MesaWater DISTRICT

Dedicated to Satisfying our Community's Water Needs

AGENDA
MESA WATER DISTRICT
BOARD OF DIRECTORS
Tuesday, October 28, 2025
1965 Placentia Avenue, Costa Mesa, CA 92627
12:00 p.m. Adjourned Regular Board Meeting

CALL TO ORDER

PLEDGE OF ALLEGIANCE

PUBLIC COMMENTS

Items Not on the Agenda: Members of the public are invited to address the Board regarding items which are not appearing on the posted agenda. Each speaker shall be limited to three minutes. The Board will set aside 30 minutes for public comments for items not appearing on the posted agenda.

Items on the Agenda: Members of the public shall be permitted to comment on agenda items before action is taken, or after the Board has discussed the item. Each speaker shall be limited to three minutes. The Board will set aside 60 minutes for public comments for items appearing on the posted agenda.

ITEMS TO BE ADDED, REMOVED OR REORDERED ON THE AGENDA

At the discretion of the Board, all items appearing on this agenda, whether or not expressly listed as an Action Item, may be deliberated and may be subject to action by the Board.

ACTION ITEMS:

1. FISCAL YEAR 2025 DISTRICT-WIDE PERFORMANCE AUDIT:

   Recommendation: Receive the presentation.

2. COLORADO RIVER WATER PRESENT PERFECTED RIGHTS:

   Recommendation: Receive the presentation.

3. MESA WATER DISTRICT FEDERAL ADVOCACY – NEW POLICY INITIATIVES:

   Recommendation: Receive the presentation.

4. REGIONAL WATER ISSUES:

   Recommendation: Receive the presentation.

5. SOUTH ORANGE COUNTY EMERGENCY WATER PROJECT PROPOSAL:

Recommendation: This item is provided for discussion.

6. EXTERIOR SIGNAGE UPGRADE:

Recommendation: Direct staff to install a Mesa Water District logo on the second floor south-facing wall of the Headquarters Administration building.

7. LANDSCAPING AND ENTRYWAY IMPROVEMENTS:

Recommendation: Direct staff to include a Mesa Water District Headquarters landscaping upgrade in the Fiscal Year 2027 budget and defer the entryway improvement project to a future fiscal year.

8. FACILITY MODERNIZATION IMPROVEMENTS:

Recommendation: Defer the Facility Modernization Improvements to a future fiscal year.

9. FISCAL YEAR 2025 STRATEGIC PLAN:

Recommendation: Receive the status of the Fiscal Year 2025 Strategic Plan.

REPORTS:

10. REPORT OF THE GENERAL MANAGER

11. DIRECTORS' REPORTS AND COMMENTS

CLOSED SESSIONS:

12. PURSUANT TO CALIFORNIA GOVERNMENT CODE SECTION 54957.6:
Public Employee Performance Evaluation
Title: General Manager

ACTION ITEMS (CONT.):

13. ANNUAL PERFORMANCE EVALUATION OF THE GENERAL MANAGER:

Recommendation: Take action as the Board desires.

In compliance with California law and the Americans with Disabilities Act, if you need disability-related modifications or accommodations, including auxiliary aids or services in order to participate in the meeting, or if you need the agenda provided in an alternative format, please call the District Secretary at (949) 631-1205. Notification 48 hours prior to the meeting will enable Mesa Water District (Mesa Water®) to make reasonable arrangements to accommodate your requests.

Members of the public desiring to make verbal comments using a translator to present their comments into English shall be provided reasonable time accommodations that are consistent with California law.

*Agenda materials that are public records, which have been distributed to a majority of the Mesa Water Board of Directors (Board), will be available for public inspection at the District Boardroom, 1965 Placentia Avenue, Costa Mesa, CA and on Mesa Water's website at **www.MesaWater.org**. If materials are distributed to the Board less than 72 hours prior or during the meeting, the materials will be available at the time of the meeting.*

ADJOURN TO A REGULAR BOARD MEETING SCHEDULED FOR WEDNESDAY, NOVEMBER 12, 2025 AT 4:30 P.M.

MEMORANDUM

MesaWater DISTRICT®

Dedicated to Satisfying our Community's Water Needs

TO: Board of Directors
FROM: Kurt Lind, Business Manager
DATE: October 28, 2025
SUBJECT: Fiscal Year 2025 District-Wide Performance Audit

RECOMMENDATION

Receive the presentation.

STRATEGIC PLAN

Goal #1: Provide an abundant, local, reliable and safe water supply.
Goal #2: Perpetually renew and improve our infrastructure.
Goal #3: Be financially responsible and transparent.
Goal #4: Increase public awareness of Mesa Water.
Goal #5: Attract, develop and retain skilled employees.
Goal #6: Provide excellent customer service.
Goal #7: Actively participate in regional and statewide water issues.
Goal #8: Practice continual business improvement.

PRIOR BOARD ACTION/DISCUSSION

At its April 11, 2013 meeting, the Board of Directors (Board) approved the Business Process Evaluation project. The purpose of this evaluation was to investigate and document current organizational operations and identify opportunities to improve various business processes, including organizational structure, labor usage, technology utilization and needs, work management, effectiveness and efficiency.

At its May 22, 2014 meeting, the Board approved the Business Improvement Process Implementation. The purpose of this implementation was to institutionalize and optimize Mesa Water District's (Mesa Water®) business processes, as well as establish new systems and upgrade existing automated tools in order to increase accountability to allow for process improvement.

At its March 26, 2018 workshop, the Board directed staff to develop District-wide key performance indicators and performance audits. The purpose of this direction was to provide the final feedback link to a sound business process strategy. The Strategic Plan establishes the vision that the Board has created. Management and staff work together to develop the plans and measures detailing how to reach that vision. The Performance Audit is an independent, third-party check of Mesa Water's system and processes to ensure they are functioning as designed.

At its April 7, 2019 workshop, the Board received a presentation from LA Consulting, Inc. (LAC) showing the results of Mesa Water's Business Improvement Process Implementation. Mesa Water staff then outlined the process of developing performance measures and conducting performance audits for Mesa Water. The Board directed staff to include in the proposed Fiscal Year (FY) 2020 Budget third-party auditors to conduct an annual performance audit for FY 2019.

At its December 10, 2020 meeting, the Board received a presentation from LAC showing the development and implementation of the FY 2019 Dry Run Performance Audit and communicating the lessons learned. Mesa Water staff then outlined the process of developing performance measures for Mesa Water.

At its January 14, 2021 meeting, the Board approved a five-year contract with LAC to conduct an annual performance audit.

At its March 22, 2022 Committee meeting, the Board received a presentation item that included the results of the District's first official Performance Audit conducted for FY 2020.

At its July 13, 2022 meeting, the Board approved changes to Mesa Water's Performance Audit Process Guide for the FY 2023 Performance Audit.

At its January 24, 2024 meeting, the Board received a presentation highlighting the results from the FY 2023 Performance Audit.

At its June 12, 2024 meeting, the Board approved changes to Mesa Water's Performance Audit Process Guide for the FY 2025 Performance Audit.

At its October 29, 2024 workshop, the Board received a presentation highlighting the results from the FY 2024 Performance Audit.

DISCUSSION

In July 2025, LAC kicked off the FY 2025 Performance Audit (Audit). The Audit focuses on Mesa Water's system and processes to ensure they are functioning as designed. The Audit comprehensively reviews the District's seven departments and measures 71 key performance indicators (KPIs) to evaluate the following:

- The quality of the information staff uses to manage and measure performance;
- Our business systems and related processes are set up and operating appropriately;
- Critical activities of the business are completed on time and with quality; and,
- Critical programs and processes are in place and operating properly.

The Audit's scoring methodology was developed collaboratively with the District's Department Managers. The KPIs are weighted based on a three-point system, with a weight of 1 having least impact and 3 having most impact on the overall department score. Each of the KPIs are then scored based on a point award system that ties to the Red/Green/Gold scoring parameters:

- 1 – Red
- 2 – Green
- 3 – Gold

An overall percentage is then calculated based on total points earned compared to total points possible. The overall score is determined based on the following scale:

- Red – 59% or less
- Green – 60% to 89%
- Gold – 90% to 100%

District-wide, Mesa Water scored an overall 77 for the FY 2025 Performance Audit, a 1-point increase from the FY 2024 Audit. Five of the departments received a score within the green range with some KPIs improving and a few reducing. Two of the departments received gold. The biggest improvement was in Customer Services, with a 15-point increase from last year moving them back to the Gold standard. Water Operations achieved the Gold standard for the first time with a 9-point increase from last year. Financial Services also increased their score with an 11-point increase keeping them a solid green.

LA Consulting's Amie Drotning will provide a presentation regarding the FY 2025 Performance Audit at the Board's October 28, 2025 workshop. Ms. Drotning will review the results and provide recommendations for improvement in efficiencies and controls.

The performance audit supports Mesa Water's commitment to continuous improvement by providing meaningful feedback that assures the vision and Strategic Plan of the Board, reassures the efficient and effective management of public funds, and ensures that measurable standards are in place and achieved.

FINANCIAL IMPACT

In Fiscal Year 2026, $32,400 was budgeted for third-party auditors to conduct the District-Wide Performance Audit; $25,920 has been spent to date.

ATTACHMENTS

Attachment A: FY 2025 Performance Audit Departmental Scorecards

Performance Audit Scorecard
Administrative Services
Fiscal Year 2025

No.	Performance Indicator	Definition	Source				Score
	Work Performance						
1	Results from the Key Performance Indicators for the Fiscal Year.	The KPI's are scored 3 points for an HPU that is lower than planned range; 2 points for within planned range; and 1 point for higher that planned range.	CMMS	**Lower than Planned Range**	**Within Planned Range**	**Higher than Planned Range**	**78%**
	Management Process						
2	Two Week Scheduling, & Monthly Status	Percent of compliance with meeting the deadline dates for submitting the 2 week scheudle and holding the monthly work status meeting	Electronic Document	**89% or Less**	**90% to 94%**	**Greater than 95%**	**100%**
	Transparency						
3	Board and Committee Meeting Minutes	Publish Draft Minutes within 60 days of the each Board and Committee Meeting	Website Report	**99% or Less**	**N/A**	**100%**	**98%**
4	Website Transparency	Verify and affirm that select items are posted on the Mesa Water website and are current	Website	**99% or Less**	**N/A**	**100%**	**100%**
	Department Compliance						
5	Board and Committee Packets	Post to website all Board and Committee Packets within 72 hours of regular or adjourned meeting or 24 hours for a special meeting	Website Report	**99% or Less**	**N/A**	**100%**	**100%**
6	Public Records Request Act Compliance	Response to all public records requests within 10 calendar days of receipt of request	Copy of Public Records Request form	**99% or Less**	**N/A**	**100%**	**100%**
	Action Plan Compliance						
7	Review of all action plans associated with the Annual Administrative Services Performance Audit. Confirm that an action plan exists and that progress is being made towards completion.	Percent of resolved actions for all plans	Electronic Document	**79% or Less**	**80% to 89%**	**90% or Greater**	**100%**
	Continuous Improvement						
8	Review of the overall score from the previous audit year.	Measure percent change of overall department performance score compared to the previous audit year.	Previous year's Performance Audit	**-5% or Lower**	**-4% to +4%**	**5% and Greater OR Maintained Gold Status**	**2%**

Overall Performance Scale		**59% or Less**	**60%-89%**	**90%-100%**	
					Overall Performance Score	**85%**

Performance Audit Scorecard
Customer Services
Fiscal Year 2025

No.	Performance Indicator	Definition	Source				Score
	Work Performance						
1	Results from the Key Performance Indicators for the Fiscal Year.	The KPI's are scored 3 points for an ADP that is higher than planned range; 2 points for within planned range; and 1 point for lower that planned range.	CMMS	**Lower than Planned Range**	**Within Planned Range**	**Higher than Planned Range**	**67%**
	Management Process						
2	Two Week Scheudling & Monthly Status	Percent of compliance with meeting the deadline dates for submitting the 2 week scheudle and holding the monthly work status meeting	Electronic Document	**89% or Less**	**90% to 94%**	**Greater than 95%**	**98%**
	Customer Satisfaction						
3	Overall result of the annual Elite Customer Service Audit	Overall Key Performance Indicator Score	Elite Customer Service Audit	**71% or Less**	**72% to 89%**	**90% or Greater**	**93%**
	Action Plan Compliance						
4	Review of all action plans associated with the Annual Customer Services Performance Audit. Confirm that an action plan exists and that progress is being made towards completion.	Percent of resolved actions for all plans	Electronic Document	**79% or Less**	**80% to 89%**	**90% or Greater**	**100%**
	Continuous Improvement						
5	Review of the overall score from the previous Elite Customer Service Audit.	Measure percent change of overall Elite Customer Service Audit score compared to the previous audit year.	Previous year's Elite Customer Service Audit	**-5% or Lower**	**-4% to +4%**	**5% and Greater OR Maintained Gold Status**	**Maintained**
6	Review of the overall score from the previous audit year.	Measure percent change of overall department performance score compared to the previous audit year.	Previous year's Performance Audit	**-5% or Lower**	**-4% to +4%**	**5% and Greater OR Maintained Gold Status**	**14%**

Overall Performance Scale		**59% or Less**	**60%-89%**	**90%-100%**	
					Overall Performance Score	**93%**

Performance Audit Scorecard
Engineering
Fiscal Year 2025

No.	Performance Indicator	Definition	Source				Score
	Verify Accurate Reporting of Work						
1	Work Reporting Accuracy	Percent of accurate work reporting and entry. Points of focus includes as applicable: Activity Number, Project Number, Employee Name, Labor Hours, Equipment Hours, Parts/Materials, and Work Quantity.	CMMS	**89% or Less**	**90% to 94%**	**95% or Greater**	**97%**
	Management Process						
2	Two Week Scheduling, Data Entry, & Monthly Status	Percent of compliance with meeting the deadline dates for submitting the 2 week scheudle, work reporting data entry, and holding the monthly work status meeting	Electronic Files	**89% or Less**	**90% to 94%**	**Greater than 95%**	**95%**
	Engineering Projects						
3	Project Hours	Percent of labor hours directly associated with Capital and Expense Projects compared to avaiable hours less leave.	CMMS	**69% or Less**	**70% to 79%**	**80% or Greater**	**85%**
4	Construction Inspections	Percent of construction inspections performed within 3 business days of request. Documentation of inspection request and actual occurrence	Manual Files & CMMS	**89% or Less**	**90% to 94%**	**95% to 100%**	**N/A**
5	Contract Management	Cost of construction contract change orders in Capital Program projects to less than 5% of the total value of open construction contracts	Financial System	**10% or Greater**	**9% to 6%**	**5% or Less**	**5%**
6	Efficiency of Plan Check	Percent of plans reviewed within 15 business days	Manual Files	**89% or Less**	**90% to 94%**	**95% to 100%**	**100%**
7	Efficiency of Contract Award for Construction or Professional Services	Average time from Committee/Board approval to securing contract signature	Records	**46 Days or Greater**	**45 to 31 Days**	**30 Days or Less**	**29**
8	Project Management	Projects less than $400,000: Labor/Construction Management Cost as a percent of the total contract cost	Financial System	**30% or Greater**	**29% to 16%**	**15% or Less**	**9%**
9	Project Management	Projects greater than $400,000: Labor/Construction Management Cost as a percent of the total contract cost	Financial System	**20% or Greater**	**19% to 11%**	**10% or Less**	**15%**
10	Close completed projects in a timely manner	Number of calendar days that projects are accepted by Engineering and closed in the financial system.	Project Sign Off Form	**120 Days or Greater**	**119 to 90 Days**	**89 Days or Less**	**163 Days**
	Action Plan Compliance						
11	Review of all action plans associated with the Annual Engineering Performance Audit. Confirm that an action plan exists and that progress is being made towards completion.	Percent of resolved actions for all plans and confirmed by signature of Department Manager and General Manager.	Electronic Files	**79% or Less**	**80% to 89%**	**90% or Greater**	**0%**
	Continuous Improvement						
12	Review of the overall score from the previous audit year.	Measure percent change of overall department performance score compared to the previous audit year.	Previous year's Performance Audit	**-5% or Lower**	**-4% to +4%**	**5% and Greater OR Maintained Gold Status**	**-4%**

Overall Performance Scale		**59% or Less**	**60%-89%**	**90%-100%**
Overall Performance Score				**79%**

Performance Audit Scorecard
Financial Services
Fiscal Year 2025

No.	Performance Indicator	Definition	Source				Score
	Work Performance						
1	Results from the Key Performance Indicators for the Fiscal Year	The KPI's are scored 3 points for an UPH that is lower than planned range; 2 points for within planned range; and 1 point for higher that planned range.	CMMS	**Lower than Planned Range**	**Within Planned Range**	**Higher than Planned Range**	**60%**
	Management Process						
2	Two Week Scheduling & Monthly Status	Percent of compliance with meeting the deadline dates for submitting the 2 week scheudle and holding the monthly work status meeting	Electronic Document	**89% or Less**	**90% to 94%**	**Greater than 95%**	**98%**
	Review of Financial System						
3	Verification of New Accounts	Verify documentation and approval of new accounts. Identify accounts within the Chart of Accounts that were established with corresponding documentation for the fiscal year	Change of Account Log book and signed request form. Financial System	**89% or Less**	**90% to 99%**	**100%**	**100%**
	Engineering Projects						
4	Close completed projects in a timely manner	Number of calendar days that projects are accepted by Engineering and closed in the financial system.	Project Sign Off Form	**120 Days or Greater**	**119 to 90 Days**	**89 Days or Less**	**163**
	Monthly Close						
5	Monthly Close Documentation	Verify the signed monthly close checklist for Projects and Expense Accounts and cooresponding fiancial statements	Monthly Close Checklist and Financial Statements	**Less than 100%**	**N/A**	**100%**	**0%**
	Action Plan Compliance						
6	Review of all action plans associated with the Annual Financial Services Performance Audit. Confirm that an action plan exists and that progress is being made towards completion.	Percent of resolved actions for all plans	Electronic Document	**79% or Less**	**80% to 89%**	**90% or Greater**	**100%**
	Continuous Improvement						
7	Review of the overall score from the previous audit year.	Measure percent change of overall department performance score compared to the previous audit year.	Previous year's Performance Audit	**-5% or Lower**	**-4% to +4%**	**5% and Greater OR Maintained Gold Status**	**7%**

Overall Performance Scale		**59% or Less**	**60%-89%**	**90%-100%**
Overall Performance Score				**75%**

Performance Audit Scorecard
Human Resources
Fiscal Year 2025

No.	Performance Indicator	Definition	Data Source				Score
	Work Performance						
1	Results from the Key Performance Indicators for the Fiscal Year.	The KPI's are scored 3 points for an hour/activity task-related planned range; 3 points for lower, 2 points for within planned range; and 3 points for higher than the planned range.	CMMS	**Lower than Planned Range**	**Within Planned Range**	**Higher than Planned Range**	**56%**
	Management Process						
2	Two Week Scheduling & Monthly Status	Percent of compliance with meeting the deadline dates for submitting the 2 week scheudle and holding the monthly work status meeting	Electronic Document	**89% or Less**	**90% to 94%**	**Greater than 95%**	**100%**
	Employee Development						
3	Professional Development Participation	Percentage of Employees participating in Tuition/Education/Certification Reimbursement Programs divided by the number of employees eligible	Electronic Document	**9% or Less**	**10% to 15%**	**16% or Greater**	**41%**
4	Time To Fill	The amount of time that it takes to fill a vacant position. Average number of business days elapsed between requisition date and offer acceptance	NeoGov	**91 Days or Greater**	**90 - 80 Days**	**79 Days or Less**	**93%**
	Employee Recruitment						
5	Job Offer Ratio	Percent of offers accepted to offers made	NeoGov	**69% or Less**	**70% to 74%**	**75% or Greater**	**73%**
6	Temporary Staff Utilization	Average duration of time using temporary staff	Human Resource Information System	**181 Days or Greater**	**180 - 91 Days**	**90 Days or Less**	**144**
	Employee Retention						
7	Turnover Rate	Monitoring employee voluntary and involuntary movement out of the organization	Human Resource Information System	**16% or Greater**	**15% to 7%**	**6% or Less**	**19.6%**
	Employee Engagement						
8	Annual Employee Performance Evaluations	All employees receive their annual review by September 30	Human Resource Information System	**94% or Less**	**95% to 99%**	**100%**	**100%**
9	Annual Employee Engagement Survey	Overall Mesa Water® score from the 12 Question Gallup Poll measuring the work environment.	Gallop Poll Report	**Below 33rd Percentile**	**33rd - 65th Percential**	**66th Percentile or Greater**	**27%**
	Action Plan Compliance						
10	Review of all action plans associated with the Annual Human Resources Performance Audit. Confirm that an action plan exists and that progress is being made towards completion.	Percent of resolved actions for all plans	Electronic Document	**79% or Less**	**80% to 89%**	**90% or Greater**	**100%**
	Continuous Improvement						
11	Review of the overall score from the previous audit year.	Measure percent change of overall department performance score compared to the previous audit year.	Previous year's Performance Audit	**-5% or Lower**	**-4% to +4%**	**5% and Greater OR Maintained Gold Status**	**-6%**

Overall Performance Scale		**59% or Less**	**60%-89%**	**90%-100%**
	Overall Performance Score			**67%**

Performance Audit Scorecard
Public Affairs
Fiscal Year 2025

No.	Performance Indicator	Definition	Source				Score
	Work Performance						
1	Results from the Key Performance Indicators for the Fiscal Year.	The KPI's are scored 3 points for an HPU that is lower than planned range; 2 points for within planned range; and 1 point for higher that planned range.	CMMS	**Lower than Planned Range**	**Within Planned Range**	**Higher than Planned Range**	**86%**
	Management Process						
2	Two Week Scheduling & Monthly Status	Percent of compliance with meeting the deadline dates for submitting the 2 week schedule and holding the monthly work status meeting	Electronic Document	**89% or Less**	**90% to 94%**	**Greater than 95%**	**50%**
	Public Awareness						
3	Mesa Water® Brand Identity	Percent of respondents who correctly identify Mesa Water® as their water provider (unaided awareness)	Annual Customer Opinion Survey	**60% or Less**	**61% to 70%**	**71% or Greater**	**86%**
4	Mesa Water® Brand Recognition	Percent of respondents who have an overall awareness of Mesa Water® (unaided awareness + aided awareness)	Annual Customer Opinion Survey	**69% or Less**	**70% to 89%**	**90% or Greater**	**95%**
5	Mesa Water® Knowledge of Water Origin	Percent of respondents who correctly know the orgin of water (produced locally) that Mesa Water® produces and delivers.	Annual Customer Opinion Survey	**49% or Less**	**50% to 89%**	**90% or Greater**	**47%**
	Communication						
6	Communication Efforts	Percent of respondents who are very satisfied with Mesa Water®'s efforts to communicate with customers	Annual Customer Opinion Survey	**42% or Less**	**43% to 53%**	**54% or Greater**	**53%**
	Social Media Growth						
7	Increase the number of Social Media followers (Costa Mesa Only) on Facebook and Instagram	Percent increase from the previous fiscal year.	Westbound Report	**29% or Less**	**30% to 49%**	**50% or Greater**	**3%**
	Action Plan Compliance						
8	Review of all action plans associated with the Annual Public Affairs Performance Audit. Confirm that an action plan exists and that progress is being made towards completion.	Percent of resolved actions for all plans	Electronic Document	**79% or Less**	**80% to 89%**	**90% or Greater**	**0%**
	Continuous Improvement						
9	Review of the overall score from the previous audit year.	Measure percent change of overall department performance score compared to the previous audit year.	Previous year's Performance Audit	**-5% or Lower**	**-4% to +4%**	**5% and Greater OR Maintained Gold Status**	**-28%**

Overall Performance Scale		**59% or Less**	**60%-89%**	**90%-100%**
	Overall Performance Score			**59%**

Performance Audit Scorecard
Water Operations
Fiscal Year 2025

No.	Performance Indicator	Definition	Source				Score
	Work Performance						
1	Results from the Key Performance Indicators for the Fiscal Year.	The KPI's are scored 3 points for an ADP that is higher than planned range; 2 points for within planned range; and 1 point for lower that planned range.	CMMS	**Lower than Planned Range**	**Within Planned Range**	**Higher than Planned Range**	**78%**
	Verify Accurate Reporting of Work						
2	Work Reporting Accuracy.	Percent of accurate work reporting and entry. Points of focus includes as applicable: Activity Number, Project Number, Employee Name, Labor Hours, Equipment Hours, Parts/Materials, and Work Quantity.	CMMS	**89% or Less**	**90% to 94%**	**Greater than 95%**	**99%**
	Management Process						
3	Two Week Scheduling, Data Entry, & Monthly Status	Percent of compliance with meeting the deadline dates for submitting the 2 week scheudle, work reporting data entry, and holding the monthly work status meeting	Electronic Document	**89% or Less**	**90% to 94%**	**Greater than 95%**	**100%**
	Accuracy of Assets						
4	Affirm quarterly asset verification meetings.	Review and affirm quarterly asset meetings occurred on time. Should be completed at 100%	Manual Files	**Less than 100%**	**N/A**	**100%**	**100%**
	Water Quality						
5	Verify monthly water quality test reports submitted to California Division of Drinking Water	Review and affirm monthly water quality reports sent to DDW submitted on time. Email confirmation attached to each monthly report.	Manual Files	**Less than 100%**	**N/A**	**100%**	**100%**
	Production Duty Operator						
6	Comparison of the submission time of the emailed Production Duty Checklist to the agreed upon time requirements in the Production System Operation Plan. Documented on the daily performance log.	Percent of work shifts where all emails/checklists were submitted on time.	Electronic File	**93% or Less**	**94% to 96%**	**97% or Greater**	**96%**
	Fleet Compliance						
7	Quarterly CHP/BIT Completed	Compare planned CHP/BIT schedule for fleet to actual results. Should be completed at 100%	Manual Files	**Less than 100%**	**N/A**	**100%**	**100%**
8	Annual SMOG Testing	Compare planned SMOG Checks schedule for fleet to actual results. Should be completed at 100%.	Manual Files	**Less than 100%**	**N/A**	**100%**	**100%**
9	Annual Opacity Testing	Compare planned Opacity Testing schedule for fleet to actual results. Should be completed at 100%.	Manual Files	**Less than 100%**	**N/A**	**100%**	**100%**
	Review of Compliance Documentation						
10	Review of Regulatory Compliance Reports. Auditor to randomly select and confirm seven (7) reports have been completed and submitted to appropriate regulatory agencies.	Seven (7) randomly selected reports completed and submitted on time at 100%.	Manual Files	**Less than 100%**	**N/A**	**100%**	**100%**
	Action Plan Compliance						
11	Review of all action plans associated with the Root Cause Analysis. Confirm that an action plan exists and that progress is being made towards completion.	Percent of resolved actions for all plans and confirmed by signature of Department Manager and General Manager.	Electronic Document	**79% or Less**	**80% to 89%**	**90% or Greater**	**100%**
12	Review of all action plans associated with the Annual Water Operations Audit. Confirm that an action plan exists and that progress is being made towards completion.	Percent of resolved actions for all plans and confirmed by signature of Department Manager and General Manager.	Electronic Document	**79% or Less**	**80% to 89%**	**90% or Greater**	**100%**
	Continuous Improvement						
13	Review of the overall score from the previous audit year.	Measure of overall department performance compared to the previous audit year.	Previous year's Performance Audit	**5% or Less**	**-4% to +4%**	**5% and Greater OR Maintained Gold**	**9%**

Overall Performance Scale		**59% or Less**	**60%-89%**	**90%-100%**	
					Overall Performance Score **93%**

Performance Audit Scorecard
Mesa Water District
Fiscal Year 2025

No.	Performance Indicator	Definition	Source				Score
	Financial Investments						
1	Investment Performance (PARS/OPEB Trust)	Rate of Return on Investments (Pension Trust & OPEB Trust). Performance tied to S&P 500 for the fiscal year timeframe.	Treasury Status Report on Investments	**Less than 90% of Rate of Return**	**+/- 10% of Rate of Return**	**Greater than 110% of Rate of Return**	**88%**
2	Investment Performance (Other Investments)	Rate of Return on Investments (Other Investments). Performance tied to LAIF for the fiscal year timeframe.	Treasury Status Report on Investments	**Less than 90% of Rate of Return**	**+/- 10% of Rate of Return**	**Greater than 110% of Rate of Return**	**27%**
3	Cash on Hand	The amount of cash on hand. Measured at the end of the fiscal year. Adjusted for any Board approved actions.	Fourth Quarter Financial Update Report	**Less than 95% of Budgeted Cash on Hand**	**+/- 5% of Budgeted Amount Cash on Hand**	**Greater than 105% of Budgeted Cash on Hand**	**137%**
4	Days Cash	The number of days Mesa Water® can fully operate with no revenue. Measured at the end of the fiscal year. Adjusted for any Board approved actions.	Fourth Quarter Financial Update Report	**Less than 95% of Budgeted Days**	**+/- 5% of Budgeted Days Cash**	**Greater than 105% of Budgeted Days**	**143%**
5	Debt Coverage Ratio	Ratio of cash available for debt servicing to interest, principal and lease payments. Measured at the end of the fiscal year. Adjusted for any Board approved actions.	Fourth Quarter Financial Update Report	**Less than 95% of Debt Ratio**	**+/- 5% of Board Approved Debt Ratio**	**Greater than 105% of Debt Ratio**	**120%**

Overall Performance Scale		**59% or Less**	**60%-89%**	**90%-100%**	
					Overall Performance Score **62%**

MesaWater DISTRICT

Dedicated to Satisfying our Community's Water Needs

MEMORANDUM

TO: Board of Directors
FROM: Stacy Taylor, Water Policy Manager
DATE: October 28, 2025
SUBJECT: Colorado River Water Present Perfected Rights

RECOMMENDATION

Receive the presentation.

