole, or in part, in any manner and for any purpose whatsoever all such data, documents, graphic displays, reports or other **MATERIALS** delivered to **DISTRICT** and **PARTICIPATING AGENCIES** pursuant to this **AGREEMENT** and to authorize others to do so. Reuse of documents by **DISTRICT** or others on extensions or modifications of this project or on other

sites or use by others on this project, shall be at the user's sole risk, without liability to **CONSULTANT**.

To the extent that **CONSULTANT** utilizes any of its property (including, without limitation, any hardware or software of **CONSULTANT** or any proprietary or confidential information of **CONSULTANT** or any trade secrets of **CONSULTANT**) in performing **SERVICES** hereunder, such property shall remain the property of **CONSULTANT**, and **DISTRICT** and **PARTICIPATING AGENCIES** shall acquire no right or interest in such property.

CONSULTANT hereby assigns to **DISTRICT**, **PARTICIPATING AGENCIES** or its designee, for no additional consideration, all **CONSULTANT**'s intellectual property rights, including, but not limited to, copyrights, in all deliverables and other works prepared by the **CONSULTANT** under this agreement. **CONSULTANT** shall, and shall cause its employees and agents to, promptly sign and deliver any documents and take any actions that **DISTRICT**, **PARTICIPATING AGENCIES**, or its designee reasonably requests to establish and perfect the rights assigned to **DISTRICT**, **PARTICIPATING AGENCIES** or its designee under this provision.

XIII EQUAL OPPORTUNITY

DISTRICT is committed to a policy of equal opportunity for all and to providing a work environment that is free of unlawful discrimination and harassment. In keeping with this commitment, **DISTRICT** maintains a policy prohibiting unlawful discrimination and harassment in any form based on race, religious creed, color, national origin, ancestry, physical or mental disability, medical condition, pregnancy or childbirth, marital status, gender, sex, sexual orientation, veteran status or age by officials, employees and non-employees (vendors, contractors, etc.).

This policy applies to all employees, consultants and contractors of the **DISTRICT**. Appropriate corrective action will be taken against all offenders, up to and including immediate discharge or termination of this **AGREEMENT**. During, and in conjunction with, the performance of this **AGREEMENT**, **CONSULTANT** shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, age, marital status or national origin.

XIV INTEGRATION OF ALL OTHER AGREEMENTS

This **AGREEMENT**, including any Exhibits and Addenda, contains the entire understanding of the **PARTIES**, and there are no further or other agreements or understandings, written or oral, in effect between the **PARTIES** hereto relating to the subject matter hereof. Any prior understanding or agreement of the **PARTIES** shall not be binding unless expressly set forth herein and, except to the extent expressly provided for herein, no changes of this **AGREEMENT** may be made without the written consent of both **PARTIES**.

XV ELECTRONIC SIGNATURES

The Uniform Electronic Transactions Act, California Civil Code section 1633.1 et seq., authorizes **PARTIES** to conduct business electronically. In accordance with California Civil Code section 1633.5, **PARTIES** acknowledge, consent and agree that transactions subject to this **AGREEMENT** may be effectuated by electronic means through the use of electronic and/or digital signatures. For purposes of this section, an electronic signature means an electronic symbol or process logically associated with the intent to sign an electronic record pursuant to Civil Code section 1633(h). A digital signature, which is a type of electronic signature, means an electronic identifier, created by a computer, that is intended to have the same force and effect as the use of a manual signature under Government Code 16.5(d). An example of an electronic signature would be a JPG of a manual signature imposed onto this **AGREEMENT**, an

example of a digital signature would be the use of DocuSign or similar provider that requires an encrypted key that certifies the authenticity of the signature.

This consent to conduct transactions by electronic means through the use of electronic and/or digital signatures extends to the execution of this **AGREEMENT** or any related contract or other document necessary for the performance of this **AGREEMENT** including, without limitation, any related offers, proposals, bids, amendments, change orders, task orders and notices.