STRATEGIC PLAN

Goal #1: Provide an abundant, local, reliable and safe water supply.
Goal #3: Be financially responsible and transparent.
Goal #7: Actively participate in regional and statewide water issues.

PRIOR BOARD ACTION/DISCUSSION

None.

DISCUSSION

The Colorado River supplies water to approximately 40 million residents and 5.5 million acres of irrigated farmland. Under the Colorado Compact of 1922 (Compact), the Colorado River water is divided evenly between seven states, divided into two basins -- the Upper Basin and the Lower Basin -- with each Basin designated 7.5 million acre-feet (maf) annually. The Upper Basin states comprise Colorado, New Mexico, Utah and Wyoming; the Lower Basin states encompass Arizona, California and Nevada. (Note: While the Compact did not include the nation of Mexico, the 1944 Mexican Water Treaty guarantees Mexico an annual delivery of 1.5 maf of Colorado River water in a normal supply year; the 1.5 maf is in addition to the 15 maf unless there is a shortage. Mexico's rights are strong, binding and federally prioritized, but do not have the same legal status or shortage protection as Present Perfected Rights.) The United States Bureau of Reclamation (USBR), a federal agency within the Department of the Interior (DOI), manages the Colorado River's water supply.

Present Perfected Rights (PPRs) – PPRs, defined under the "Law of the River", are Colorado River water rights that were established -- or "perfected" by being put to beneficial use, such as for irrigation or municipal works -- prior to the Boulder Canyon Project Act which took effect June 25, 1929. The USBR recognizes PPRs as "Tier 1 Rights" within a six-tiered priority system of rights to Colorado River water. PPRs are the most senior rights to Colorado River water and the last to be curtailed in a shortage. PPRs are held by several Lower and Upper Basin cities/towns, individual landowners, irrigation districts and Tribes.

Lower Basin PPRs – Following a 1963 United States Supreme Court decree (*Arizona v. California*), PPRs were quantified for the Lower Basin states. **California is the largest water user in the Colorado River basin with the most senior water right in the Lower Basin:**

- California's share of the Colorado River irrigates approximately 770,000 acres and supplies water to more than 20 million people;
- California has an allocation of 4.4 maf per year. A 1931 agreement allocates this water among the Coachella Valley Water District, Imperial Irrigation District, Metropolitan Water District of Southern California, Palo Verde and Yuma irrigation districts, and San Diego County Water Authority; and,
- Four tribal nations with reservations along the lower Colorado River, located partly or entirely within California, also share in this water. These tribes have diversion rights to 156,522 acre-feet per year to serve these lands. The tribal water rights are deducted from California's 4.4 maf annual allocation.

Upper Basin PPRs – The quantification of PPRs is less concrete in the Upper Basin. The Upper Colorado River Basin Compact states that rights perfected before November 24, 1922 are unimpaired. However, some ambiguity exists over the correct priority date and whether the 1929 date from the Arizona lawsuit applies. The Upper Basin PPRs have not been fully adjudicated, though they are a major consideration during water curtailment negotiations.

Tribal PPRs – Federally reserved water rights for Native American tribes are also considered PPRs and have a priority date corresponding to the establishment of the reservation, which can precede 1929. These are also of high priority and further complicate the allocation of water, especially in the Upper Basin where some tribal water rights are still unresolved.

Challenges exist in fully quantifying and managing PPRs, especially in the Upper Basin and regarding tribal water rights, which can significantly impact how resources are managed during shortages. Adding to these unresolved issues is that the Colorado River water has been over-allocated and, since 2000, has faced persistent drought, shrinking the available water by as much as 20 percent. In 2019, a Drought Contingency Plan was agreed to by all parties to manage shortages, however, the plan will expire at the end of 2025.

Additionally, the current Colorado River water agreements expire at the end of 2026, and a new long-term operating plan must be in place by October 1, 2026, marking the start of the 2027 water year. While a multi-year National Environmental Policy Act process is underway to develop post-2026 operating guidelines -- with a Draft Environmental Impact Statement expected by the end of 2025 -- the DOI has set a deadline of November 2025, or face federal action, for the negotiations to reach consensus on a new Colorado River plan.

Recent USBR-Proposed Draft Long-Term Operating Plan

Regarding post-2026 Colorado River operations, the USBR's most recent draft long-term Operating Plan (Plan) is likely to require new delivery curtailments, especially for the Lower Basin, and may reduce Lake Powell releases to protect Upper Basin water supplies. All draft alternatives under consideration would impose additional mandatory reductions beyond the current shortage guidelines, with substantial emphasis on protecting Upper Basin reservoir elevations, which means Upper Basin states would be less exposed to involuntary shortages if the new rules are adopted.

California's PPRs remain the most senior rights in the system by law. The draft Plan alternatives generally maintain legal priorities, meaning that any mandatory cuts imposed by the USBR are likely to affect junior users before senior PPR holders in California. However, the Plan makes clear that, if critical reservoir levels are reached and consensus cannot be achieved among the Basin states, the USBR may impose mandatory percentage-based reductions even on senior users, which could trigger litigation regarding California's protected status. The Lower Basin "consensus plan" -- supported by California -- seeks to maintain existing priorities, while federal alternatives propose deeper -- and less priority-driven -- cuts to the Lower Basin, possibly impacting PPRs.

In summary, the draft Plan will likely reinforce Upper Basin protection and maintain California's PPRs seniority but does open the door to federal mandatory cuts (in case of failure to reach voluntary agreement), increasing the risk of legal conflict if California's priorities are reduced.

Attorney Travis Van Ligten, partner with Costa Mesa-based law firm Rutan & Tucker, LLP, will provide a presentation about the subject item, followed by a question-and-answer session with the Mesa Water District Board of Directors regarding the issues summarized by this memorandum.

FINANCIAL IMPACT

None.

ATTACHMENTS

None.

MEMORANDUM

Dedicated to Satisfying our Community's Water Needs

TO: Board of Directors
FROM: Stacy Taylor, Water Policy Manager
DATE: October 28, 2025
SUBJECT: Mesa Water District Federal Advocacy – New Policy Initiatives

RECOMMENDATION

Receive the presentation.

STRATEGIC PLAN

Goal #1: Provide an abundant, local, reliable and safe water supply.
Goal #4: Increase public awareness of Mesa Water.
Goal #7: Actively participate in regional and statewide water issues.

PRIOR BOARD ACTION

At its November 15, 2022 Committee meeting, following a competitive procurement process, the Board of Directors (Board) approved retaining Van Scoyoc Associates, Inc. (VSA) to provide Federal Government Advocacy Consulting Services to Mesa Water District (Mesa Water®), with annually-approved renewals since then, to support the District's Federal Advocacy Program and help implement Mesa Water's annually-updated Federal Advocacy Plan.

At its January 25, 2023 meeting, the Board approved a $12,500 sponsorship of the California Policy Center (CPC) to help fund and support the organization's research on *Water Infrastructure Solutions for California*.

At its February 14, 2024 meeting, the Board received a presentation from CPC Co-Founder Edward Ring on *The Abundance Mindset: A New Approach to Water Policy.*

At its February 28, 2024 meeting, the Board approved a $12,500 sponsorship of the CPC to help fund the organization's ongoing research on *Water Solutions for California*.

At its June 11, 2025 meeting, the Board approved its Fiscal Year 2026 budget which included funds for Mesa Water's Federal Advocacy Program, and a $12,500 sponsorship of the CPC to support its ongoing efforts to promote water supply abundance for Californians.

At its August 13, 2025 meeting, the Board approved expanded advocacy activities to further existing federal policy engagement and pursue new federal policy initiatives, in collaboration with the CPC, as part of the District's Federal Advocacy Program

At its October 8, 2025 meeting, the Board approved additional funding for expanded Federal Advocacy activities on behalf of Mesa Water District.

BACKGROUND

Since November 2022, Mesa Water and its Washington, D.C. lobbyist -- VSA -- have implemented the District's Federal Advocacy Program to promote: 1) high priority Mesa Water projects for

government funding consideration (e.g., appropriations, grants, low-interest loans); 2) the District's Policy Positions and Policy Platforms as relevant to Federal issues; and 3) Mesa Water in general and its Strategic Plan goals, mission, values and vision. As part of its Federal Advocacy Program, the District has annually conducted (since 2023) a week of advocacy engagement -- dedicated to promoting Mesa Water's projects and policies -- in Washington, D.C. via meetings with members of the Orange County, CA Congressional delegation as well as with Federal Administration and Agency representatives.

This year's meetings (in June 2025) included very productive policy discussions and ideas exchange with Congressional staff and representatives from the U.S. Environmental Protection Agency and the U.S. Department of the Interior.

To build upon this foundation for its Federal Advocacy Program, Mesa Water determined it would be advantageous for the District, as well as for other public water agencies statewide and in the Western U.S., to follow-up on and further research two policy concepts that developed from the District's June 2025 meetings in Washington, D.C.:

1. Assessing the U.S. Drought Monitor via a statistical review; and,

2. Desalination Plants on Federally-Owned Coastal Lands.

To that end, and as part of the District's Federal Advocacy Program, the Board approved a Research and Policy Proposal (Proposal) from CPC's Co-Founder Edward Ring, encompassing the following scope of work:

1. Conduct research on the two above-mentioned issues, including the retention of:
   a. a statistician to compare the U.S. Drought Monitor's records to actual hydrology data; and
   b. an attorney with expertise in coastal land use authorities.

2. Develop a white paper, as deemed apropos, for one or both of the two above-mentioned issues; and

3. Accompany Mesa Water Board and lobbyist representatives in Washington, D.C. for a week of meetings dedicated to advocating on and presenting the findings of the white paper(s).

Mr. Ring will provide a presentation on the two white papers at Mesa Water's October 28, 2025 Board workshop. Additionally, to further the District's existing federal policy engagement and pursue the new federal policy initiatives, future advocacy in Washington, D.C. is planned to entail meetings with representatives from the United States Bureau of Reclamation, Department of Agriculture, Department of Commerce, Department of the Interior, Environmental Protection Agency, National Oceanic & Atmospheric Administration, and possibly with Congressional and White House representatives.

FINANCIAL IMPACT

In Fiscal Year 2026, $450,000 is budgeted for Water Policy Support Services; $93,030 has been spent to date.

ATTACHMENTS

None.

MEMORANDUM

MesaWater DISTRICT®

Dedicated to Satisfying our Community's Water Needs

TO: Board of Directors
FROM: Andrew D. Wiesner, P.E., District Engineer
DATE: October 28, 2025
SUBJECT: Regional Water Issues

RECOMMENDATION

Receive the presentation.

STRATEGIC PLAN

Goal #1: Provide an abundant, local, reliable and safe water supply.
Goal #2: Perpetually renew and improve our infrastructure.
Goal #7: Actively participate in regional and statewide water issues.

PRIOR BOARD ACTION/DISCUSSION

At its October 29, 2024 and April 3, 2025 workshops, the Board of Directors (Board) received a presentation regarding Regional Water Issues.

DISCUSSION

Mesa Water District (Mesa Water®) staff keeps abreast of regional water supply issues. The following regional water supply topics will be presented and discussed at the October 28, 2025 Board workshop:

1. **Local groundwater Supply Improvement Project (Local SIP):** This update will discuss the progress of the Local SIP — a brackish groundwater desalination facility located seaward of the groundwater injection barrier within the Mesa Water, City of Huntington Beach and City of Newport Beach service areas. The initial phase of the Local SIP is a feasibility study. The Local SIP study is being executed and funded through a partnership between Mesa Water (as the lead agency), the City of Huntington Beach, the City of Newport Beach and Orange County Water District, with Mesa Water receiving a $250,000 grant from the U.S. Bureau of Reclamation (USBR) to fund 50% of the study. The draft feasibility study was submitted to USBR for review in September 2025. A summary of the report's findings along with recommended next steps will be presented and discussed.

2. **Interagency Water Transfer:** This update will discuss the progress of the Interagency Water Transfer Project. A feasibility study that looked into water transfers with the City of Newport Beach was completed in September 2025. A feasibility study looking into water transfers with the City of Huntington Beach was kicked off in September 2025. The draft feasibility study report is due in December 2025. A summary of the progress with both the City of Newport Beach and the City of Huntington Beach, along with recommended next steps, will be presented and discussed.

FINANCIAL IMPACT

None.

ATTACHMENTS

Attachment A: Local SIP Title XVI Feasibility Study
Attachment B: Newport Beach Interagency Water Transfers Feasibility Study

FINAL

LOCAL GROUNDWATER SUPPLY IMPROVEMENT PROJECT (LOCAL SIP)

WaterSMART: Title XVI Feasibility Study

BLACK & VEATCH PROJECT NO. 420122

PREPARED FOR

Mesa Water District

9 OCTOBER 2025

BLACK & VEATCH

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ACRONYMS AND ABBREVIATIONS LIST

BEA	Basin Equity Assessment
BGEPA	Bald and Golden Eagle Protection Act
BPP	Basin Production Percentage
CaCO3	Calcium Carbonate
CCRO	Closed-Circuit Reverse Osmosis
CDFW	California Department of Fish and Wildlife
CESA	California Endangered Species Act
CEQA	California Environmental Quality Act
CFGC	California Fish and Game Commission
CHRIS	California Historical Resource Information System
CRA	Colorado River Aqueduct
CRHR	California Register of Historic Resources
CWA	Clean Waters Act
DAC	Disadvantage Communities
DWR	Department of Water Resources
ESA	Endangered Species Act
FTEs	Full Time Employees
GRF	Groundwater Recovery Facility
GWMP	Groundwater Management Plan
GWRS	Groundwater Replenishment System
Huntington Beach	City of Huntington Beach
IPaC	Information for Planning and Consultation
kWH	Kilowatt-hour
Local SiP	Local Groundwater Supply Improvement Project
LRP	Local Resources Program
MBTA	Migratory Bird Treaty Act
MCLs	Maximum Containment Levels
Mesa Water	Mesa Water District
MG	Million Gallons
mg/L	Milligrams per Liter
MWD	Metropolitan Water District of Southern California
MWDOC	Municipal Water District of Orange County
MWRF	Mesa Water Reliability Facility
NEPA	National Environmental Policy Act
Newport Beach	City of Newport Beach
NHPA	National Historic Preservation Act

NPDES	National Pollutant Discharge Elimination System
NPPA	California Native Plant Protection Act
NPV	Net Present Value
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
OC Basin	Orange County Groundwater Basin
OC San	Orange County Sanitation District
OCWD	Orange County Water District
OPCC	Opinion of Probable Construction Cost
OPEX	Operational Expenses
PEC	Policy and Environmental Compliance
ppm	Parts Per Million
RA	Replenishment Assessment
RM D&S	Reclamation Manual Directive and Standards
RWQCBs	Regional Water Quality Control Boards
SCWD	South Coast Water District
SDWA	Safe Water Drinking Act
SGMA	Sustainable Groundwater Management Act
SHPO	State Historic Preservation Office
SWP	State Water Project
SWRCB	State Water Resources Control Board
T&E	Threatened and Endangered
Talbert Barrier	Talbert Seawater Intrusion Barrier
TDS	Total Dissolved Solids
Title XVI	WaterSMART Title XVI Water Reclamation and Reuse Program
USBR	United States Bureau of Reclamation
USFWS	U.S. Fish and Wildlife Service
UWMP	Urban Water Management Plan
WDRs	Waste Discharge Requirements
WOTUS	Waters of the United States

Executive Summary

The feasibility study for the Local Groundwater Supply Improvement Project (Local SiP), prepared by Mesa Water District (Mesa Water), is submitted for the US Bureau of Reclamation's (USBR) WaterSMART Title XVI Water Reclamation and Reuse Program (Title XVI) for a brackish groundwater desalination facility. Mesa Water is submitting this feasibility study in conjunction with the project stakeholders of Orange County Water District (OCWD), City of Huntington Beach (Huntington Beach), and City of Newport Beach (Newport Beach) to address regional water supply issues.

To ease Reclamation's review, the document layout aligns with WTR 11-01, Section 5 Requirements, for a Title XVI Feasibility Study Report. Not all required sections are relevant to the proposed Local SiP. However, these sections are included in the document to confirm that they were considered but were inapplicable.

Introduction

The proposed Local SiP will provide a regional benefit to all project stakeholders. Mesa Water, Huntington Beach, and Newport Beach all work together with OCWD and the Municipal Water District of Orange County (MWDOC) to ensure a safe and reliable water supply to the community.

Mesa Water is an independent special district that provides water service to 110,000 customers in a service area that includes Costa Mesa, a portion of Newport Beach, and John Wayne Airport. Currently, Mesa Water provides 100% locally sourced drinking water to its service area. The water provided is a blend of groundwater from the Orange County Groundwater Basin (OC Basin) Principal Aquifer System and a Deep Aquifer System that are both managed by OCWD. The Deep Aquifer System contains amber-colored groundwater which is treated at the Mesa Water Reliability Facility (MWRF). The MWRF can serve up to 50% of the community's water demands if needed.

In emergency situations, Mesa Water purchases imported water from the State Water Project (SWP) and the Colorado River Authority (CRA) from the Metropolitan Water District of Southern California (MWD) through MWDOC. Both Huntington Beach and Newport Beach currently source approximately 15% of their drinking water from imported water.

There are several challenges driving the need for the Local SiP. First, north-central Orange County currently lacks a diverse range of influent water resources. Additionally, the coastal community surrounding the Local SiP study area is impacted by the extreme drought conditions that have significantly reduced the availability of imported water supplies from the SWP and the CRA. California's Water Supply Strategy: Adapting to a Hotter, Drier Future, adopted by the Newsom Administration in 2022, anticipates the loss of 10% of the state's water supply due to changing weather patterns by 2040. The uncertainty around the future availability of imported water supplies and the approaching reduction of California's contractual rights to the Colorado River water, make it essential that Orange County continues to protect its economy, public health, and safety by developing new, locally controlled potable water supplies.

In addition, brackish groundwater from seawater intrusion further strain the water supply. The Local SiP study area covers a variety of shallow, principal, and deep aquifers of the OC Basin. However, some of the regions have total dissolved solids (TDS) concentrations exceeding 2,000 milligrams per liter (mg/L). The high TDS levels present challenges for potable water use, although current conditions indicate that saline water in Talbert Gap is largely being maintained seaward of the existing Talbert Barrier and is not an active threat to inland production wells. A local SiP project would create an extraction trough that pulls

some of the injection water at the Talbert Barrier seaward, inducing additional capture of brackish and seawater intrusion that would otherwise be slowly flushing toward the ocean. In this way the project does not create an entirely new supply, but instead provides a managed opportunity to recover and treat high-TDS groundwater seaward of the barrier—supplementing local sources, offsetting imported water, and potentially increasing the long-term effectiveness of the Talbert Barrier.

Goals and Objectives

Mesa Water and the project stakeholders established the following goals and objectives to guide the development of the Local SiP:

1. Add 5 to 8 million gallons per day (MGD) of potable water supply
2. Reduce reliance on imported water
3. Improve the region's ability to withstand droughts and changing weather patterns
4. Protect the groundwater basin from further seawater intrusion
5. Provide the most cost-effective alternative with the highest beneficial use of brackish groundwater

Alternatives Analysis

The following three alternatives were developed for evaluation in this feasibility study:

5.35 MGD Brackish Groundwater Treatment Facility

The first alternative consists of a 5.35 MGD brackish groundwater treatment facility. A total of five groundwater wells located evenly along the seaward portion of the Talbert Gap would pump 8.0 MGD of brackish groundwater to a new treatment facility. The brackish groundwater desalination facility would include a reverse osmosis (RO) feed tank, cartridge filters, 2-pass RO system, post-treatment including carbon dioxide and hydrated lime, disinfection, and a finished water pump station. The 5.35 MGD of finished water will be treated to drinking water standards and tied into an existing distribution line to serve Mesa Water, Newport Beach, and Huntington Beach customers. Brine concentrate from the RO system will be conveyed to Orange County Sanitation District's (OC San's) Interplant Trunkline to ultimately be discharged through their ocean outfall system.

2.65 MGD Brackish Groundwater Treatment Facility

The second alternative is a 2.65 MGD brackish groundwater treatment facility. Similar to the first alternative, there would be five groundwater wells spread evenly along the seaward portion of the Talbert Gap to pump brackish groundwater to a new treatment facility. However, only 4.0 MGD would be pumped from the groundwater basin. This alternative was considered because according to the current groundwater model, pumping 4.0 MGD from the Talbert Gap does not pose a concern for land subsidence in the area. As discussed in Section 10.1, the groundwater model needs further recalibration to determine a more accurate limit of groundwater pumping.

The treatment process flow diagram would be the same as the first alternative, but with fewer pieces of equipment to reflect the reduced treated water flow capacity. This alternative would produce 2.65 MGD of finished water treated to drinking water standards and tied into an existing distribution line to serve Mesa Water, Newport Beach, and Huntington Beach customers. Brine concentrate from the RO system will be conveyed to OC San's Interplant Trunkline to ultimately be discharged through their ocean outfall system.

No Project Alternative

The No Project Alternative would consist of Mesa Water, Huntington Beach, and Newport Beach continuing to rely on imported water from the SWP and CRA. There would be no further diversification of the region's water supply portfolio. Given the severe drought conditions caused by changing weather patterns in the study area, continuing with the current water management strategies of imported water reliance presents an increased risk to water supply. In addition to reliability risks, there are significant economic risks as reflected by historical and projected annual imported water price increases. For example, MWDOC is anticipating a 11.5% imported water rate increase from 2027 to 2028. Per project stakeholder input and MWDOC inflation rate projections, a treated imported water inflation rate of 9.0% was used for the first 10 years and 7.2% for the remaining 20 years of the alternatives cost analysis. Due to these risks for the study area, this alternative does not meet Mesa Water's objectives of providing sustainable water supply to its customers.

The cost comparison between the three alternatives described above is shown in Table ES-1.

Table ES-1 Alternatives 30-Year Net Present Value Cost Comparison

Cost Component	5.35 MGD Brackish Groundwater Treatment Facility [1]	2.65 MGD Brackish Groundwater Treatment Facility [1]	Import 5.35 MGD of Treated Water (No Project Alternative) [1, 2]
Total Construction Costs	$276.9 M	$193.3 M	-
Total Project Cost [4]	$317.5 M	$223.4 M	-
Total Project Cost less 20% Grant	$254.0 M	$178.7 M	-
OPEX Costs (Year 2025) [5]	$8.870 M	$4.771 M	$9.625 M
30-Year Net Present Value (NPV)	$448.5 M	$284.4 M	$490.6 M
Annual Project Yield (AFY)	5,993	2,996	5,993
Lifetime Project Yield (AF)	179,800	89,890	179,800
First Year Unit Cost per AF (2025)	$2,671	$3,459	$1,606
Unit Cost per AF [3]	**$2,495**	**$3,163**	**$2,728**

1. The interest rate, discount rate, inflation rate, and other cost assumptions are described in Section 4.4.
2. A treated water cost baseline (2025) of $1,528 was used with a 9.0% treated imported water inflation rate for the first 10 years followed by 7.2% for the remaining 20 years.
3. Unit cost per AF is in 2025 dollars over the next 30 years.
4. Project costs include total construction costs, site procurement, and consultant's design fee as described in Section 4.3.10.
5. OPEX costs are defined in Section 4.3.11 and Appendix B.

Comparing the 5.35 MGD Brackish Groundwater Treatment Facility Alternative with the No Project Alternative, the break-even point in cumulative present value may occur anywhere between year 18 and year 25 of the 30-year analysis as shown in Figure ES-1.

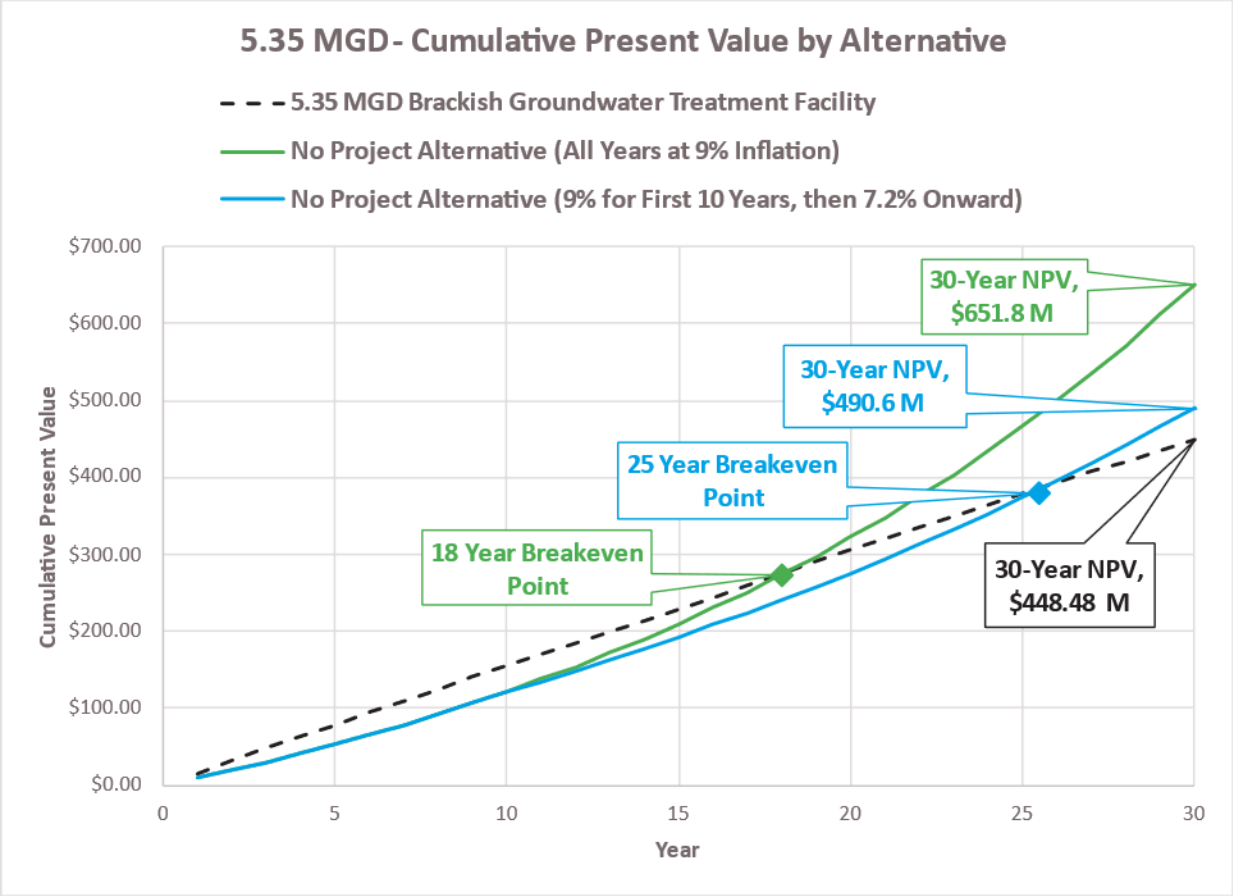


Figure ES-1 **Net Present Value Break-even Point**

Proposed Project

The Local SiP proposed project is the 5.35 MGD Brackish Groundwater Treatment Facility, based on both quantitative and qualitative assessments. Not only does this alternative have the lowest unit cost per AF, but it also meets all of Mesa Water's project goals. The finished water produced would offset imported water to the region and provide a new, locally controlled, and sustainable water supply to project stakeholders. By strategically spacing the groundwater wells along the coastal portion of the Talbert Gap, seaward of the existing Talbert Barrier Injection wells, pumping from this area could intercept intruding seawater and reduce chloride concentration from the protected inland basin. This approach also could enhance barrier performance by increasing seaward hydraulic gradients. Finally, the 5.35 MGD Brackish Water Treatment Facility is the most cost-effective alternative over a 30-year life cycle and has the highest beneficial use of local brackish groundwater.

Conclusions

The Local SiP aligns with Mesa Water's goals and objectives to provide a reliable, local water supply source to offset imported water usage in the region. While many project components have been analyzed

for preparation of this feasibility study including groundwater modeling, preliminary site investigations, a preliminary treatment plan, and conveyance routing; risks and challenges still exist as project refinement and implementation occurs. Project areas that will be further developed throughout the detailed design phase include groundwater model refinement, site selection, brine discharge coordination with OC San, California Environmental Quality Act (CEQA) permitting, National Pollutant Discharge Elimination System (NPDES) permitting, and securing funding with project stakeholders. Mesa Water is committed to constructing and operating the Local SiP throughout its life to maximize the beneficial use of harnessing local brackish groundwater supplies.

1.0 Introduction

1.1 Non-Federal Project Sponsors

Identification of the non-Federal project sponsor(s).

The feasibility study for the Local Supply Improvement Project (Local SiP), prepared by Mesa Water District (Mesa Water), the primary non-Federal project sponsor, is submitted for Reclamation's response to the requirements of the WaterSMART Title XVI Water Reclamation and Reuse Program (Title XVI). Mesa Water is submitting the feasibility study on behalf of the following non-Federal project sponsors: Orange County Water District (OCWD), City of Huntington Beach, and City of Newport Beach. Refer to Figure 1-1 for each non-Federal project sponsor's service area.

1.1.1 Mesa Water District

In 1960, Mesa Water, formerly Costa Mesa County Water District, began operations by acquiring the assets and obligations of consolidating the city of Costa Mesa's Water Department, Fairview County Water District, Newport Mesa Irrigation District, and Newport Mesa County Water District.

Mesa Water now serves approximately 110,000 residents and covers around 11,500 acres. The service area includes Costa Mesa, parts of Newport Beach, and the John Wayne Airport. Groundwater is Mesa Water's primary water source. Mesa Water pumps the Orange County Groundwater Basin (OC Basin) via nine wells to provide 100% locally sourced drinking water to its service area. Water from the Santa Ana River, OCWD's Ground Water Replenishment System (GWRS), and imported water from the Metropolitan Water District of Southern California (MWD) are used to replenish the basin. Groundwater from the Mesa Water Reliability Facility (MWRF) is also used to serve the community's water needs and sources deeper aquifer groundwater which receives treatment for color removal. The facility has a capacity of 8.6 MGD and can provide up to 50% of water demand if needed.

1.1.2 Orange County Water District

Orange County Water District (OCWD) was established in 1933 to manage and replenish the groundwater basin. OCWD serves over 2.5 million people across nearly 350 square miles in Orange County, California. To provide a reliable high-quality water supply, OCWD utilizes a wide range of water management practices. OCWD operates the Groundwater Replenishment System (GWRS), one of the world's largest purification systems for indirect potable reuse. Through research and monitoring programs, OCWD strives to maintain and improve groundwater quality. OCWD collaborates with local, state, federal, and private sectors to improve water reliability.

1.1.3 City of Huntington Beach

The City of Huntington Beach (Huntington Beach) water infrastructure consists of wells, reservoirs, treatment facilities, and over 400 miles of pipelines. The water is sourced from a combination of local groundwater and imported water from MWD. Huntington Beach serves 200,000 residents and covers around 17,000 acres. Huntington Beach promotes water conservation and sustainability through various programs, incentives, and public education. Huntington Beach currently sources approximately 15% of their drinking water from imported water.

1.1.4 City of Newport Beach

The City of Newport Beach (Newport Beach) manages a variety of wells, pipelines, reservoirs, and treatment facilities to provide water to approximately 87,000 residents over 24,000 acres. Newport Beach sources its water from a combination of local groundwater and imported water from MWD. Newport Beach's water department emphasizes the importance of water sustainability through conservation initiatives, public outreach, and use of advanced water management technologies. Newport Beach currently sources approximately 15% of their drinking water from imported water.

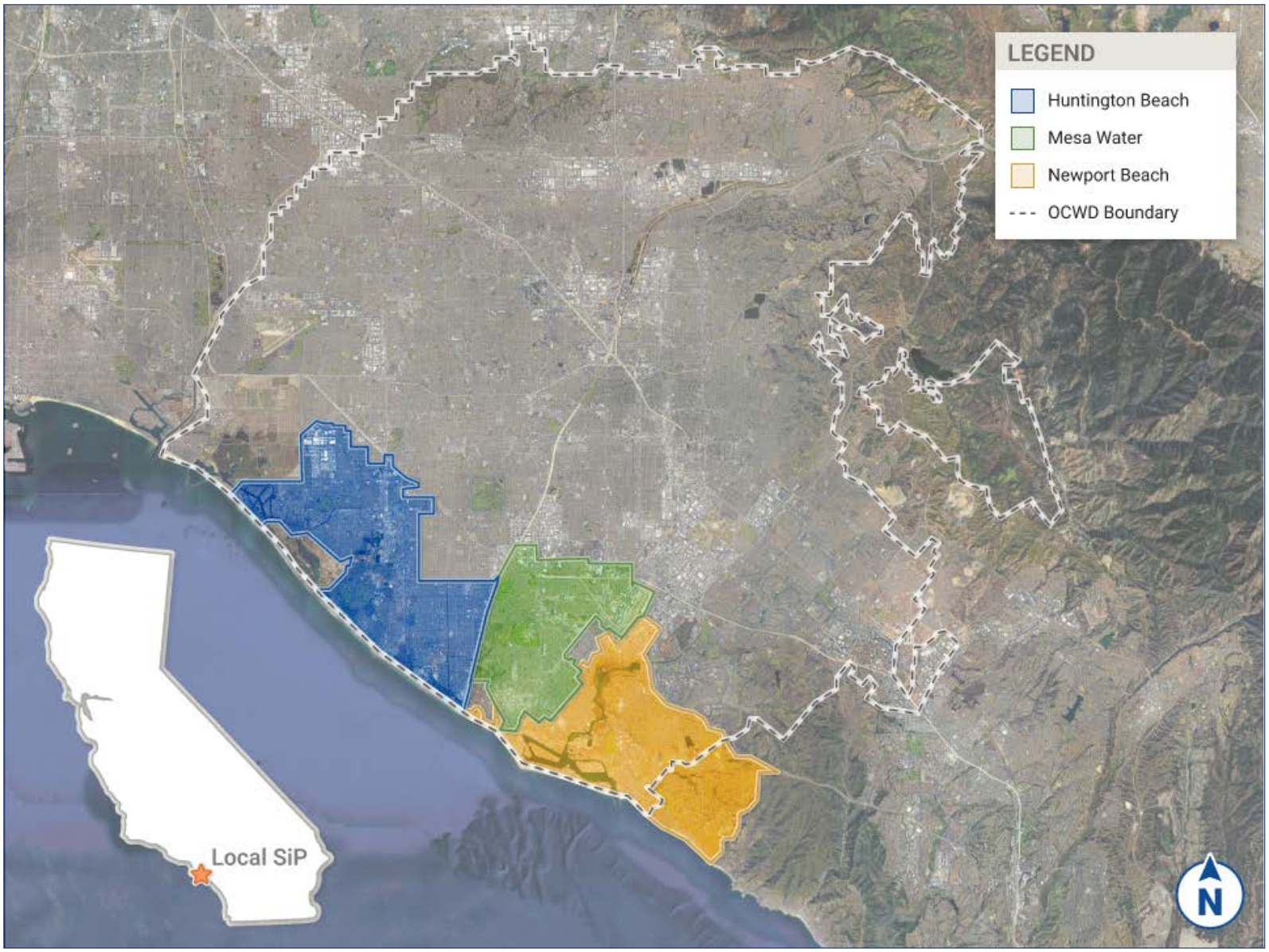


Figure 1-1 **Non-Federal Project Sponsors' Service Areas**

1.2 Description of Study Area

Description of the study area and area/project map.

The study area identified for the Local SiP is in north-central Orange County, California. The area is highly susceptible to the impacts of changing weather patterns and drought periods. Integrated finished water distribution infrastructure, dense urban populations with consistent demand and groundwater basin replenishment, via OCWD's GWRS, makes the study area well-suited to develop supplemental local water supplies that provide benefit across project stakeholders.

As shown in Figure 1-2, the study area is within OCWD, Mesa Water, Huntington Beach, and Newport Beach service areas. The terrain is diverse, consisting of a mixture of coastal plains, rolling hills, and flat plains. Land surface elevations range from approximately 0 to 100 feet above sea level. The identified area has a Mediterranean climate with mild winters and dry summers. Temperatures typically range between 45 to 85 degrees Fahrenheit (°F) year-round. The area is surrounded by many bodies of water including the Santa Ana River, Talbert Channel, Upper Newport Bay, Huntington Beach Wetlands, and the Pacific Ocean.

Mesa Water serves approximately 110,000 residents and additional tourists. The community consists of a mix of residential, commercial, and recreational environments. The area hosts many cultural and community events including the highly attended Orange County Fair. The South Coast Plaza is a large shopping center in the area that local and out-of-town shoppers visit. The area has a strong economy and various employment opportunities such as healthcare and other professional services. Costa Mesa is experiencing a growing population, residential and commercial development, economic development, and upgrades to public infrastructure. As the area continues to grow, increasing the use of sustainable water sources is crucial to meet future demands.

Currently, Mesa Water's sole source of water is groundwater from the OC Basin. The OC Basin is in the north-central portion of Orange County, extending from the Pacific coast to the Santa Ana Mountains. The OC basin provides 100% of Mesa Water's demand. Approximately 85% comes from the Principal Aquifer System, which does not require treatment, and the remaining 15% is drawn from the Deep Aquifer System which receives nanofiltration treatment at the MWRF to remove organics and color. Additionally, Mesa Water has the ability to purchase imported water from MWD as a backup water source. Huntington Beach and Newport Beach both rely on imported water to meet approximately 15% of their respective service areas' demands.

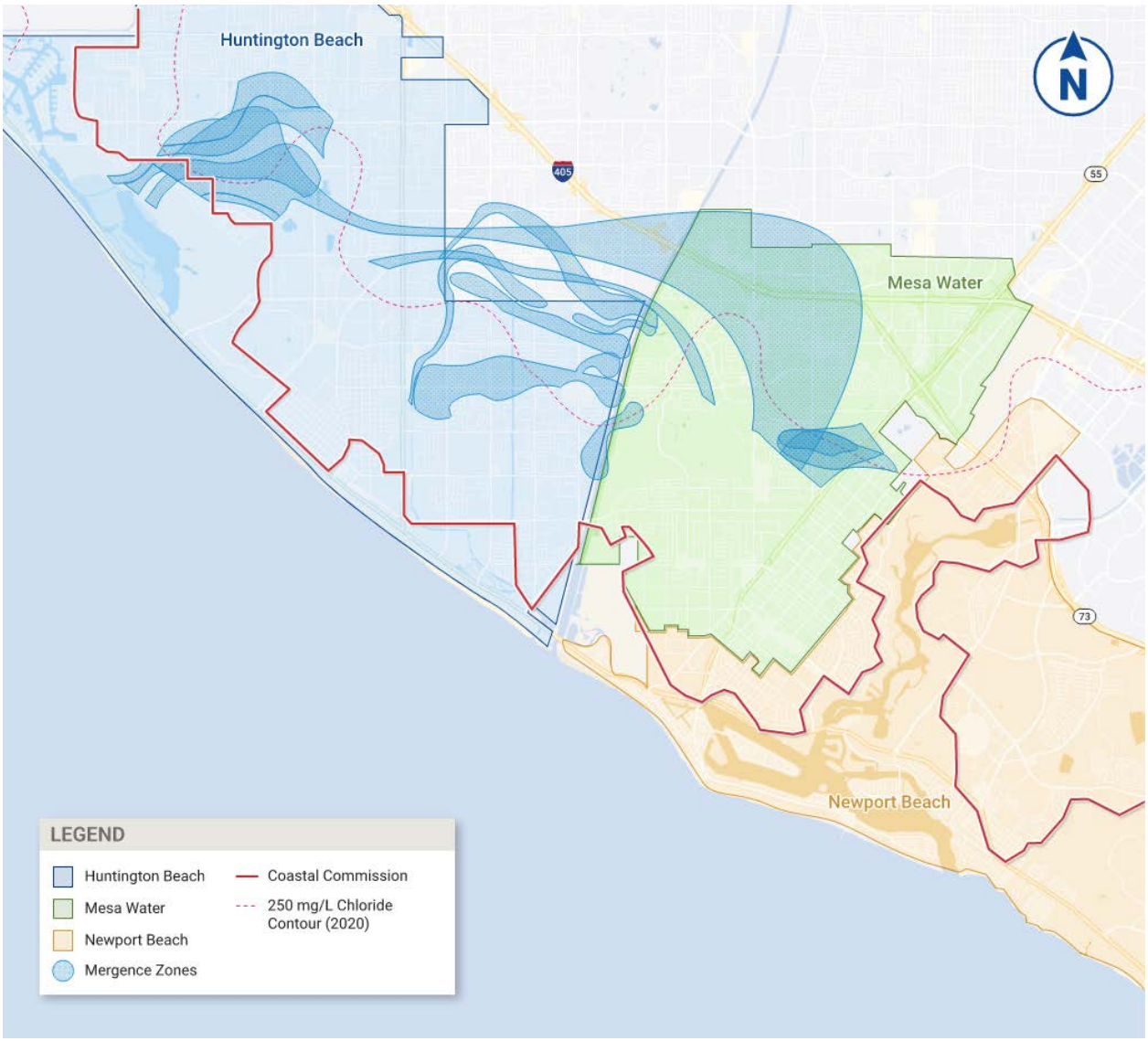


Figure 1-2 **Local Groundwater Supply Improvement Study Area**

1.3 Definition of Study Area

Definition of the study area in terms of both the site-specific project area where the reclaimed water supply will be needed and developed, and any reclaimed water distribution systems.

The Local SiP study area includes Huntington Beach, Costa Mesa, and Newport Beach, specifically areas west of the 405 Freeway and inland of the Coastal Commission Zone. Additionally, a portion of Fountain Valley was evaluated as a potential location for the proposed treatment facility. Water resources within this area include a combination of imported water supplied through MWDOC and local groundwater managed by OCWD. The area is supported by key water infrastructure including GWRS along with drinking water and brine distribution networks.

1.3.1 Imported Water Through MWDOC

Mesa Water, Newport Beach, and Huntington Beach have access to imported water from the MWD through MWDOC. MWD imports water from the State Water Project (SWP) and the Colorado River Aqueduct (CRA) and distributes it to its 26 member agencies across Southern California, including MWDOC. Refer to Figure 1-3 for map of the MWD member agencies.

The SWP collects water from the Feather River in Northern California, channels it through Lake Oroville, and conveys it through the Sacramento-San Joaquin Delta. From there, it enters the California Aqueduct for delivery to Southern California. MWD manages and maintains a large system of reservoirs, treatment plants, pipelines, and service connections to distribute water across its service area.

Across all project stakeholders, MWD imported water is an essential source to meet service demands and as back up during droughts and emergencies. As population driven demand continues to increase over time, there is an immediate need to identify new water supply sources for the region to further strengthen the local water sources as a sustainable supplement to imported water.

1.3.2 Local Groundwater Supplies

The project stakeholders rely primarily on the OC Basin (California Department of Water Resources Designated Basin 8-1; DWR, 2003), a large coastal aquifer system managed by OCWD. The OC Basin serves as the principal water source for over 75% of north and central Orange County's water supply and is replenished through a combination of natural recharge and managed recharge using Santa Ana River flows, imported water, and advanced-treated indirect potable reuse water from OCWD's Groundwater Replenishment System (GWRS; OCWD, 2017).

The OC Basin is subdivided into three hydraulically connected aquifer systems as shown on Figure 1-4:

- The Shallow Aquifer System, generally used for non-potable or small-scale industrial use.
- The Principal Aquifer System, the primary source of groundwater production and supplies the project stakeholders' clear wells.
- The Deep Aquifer System, locally contains amber-colored groundwater that requires treatment for potable supply; therefore is used more selectively and supplies the MWRF.

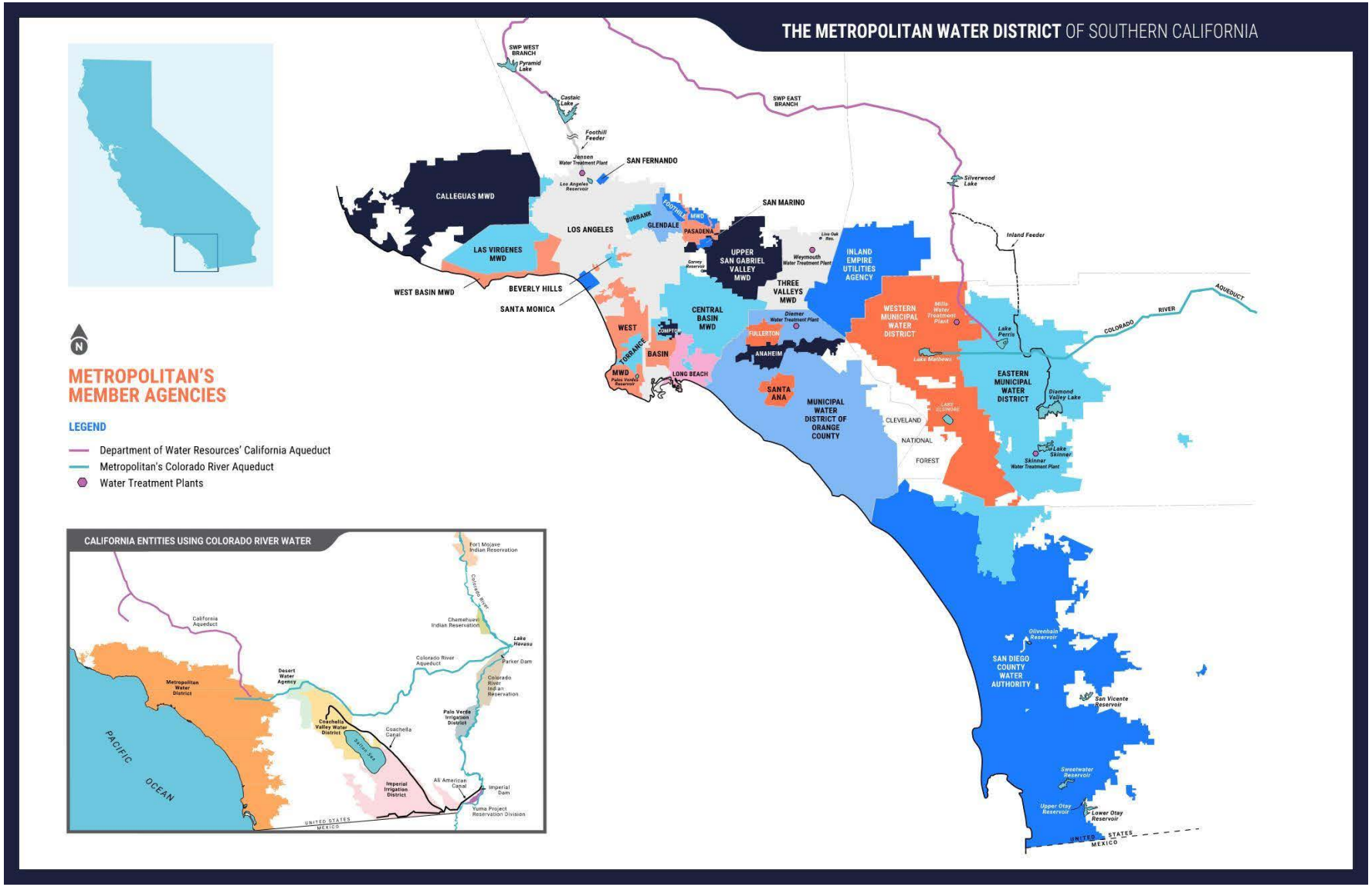
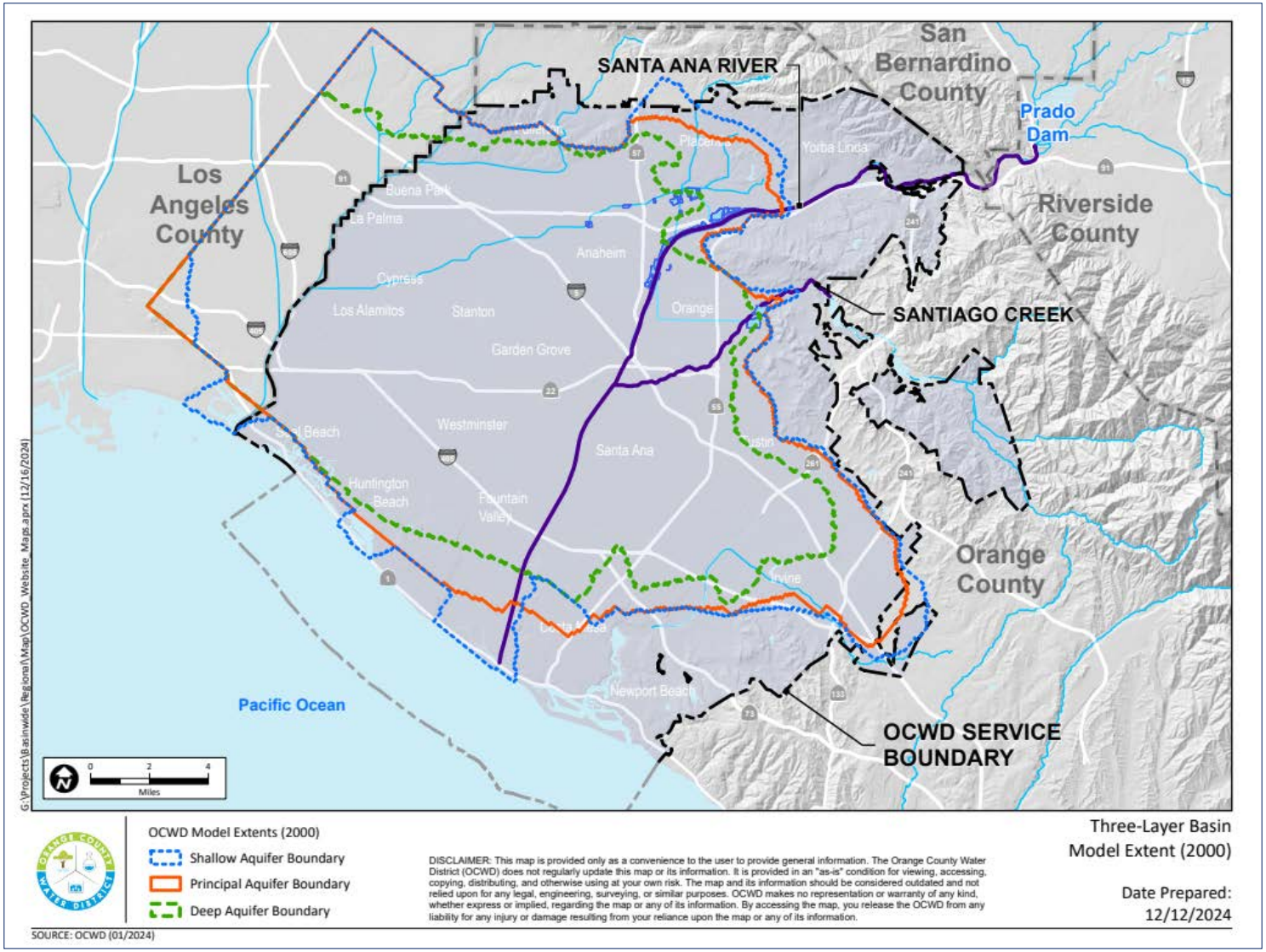


Figure 1-3 **MWD Member Agencies Map**



Source: OCWD Service Boundary and Groundwater Basin Boundary

Figure 1-4 Orange County, California Groundwater Basin Map

Mesa Water operates nine active groundwater wells within the OC Basin's Pressure Area, where aquifers are confined and well-protected from surface contamination. Seven wells produce high-quality "clear" water that is disinfected and delivered directly into the system. Two "amber" wells extract deeper groundwater that is treated at the MWRF before entering distribution (Arcadis, 2021). Refer to Figure 1-5.