XVI ATTORNEYS' FEES

In any action at law or in equity to enforce any of the provisions or rights under this **AGREEMENT**, the prevailing **PARTY** shall be entitled to recover from the unsuccessful **PARTY** all costs, expenses and reasonable attorney's fees incurred therein by the prevailing **PARTY** as determined by a court of competent jurisdiction.

XVII JURISDICTION AND VENUE SELECTION

In all matters concerning the validity, interpretation, performance, or effect of this **AGREEMENT**, the laws of the State of California shall govern and be applicable. The **PARTIES** hereby agree and consent to the exclusive jurisdiction of the courts of the State of California and that venue of any action brought hereunder shall be in Orange County, California.

IN WITNESS WHEREOF, the **PARTIES** have hereunto affixed their names as of the day and year thereafter, which shall be and is the effective date of this **AGREEMENT**.

APPROVED BY:

Date _____

CONSULTANT ACCEPTANCE:

Date _____

Date _____

Harvey De La Torre
General Manager
Municipal Water District of Orange County
18700 Ward Street, Unit B
P.O. Box 20895
Fountain Valley, CA 92708
(714) 963-3058

Internal Use Only:

Program No. _____

Line Item: _____

Funding Year: _____

Contract Amt.: _____

Purchase Order # _____

EXHIBIT "A"

ETHICS POLICY	§7100-§7110
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§7100 PURPOSE

The policy of MWDOC is to maintain the highest standards of ethics from its Board members, officers and employees (all shall be referred to as employees for the purposes of this section). The proper operation of MWDOC requires decisions and policy to be made in the proper manner, that public office not be used for personal gain, and that all individuals associated with MWDOC remain impartial and responsible toward the public. Accordingly, all employees are expected to abide by the highest ethical standards and integrity when dealing on behalf of MWDOC with fellow Board members or employees, vendors, contractors, customers, and other members of the public.

§7101 RESPONSIBILITIES OF BOARD MEMBERS

Board members are obliged to uphold the Constitution of the United States and the Constitution of the State of California and shall comply with all applicable laws regulating Board member conduct, including conflicts of interest and financial disclosure laws. No Board member or officer shall grant any special consideration, treatment, or advantage to any person or group beyond that which is available to every other person or group in the same circumstances.

§7102 PROPER USE OF MWDOC PROPERTY AND RESOURCES

Except as specifically authorized, no employee shall use or remove or permit the use or removal of MWDOC property, including MWDOC vehicles, equipment, telephones, office supplies, and materials for personal convenience or profit. No employee shall require another MWDOC employee to perform services for the personal convenience or profit of another employee. Each employee must protect and properly use any MWDOC asset within his/her control, including information recorded on paper or in electronic form. Employees shall safeguard MWDOC property, equipment, monies, and assets against unauthorized use or removal, as well as from loss due to criminal act or breach of trust.

Employees are responsible for maintaining written records, including expense reports, in sufficient detail to reflect accurately and completely all transactions and expenditures made on MWDOC's behalf. Creating a document with misleading or false information is prohibited.

Motion - 1/17/96;

§7103 CONFLICT OF INTEREST

All MWDOC Directors, officers, and employees at every level shall comply with the requirements of Section 1090 of the California Government Code which prohibits such persons from being financially interested in any contract made by them in their official

capacity, or by any body or board of which they are members, or from being a purchaser at any sale or a vendor at any purchase made by them in their official capacity.

All Directors and employees designated under MWDOC's Conflict of Interest Code ("designated employees") and employees required to report under Chapter 7, Article 2 of the Political Reform Act (Government Code Section 7300 et seq.) shall promptly and fully comply with all requirements thereof.

MWDOC employees who are not designated employees under MWDOC's Conflict of Interest Code shall refrain from participating in, making a recommendation, or otherwise attempting to influence MWDOC's selection of a contractor, consultant, product, or source of supply if the non-designated employee, or an immediate family member, has a direct or indirect financial interest in the outcome of the selection process. No employee shall use his/her position with MWDOC in any manner for the purpose of obtaining personal favors, advantages or benefits for him/herself or an immediate family member from a person or entity doing business or seeking to do business with MWDOC. Such favors, advantages, or benefits would include, but are not limited to: 1) offers of employment; 2) free or discounted goods or services; or 3) gifts.