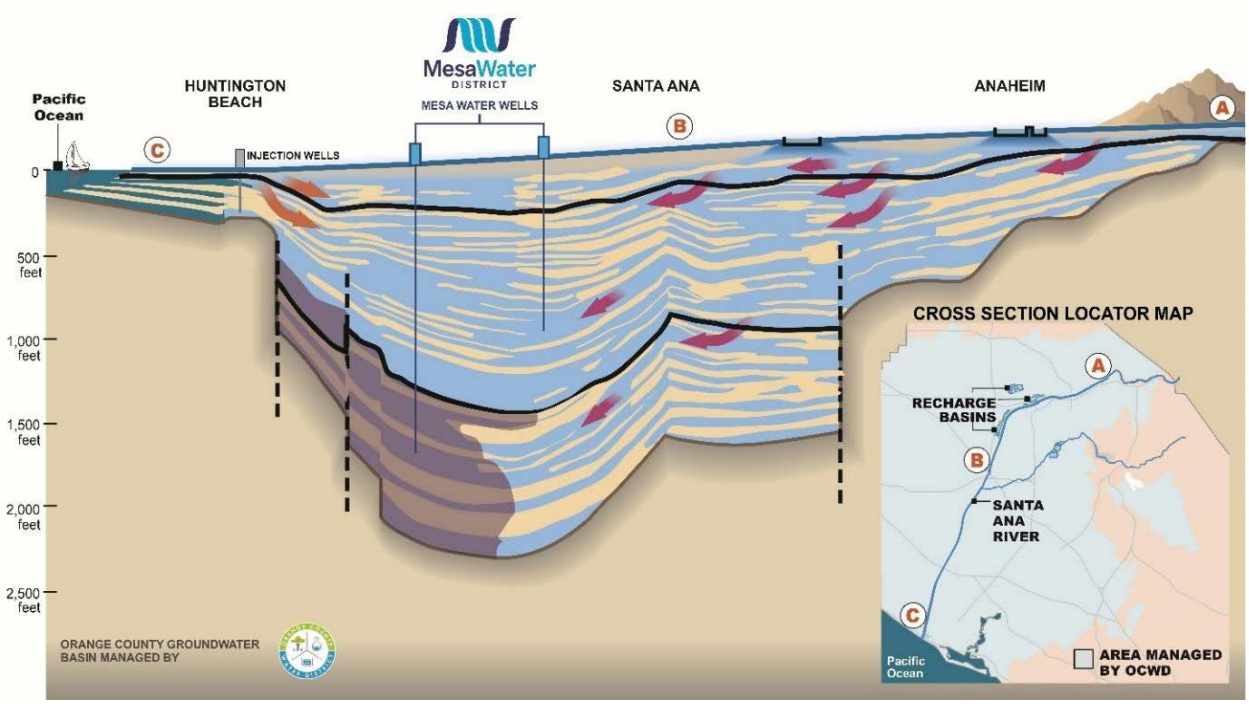


Figure 1-5 Mesa Water Within the OC Basin

1.3.3 Drinking Water Distribution System

The study area is a highly developed region with a mix of commercial, industrial, and residential land uses. The region is sustained by a mix of local groundwater and imported water through MWDOC. Three main MWDOC connections to the distribution system are within the study area. OC-09, OC-35, and OC-44 serve as the primary sources of imported water to this area. The agencies served by the three connections and pipelines are summarized in Table 1-1 and their distribution line locations are displayed in Figure 1-6. These pipelines play a vital role in delivering potable drinking water to the densely populated area.

Table 1-1 MWDOC Distribution Lines in the Study Area

Distribution Line	Served Agencies
OC-09	Huntington Beach; other retail water agencies in central and western Orange County
OC-35	Huntington Beach, Fullerton, Placentia, Brea, and LaHabra
OC-44	Huntington Beach and Mesa Water

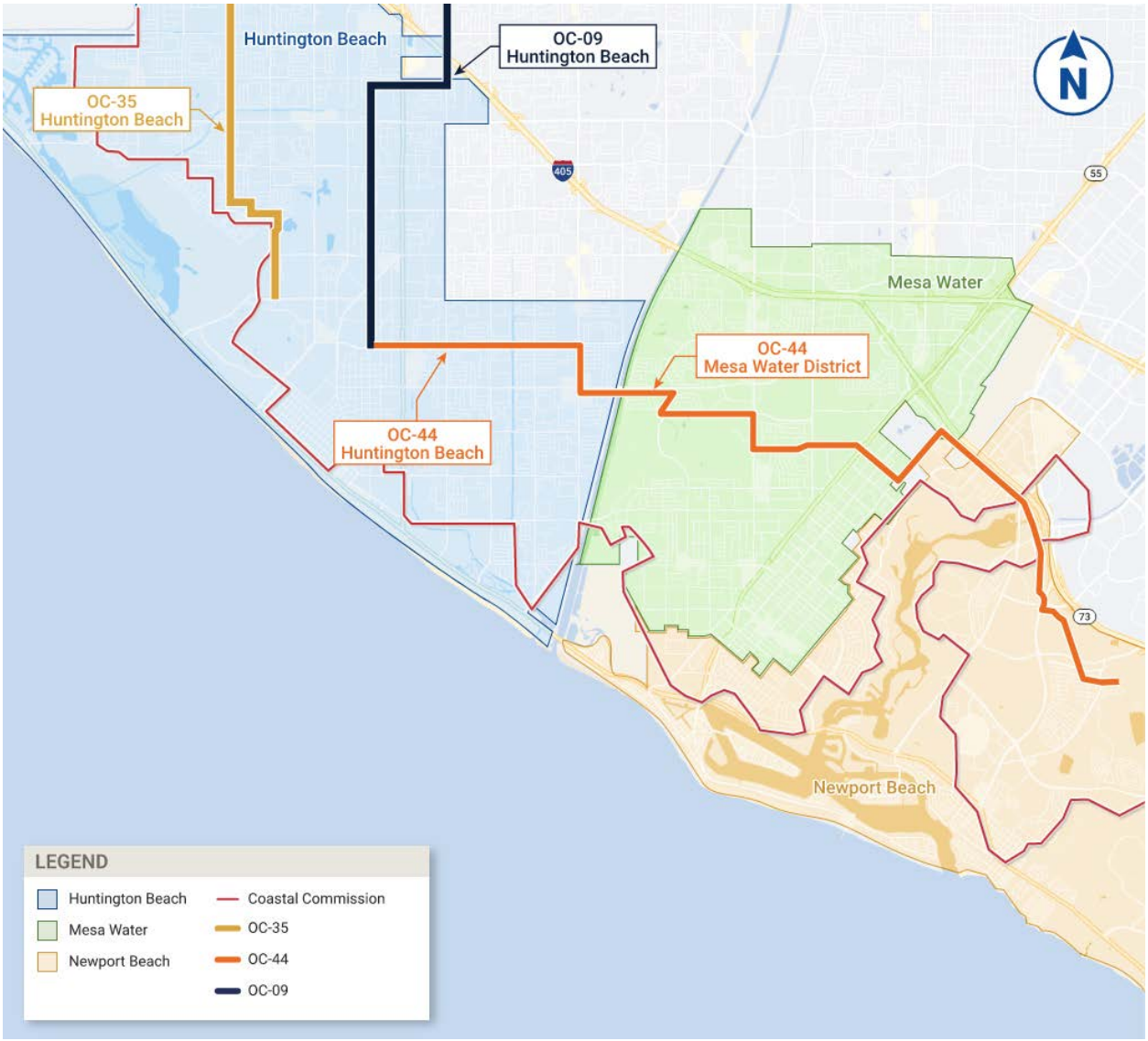


Figure 1-6 **MWD Distribution Lines in the Study Area**

1.3.4 Brine Disposal System

Within the study area, there are multiple brine disposal lines that are primarily managed through ocean discharge systems. In addition to the dedicated brine lines, there is an extensive sewer collection system which was considered for brine management. Figure 1-7 identifies the brine lines evaluated within the study area. The following subsections summarize the assessment of each brine disposal option and selection.

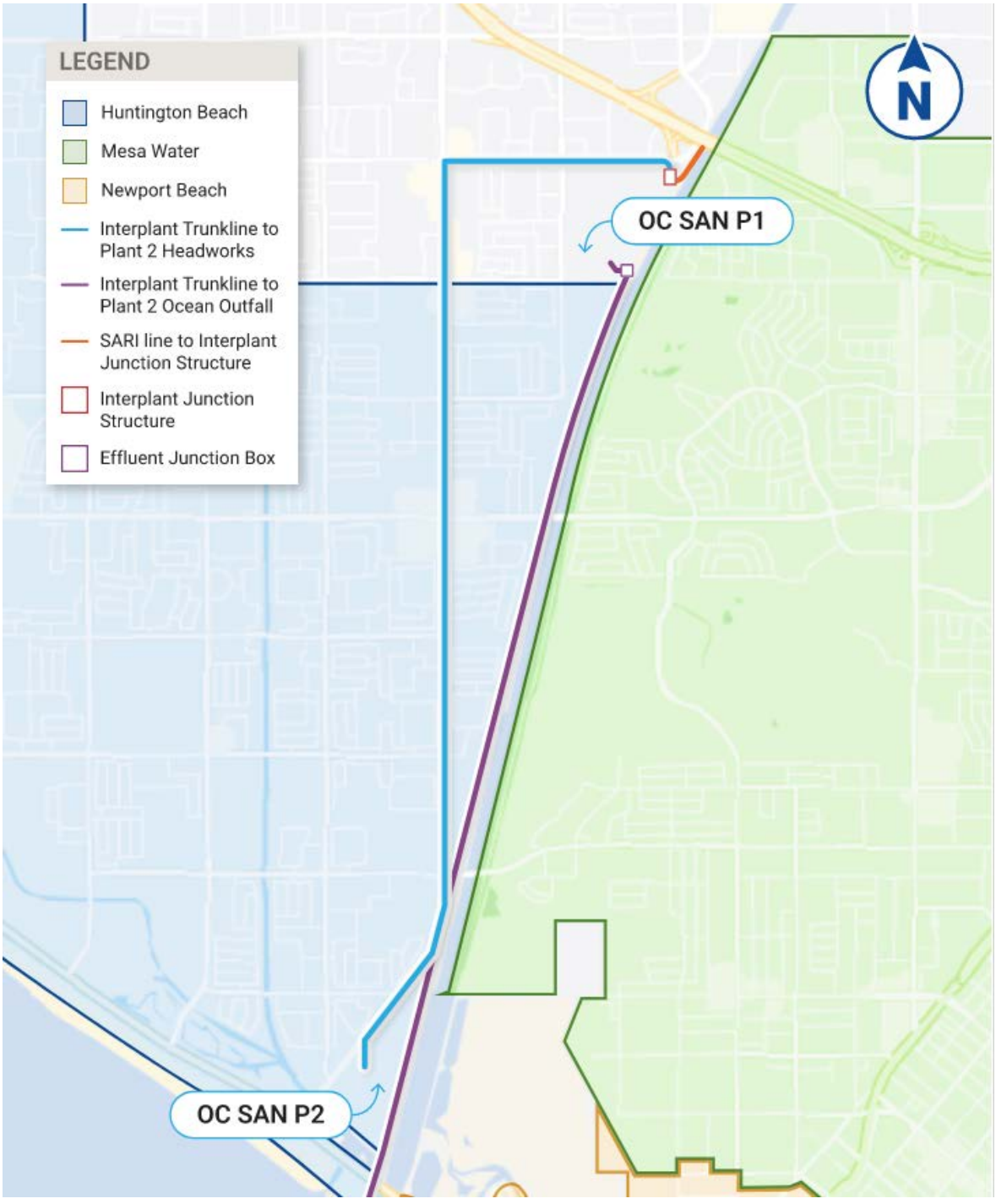


Figure 1-7 **Brine Lines Within the Study Area**

1.3.4.1 Orange County Sanitation District Interplant Trunkline

The Orange County Sanitation District (OC San) 78" Interplant trunkline is a critical part of the wastewater infrastructure in the area. The trunkline transports non-reclaimable waste streams and brine from various sources from OC San Plant 1 to Plant 2 for further treatment and discharge through the OC San Ocean Outfall system. The primary waste stream from the USBR proposed project will be groundwater desalted brine, as such it will be relatively low in organics but higher in salinity than typical wastewater primary influent. Because OC San Plant 2 does not include a desalination step, and due to the relatively small flows compared to the primary influent flow, impact to Plant 2 treatment processes are assumed to be minimal. Use of the Interplant Trunkline is assumed for this project and would send project brine for treatment at Plant 2 prior to disposal.

1.3.4.2 OC San Effluent Junction Box at Plant 1

Another brine disposal infrastructure option in the immediate project area is the Effluent Junction Box at OC San Plant 1. Currently reverse osmosis (RO) brine from GWRS is sent to the Effluent Junction Box for flow management, and subsequently the flows are conveyed directly to the OC San Ocean Outfall System, thereby bypassing additional treatment at Plant 2. The OC San Ocean Outfall system extends over 5 miles offshore and uses a diffuser system to minimize environmental impact. Utilization of the Effluent Junction Box is not assumed for this project but would provide mutual benefits across project stakeholders. Because the waste stream from the USBR proposed project would be groundwater desalted brine, the quality is anticipated to be of a higher quality than GWRS indirect potable reuse brine and therefore should not require additional treatment at OC San Plant 2 prior to ocean discharge. Utilization of this line should be considered during future project phases and will require further coordination with OC San prior to selection.

1.3.4.3 Sewer System Discharge

The primary waste stream from the USBR proposed project will be groundwater desalted brine. Within the region there are multiple examples of similar projects discharging groundwater desalted brine directly to the sewer collection system. However, because the project area provides immediate access to dedicated brine lines, sewer collection system discharge is not required. Additionally, if sewer collection discharge were utilized, the groundwater desalted brine could increase the salinity of GWRS influent by ten to fifteen percent and risk increasing energy consumption at GWRS. Due to the availability of dedicated brine lines, and potential impacts to GWRS influent salinity, sewer collection system discharge is not recommended for the proposed project.

1.3.5 OCWD Basin Replenishment

OCWD actively replenishes the OC Basin using multiple sources: Santa Ana River, GWRS, and purchased imported water when needed during periods of drought. At the Talbert Barrier, up to 30 MGD (with an average of 15 MGD) of advanced treated indirect potable reuse water from GWRS is injected to maintain water levels in the Talbert Aquifer at protective elevation to restrict the inland migration of saltwater intrusion. A significant portion of the water injected at the Talbert barrier serves to replenish the basin as well.

OCWD manages the basin sustainably through a financial incentive structure based on the Basin Production Percentage (BPP), which sets the portion of a retailer's demand that can be met by groundwater at a specific Replenishment Assessment (RA) rate. Pumping above the BPP incurs an additional Basin Equity Assessment (BEA), aligning producer behavior with basin sustainability goals and ensuring adequate funding for recharge and basin management operations. Mesa Water's production of

amber water is exempt from OCWD's BEA, due to the MWRF basin water quality benefit of utilizing lower-quality water while protecting the broader aquifer (OCWD, 2017).

2.0 Statement of Problems and Needs

Describe key water resource management problems and needs for which a water reclamation, recycling or desalination project will provide a solution, including the following information. All projections shall be reasonable and applicable for a minimum of 20 years.

2.1 Description of Problem and Need for Project

Description of the problem and need for a water reclamation, recycling, or desalination project.

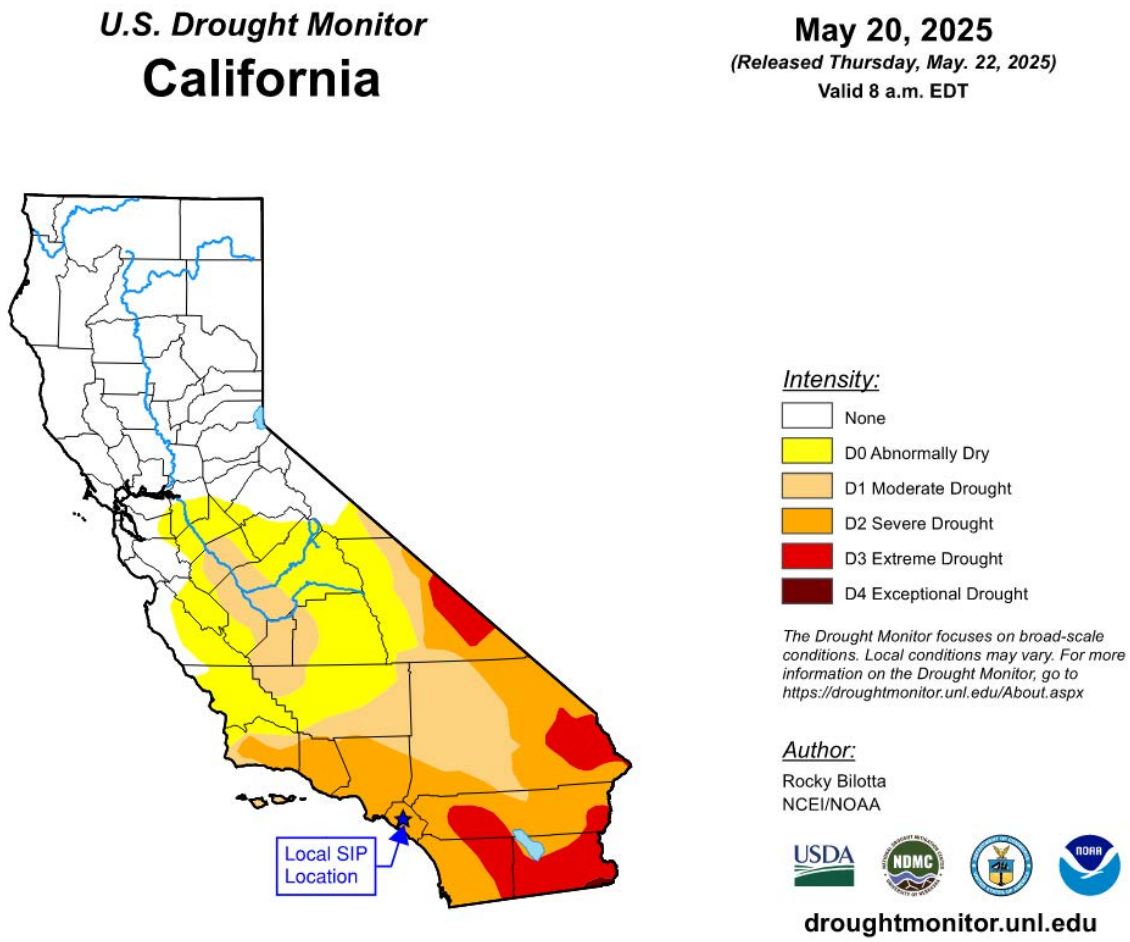
The need for the Local SiP stems from multiple factors including:

- The demand for new water supplies for the region to support the project stakeholders' Urban Water Management Plan (UWMP) reliability objectives
- Risks to imported water supplies and supporting SB 606/AB 1668 Long Term Water Use Efficiency and Drought Resilience mandates
- Seawater intrusion impacting the OC Basin groundwater quality
- Increasing population size in the project area
- Supporting compliance with California's Title 22 drinking water standards by ensuring treated groundwater consistently meets potable water quality requirements

2.1.1 Imported Water Supply Risk

North-central Orange County currently lacks a diverse range of influent water resources. The coastal community surrounding the Local SiP study area is impacted by the extreme drought conditions as shown on Figure 2-1 and Figure 2-2 that displays the drought status in the Orange County area over the last 5 years. The ongoing drought in California has significantly impacted the availability of imported water supplies from the SWP and the CRA. While Mesa Water uses imported water as a backup source; Huntington Beach and Newport Beach use imported water to meet approximately 15% of their annual water demand. The uncertainty around the future availability of the SWP supplies and the approaching reduction of California's contractual rights to the Colorado River water, make it essential that Orange County continues to protect its economy, public health, and safety by developing new, locally sourced, sustainable potable water supplies.

California's Water Supply Strategy: Adapting to a Hotter, Drier Future, adopted by the Newsom Administration in 2022, anticipates the loss of 10% of the state's water supply due to changing weather patterns within the next 15 years. It includes specific targets for expanded brackish water desalination by 28,000 AF by 2030 and 84,000 AF by 2040. The Department of Water Resources and State Water Resources Control Board have started identifying sites for future brackish groundwater supplies. This recent state regulation further supports the need to fully explore the engineering and environmental feasibility, costs, regulatory permitting, and institutional requirements associated with developing new water supplies via the Local SiP.



Source: U.S. Drought Monitor

Figure 2-1 Drought Status Map

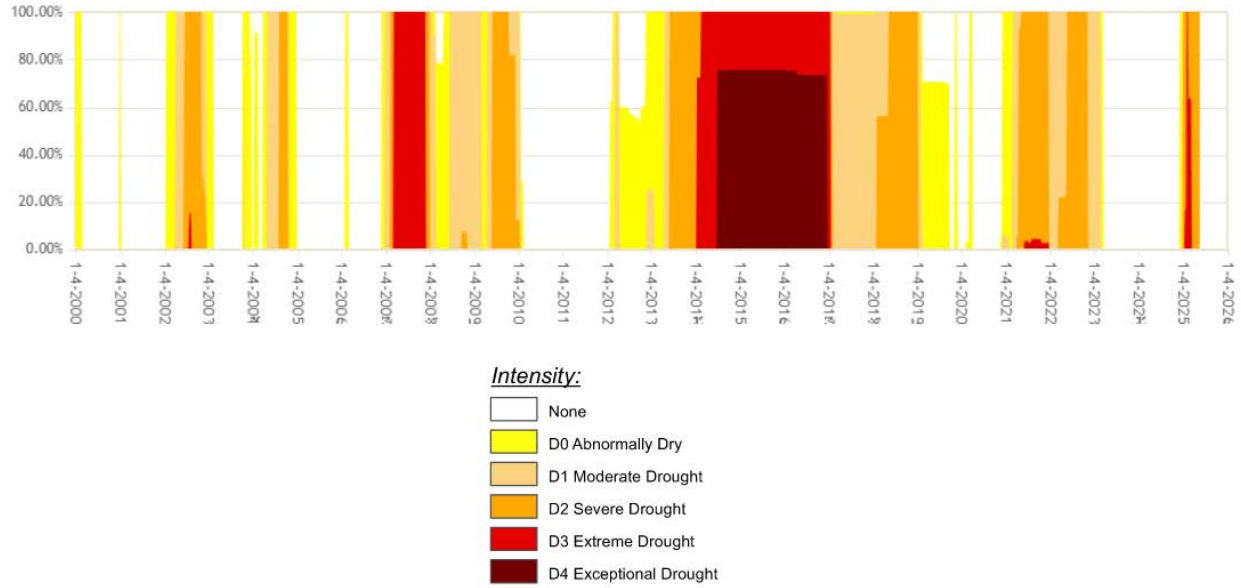


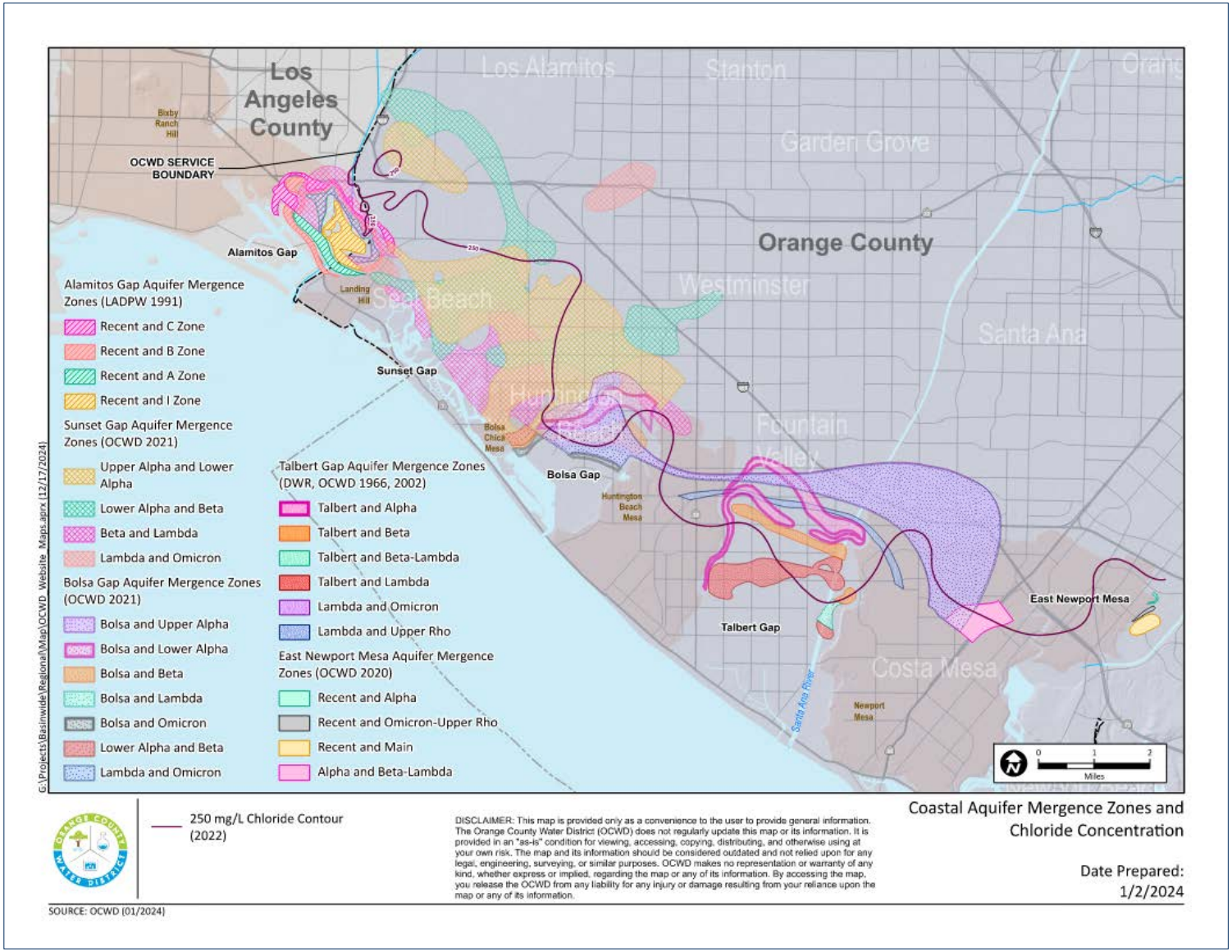
Figure 2-2 Orange County Drought Status 2000-2025

2.1.2 OC Basin Seawater Intrusion

Seawater intrusion poses a significant challenge to the OC Groundwater Basin, particularly in the coastal areas. T-he 250 mg/L chloride contour line (Figure 2-3) serves as a key indicator of the inland-most leading edge of intrusion. By strategically placing the Local SiP wells seaward of the chloride contour, an extraction trough is created that captures high TDS water and pulls the leading-edge seaward, providing additional protection to critical freshwater supplies and municipal wells. This approach supplements the long-term effectiveness of the Talbert Barrier and protects the high-quality water in the Principal Aquifer which is used for over 90% of the basin's groundwater pumping. Furthermore, future sea level rise may increase the threat of seawater intrusion, and the Local SiP, working in combination with the Talbert Barrier, would be able to provide a reliable defense. This is especially important for Newport Beach, which relies on the Shallow aquifer for its municipal water supply.

Prior to implementation of the GWRS, multiple groundwater wells were abandoned within the study area due to seawater intrusion. Two such wells controlled by Newport Beach were located at the Southeast corner of Adams and Brookhurst, and a second at the southeast corner of Bushard and Hamilton. Similarly, Laguna Beach was forced to abandon a groundwater well in the study area that was previously located at the southwest corner of Garfield and Magnolia. Based on discussions with the project stakeholders, there were additional abandoned groundwater wells due to seawater intrusion, however a complete catalog was not available at the time of the writing of this feasibility study.

Based on the available groundwater modeling it is estimated that the Local SiP would improve the groundwater quality at these previously abandoned locations. However, pumping groundwater from these locations would have to be closely coordinated under the larger groundwater basin management plan.

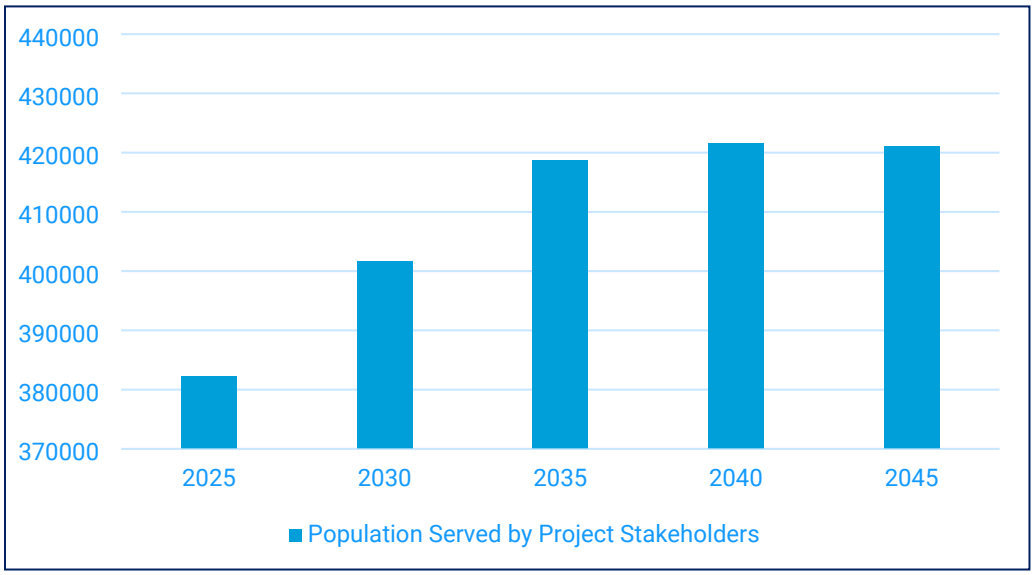


Source: Coastal Aquifer Mergence Zones and Chloride Concentration

Figure 2-3 OCWD Coastal Aquifer Mergence Zones and Chloride Concentration Map

2.1.3 Increasing Population Growth and Demand

Across all project stakeholders, ongoing support for economic development is needed by servicing a continually growing Orange County population. From 2020 to 2045, the project stakeholders' retail population is projected to increase 12.04%, as shown on Figure 2-4. Even though Mesa Water and the project stakeholders have already implemented proactive demand management practices as shown in Table 2-1, there is a further need to diversify the water portfolio to reduce their vulnerability to external factors.



Source: (2020 Mesa Water UWMP, 2020 Huntington Beach UWMP, and 2020 Newport Beach UWMP)

Figure 2-4 **Population Served by Project Stakeholders Growth Projection**

Table 2-1 **Current Demand Management Practices**

Demand Management Practices	Description
Rebates and Incentives	Project Stakeholders offer rebates for residential and commercial customers to save water and money on high efficiency appliances and devices. Many of the rebates and incentives are provided through MWDOC.
Water Conservation Requirements	Project Stakeholders enforce permanent water conservation requirements that prohibit runoff and place limits on water usage and irrigation hours.
Water-Wise House Call	A Mesa Water employee visits customer's home to check irrigation, explain water meter, and offer watering tips and rebate information. Huntington Beach and Newport Beach participate in the MWDOC's Water Wise House Call Program for efficiency assessments.
Educational Resources	The Urban Water Management Plan and Water Shortage Contingency Plan guide long term conservation and emergency preparedness.
Mesa Water Education Center	A facility dedicated to teaching the community about water science, conservation, and local water systems.

With the increasing demand and the push to diversify the local water supplies under California's Water Supply Strategy, it is essential for the Local SiP to establish a new water supply source via a brackish groundwater desalination treatment facility. This approach will ensure a more reliable and sustainable water source for the Orange County coastal community and will help address the area's current needs and projected demands.

2.2 Description of Current and Projected Water Supplies

Description of current and projected water supplies, including water rights, and potential sources of additional water other than the proposed water reclamation, recycling or desalination project, and plans for new facilities other than the proposed project, if any.

The sole sources of water for Mesa Water, Huntington Beach, and Newport Beach include groundwater from the OC Basin, imported water from the SWP and CRA, and minor portions of recycled water. The groundwater is replenished with highly purified indirect potable reuse water from GWRS. All imported water supplies are managed by MWDOC, while the OC Basin is managed by OCWD.

According to the supply projections in the project stakeholders 2020 Urban Water Management Plans, water demands are expected to be met through 2045 only if imported water continues to be available. However, there is an expected 10% reduction in total supply expected due to changing weather patterns. Table 2-2 presents the projected supplies and anticipated 10% reduction in supplies for Mesa Water, Huntington Beach, and Newport Beach.

Table 2-2 Projected Supplies

Supply Type	2025	2030	2035	2040	2045
Groundwater	50,968	53,159	54,118	54,424	54,735
Imported Water	6,109	6,203	6,197	6,185	6,173
Recycled Water	1,642	1,642	1,642	1,642	1,642
Total Supplies (AFY)	58,719	61,004	61,957	62,251	62,550
Total Supplies After Anticipated 10% Reduction (AFY)	*52,847*	*54,904*	*55,761*	*56,026*	*56,295*
Sources: *Supply and demand projections based on the Mesa Water, Huntington Beach, and Newport Beach 2020 UWMPs, (Arcadis, 2021).* *WaterSMART: Water Recycling and Desalination Planning Grant Application – Local Groundwater Supply Improvement Project*					

2.3 Description of Current and Projected Water Demands

Description of current and projected water demands, including a description of the current and projected water supply and demand imbalances.

Although projections in the 2020 Urban Water Management Plan indicate water demands will be met through the year 2045, the anticipated reduction of imported water warrants a need for an increase in local water supply. Huntington Beach and Newport Beach both currently source approximately 15% of their water from imported water. In 2020, approximately 11,925 AFY of imported water supplied the needs of Huntington Beach and Newport Beach. Due to the population increase described in Section 2.1, water

demands for Mesa Water, Newport Beach, and Huntington Beach are projected to increase by nearly 4,500 AFY through 2045. With imported water supplies at risk, meeting these future water demands is a significant challenge.

In April 2019, Governor Gavin Newsom issued the Executive Order N-10-19 which directs several state agencies to develop a comprehensive Water Resilience Portfolio. The portfolio prioritizes key actions to secure California's water future. The Water Resilience Portfolio laid the groundwork for the 2022 Water Supply Strategy. Due to less snowfall, more evaporation, and greater water consumption by dry vegetation and soils (Department of Water Resources (DWR), 2022), existing water supplies are expected to be reduced by 10% by 2040. By the year 2045, an estimate of 6,255 AFY supply reduction is expected for Mesa Water, Huntington Beach, and Newport Beach. With the 10% reduction for all supply sources, there is projected to be an imbalance of supply and demand for the area, as shown in Figure 2-5.

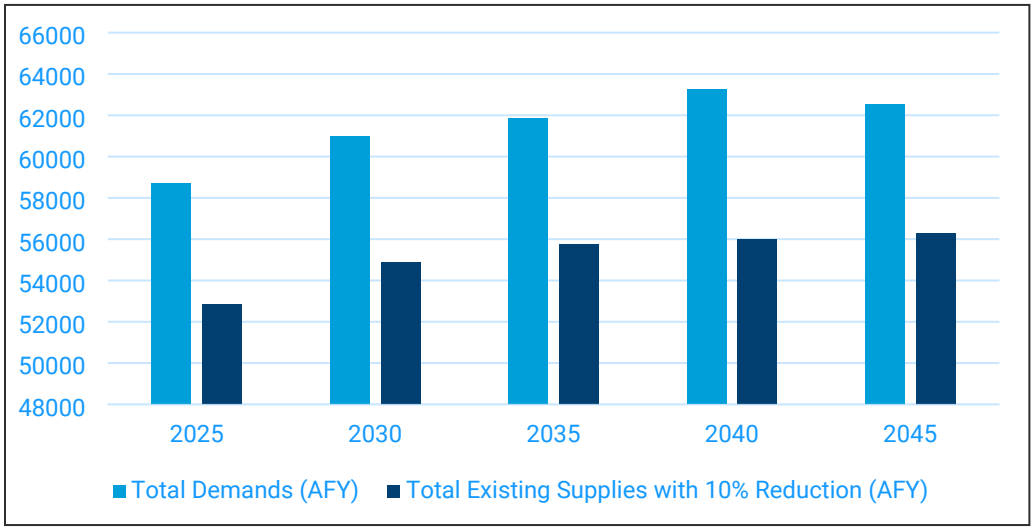


Figure 2-5 Projected Supply and Demand

The difference between the total demands and total existing supplies with the 10% reduction is shown in Figure 2-6. The Local SiP will help mitigate this projected supply gap by providing a new supplemental local water source. As described in later sections of this feasibility study, the Local SiP is designed to produce 5,993 AFY of potable drinking water. By 2045, the Local SiP will offset imported water supply by 95% (262 AFY).

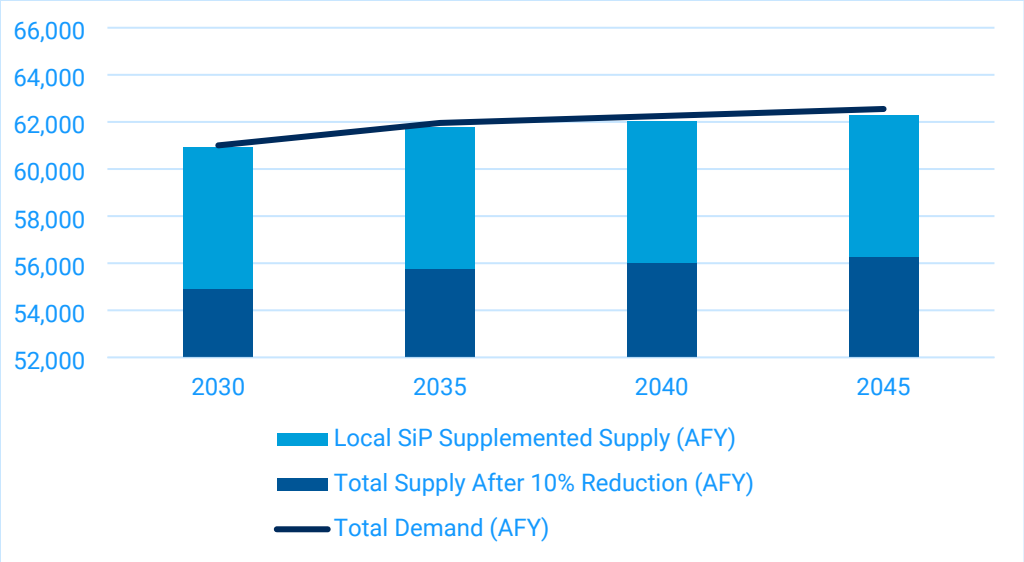


Figure 2-6 Supply and Demand with Local SiP Supplemented Supply (AFY)

2.4 Description of Water Quality Concerns

Description of any water quality concerns for the current and projected water supply.

Mesa Water's 2024 Water Quality Report confirms that there are currently no water quality concerns within their drinking water distribution system. The water meets or surpasses all state and federal drinking water standards. Although there are no current concerns with the existing drinking water quality, the Local SiP will enhance the OC Basin source water quality of the Shallow and possibly the Principal Aquifer Systems by drawing the chloride concentrations further away from the existing production wells. As the intrusion front in Talbert Gap continues to move seaward, enhancing the seawater intrusion barrier will sustain and stabilize this trend by limiting inland encroachment. This will be achieved by strengthening the seawater intrusion barrier, which will help prevent seawater from moving inland and shift the intrusion front back toward the coast. In terms of effluent water, brine or waste discharge for the watershed is historically treated at OC San's facilities. The Local SiP is not expected to have an impact on wastewater effluent water quality since it is a small percentage of the overall influent flow at the OC San Plant 2 wastewater treatment plant. The project's main objective is to increase the local water supplies, diversify the water portfolio and improve the OC Basin groundwater quality by enhancing the seawater intrusion barrier. Distribution system finished water quality issues are not anticipated.

2.4.1 Seawater Intrusion

Seawater intrusion is a long-recognized water quality concern in coastal Orange County, particularly in the Talbert Gap. Though actively managed by OCWD's injection barriers, future conditions such as increased accumulated overdraft in the basin, sea level rise, or increased pumping could reintroduce risks. A proposed brackish groundwater supply project must carefully evaluate its influence on local aquifer hydraulic gradients, as it could either exacerbate intrusion if improperly managed or help intercept intruding seawater if strategically located.

Importantly, the Local SiP also presents an opportunity to utilize currently underused brackish storage zones near the saltwater-freshwater interface—providing both a new water supply and enhancing seawater intrusion prevention. To evaluate these potential outcomes, groundwater flow and transport modeling has been utilized to simulate the effects of proposed extraction scenarios on both hydraulic

gradients and chloride migration patterns. These simulations are being used to inform well siting, production rates, and management strategies to minimize seawater intrusion risks while maximizing beneficial capture of brackish water.

3.0 Water Reclamation, Recycling or Desalination Opportunities

Address the opportunities for water reclamation, recycling and desalination in the study area, and identify the sources of water that could be reclaimed or desalinated, including the following information.

3.1 Description of All Uses for Groundwater

Description of all uses for reclaimed or desalinated water, or categories of potential uses, including, but not limited to, environmental restoration, fish and wildlife, groundwater recharge, municipal, domestic, industrial, agricultural, power generation, and recreation. Identify any associated water quality, and associated treatment requirements.

All groundwater extracted and conveyed in the Local SiP will be used for municipal use only. The water will be provided to existing potable water customers served by Mesa Water, Huntington Beach, Newport Beach, and OCWD. Brine produced during treatment will be conveyed to the OC San Interplant Trunkline and ultimately discharged to the OC San Ocean Outfall. Product Water is anticipated to tie into distribution line OC-44 which will directly serve the communities of Huntington Beach, Newport Beach, and Mesa Water.

The water treated and distributed through the proposed facilities will adhere to California's maximum containment levels (MCLs). It will also match the local historical distribution system water quality stability parameters. The key constituents presented in Table 3-1 are from Mesa Water's 2024 Water Quality Report, Huntington Beach's Annual Water Quality Report Reporting Year 2024, and Newport Beach's Annual Water Quality Report Reporting Year 2024. The Local SiP is designed to connect to the OC-44 distribution pipeline which serves Mesa Water, Newport Beach, and Huntington Beach. Therefore, the finished water must meet the water quality standards and regulatory requirements of both agencies. Feed water bromide concentration is also considered in the treatment design due to its potential to form brominated disinfection byproducts (DBPs) during chlorination.

Table 3-1 Key Constituents

Constituent	MCL	SDWA Secondary MCL	Mesa Water Average	Newport Beach Average	Huntington Beach Average	Local SiP Targets
TDS (ppm)	1000	500	319	357	309	<500
Chloride (ppm)	500	250	56	41	44	<250
Boron (ppm)[1]	5	1	0.20	0.16	0.02	<0.5
Bromide (ppm)	Not Regulated	Not Regulated	Not Regulated	Not Regulated	Not Regulated	<0.1
pH (pH unit)	Not Regulated	6.5 – 8.5	8.2	8	8.1	8.0 - 8.5
Calcium (ppm)	Not Regulated	Not Regulated	33	63	50	>25
Alkalinity (ppm as CaCO3)	Not Regulated	Not Regulated	143	141	146	>60
Hardness (ppm as CaCO3)	Not Regulated	Not Regulated	109	225	170	-

1) EPA non-enforceable lifetime health advisory

3.2 Description of Water Market

Description of the water market available to utilize reclaimed, recycled or desalinated water, including:

3.2.1 Existing and Potential Users

(i) Identification of existing and potential users, expected use, peak use, on-site conversion costs if necessary, desire to use reclaimed, recycled or desalinated water, including letters of intent if available.

The Local SiP is planned to tie-in to the OC-44 distribution line which currently serves customers in Huntington Beach, Mesa Water, and Newport Beach through interties. Additionally, OC-44 serves as a backup supply for the Talbert Barrier during GWRS shutdowns for maintaining a pressurized barrier pipeline. Existing users of OC-44 are expected to remain users following the construction of the proposed project. Peak water use is anticipated during the summer months. The Local SiP will provide a locally produced water supply to meet future demands in the area and reduce reliance on increasingly uncertain imported water sources.

3.2.2 Consultation With Potential Customers

(ii) Description of any consultation with potential reclaimed, recycled or desalinated water customers. Letters of intent must be included, if applicable.

Because groundwater is the source water for the Local SiP and potable water is the produced water, it is anticipated the public perception of the Local SiP will be positive. Mesa Water regularly engages in public outreach and education programs related to water conservation and water use efficiency efforts, as well as general water resource information. Current public outreach efforts are aimed at increasing consumer

awareness for conservation, efficient water use, and investing in water reliability projects that are in the best interest of the region.

Opportunities for the public to learn about the Local SiP will include multiple public meetings where the feasibility study will be slated for discussion, information, presentation, and possible action. The meetings will take place at Mesa Water, Huntington Beach, Newport Beach, and OCWD. Other public outreach about the project will include newsletter articles, press releases, social media postings, and website postings by Mesa Water.

3.2.3 Market Assessment Procedures

(iii) Description of the market assessment procedures used.

The project stakeholders' 2020 Urban Water Management Plans were used to assess the water market demand and provide projection of current and future water supplies and demands as discussed in Sections 2.2 and 2.3. The 2020 UWMPs use historical consumption data, population, and regional growth estimates to predict future demands. Despite Mesa Water's strong local supply, the 2020 UWMP acknowledges a potential supply and demand gap during emergency or peak conditions. The OC-44 pipeline serves as the project stakeholder's connection to imported water from MWDOC.

The OC-44 pipeline is a turnout from East Orange County Feeder No. 2, which originates near Irvine and extends southwest toward Costa Mesa and Huntington Beach. Huntington Beach and Mesa Water jointly own the pipeline. The OC-44 pipeline allows imported water from MWDOC to be delivered directly into the Huntington Beach distribution system. The OC-44 pipeline is also connected to Mesa Water's system, but Mesa Water does not use the imported water under normal operating conditions. The connection serves as an emergency or supplemental supply source if local groundwater supplies are unavailable or insufficient.

With the increasing demands projected in the Mesa Water 2020 UWMP, maintaining access to reliable supplemental supplies is important. The Local SiP will provide 5.35 MGD of treated water to the OC-44 pipeline. Diversifying the supply delivered to the OC-44 pipeline will decrease regional reliance on imported water and ensure that project stakeholders can continue to meet growing market demands while preserving the reliability of their systems.

3.3 Considerations Which May Prevent Project Implementation

Discussion of considerations (for example: physical, converting systems for reused water, or public acceptance) which will prevent implementing a water reclamation, recycling or desalination project. Identify methods or community incentives to stimulate reclaimed, recycled or desalinated water demand, and methods to eliminate obstacles which will inhibit the use of reclaimed, recycled or desalinated water, including pricing.

While many project components have been analyzed for preparation of this feasibility study including groundwater modeling, preliminary site investigations, a preliminary treatment plan, and conveyance routing; risks and challenges still exist as project refinement and implementation occurs. One physical challenge of implementing the Local SiP includes selection of the project site and further optimizing the various conveyance alignments.

As mentioned in Subsection 1.3.3, the study area is highly developed with minimal parcels zoned for industrial use. A more detailed site investigation will need to occur to identify and procure not only the trea

tment site, but also the five groundwater well locations. To minimize conveyance costs, it is recommended that Mesa Water procures a treatment site:

1. Near the groundwater well locations
2. In proximity to OC San's Interplant Trunkline for brine discharge

By doing so, this will alleviate construction costs of installing large diameter pipes on busy roads within the dense urban study area and further support the Local SiP costs to be comparable to imported water costs.

As stated in Subsection 3.2.2, it is anticipated that public perception of the Local SiP will be positive and would not require customer incentives. It is important to consider options that can reduce project cost (such as site optimization noted above), to reduce the barrier for public acceptance by keeping the project cost low.

3.4 Agencies with Jurisdiction

Identify all water and wastewater agencies in service area

The non-Federal sponsors for the Local SiP include Mesa Water, OCWD, Huntington Beach, and Newport Beach, which all are water and wastewater agencies operating within the service area. These sponsors actively participated in the development of this feasibility study and are informed of the Local SiP components. While OC San is not a sponsor of the project, it holds authority of the brine disposal. Other agencies, such as the City of Fountain Valley Water Division and MWDOC, may also have jurisdiction depending on the final location of the treatment facility. Refer to Table 3-2 for an overview of the different agencies and the services they provide.

Table 3-2 Agencies with Potential Jurisdiction

Agency	Serves	Water	Wastewater
Mesa Water District	Costa Mesa/Newport Beach	Yes	No
Orange County Water District	Orange County	Yes	Treats recycled water
Huntington Beach Utilities	Huntington Beach	Yes	Yes
Newport Beach Utilities	Newport Beach	Yes	Yes
Orange County Sanitation District	Orange County	No	Yes
City of Fountain Valley Water Division	Fountain Valley	Yes	No
Municipal Water District of OC	Orange County	Yes	No

3.5 Potential Brackish Groundwater Sources to be Desalinated

Description of potential sources of water to be reclaimed, recycled or desalinated, including impaired surface and groundwaters.

Potential groundwater sources were considered within the project stakeholders' jurisdictions. The evaluation of potential groundwater sources included regions where aquifers were known to contain brackish water and organized into four sub-areas: Talbert Gap, Bolsa Gap, Huntington Beach Mesa, and

Newport Beach Mesa (Figure 3-1). Each area was reviewed for hydrogeologic suitability, potential yield, and water quality characteristics, as well as regional management and sustainability considerations.

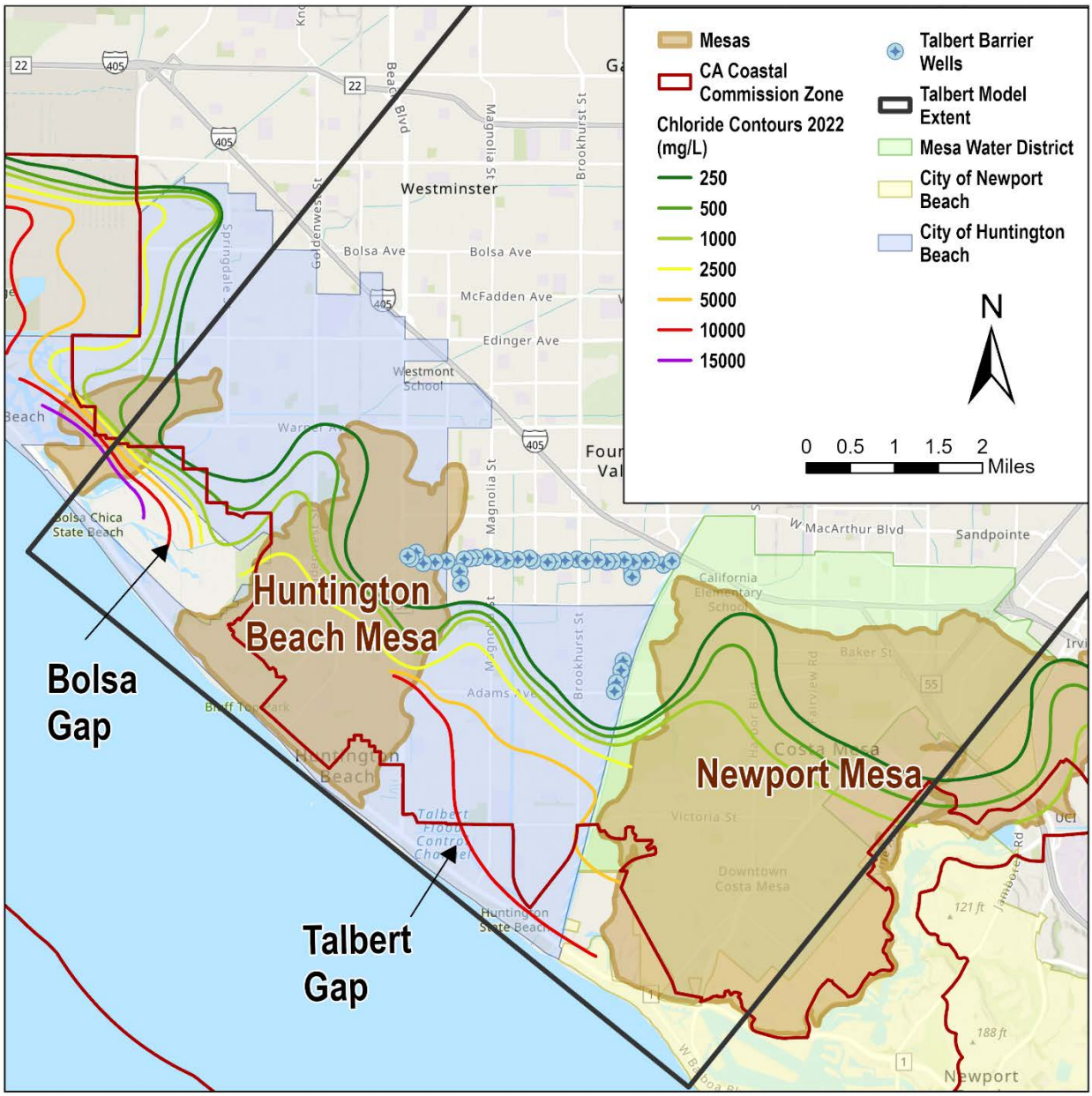


Figure 3-1 Overview of Potential Brackish Production Areas

3.5.1 Talbert Gap

The Talbert Gap is a coastal lowland located between the uplifted Huntington Beach Mesa and Newport Beach Mesa, characterized by an ancient erosional channel filled with highly permeable alluvial sediments. Historically, this gap served as a primary pathway for seawater intrusion into the OC Basin before regional protection measures were implemented.

The Talbert Aquifer, the principal hydrostratigraphic unit in this area, is part of the Shallow Aquifer System and is composed primarily of coarse-grained Holocene to Pleistocene-age sands and gravels. In the

Talbert Gap, the aquifer lies in direct hydraulic connection with the Pacific Ocean, extending seaward beneath Huntington State Beach, and inland where it is interfaced by the Talbert Seawater Intrusion Barrier.

Importantly, in this part of the basin, the Talbert Aquifer is also known to merge hydraulically with deeper aquifers in the Principal Aquifer System, particularly where aquitards are thin or are laterally discontinuous. This mergence increases the potential for vertical and lateral flow exchange, making the Talbert Gap a key zone for managing both intrusion risks and opportunities for accessing seawater replenishable brackish groundwater production.