§7104 GIFTS

No employee shall accept, directly or indirectly, any compensation, reward or gift from any source except from MWDOC, for any action related to the conduct of MWDOC business, except as set forth below:

1. Acceptance of food and refreshments of nominal value on infrequent occasions in the ordinary course of a breakfast, luncheon or dinner meeting or other meeting or on an inspection tour where the arrangements are consistent with the transaction of official business.*
2. Acceptance of transportation, lodging, meals or refreshments, in connection with attendance at widely attended gatherings sponsored by industrial, technical or professional organizations; or in connection with attendance at public ceremonies or similar activities financed by nongovernmental sources where the employee's participation on behalf of MWDOC is the result of an invitation addressed to him or her in his/her official capacity, and the transportation, lodging, meals or refreshment accepted is related to, and is in keeping with, his/her official participation.*
3. Acceptance of unsolicited advertising or promotional materials such as pens, pencils, note pads, calendars, or other items of nominal value.*
4. Acceptance of plaques and commemorative mementoes, of nominal value, or of value only to the recipient, such as service pins, recognition awards, retirement mementoes.
5. Acceptance of incidental transportation from a private organization, provided it is furnished in connection with an employee's official duties and is of the type customarily provided by the private organization.

* Nothing herein shall be deemed to relieve any Director or designated employee from reporting the value of such meals, transportation, lodging or gifts and abstaining from

participation in any decision of MWDOC which could foreseeably have a material financial effect on the donor when the value of such gifts reaches the limits set forth in MWDOC's Conflict of Interest Code and the Political Reform Act.

In no event shall any employee accept gifts from any single source, the cumulative value of which exceeds the applicable gift limit under California law.

A gift or gratuity, the receipt of which is prohibited under this section, shall be returned to the donor. If return is not possible, the gift or gratuity shall be turned over to a public or charitable institution without being claimed as a charitable deduction and a report of such action, and the reasons why return was not feasible shall be made on MWDOC records. When possible, the donor also shall be informed of this action.

Motion - 1/17/96;

§7105 PERSONS OR COMPANIES REPORTING GIFTS

All persons and companies doing business with MWDOC, with the exception of public agencies, shall submit a summary, by January 31 of each calendar year, of all gifts claimed for internal vendor audits (including meals) made to, or on behalf of, employees or Directors of MWDOC, or their immediate family members, that have occurred in the normal course of business during the previous calendar year. Failure to provide this information to MWDOC may result in the termination of MWDOC business with that person or company.

Motion - 7/21/93; Motion - 8/18/93;

§7106 USE OF CONFIDENTIAL INFORMATION

Confidential information (i.e., information which is exempt from disclosure under the California Public Records Act) shall not be released to unauthorized persons unless the disclosure is approved by the Board, President of the Board, or General Manager. Employees are prohibited from using any confidential information for personal advantage or profit.

§7107 POLITICAL ACTIVITIES

During the course and scope of their employment employees are prohibited from engaging in campaign activities associated with MWDOC Director elections, MWDOC Director appointments, the appointment of MET Directors, or from attempting to influence changes to MWDOC Division boundaries, except where such activities are expressly required in the course of official duties. Employees are otherwise free to personally, endorse, advocate, contribute to, or otherwise support any political party, candidate, or cause they may choose; however, employees are prohibited from soliciting political funds or contributions at MWDOC facilities or during the course and scope of their duties for MWDOC. In any personal political activity an employee may be involved in, it shall be made clear that the employee is acting personally and not for MWDOC. These provisions are intended to protect employees against political assessments, coerced political activities, and to prevent political activities on the part of employees from interfering with MWDOC operations. Nothing in this section shall be

interpreted or applied in a manner to unlawfully curtail the constitutional right to political activity of MWDOC employees.