The Talbert Aquifer contains brackish groundwater, with chloride concentrations exceeding 10,000 mg/L in the southwestern portion of the gap (Figure 3-1). Groundwater model simulations demonstrate that, with appropriate well spacing and production rates, pumping from this area could:

- Intercept intruding seawater as a project source water,
- Minimize inflow from the protected inland basin, and
- Possibly enhance barrier performance by reducing increasing or steepening hydraulic gradients from the Talbert Barrier.

Given the hydrogeologic connectivity to the ocean, favorable aquifer properties, and the opportunity to complement existing basin protection infrastructure, the seaward portion of the Talbert Gap was selected as the preferred sub-area for developing a brackish groundwater supply project.

3.5.2 Bolsa Gap

Bolsa Gap is a low-lying coastal area northwest of the uplifted Huntington Beach Mesa. It is underlain by permeable alluvial deposits, but unlike Talbert Gap, it is structurally constrained by the Newport-Inglewood Fault Zone, which significantly offsets and impedes the hydraulic continuity of the aquifers in this area.

As a result, seawater intrusion is not actively occurring through Bolsa Gap, and brackish conditions are more limited in extent. OCWD modeling indicates that groundwater inflow from the ocean at Bolsa Gap is minimal due to the offsetting effect of the Newport-Inglewood Fault (OCWD, 2017). Furthermore, water quality data suggest a less well-defined brackish wedge. For these reasons—including limited yield potential and the fault-constrained flow paths—Bolsa Gap was not selected as a candidate for brackish groundwater recovery.

3.5.3 Huntington Beach Mesa

Aquifers beneath the Huntington Beach Mesa were evaluated as a potential source due to historical degradation and chloride concentrations that may exceed 2,500 mg/L, indicative of brackish conditions. However, this area was ruled out for two primary reasons.

First, groundwater modeling showed that extraction from this location could increase the risk of seawater intrusion in areas not currently protected by the Talbert Barrier, potentially drawing saline water inland. Second, a large portion of the groundwater yield from this area would come from the Orange County Groundwater Basin itself, rather than from the intruding wedge of seawater, placing undue stress on OCWD's basin management operations. Given these risks and management constraints, this sub-area was not selected for further consideration.

3.5.4 Newport Beach Mesa

Aquifers beneath the Newport Beach Mesa were also considered. This area exhibits moderately elevated chloride concentrations, generally upwards of 1,000 mg/L in deeper wells. However, like Huntington Beach Mesa, pumping from this area presents a risk of inducing seawater flow around the Talbert Barrier, potentially allowing saline water to spread toward inland production wells. Because of this risk to adjacent potable supplies and the likelihood of drawing water primarily from the basin rather than intercepting seawater, this area was not pursued as a brackish supply source.

3.6 Description of Location and Source Water

Description and location of the source water facilities, including capacities, existing flows, treatment processes, design criteria, plans for future facilities, and quantities of impaired water available to meet new reclaimed, recycled and desalinated water demands.

This section describes the proposed location, construction characteristics, and water quality of the brackish groundwater wells that will supply the source water for the project. The project is located in the coastal portion of the OC Basin within the Talbert Gap, a known zone of brackish groundwater and historical seawater intrusion.

3.6.1 Groundwater Model

To support the evaluation of brackish groundwater recovery in the coastal portion of the basin, a refined groundwater flow model—the Talbert Groundwater Model—was utilized for this study. The Talbert Groundwater Model was originally developed by OCWD as a focused sub-model of the larger Orange County Basin Model to analyze groundwater conditions, barrier performance, and seawater intrusion dynamics in the Talbert Gap area (CDM Smith, 2003, draft).

The model discreetly represents the complex hydrogeologic layering of the Talbert Aquifer, which is part of the Shallow Aquifer System, and its interaction with deeper aquifers within the Principal Aquifer System. The model incorporates OCWD's extensive monitoring data, including multi-depth observation wells, production wells, and injection operations at the Talbert Seawater Intrusion Barrier (Talbert Barrier). It has been previously calibrated to simulate both steady-state and transient conditions, representing basin operations, recharge, and coastal barrier performance.

For this study, the Talbert Groundwater Model was applied to simulate proposed brackish water extraction scenarios within the seaward portion of the Talbert Gap, where elevated chloride concentrations have been identified. As part of this analysis, chloride transport capabilities were incorporated into the model, allowing for simulation of salinity dynamics and estimation of chloride concentrations at proposed well locations. The model was also used to evaluate the proportional source contributions of extracted water (i.e., seawater versus inland basin groundwater) and to assess potential drawdown impacts under various extraction scenarios.

While the model provides a valuable framework for testing preliminary feasibility, it should be noted that its calibration does not fully meet industry-standard guidelines for predictive accuracy. The calibration was deemed sufficient for scoping-level analysis, but additional refinement would be warranted in future stages of project planning to improve confidence in long-term performance predictions. In addition, although potential land subsidence from proposed pumping is an important consideration, the Talbert Groundwater Model can only be used to evaluate if water levels may pose a risk of subsidence but not simulate or predict actual subsidence itself.

3.6.2 Location of Groundwater Wells

The Local SiP includes five extraction wells sited within the seaward portion of the Talbert Gap, south of Atlanta Avenue and north of the California Coastal Commission Zone (Figure 3-2). The wells are spaced between Beach Boulevard (west) and Brookhurst Street (east) in Huntington Beach. These locations were selected to:

- Distribute drawdown impacts evenly across the gap,
- Maximize brackish water capture from the seaward portion of the aquifer,
- And minimize interference with the Talbert Barrier, which lies inland of the well field area.

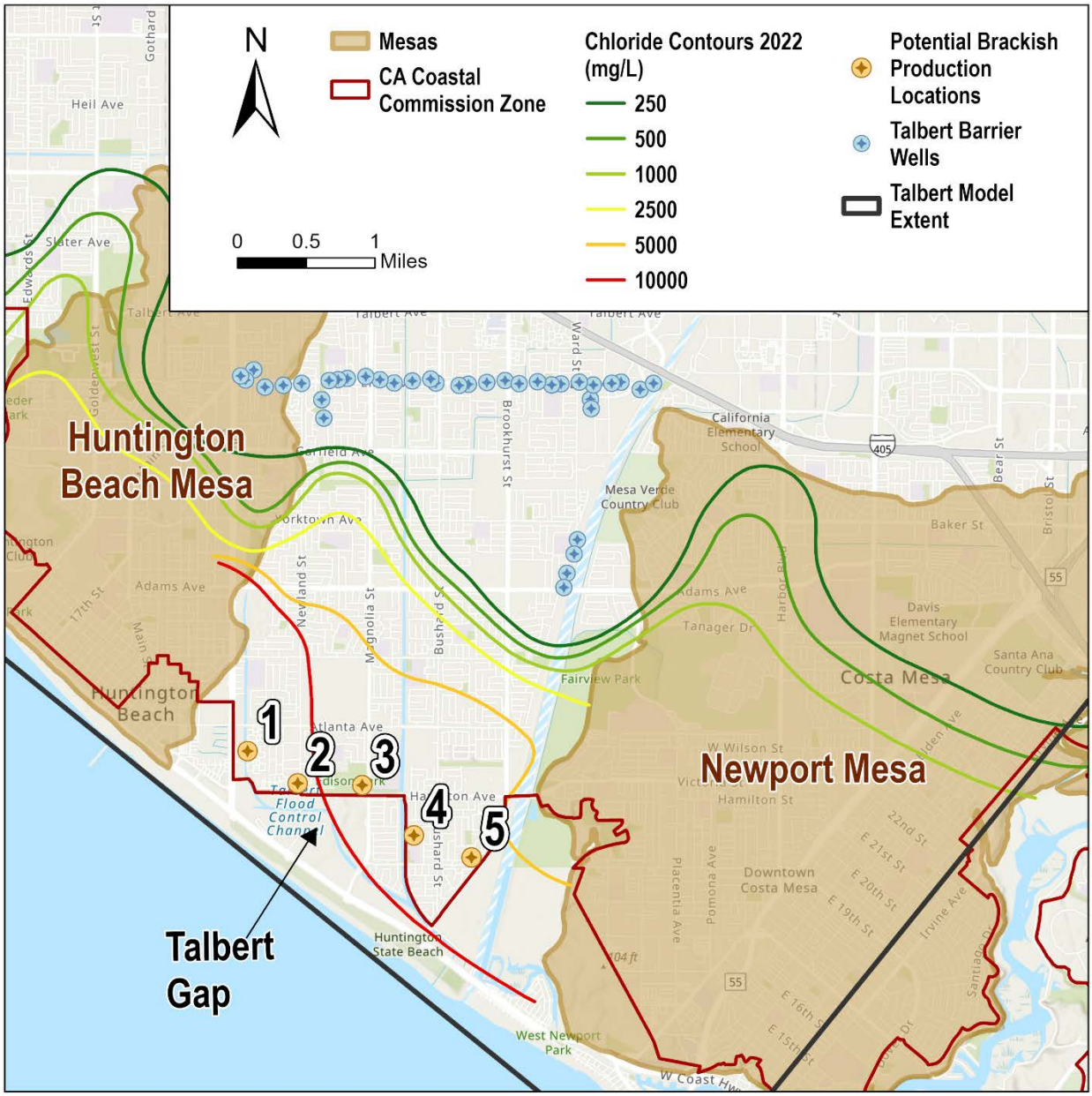


Figure 3-2 Location of Project Wells

The wells will be constructed in the highly transmissive Shallow Talbert Aquifer system. Target well depths are anticipated up to approximately 180 feet below ground surface, informed by prior lithologic data from the area including geologic cross sections, groundwater model lithology, and borehole lithologic logs.

3.6.3 Seaward Talbert Gap Flow and Quality

The seaward portion of the Talbert Gap is characterized by a brackish water zone formed by the mixing of seawater with OC Basin groundwater due to historical intrusion. Groundwater modeling estimates indicate that a groundwater well pumping rate of 8 MGD from the proposed wellfield would induce increased flow from the ocean boundary (~6 MGD) with the remainder (~6 MGD) being inland inflow from the basin, effectively capturing brackish water near the mixing zone between freshwater and saltwater.

The salinity profile at each of the wells during production is expected to vary slightly across the wellfield and remains in the brackish to saline range, with chloride concentrations between 5,000 and 11,000 mg/L depending on relative connectivity to the ocean and the Talbert Barrier.

Using the modeled chloride concentrations, a mass balance calculation was used to determine the blended water quality data shown in Table 3-3. The modeled water quality was validated against historical water quality data from nearby monitoring wells. The majority of modeled parameters aligned with the historical water quality data however, boron and bromide concentrations were both higher in the monitoring well data than the model projected. This could be due to the proximity of the wells to an old landfill. The model was then adjusted by raising the groundwater boron and bromide inputs, so the blend more closely matched historical values. This adjustment addressed the unusually high boron and bromide concentration observed in the coastal aquifer. Because of the high boron, bromide, and TDS levels resulting from the seawater dominated blended water quality, a two-pass RO system typical of seawater designs was included in the conceptual design to treat water to potable drinking water standards.

Table 3-3 Talbert Gap Modeled Water Quality

Feed Parameters	Blended Water Quality from Wells (5.35 MGD Finished Water)
Potassium (mg/L)	208
Sodium (mg/L)	5,588
Magnesium (mg/L)	671
Calcium (mg/L)	265
Strontium (mg/L)	4.70
Barium (mg/L)	0.18
Bicarbonate (mg/L)	287
Nitrate (mg/L)	5.86
Fluoride (mg/L)	0.70
Chloride (mg/L)	10,009
Bromide (mg/L)	40.20
Sulfate (mg/L)	1,460
Phosphate (mg/L)	0.04
Silicon (mg/L)	27.0
Boron (mg/L)	5.09
pH	7.8
TDS (mg/L)	17,597

3.7 Current Groundwater Desalination in the Study Area

Description of any current water reclamation, recycling or desalination taking place in the study area, including a list of reclaimed water uses, type and amount of reuse, and a map of existing pipelines and use sites.

Currently, there are no groundwater desalination facilities in the immediate study area. Outside of the study area, there are multiple brackish groundwater desalters and one major seawater desalination facility that are implemented to supplement the Southern California drinking water supplies. These facilities provide a proved foundation of industry knowledge that serve as a baseline for the proposed treatment approach. The Local SiP will meet the same objectives by enhancing water supply sustainability in the north-central Orange County region.

3.8 Other Wastewater Disposal Options

Description of current and projected wastewaters and disposal options other than the proposed water reclamation, recycling or desalination project, and plans for new wastewater facilities, including projected costs, if any.

As discussed in Subsection 1.3.4, there are multiple brine disposal options within the study area. For the Local SiP, it is anticipated that the groundwater desalted RO brine generated at the treatment plant will be disp

osed to the OC San 78" Interplant trunkline which goes to Plant 2 for retreatment and then ultimately to the OC San Ocean Outfall.

While evaluating brine disposal options, two other approaches were considered. One option was discharging the brine into the sewer collection system; however, this approach was determined to be unnecessary due to access to pre-existing brine management lines. Additionally, if sewer collection discharge were utilized, the groundwater desalted brine could impact the salinity of GWRS influent and risk increasing energy consumption at GWRS. Due to the availability of dedicated brine lines, and potential impacts to GWRS influent salinity, sewer collection system discharge is not recommended for the proposed project.

Another option considered was disposing the brine to the Effluent Junction Box at OC San Plant 1. Utilization of the Effluent Junction Box is not assumed for this project but would provide mutual benefits across project stakeholders. Because the waste stream from the Local SiP would be groundwater desalted brine, the quality is anticipated to be of a higher quality than GWRS indirect potable reuse brine, and therefore should not require additional treatment at OC San Plant 2 prior to ocean discharge. Utilization of this line should be considered during future project phases and will require further coordination with OC San prior to selection.

3.9 Desalination Technology in Use in Study Area

Summary of any water reclamation, recycling and desalination technology currently in use in the study area, and opportunities for development of improved technologies.

Currently there are no groundwater desalination facilities located within the specific project study area. However, within the study area the region does utilize groundwater recharge via indirect potable reuse by GWRS. The treated effluent from GWRS is used to recharge the local groundwater basin and prevent seawater intrusion by injecting water into the Talbert Barrier.

In addition to the ongoing water recycling in the study area, as described in Section 3.7, there are multiple brackish groundwater desalter facilities and one major seawater desalination facility in the Southern California region. These brackish groundwater desalter facilities and the Carlsbad Seawater Desalination Plant offer an industry recognized basis for the conceptual design of the Local SiP treatment process. Commonly utilized desalination technologies include the following:

- **Source Water Abstraction**
  - The groundwater is extracted from brackish groundwater wells.
- **Pre-treatment**
  - The groundwater typically undergoes cartridge filter pre-treatment to remove larger particles and non-soluble material.
- **Reverse Osmosis Desalination**
  - Cartridge filter effluent is provided as source supply for brackish groundwater reverse osmosis desalination.
  - Multi-stage array designs are used to help increase recovery up to the feedwater specific osmotic pressure, or sparingly soluble salt recovery limit
  - For seawater desalination two pass RO design are implemented to reduce boron and bromide concentrations to acceptable levels

- **Decarbonator**
  - After the groundwater is desalinated, it is sent to the forced-air decarbonator to remove the excess carbon dioxide.
  - Note: While typical brackish groundwater desalters require carbon dioxide removal, the seawater influenced Local SiP project will require carbon dioxide addition to meet finished water alkalinity requirements.
- **Post-treatment**
  - Sodium hydroxide and calcium species are added to stabilize the RO permeate and reduce the corrosion potential to the distribution system. Testing is performed to ensure the potable water meets all drinking water health and safety standards.
- **Disinfection**
  - Post-treated effluent is dosed with sodium hypochlorite to provide a free chlorine residual prior to a chlorine contact tank. Residence time within the chlorine contact tank provides pathogen removal credits. Following disinfection, liquid ammonium sulfate is added to form chloramines for disinfection residual.

4.0 Description of Alternatives

4.1 Non-Federal Funding Condition

Description of the non-Federal funding condition. The reasonably foreseeable future actions that the non-Federal project sponsor would take if Federal funding were not provided for the proposed water reclamation, recycling or desalination project, including estimated costs.

Should Federal funding not be provided for this project, Mesa Water and the other project stakeholders would explore alternative funding sources for the construction of the new brackish groundwater treatment facility and groundwater wells. Potential funding sources may include the following:

- Grants
- Low interest loans from local and/or state sources
- Rates and revenues from rate payers

4.2 Alternative Objectives

Statement of the specific objectives all alternatives, including the water reclamation, recycling or desalination project, are designed to address.

Mesa Water's goal for the Local SiP is to develop a new local water supply sources by pumping and treating areas of the OC Basin that are impacted by seawater influenced brackish groundwater. This includes enhancing the effectiveness of the Talbert Barrier to help protect production wells into the future, especially given the potential for future sea level rise. The project alternatives were designed to address the following objectives:

1. Add 5 to 8 MGD of potable water supply
2. Reduce reliance on imported water
3. Improve the region's ability to withstand droughts and changing weather patterns
4. Protect the groundwater basin from further seawater intrusion
5. Provide the most cost-effective alternative with the highest beneficial use of brackish groundwater

4.3 Description of Project With Cost Estimate

Description of the proposed water reclamation, recycling or desalination project including detailed project cost estimate; annual operation, maintenance, and replacement cost estimate; and life cycle costs shall be provided with sufficient detail to permit a more in-depth evaluation of the project, including non-construction costs. In this regard, the cost estimates shall clearly identify expenditures for major structures and facilities, as well as other types of construction and non-construction expenses and shall be based on calculated quantities and unit prices.

4.3.1 Project Description

The Local SiP includes planning, design, permitting, and construction of infrastructure to support long-term water sustainability. The proposed project will produce 5.35 MGD of treated finished water, reducing reliance on imported water, and strengthening the regions' water supply portfolio. By implementing groundwater wells, a brackish groundwater desalination facility, feed conveyance, and brine management,

the project will support environmental resilience and secure a reliable water supply for the future. Details regarding the Local SiP components and estimated costs are outlined below.

4.3.2 Groundwater Wells

As stated in Subsection 3.6.1, five groundwater wells will be placed in evenly distributed locations along the seaward portion of the Talbert Gap, as shown in Figure 3-2. The exact locations of the groundwater wells will be finalized during detailed design. These wells, screened within the shallow Talbert Aquifer, will be outside of the Coastal Commission Zone which will simplify permitting requirements by eliminating the need for Coastal Commission approval. As shown in Table 4-1, the well depths will range from 120 to 180 feet, with individual well flows varying between 0.6 and 2.0 MGD collectively extracting nearly 8 MGD of source water for the proposed 5.35 MGD project.

Table 4-1 Local SiP (5.35 MGD) Groundwater Wells Flow and Depth Information

Well	Approximate Flow (MGD)	Approximate Depth (ft)
Well #1	1.8	180
Well #2	2.0	180
Well #3	2.0	180
Well #4	1.7	180
Well #5	0.6	120
Total	8.0	Not Applicable

For the purposes of this feasibility study, it was assumed that the groundwater wells would be operating at full capacity throughout the year. During detailed design, additional operational modeling scenarios will be evaluated to determine how the new groundwater wells will operate during various seasons, as well as under emergency and drought conditions. These scenarios will consider Mesa Water and the project stakeholder's existing systems.

4.3.3 Site Procurement

A preliminary site investigation was included as part of this Study. Several factors were taken into consideration including:

- Zoning classification
- Footprint
- Ensuring pipeline conveyance would not cross over major highways, railroad tracks, or waterways (including the Santa Ana River)
- Distance to the brine discharge locations
- Distance to the nearest wetland or environmentally sensitive areas

Filtering all the industrial parcels larger than one acre in the study area, an industrial zone in Fountain Valley was recommended for the treatment facility. There is also the potential to find a parcel closer to the groundwater wells during the detailed design phase to reduce construction costs for the conveyance portion of the project; however, further permitting and coordination with Huntington Beach's planning

division would be required to identify the selected parcel of land. Regardless of the treatment site location, Mesa Water would need to procure the land and demolish the existing structure(s). Similarly, Mesa Water will need to procure five separate sites for the groundwater wells. Refer to Section 11.1 for further considerations.

4.3.4 Treatment Process and Facility Area

An illustrative block flow diagram for the proposed treatment facility is shown on Figure 4-1. Table 4-2 describes each component and justification for their inclusion.

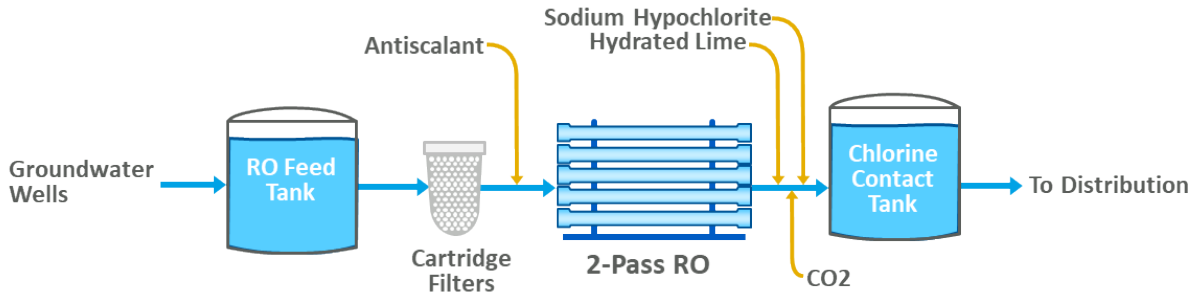


Figure 4-1 Treatment Block Flow Diagram

Table 4-2 Treatment Process Descriptions

Process	Purpose
RO Feed Tank	Flow equalization.
Cartridge Filters	Remove particulates prior to RO.
2-Pass RO	For TDS, boron, and bromide reduction.
Post-treatment	Hydrated lime used for pH adjustment and remineralization of permeate. CO2 addition used for pH adjustment and alkalinity.
Disinfection	Virus inactivation in accordance with regulatory requirements.

A conceptual site layout, incorporating each treatment component, was developed to estimate the total footprint required for site acquisition. The estimated total site footprint is approximately 70,000 square feet (sq-ft) or 1.6 acres. The estimated area includes space for an electrical room, chemical storage, vehicle road access, and an administration office. The estimated footprint will serve as a basis for evaluating site feasibility and guiding future design and permitting activities.

4.3.5 Design Capacity and Annual Yield

There were two design capacities that were evaluated for this feasibility study that are summarized in Table 4-3.

Table 4-3 Design Capacity Summary

	2.65 MGD Alternative	5.35 MGD Alternative
Feed Flow from Groundwater Wells (MGD)	4.00	8.00
Overall RO Recovery	70%	70%
Brine Discharge (MGD)	1.19	2.38
Finished Water Capacity (MGD)	2.65	5.35
Annual Yield (AFY)	2,996	5,993

One of Mesa Water's goals for this project was to produce 5 to 8 MGD of finished water to offset the supply of imported water. The 5.35 MGD finished water capacity achieves this goal.

4.3.6 Distribution

The finished water from the brackish groundwater treatment facility will be conveyed into Huntington Beach and Mesa Water's existing distribution system via OC-44 line as described in Subsection 1.3.3 and Section 3.2. The finished water will feed Mesa Water's two existing reservoirs to then be pumped to customers' homes or used for emergency water storage. The preliminary distribution piping, assuming the treatment facility will be located in the Fountain Valley industrial zone, is shown on Figure 4-2.

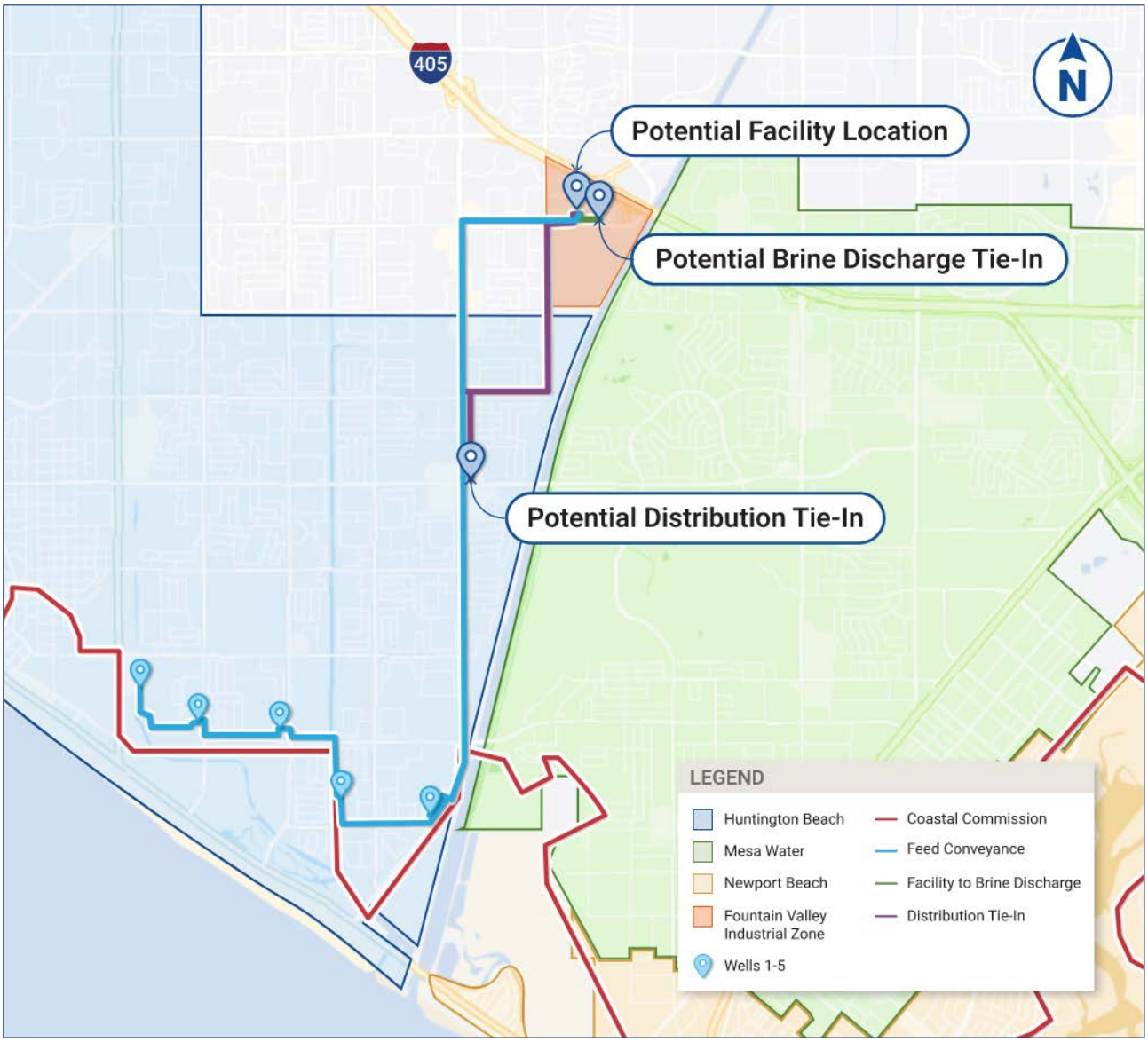


Figure 4-2 **Proposed Local SIP Infrastructure**

4.3.7 Brine Disposal

The preliminary brine disposal strategy for the Local SiP is to convey the brine approximately 1,000 LF from the treatment facility to the OC San Interplant Trunkline. From there, it will be routed to OC San Plant 2 for re-treatment and final discharge through the existing ocean outfall system. For the 5.35 MGD proposed project, a brine flow of 2.38 MGD is anticipated. Discharge into OC San's Interplant Trunkline will comply with specific water quality requirements from OC San and NPDES regarding temperature, salinity, and concentration of pollutants. The project will incorporate operational controls and monitoring to ensure the brine discharge consistently meets all applicable water standards. The proposed brine conveyance alignment can be found in Figure 4-3. The Interplant Trunkline pipe alignment can be found in Figure 4-3.

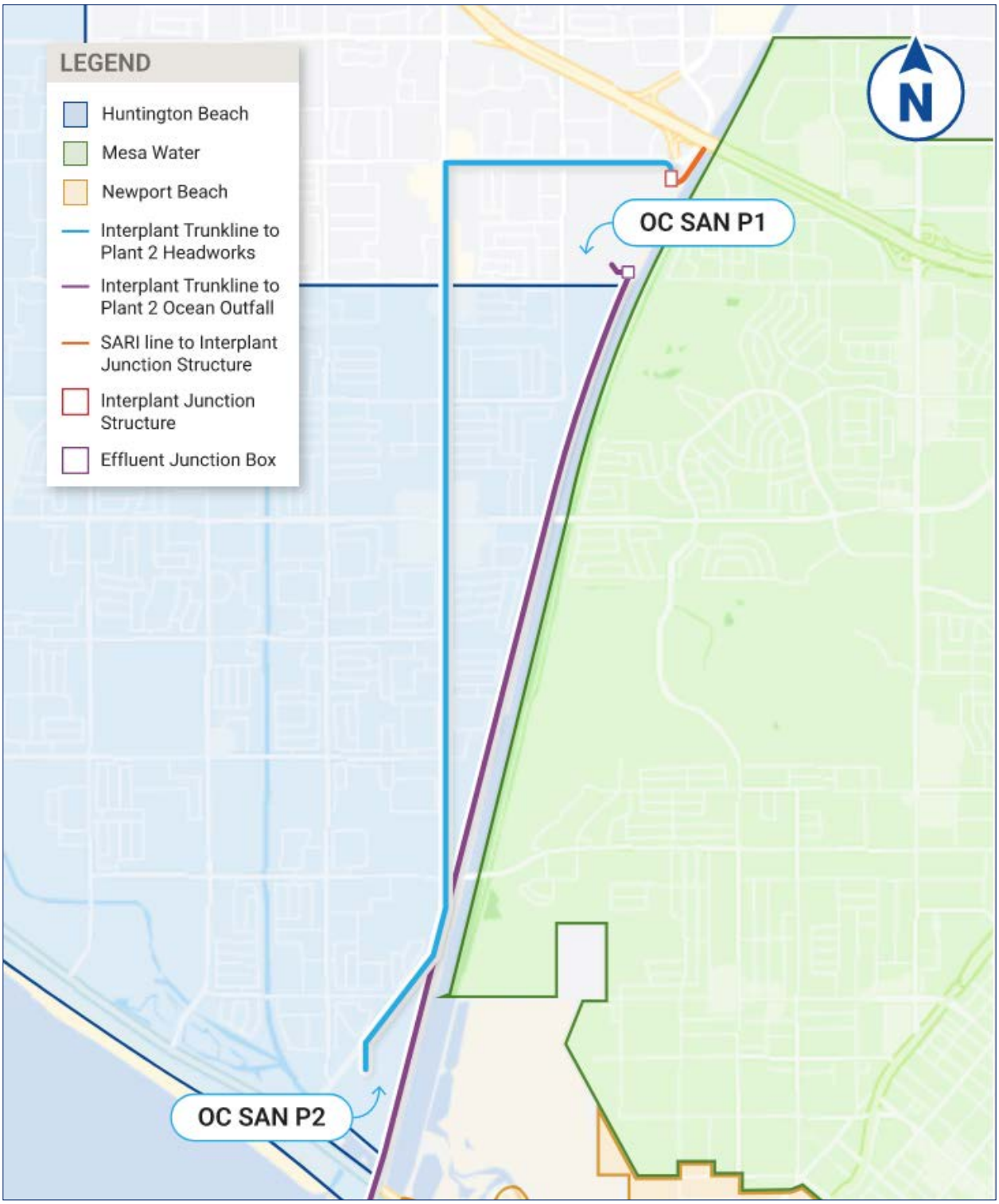


Figure 4-3 Interplant Trunkline Map

4.3.8 Local Supply Improvement Project Cost Estimate

A high-level summary of the costs associated with the proposed Local SiP is summarized in Table 4-4. The costs below do not have any grant funding applied.

Table 4-4 Local Supply Improvement Project 5.35 MGD Cost Summary

Component	Costs
Total Construction Cost	$276.9 M
Site Procurement	$12.97 M
Annualized O&M	$8.870 M per year
30-Year Net Present Value (NPV)	$448.5 M
First Year Unit Cost per AF (2025)	$2,671
Cost per AF	$2,495 per AF

4.3.9 Class 5 OPCC Direct Costs

This feasibility study prepared a Class 5 opinion of probable construction costs (OPCC) for the various project components listed in Table 4-5. The direct costs shown in Table 4-5 include material, labor, and equipment costs. The various contractor markups and contingencies were added to the construction subtotal to calculate the total construction costs. According to the Association for the Advancement of Cost Engineering guidelines, a Class 5 cost estimate is defined within a probable range between -50% to +100%. A detailed breakdown of the Local SiP OPCC can be found in Appendix A.

Table 4-5 Class 5 OPCC Direct Costs Summary

Project Component	Class 5 Cost Estimate	Notes
Groundwater Wells	$11.38 M	Refer to Subsections 3.6.2 and 4.3.2
Feed Conveyance	$23.44 M	CML&C pipe from each groundwater well location to the proposed treatment site
Site Demolition	$948,900	Structure demolition at existing site to be procured
Treatment	$64.15 M	Refer to Subsection 4.3.4
Finished Water Distribution	$7.617 M	CML&C pipe from treatment site to distribution tie in point
Brine Disposal	$722,300	CML&C pipe to brine discharge location
Construction Subtotal	$108.3 M	Subtotal includes material, labor, and equipment costs
Contractor Markups and Contingencies	$168.6 M	Refer to Appendix A
Total Construction Costs	**$276.9 M**	

4.3.10 Project Costs

In addition to the total construction costs for the Local SiP, Mesa Water will need to procure a new treatment site and five new groundwater well sites as described in Section 0. Based on current real estate values in Fountain Valley's industrial zone, $7.8 million/acre was the assumed land value in the analysis. Finally, a 10% design fee was assumed for the consultant to develop the construction drawings and specifications, groundwater modeling, coordinate permitting requirements, administrative efforts, and construction phase services. The total project cost is summarized in Table 4-6.

Table 4-6 Local SiP Project Costs

Project Component	Class 5 Cost Estimate	Notes
Total Construction Costs	$276.9 M	See Table 4-5
Site Procurement	$12.97 M	Assumed a 1.6-acre treatment site and five groundwater well sites at $7.8 million/acre
Consultant Design Fee	$27.69 M	Assumed 10% of total construction costs
Total Project Cost	$317.5 M	

4.3.11 Operating Costs

In addition to the OPCC, costs to operate the facility were also developed. Refer to Appendix B for more detailed operational expenses (OPEX) cost assumptions. Operational costs consist of:

- Chemical costs (varies for each chemical)
- Energy – $0.13 per kWh
- Process consumables such as cartridge filter replacements and RO membrane replacements
- Spare parts and maintenance
- Labor – Three full time employees (FTEs)
- Brine disposal – Assumed $90 per AF
- Replenishment Assessment Fee to OCWD – Assumed $206 per AF, based on the proportion of groundwater flowing from the inland basin

4.4 Feasibility Study Level Project Cost Estimate

The estimated costs shall also be presented in terms of dollars per million gallons (MG), and/or dollars per acre-foot of capacity, to facilitate comparison of alternatives described in Paragraph 4.B.(5) below. References, design data, and assumptions must be identified. The level of detail shall be as required for feasibility studies in RM D&S, Cost Estimating (FAC 09-01).

The overall project life-cycle costs and financial assumptions are summarized in Table 4-7. A breakdown of the 30-year life-cycle costs are provided in Table 4-8. The Local SiP would provide potable water at a first-year cost of $2,671 per AF. The life-cycle approach assumes that 20 percent of the total project cost would be covered via grants, and the remaining balance would be covered through a loan with an upward-sloping

debt profile (2.5% increase in interest per year over 30 years). The following assumptions were applied to the life-cycle analysis:

- Project Cost Loan – 2.5% interest rate with 2.5% increase per annum
- O&M (General) Inflation Rate– 2.5%
- O&M (RA Fee) Inflation Rate – 3.0%
- Discount Rate – 3.7%

Table 4-7 Project Life-Cycle Costs

Life-Cycle Costs and Yield	Cost and Yield	Notes
Project Cost	$317.5 M	Presented in 2025 dollars. Includes total construction cost, site procurement, and 10% design fee. Refer to Table 4-6.
30-Year Net Present Value (NPV)	$448.5 M	See breakdown in Table 4-8 for details.
Annual Project Yield (AFY)	5,993	Equates to 5.35 MGD.
Lifetime Project Yield (AF)	179,800	Life-cycle period of 30 years.
First Year Unit Cost per AF (2025)	$2,671	Year 1 Total Annual Cost ÷ Annual Project Yield
Unit Cost per AF	$2,495	30-Year NPV ÷ Lifetime Project Yield

Table 4-8 30-Year Life Cycle Cost Breakdown for 5.35 MGD Alternative

Year	Loan Payment	O&M (General)	O&M (RA Fee)	Total Annual Cost	Total Annual Cost (in 2025 Dollars)	Cumulative Cost (in 2025 Dollars)
1	$10.3 M	$7.2 M	$1.9 M	$16.5 M	$16.0 M	$16.0 M
2	$10.6 M	$7.3 M	$1.9 M	$17.0 M	$15.8 M	$31.8 M
3	$10.8 M	$7.5 M	$2.0 M	$17.6 M	$15.7 M	$47.6 M
4	$11.1 M	$7.7 M	$2.0 M	$18.1 M	$15.6 M	$63.3 M
5	$11.4 M	$7.9 M	$2.1 M	$18.6 M	$15.5 M	$78.9 M
6	$11.7 M	$8.1 M	$2.2 M	$19.2 M	$15.4 M	$94.3 M
7	$11.9 M	$8.3 M	$2.2 M	$19.7 M	$15.3 M	$109.6 M
8	$12.2 M	$8.5 M	$2.3 M	$20.3 M	$15.2 M	$124.8 M
9	$12.6 M	$8.7 M	$2.4 M	$20.9 M	$15.0 M	$139.9 M
10	$12.9 M	$8.9 M	$2.4 M	$21.5 M	$14.9 M	$154.9 M
11	$13.2 M	$9.2 M	$2.5 M	$22.1 M	$14.8 M	$169.8 M
12	$13.5 M	$9.4 M	$2.6 M	$22.8 M	$14.7 M	$184.5 M
13	$13.9 M	$9.6 M	$2.7 M	$23.4 M	$14.6 M	$199.2 M
14	$14.2 M	$9.9 M	$2.7 M	$24.1 M	$14.5 M	$213.7 M
15	$14.6 M	$10.1 M	$2.8 M	$24.8 M	$14.3 M	$228.1 M
16	$14.9 M	$10.4 M	$2.9 M	$28.3 M	$15.8 M	$243.9 M
17	$15.3 M	$10.6 M	$3.0 M	$29.0 M	$15.6 M	$259.6 M
18	$15.7 M	$10.9 M	$3.1 M	$29.8 M	$15.5 M	$275.1 M
19	$16.1 M	$11.2 M	$3.2 M	$30.5 M	$15.3 M	$290.5 M
20	$16.5 M	$11.5 M	$3.3 M	$31.3 M	$15.1 M	$305.6 M
21	$16.9 M	$11.7 M	$3.4 M	$32.1 M	$15.0 M	$320.6 M
22	$17.3 M	$12.0 M	$3.5 M	$33.0 M	$14.8 M	$335.5 M
23	$17.8 M	$12.3 M	$3.6 M	$33.8 M	$14.6 M	$350.1 M
24	$18.2 M	$12.6 M	$3.7 M	$34.7 M	$14.5 M	$364.7 M
25	$18.7 M	$13.0 M	$3.8 M	$35.5 M	$14.3 M	$379.0 M
26	$19.1 M	$13.3 M	$3.9 M	$36.5 M	$14.1 M	$393.2 M
27	$19.6 M	$13.6 M	$4.1 M	$37.4 M	$14.0 M	$407.2 M
28	$20.1 M	$14.0 M	$4.2 M	$38.3 M	$13.8 M	$421.1 M
29	$20.6 M	$14.3 M	$4.3 M	$39.3 M	$13.7 M	$434.9 M
30	$21.1 M	$14.7 M	$4.4 M	$40.3 M	$13.5 M	**$448.5 M**

4.5 Waste-stream Disposal and Water Quality

Description of waste-stream discharge treatment and disposal water quality requirements, if applicable, for the proposed water reclamation, recycling or desalination project.

Brine generated from the RO concentrate would be discharged into OC San's existing Interplant Trunkline that feeds into Plant 2. The flow would be re-treated at Plant 2 and ultimately be discharged through OC San's 5-mile ocean outfall while complying with ocean discharge standards that meet OC San's NPDES permit requirements. Further coordination with OC San is required during detailed design. Mesa Water would pay a brine disposal fee per AF of discharge to OC San. These costs are reflected in the cost estimates for the project.

4.6 Alternative Measures or Technologies for Reclamation, Distribution, and Reuse

Description of one or more alternative technologies that could be used in the proposed water reclamation, recycling or desalination project under consideration. Where a project only consists of reclaimed, recycled or desalinated water distribution, alternative plans for distribution or implementation will be provided. These alternatives must be approvable by the state(s) or tribal authorities in which the project will be located.

4.6.1 Slant Wells

Slant wells are drilled at an angle from a location on land that allows access to offshore or nearshore aquifers, targeting the saline front. Slant wells should be explored for this project to help more specifically target aquifer zones or zones of particular salinity as well as potentially minimize subsidence risk.

Slant wells would enable specific targeting of aquifer zones which can provide more precision in the salinity zones targeted as well as optimizing the ratio of water sourced from inland (Talbert Barrier) versus the ocean. To prevent concerns over potential induced land subsidence from projected drawdown at the potential well locations, slant wells could distribute the effects of drawdown over a wider area, reducing the likelihood of inducing land subsidence.

4.6.2 High Recovery Reverse Osmosis

A conventional two-pass seawater RO system is proposed for the Local SiP due to elevated TDS, boron, and bromide concentrations in the coastal aquifer caused by seawater intrusion. Conventional seawater RO designs are a proven approach for seawater desalination, however alternative high-recovery technologies such as DesaliTec's Closed-Circuit Reverse Osmosis (CCRO), Rotec's Flow-Reversal RO (FRRO), and IDE Technologies Pulse Flow RO (PFRO) all provide operational advantages that could increase the overall energy efficiency, chemical usage and recovery of the treatment plant. In the case of each of these technologies off-the-shelf conventional RO components are re-configured into non-conventional system designs that are operated with proprietary control programs. These technologies typically seek to vary the local concentration factor on the feed side of the RO membranes, as well as the flow patterns as compared to conventional RO system designs.

As part of pre-design investigations these high recovery RO technologies should be further investigated to quantify their ability to decrease energy and chemical usage, potentially increase the recovery of the first pass of the proposed SWRO and lower annual operational costs. Implementation of these processes could increase the potable water production capacity of the treatment plant and reduce the volume of disposed concentrate. A desktop evaluation and competitive analysis would be required to assess the applicability and financial implications across all available technologies prior to employing the process.

5.0 Economic Analysis

A water reclamation, recycling or desalination feasibility study report must include an economic analysis of the proposed water reclamation, recycling or desalination project relative to other water supply alternatives that could be implemented by the non-Federal project sponsor in lieu of a water reclamation, recycling or desalination project. This assessment needs to identify the degree to which the water reclamation, recycling or desalination project alternative is cost-effective, and the economic benefits that are to be realized after implementation. The study lead must submit the following information for the economic analysis in a water reclamation, recycling or desalination feasibility study report.

5.1 Existing and Projected Future Conditions With and Without Project

The economic analysis included in the feasibility study report shall describe the conditions that exist in the area and provide projections of the future with, and without, the project. Emphasis in the analysis must be given to the contributions that the plan could make toward alleviation of economic problems and the meeting of future water demand.

The existing economic conditions of the project area can first be described with a summary of the Orange County economy. In 2023 the Federal Reverse Bank calculated the Gross Domestic Product of Orange County to be $333 billion dollars annually. If compared as a country this would rank the size of Orange County's economy just behind Chile and ahead of Finland. Major industries in Orange County include technology, aerospace, healthcare, tourism, real estate, higher education, financial and professional services, and agriculture. Once one of the largest agricultural regions in the country, agricultural output has dropped in recent decades due to urbanization of the environment. Currently, Orange County's top agricultural crops include ornamental trees and shrubs, strawberries, vegetables, citrus and fruits and berries. Despite the changing industrial landscape paradigm, the existing economic condition that remains constant in Orange County is growth. Growth in population, employment and economic output all which are built on the foundation of ready access to water.

Future Conditions without Project

Future conditions without the project will require project stakeholders to depend on the existing water supply portfolio to sustain population and economic development growth in the face of furthering water supply reductions. Per the 2022 California Water Supply Strategy, existing water supplies are expected to decrease by 10% by 2045. Across Mesa Water, Huntington Beach and Newport Beach's 2020 Urban Water Management Plans, the projected supply gap resulting from a reduction in available supplies will grow to approximately 6,255 AFY by 2045 (Table 5-1). Without the proposed project, the non-federal project sponsors will need to reduce supply to either business or residential sectors.

Table 5-1 Projected Supply Gap by 2045

Supply Type	2025	2030	2035	2040	2045
Total Supplies (AFY)	58,719	61,004	61,957	62,251	62,550
Total Supplies After Anticipated 10% Reduction (AFY)	52,847	54,904	55,761	56,026	56,295
Projected Demand (AFY)	*58,719*	*61,004*	*61,957*	*63,251*	*62,550*
Project Supply Gap (AFY)	**-5,872**	**-6,100**	**-6,196**	**-6,225**	**-6,255**

Sources:

1. Supply and demand projections based on the Mesa Water, Huntington Beach, and Newport Beach 2020 UWMPs, (Arcadis, 2021).
2. WaterSMART: Water Recycling and Desalination Planning Grant Application – Local Groundwater Supply Improvement Project

According to *The Economic Impacts of Water Shortages in Orange County (Brattle, 2022)* reductions in residential and commercially available water supply are likely to result in:

- Direct revenue loss to utilities that would need to either be absorbed by services providers or passed on to rate payers.
- Reduction in annual business output and loss of jobs.

To offset the loss of supply services, providers would also likely need to implement strict water restrictions. However, following the severe drought period from 2013 to 2015, the project stakeholders have already implemented permanent water conservation practices to reduce per capita water use across their services areas. As a result, the projected supply gap is at risk of directly hampering economic development in the study area in the form of reduced economic output and job losses.

Future Conditions with Project

With the implementation of the Local Sip project stakeholders will be able to develop a new sustainable locally sourced water supply to offset the projected water supply gap. Based on the groundwater model performed to date, it is estimated that up to 85% of the anticipated supply gap could be met with implementation of the Local SiP. Additionally, proper implementation of the seawater influenced extraction wells could help draw the current 250 mg/L chloride contour line closer to the seaward portion of the Talbert Gap, thereby improving water quality in the OC Basin. Finally, the proposed project would also help reduce the dependence of project stakeholders on imported water during emergency periods of severe drought or seismic activity.

5.2 Alternatives Cost Comparison

A cost comparison of alternatives that would satisfy the same demand as the proposed water reclamation, recycling or desalination project. Alternatives used for comparison must be likely and realistic, and developed with the same standards with respect to interest rates and period of analysis.

This section provides a cost comparison for the three alternatives investigated during this feasibility study.

5.35 MGD Brackish Groundwater Treatment Facility

The Local SiP consists of a 5.35 MGD brackish groundwater treatment facility. Refer to Section 4.3 for further information.

2.65 MGD Brackish Groundwater Treatment Facility

The second alternative is a 2.65 MGD finished water flow brackish groundwater treatment facility. Similar to the first alternative, there would be five groundwater wells spread evenly through the seaward portion of the Talbert Gap to pump seawater influenced brackish groundwater to a new treatment facility. However, only 4.0 MGD would be pumped from the groundwater basin. This alternative was considered because it is the upper limit of groundwater pumping before land subsidence becomes a concern. As discussed in Section 10.1, the groundwater model needs further recalibration to determine a more accurate limit of groundwater pumping.

The treatment process flow diagram would be the same as presented in Section 4.3 but with a reduced number of equipment to reflect the reduced influent flow. For example, only two RO trains would be needed instead of three trains in the proposed project alternative. Mesa Water would produce 2.65 MGD of finished water that would be tied into the existing distribution system. Finally, 1.19 MGD of brine would be discharged into the OC San Interplant Trunkline to be routed to the ocean outfall.

No Project Alternative

The No Project Alternative would consist of Mesa Water and project stakeholders continuing to rely on imported water from the SWP and CRA. There would be no further diversification of the region's water supply portfolio. With severe drought conditions in the study area, there is a larger risk for Mesa Water to continue their current water management strategy. In addition, MWDOC is anticipating an 11.5% imported water rate increase from 2027 to 2028. While MWDOC projections extend to 2030, the project life-cycle period extends 25 years further. There are a wide variety of unknowns that may impact the inflation rate of imported water over the 30-year span, including exponential exacerbation of imported water supply and the implementation of large-scale MWD projects, such as Pure Water Southern California. Accordingly, the project team has elected to provide a potential range of life-cycle costs for the No Project Alternative. The more-favorable end of the range assumes a 9% inflation rate of imported water over the full 30-year project life cycle. The less-favorable end of the range assumes a 9% inflation rate for the first 10 years of the project, followed by 7.2% inflation rate for the remaining 20 years. 7.2% was derived by averaging all historical inflation rates from 2008 to 2030, along with five years of 9% inflation from 2030 to 2035.

Besides being able to meet water demand for the study area, this alternative does not meet any of Mesa Water's objectives to provide a sustainable water supply to its customers.

Alternatives Cost Comparison

The cost comparison between the three alternatives described above is shown in Table 5-2. The proposed project has the lowest cost per AF as shown below and is recommended because it meets Mesa Water's water supply goals and is the most cost effective over a 30-year life cycle.

Table 5-2 Alternatives Cost Comparison

Cost Component	5.35 MGD Brackish Groundwater Treatment Facility [1]	2.65 MGD Brackish Groundwater Treatment Facility [1]	Import 5.35 MGD of Treated Water (No Project Alternative) [1, 2]
Total Construction Costs	$276.9 M	$193.3 M	-
Total Project Cost [4]	$317.5 M	$223.4 M	-
Total Project Cost less 20% Grant	$254.0 M	$178.7 M	-
OPEX Costs (Year 2025)	$8.870 M	$4.771 M	$9.625 M
30-Year Net Present Value (NPV)	$448.5 M	$284.4 M	$490.6 M
Annual Project Yield (AFY)	5,993	2,996	5,993
Lifetime Project Yield (AF)	179,800	89,890	179,800
First Year Unit Cost per AF (2025)	$2,671	$3,459	$1,606
Unit Cost per AF [3]	**$2,495**	**$3,163**	**$2,728**

1. The interest rate, discount rate, inflation rate, and other cost assumptions are described in Section 4.4.
2. A treated water cost baseline (2025) of $1,528 was used with a 9.0% treated imported water inflation rate for the first 10 years followed by 7.2% for the remaining 20 years.
3. Unit cost per AF is in 2025 dollars over the next 30 years.
4. Project costs include total construction costs, site procurement, and consultant's design fee as described in Section 4.3.10.

Comparing the 5.35 MGD Brackish Groundwater Treatment Facility Alternative with the No Project Alternative, the break-even point in cumulative present value may occur anywhere between year 18 and year 25 of the 30-year analysis as shown in Figure 5-1.

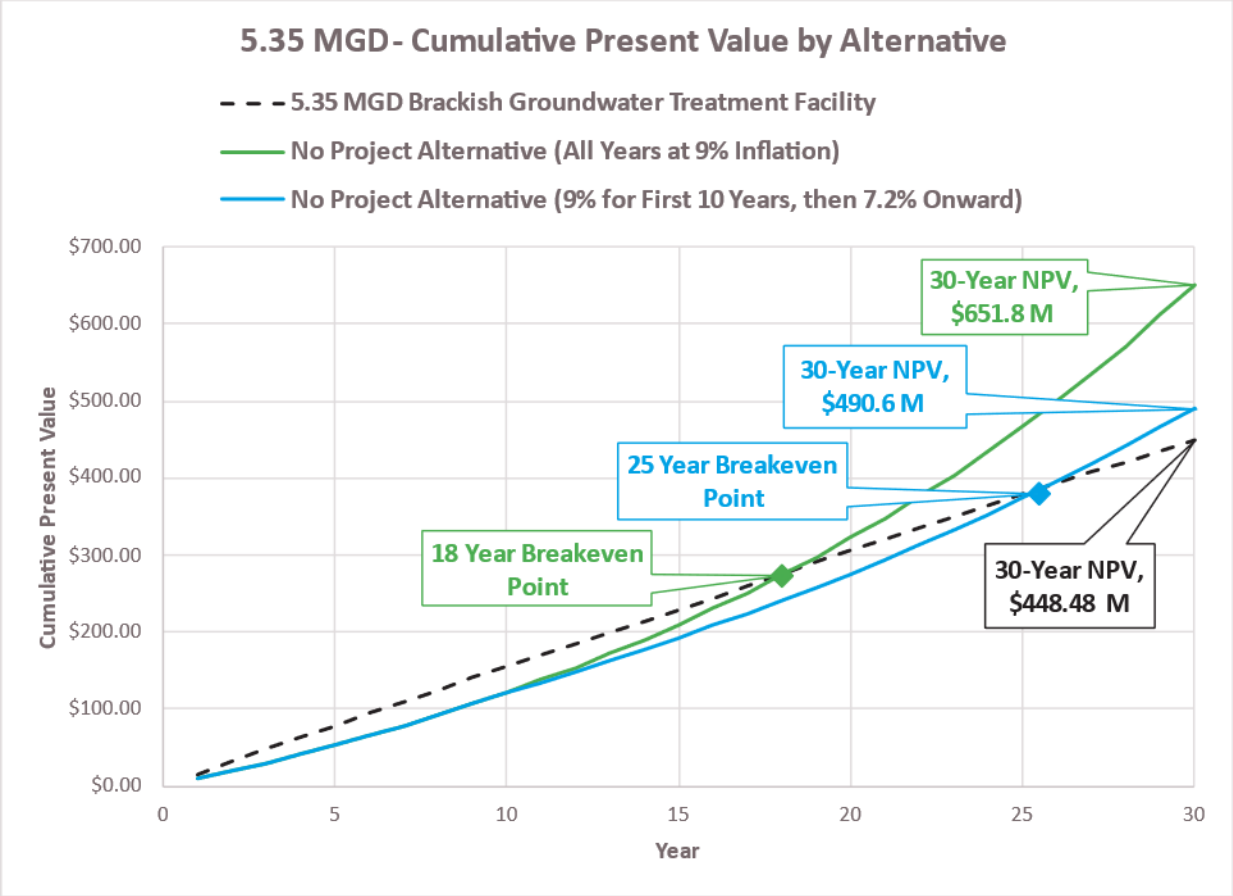


Figure 5-1 **Net Present Value Break-even Point**

5.3 Description of Water Supply Alternatives

Description of other water supply alternatives considered to accomplish the objectives to be addressed by the proposed water reclamation, recycling or desalination project, including benefits to be gained by each alternative, total project cost, life cycle cost, and corresponding cost of the project water produced expressed in dollars per MG, and/or dollars per acre-foot. An appraisal level cost estimates, or better, is acceptable for these alternatives.