Motion – 6/17/15

§7108 IMPROPER ACTIVITIES

Employees shall not interfere with the proper performance of the official duties of others, but are strongly encouraged to fulfill their own moral obligations to the public, MWDOC, and its member agencies by disclosing, to the extent not expressly prohibited by law, improper activities within their knowledge. No employee shall directly or indirectly use or attempt to use the authority or influence of his/her position for the purpose of intimidating, threatening, coercing, commanding, or influencing any person with the intent of interfering with that person's duty to disclose improper activity.

§7109 VIOLATION OF POLICY – STAFF AND STAFF OFFICERS

If an employee is reported to have violated MWDOC's Ethics Policy, the matter shall be referred to any of the following: (1) the General Manager; (2) Human Resources; (3) the Board of Directors; or (4) any member of the management staff, for investigation and consideration of any appropriate action warranted which may include employment action such as demotion, reduction in salary, or termination.

If a Board appointed officer (Secretary, Treasurer or General Manager) is reported to have violated MWDOC's Ethics Policy, the matter shall be referred to the Executive Committee for investigation and consideration of any appropriate action. The Executive Committee may make a determination and present the issue to the full Board.

Motion - 1/17/96; 6/17/15

§7110 VIOLATION OF POLICY -- DIRECTORS

A perceived violation of this policy by a Director should be referred to the President of the Board or the full Board of Directors for investigation, and consideration of any appropriate action warranted. A violation of this policy may be addressed by the use of such remedies as are available by law to MWDOC, including, but not limited to: (a) adoption of a resolution expressing disapproval of the conduct of the Director who has violated this policy, (b) injunctive relief, or (c) referral of the violation to MWDOC Legal Counsel and/or the Grand Jury.

§7111 PERIODIC REVIEW OF ETHICS, CONFLICT OF INTEREST AND ADMINISTRATIVE GUIDELINES

Pursuant to the terms of Government Code Sections 53234 through 53235.2, each Director shall receive at least two hours of training in general ethics principles every two years. Pursuant to Government Code Section 53235(c), the curricula for ethics training must be approved by the Fair Political Practices Commission (FPPC) and the Attorney General. It is the general desire of the MWDOC Board to meet and review and/or receive a presentation that addresses principles relating to reporting guidelines on compensation, conflict of interest issues, and standards for rules of conduct during the first quarter of the year immediately following an election (every two years).

Each Director shall retain the certificate of completion from any ethics course in which he/she participates and shall provide a copy of such report to MWDOC. Such records shall be retained for five years from the date they are received.

M-12/21/05

Please note If using Consultant's proposal as Exhibit "B" please attach the proposal or complete the standard Exhibit "B" Form below, BOTH Parties must verify that all sections of this form are FULLY ADDRESSED and the appropriate Exhibit is attached and labeled accordingly

EXHIBIT "B"

**SCOPE OF WORK, TERMS OF AGREEMENT
AND TERMS AND CONDITIONS FOR BILLING**

Company: _____
Name: _____
Address: _____

Phone: _____
Tax I.D. # _____

1. Term – Commencement (Insert Date) _____ Termination (Insert Date) _____
2. Fees/Rates to be billed - \$ _____
3. Budgeted Amount – Compensation is to be on a “time and material” basis, not to exceed \$ _____. **CONSULTANT's** fees shall be billed by the 25th day of the month for the previous month's activities. Invoices received by the 25th day of the month will be paid by **DISTRICT** by the end of the following month. Invoices shall reference the Purchase Order number from **DISTRICT**.

Consultant shall prepare a breakdown of percent complete by task to submit with each monthly invoice.

Upon invoicing **DISTRICT** 80% of the contract amount, **CONSULTANT** shall prepare and provide to **DISTRICT** a “cost to complete” estimate for the remaining work.
4. Scope of Work/Services – (Insert **SPECIFIC** description – do not list “refer to Exhibit “) _____
5. Consultant Representative: _____