Water supply alternatives such as seawater desalination and indirect potable reuse are not suitable solutions for Mesa Water's water demand concerns; therefore, there are no costs to compare to the Local SiP.

From 1998 to 2022, seawater desalination in the area was thoroughly studied for the Huntington Beach Desalination Project which is near the Local SiP study area. The project aimed to convert seawater to 50 MGD of potable drinking water. The seawater desalination facility was designed to use reverse osmosis to treat the seawater and planned to discharge the brine byproduct back into the Pacific Ocean. Opposing parties argued that treating seawater with reverse osmosis was an energy intensive method and that brine discharge could result in negative environmental impacts. The proposed location of the

seawater desalination facility was also a concern due to its proximity to the coast and the risk of flooding from sea level rise and increased storm surges. Due to the outside opposition associated with desalinating seawater, the California Coastal Commission denied the project in 2022. Therefore, exploring seawater desalination is not a relevant alternative for Mesa Water.

Indirect potable reuse is currently not a feasible water supply alternative because the GWRS facility in Orange County, California, is already capturing and treating all reclaimable wastewater sources in the study area. As a result, there is no further recycled water or indirect potable reuse production capacity due to source supply constraints.

5.4 Alternatives Cost Comparison in Absence of Project

When a water reclamation, recycling or desalination project provides water supplies for municipal and industrial use, the benefits of the project can be measured in terms of the cost of the alternative most likely to be implemented in the absence of the project. This is assuming that the two alternatives would provide comparable levels of service. This comparison must be provided, if applicable.

The most feasible and comparable alternative to the Local SiP would be the 2.65 MGD Brackish Groundwater Treatment Facility Alternative presented in Section 5.2. As noted, this alternative does not meet Mesa Water's objective of providing sufficient potable water supply to offset the reliance on imported water and account for the future projected supply gap. Additionally, it has a higher cost per AF because of the economies of scale related to the reduced finished water capacity.

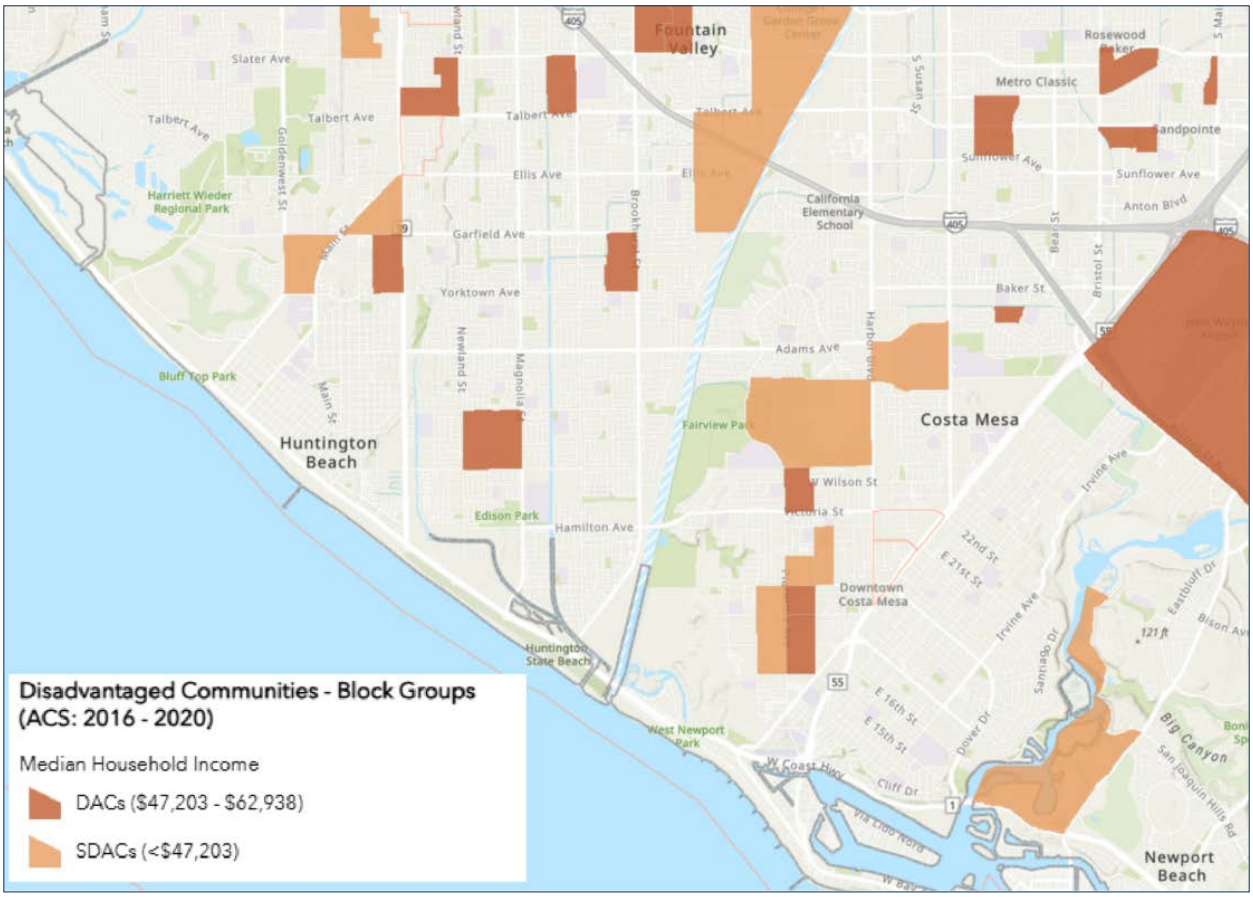
5.5 Project Benefits

Some water reclamation, recycling or desalination project benefits will be difficult to quantify; for example, a drought tolerant water supply, reduced water importation, and other social or environmental benefits. These benefits shall be documented and described qualitatively as completely as possible. These qualitative benefits can be considered as part of the justification for a water reclamation, recycling or desalination project in conjunction with the comparison of project costs described above.

The Local SiP would provide a new and sustainable potable water supply to the project stakeholders that would reduce the region's reliance on imported water and directly address projected future supply gap threatening Orange County's economy. In addition to having the lowest cost per AF of water, there are a range of qualitative benefits related to water supply, water quality, environmental, and the community as defined in Table 5-3 and Figure 5-2Table 5-3. Finally, the Local SiP is the only alternative that meets all of Mesa Water's objectives to supply 5 to 8 MGD of potable water; reduce reliance on imported water; improve the region's ability to withstand droughts and changing weather patterns; protect the groundwater from seawater intrusion; and provide a cost-effective alternative with the highest beneficial use of brackish groundwater.

Table 5-3 Qualitative Project Benefits

	Project Benefits	Description
Water Supply	Increased Resiliency	Mesa Water currently provides 100% of its water supply from local groundwater. The Local SiP will enhance local and regional water supplies.
	Increased Reliability	By providing alternative supplies within Orange County, the Local SiP will enhance supply reliability for Mesa Water and project stakeholders.
	Reduce Imported Water Usage	The Local SiP will reduce reliance on imported water sources from MWD.
	Reduced Potable Water Usage	The project will reduce potable water usage through desalination of brackish groundwater.
Environment	Support Seawater Intrusion Management	Strategic extraction of brackish groundwater from the seaward portion of the Talbert Gap may intercept seawater before it migrates inland, potentially reducing injection volumes required at the Talbert Barrier while maintaining protection of inland aquifers.
	Resilience	Implementing the Local SiP will provide a flexible water supply during water shortages resulting from droughts and changing weather patterns
	Salinity Management in Groundwater Basin	The Local SiP would reduce the salinity of the local groundwater basin over the life-cycle of the project.
Community/ Economy	Regional Collaboration	Continued water resource collaboration for OCWD, Huntington Beach, Newport Beach, Mesa Water, and other community stakeholders within Orange County.
	Disadvantage Communities (DAC)	The project will increase water security in Mesa Water's service area (13% DAC) and will enhance the supply reliability for the Santa Ana River Watershed (23% DAC). Refer to Figure 5-2.
	Public Knowledge/Education	Public outreach and opportunities for the public to learn about the project details. Educational programs related to water conservation and water use efficiency efforts.



Source: [DAC Mapping Tool]

Figure 5-2 Disadvantaged Communities Map

6.0 Selection of the Proposed Title XVI Project

6.1 Selected Alternative

Provide a justification of why the proposed water reclamation, recycling or desalination project is the selected alternative in terms of meeting objectives, demands, needs, cost effectiveness, and other criteria important to the decision.

The selected Local SiP would provide local, reliable, year-round and cost-effective water supplies to Mesa Water and other project stakeholders. The Local SiP would meet the following objectives:

- Add 5 to 8 MGD of potable water supply
- Reduce reliance on imported water
- Improve the region's ability to withstand droughts and changing weather patterns
- Protect the groundwater basin from further seawater intrusion
- Provide the most cost-effective alternative with the highest beneficial use of brackish groundwater

The Local SiP would provide water at a first year unit cost of $2,655 per AF. Although this is higher than the current 2025 cost of imported water, it is important to consider the long-term financial implications. Project stakeholders have experienced significant increases in the cost per AF of imported water over recent years. Additionally, with concerns about drought conditions, imported water from the SWP is not a reliable source of drinking water for the study area. Overall, the Local SiP would improve the region's resilience in the face of changing weather patterns and unreliable water supply. It is the most cost-effective investment to meet the long-term goals.

6.2 Project Impacts to Existing and Future Supplies

Provide an analysis and, if applicable, an affirmative statement of whether the proposed water reclamation, recycling or desalination project would address the following:

(i) ***Reduction, postponement, or elimination of development of new or expanded water supplies;***

(ii) ***Reduction or elimination of the use of existing diversions from natural watercourses, or withdrawals from aquifers;***

(iii) ***Reduction of demand on existing Federal water supply facilities; and***

(iv) ***Reduction, postponement, or elimination of new or expanded wastewater facilities.***

6.2.1 New or Expanded Water Supplies

The local SiP provides an alternative water supply to the region by treating seawater influenced groundwater from the Talbert Gap. This allows Mesa Water and project stakeholders to offset buying imported water with groundwater within the region, creating a new, sustainable water supply.

6.2.2 Reduction or Elimination of the Use of Existing Diversions or Withdrawals

The Local SiP has been designed to offset the amount of imported water by 5.35 MGD (5,993 AFY) to the region by pumping local seawater influenced brackish groundwater, treating it to meet local drinking water standards, and distributing to Mesa Water and project stakeholders' customers. The Local SiP would reduce the reliance on imported water and provide a local, reliable, and clean option for Mesa Water.

6.2.3 Existing Federal Water Supply Facilities

This subsection is not applicable to the Local SiP. Mesa Water and project stakeholders use groundwater from the OC Basin, which is managed by OCWD, and imported water through the SWP and CRA which is managed by MWD and provided by MWDOC.

6.2.4 New or Expanded Wastewater Facilities

This subsection is not applicable to the Local SiP. There are no new wastewater facilities planned in the study area.

7.0 Environmental Considerations and Potential Effects

The review of a water reclamation, recycling or desalination feasibility study report does not require National Environmental Policy Act (NEPA) compliance. The Department of the Interior categorical exclusion 1.11 "Activities which are educational, informational, advisory, or consultative to other agencies, public and private entities, visitors, individuals or the general public" applies to Reclamation's consultative review, and preparation of the water reclamation, recycling or desalination feasibility study reports. As stated in Paragraph 1. Scope, Reclamation is not making a recommendation to go forward with the proposed water reclamation, recycling or desalination project, nor is Reclamation using the water reclamation, recycling or desalination feasibility study report to propose an action to the Congress.

The water reclamation, recycling or desalination feasibility study report must include sufficient information on the proposed water recycling or desalination project to allow Reclamation to assess the potential measures and costs that will be necessary to comply with NEPA, and any other applicable Federal law. Accordingly, the following information is required.

(i) Discussion whether, and to what extent, the proposed water reclamation, recycling or desalination project will have potentially significant impacts on endangered or threatened species, public health or safety, natural resources, regulated waters of the United States, or cultural resources.

(ii) Discussion whether, and to what extent, the project will have potentially significant environmental effects, or will involve unique or undefined environmental risks.

(iii) Description of the status of required Federal, state, tribal, and/or local environmental compliance measures for the proposed water reclamation, recycling or desalination project, including copies of any documents that have been prepared, or results of any relevant studies.

(iv) Any other information available to the study lead that would assist with assessing the measures that will be necessary to comply with NEPA, and other applicable Federal, state or local environmental laws such as the Endangered Species Act or the Clean Water Act.

(v) Discussion of how the proposed water reclamation, recycling or desalination project will affect water supply and water quality from the perspective of a regional, watershed, aquifer, or river basin condition.

(vi) Discussion of the extent to which the public was involved in the feasibility study, and a summary of comments received, if any.

(vii) Description of the potential effects the project will have on historic properties. Discussion must include potential mitigation measures, the potential for adaptive reuse of facilities, an analysis of historic preservation costs, and the potential for heritage education, if necessary.

7.1 Environmental Considerations for Assessing NEPA Compliance

Efforts to analyze potential project impacts are in the early stages. However, preliminary analysis shows that impacts from the Local SiP would be less than significant, or could be reduced to less than significant, with implementation of appropriate mitigation measures. Necessary mitigation measures would be further developed and refined during the CEQA/NEPA process and incorporated into the final design. Preliminary analysis did not identify any significant and unavoidable impacts associated with implementation of the proposed project.

The Local SiP Feasibility Study analyzes various alternatives for implementation, as described below:

- Alternative 1 – Construct groundwater wells and treatment plant to produce 2.65 MGD
- Alternative 2 – Construct groundwater wells and treatment plant to produce 5.35 MGD
- Alternative 3 – No Action Alternative

Refer to Section 5.0 for a detailed description of the alternatives.

7.1.1 Potential Significant Impacts

Discussion whether, and to what extent, the proposed water reclamation, recycling, or desalination project will have potentially significant impacts on endangered or threatened species, public health or safety, natural resources, regulated waters of the United States, or cultural resources.

7.1.1.1 Endangered, Threatened, or Proposed Species

Species listed as threatened or endangered under the Endangered Species Act (ESA) are provided federal protection, and the killing or possession of plants and animals listed as a California endangered species is prohibited by the California Endangered Species Act (CESA).

The U.S. Fish and Wildlife Service's (USFWS) Information for Planning and Consultation (IPaC) online tool, accessed on June 12, 2025, was used to generate a list of federally protected species that could be impacted by projects within the study area. The list is based on the geography of the study area boundary, which encompasses all alternatives. According to the IPaC, a total of 15 threatened and endangered (T&E) species were identified to potentially inhabit the alternative study areas. No designated critical habitat was identified within the Local SiP vicinity.

Alternatives 1 and 2 run along the same route eastward from five wells near Huntington City Beach, across the Talbert Channel, and then north to a proposed desalination facility near the Santa Ana River. Both these alternatives could have the potential to impact the federally listed species discussed in this report. However, based on a preliminary analysis and experience with similar projects, no impacts are anticipated. If impacts were to occur, adequate mitigation is available and can be implemented to avoid them, reduce them to less than significant, or compensate for potential impacts, if necessary.

Currently, California does not maintain databases of state-listed protected plant or animal species by geographic area, such as by county. However, the online Calflora® database is a nonprofit database that provides information on California vegetation, including records of species identification across the state. Black & Veatch reviewed this database to identify if any state-listed threatened or endangered plant species have been recorded within the project area. Although the database records showed no current identification of state-listed species within the study area, it is recommended to survey for these species should future field visits and/or site reconnaissance be necessary. Along with protection under the CESA, the California Native Plant Protection Act (NPPA) prohibits the take of endangered or rare native species. There are some exceptions for agricultural and nursery operations, emergencies, and after proper notification to the California Department of Fish and Wildlife (CDFW).

The construction and operation of the Local SiP may directly or indirectly affect biological resources as it will potentially utilize areas within Huntington Beach. T&E fauna and flora species that may occur in the Local SiP vicinity and may be impacted by the implementation of this project, are described below.

- The **Pacific pocket mouse (*Perognathus longimembris pacificus*)** is listed as endangered by the ESA, but is not listed by the state. The species has been federally listed since 1994, when a single population in Orange County was discovered after the species had been assumed extinct. Several more populations have been discovered since. The Pacific pocket mouse is primarily associated with sandy soils in a range of habitats with open vegetation structure in coastal southern California, including dunes, strands, mesas, and drainages with mixed coastal scrub, grasses, and forbs. Besides their small population size, the main threat to the species is habitat fragmentation and degradation. The probability of the Pacific pocket mouse occurring within the vicinity of the Local SiP is low, but upland areas of the Newland Marsh property south of Wells 1 and 2 could potentially provide adequate habitat.
- The **California least tern (*Sternula antillarum browni*)** is listed as endangered by both the ESA and CESA. One of the smallest species of tern, the California least tern was first listed as endangered in 1970 after habitat loss caused drastic population decline. The species' current range includes coastal areas from San Pablo Bay, California, in the north, to San Jose del Cabo, in the state of Baja California Sur, Mexico, to the south. They require open/sandy dunes for nesting habitat and shallow coastal waters for feeding. Considering the Local SiP's vicinity to the coastline and Newland's marsh property, which includes patches of open sand, the probability of the California least tern occurring within the vicinity of the Local SiP is moderate.
- The **coastal California gnatcatcher (*Polioptila californica californica*)** is listed as threatened under the ESA, but is not listed by the state. The species has been federally listed as threatened since 1993. The range of this species extends coastal southern California to northwestern Mexico, where it lives in and around coastal sage scrub. This species is non-migratory, and is threatened by habitat loss and brood parasitism by the brown-headed cowbird (*Molothrus ater*). Due to the general lack of appropriate habitat, the probability of the coastal California gnatcatcher occurring within the Local SiP vicinity is low.
- The **least Bell's vireo (*Vireo bellii pusillus*)** is listed as endangered by both the ESA and CESA. First federally listed as endangered in 1986, the least Bell's vireo is threatened primarily by habitat loss. However, the species' recovery has also been hindered by brood parasitism by the brown-headed cowbird. During breeding season, they require areas with dense vegetation along riparian corridors. They forage in a variety of habitats and migrate from southern California to northwestern Mexico in winter. Considering the Local SiP's vicinity to the Newland's marsh property, which includes some riparian vegetation, the probability of the least Bell's vireo occurring within the vicinity of the Local SiP is moderate.
- The **light-footed Ridgway's rail (*Rallus obsoletus levipes*)** is listed as endangered by both the ESA and CESA. The species was originally federally listed as endangered in 1969, and its largest threats continue to be habitat degradation associated with hydrology modifications, pollution, sea level rise, and non-native invasive species. They rely on saltmarsh habitats for foraging and nesting areas. Currently, their range is restricted to a handful of coastal marshes, lagoons, and some freshwater habitats from southern Ventura County, California, southward to northern Baja California, Mexico. Considering the project's vicinity to the Newland's marsh property, probability of the light-footed Ridgway's rail occurring within the vicinity of the Local SiP is moderate.
- The **southwestern willow flycatcher (*Empidonax traillii extimus*)** is listed as endangered by the ESA and CESA. It has been federally listed as endangered since 1995, mostly due to loss of

densely vegetated riparian habitats. These habitats have been altered by development, water impoundment (dams), water diversion for agriculture, and groundwater pumping. Their current breeding range includes southern California, southern Nevada, southern Utah, Arizona, New Mexico, and southwestern Colorado. They are migratory, travelling south to overwinter in Mexico, Central America, and northern South America. Considering the Local SiP's vicinity to the Newland's marsh property, which includes some riparian vegetation, the probability of the southwestern willow flycatcher occurring within the vicinity of the project is moderate.

- The **western snowy plover (*Charadrius nivosus nivosus*)** is listed as threatened by the ESA, but is not listed by the state. The species was first federally listed in 1993 as human activity, urban development, and increased predation caused declining populations. The western snowy plover nests on the ground on broad open beaches or flats, where vegetation is sparse. Human disturbance, such as beach use and introduction of beach grasses, continues to limit reproductive success. They are migratory, and their current range covers several southwestern states and Mexico. Due to the general lack of appropriate habitat, the probability of the coastal western snowy plover occurring within the Local SiP vicinity is low.
- The **southwestern pond turtle (*Actinemys pallida*)** is proposed for listing as threatened under the ESA, but is not listed under the CESA. They are a medium-sized turtle that can inhabit aquatic habitats at varying elevations throughout their range, including ponds, lakes, and rivers. Habitat loss combined with high nest predation, siltation, and invasive predators such as the bullfrog, have caused declines in the southwestern pond turtle population. Their current range extends from just south of San Francisco Bay to Baja California, Mexico. Due to the general lack of appropriate habitat, the probability of the southwestern pond turtle occurring within the Local SiP vicinity is low.
- The **western spadefoot (*Spea hammondii*)** is proposed for listing as threatened under the ESA, but is not listed under the CESA. It is a relatively smooth-skinned species of spadefoot toad that can be found in localized populations throughout the central valley of California, and as far south as San Diego. It is predominantly found in grassland, scrub, and chaparral communities. The western spadefoot's largest threat is urban development of their primary habitats, along with growing scarcity of vernal pools for egg-laying. Due to the general lack of appropriate habitat, the probability of the western spadefoot occurring within the Local SiP vicinity is low.
- The **monarch butterfly (*Danaus plexippus*)** is proposed for listing as threatened under the ESA. The monarch butterfly overwinters in southwestern California and Mexico. During spring, the butterfly disperses northward across North America. They utilize a wide variety of habitats in search of nectar sources and milkweed plants (genus *Asclepias*). Milkweed plants are essential in their life cycle, as only species of *Asclepias* provide food for monarch caterpillars. Adult monarchs require flowering plants to provide nectar as a food source. From October through early March, they migrate to southwestern California. Because the Local SiP area is within the migratory corridor of the monarch butterfly, and could contain suitable habitat for the species life-history requirements, the probability of occurrence is moderate.
- The **San Diego fairy shrimp (*Branchinecta sandiegonensis*)** is listed as endangered by the ESA, but is not listed by the state. The species was first listed as federally endangered in 1997, and faces threats that include habitat development, off-road vehicles, and altered hydrological regimes. The San Diego fairy shrimp lives exclusively in vernal pools and ephemeral basins, hatching and developing rapidly after adequate rainfall between January and March. They feed on algae and organic matter, and the cysts that contain their eggs can withstand long dry periods. The current range of the San Diego fairy shrimp is believed to be limited to southwestern

California and northwester Baja California, Mexico. Due to the lack of appropriate habitat, the probability of the San Diego fairy shrimp occurring within the Local SiP vicinity is zero.

- **Nevin's barberry (*Berberis nevinii*)** is listed as endangered by both the ESA and the CESA. The Nevin's barberry is an evergreen, flowering shrub that grows up to 13 feet tall, flowering from March to April. The species has tough leaves and many small yellow flowers that produce clusters of yellow/red berries, which are eaten by many bird species. Although it can be found in a variety of topographies and habitats, populations of Nevin's barberry have drastically declined due to development, fire, and low reproductive output. They are generally found in mesic habitats, which can also be threatened by changes in hydrological regimes. Considering the Local SiP's vicinity to the Newland's marsh property, and Nevin's barberry ability to survive in a variety of habitats, the species could occur within the Local SiP vicinity, but probability is low.
- **Salt marsh bird's-beak (*Cordylanthus maritimus ssp maritimus*)** is listed as endangered by the ESA, but is not listed by the state. Salt marsh bird's beak is a flowering annual plant and may grow up to 1.5 feet in height. While the species' historical range was widespread from Santa Barabara County, California, south to Baja California, Mexico, its current range has become fragmented to isolated salt marshes along the California coast. Along with habitat fragmentation, the salt marsh bird's beak is sensitive to changes in salinity. Considering the Local SiP's vicinity to the Newland's marsh property, which includes marsh vegetation, salt marsh bird's beak could occur within the Local SiP vicinity, but probability is low.
- **San Diego button-celery (*Eryngium aristulatum var parishii*)** is listed as endangered by the ESA and the CESA. It is an annual herbaceous species that grows in a spreading pattern along the ground, up to 16 inches across. It is only found in vernal pools within freshwater wetland, sage scrub, or grassland communities. Loss of these vernal pools is the greatest threat to the San Diego button-celery, but trampling, vehicle traffic, and nonnative species competition also challenge the species' recovery. Due to the lack of appropriate habitat, the probability of San Diego button-celery occurring within the Local SiP vicinity is zero.
- **Venture marsh milk-vetch (*Astragalus pycnostachyus var lanosissimus*)** is listed as endangered by the ESA and the CESA. It is a short-lived perennial herb with yellow-white flower cluster that bloom from June to October. The Ventura marsh milk-vetch was thought to have gone extinct until its rediscovery in 1997, and was subsequently listed as federally endangered. It has an extremely limited current range, with only one known wild population surviving in an abandoned oil-field site in Oxnard known. Habitat loss and degradation are the largest factor in the species' decline, although its complicated pollinator requirements have also hindered reintroduction efforts. Due to the lack of appropriate habitat, and Venture marsh milk-vetch's extremely limited range, the probability of the species occurring within the Local SiP vicinity is zero.

Considering the current information from the alternatives, which includes the use of existing infrastructure and ground disturbance in already disturbed areas, Tables 7-1 and 7-2 illustrate the Probability of Occurrence for each species within the study area.

Black & Veatch reviewed available federal, and state listed species data and study area habitats to assign a Probability of Occurrence rating for each species. Probability of Occurrence ratings found in Table 7-1 are defined as follows:

- **Zero** – Species has no chance of naturally occurring within the study area.
- **Low** – Species has not been documented in the region or suitable habitat within the study area is limited and of low quality.

- **Moderate** – Species has been documented in the region and suitable habitat is present within the study area.
- **High** – Species has been documented in the region and high-quality suitable habitat is available within the study area.

Table 7-1 Federal and State Listed Species, Study Area Polygon, Orange County, California

Scientific Name	Common Name	Federal Status	State Status	Probability of Occurrence
Mammals				
Pacific Pocket Mouse	*Perognathus longimembris pacificus*	E	N	Low
Birds				
California Least Tern	*Sternula antillarum browni*	E	E	Moderate
Coastal California Gnatcatcher	*Polioptila californica californica*	T	N	Low
Least Bell's Vireo	*Vireo bellii pusillus*	E	E	Moderate
Light-footed Ridgway's Rail	*Rallus obsoletus levipes*	E	E	Moderate
Southwestern Willow Flycatcher	*Empidonax traillii extimus*	E	E	Moderate
Western Snowy Plover	*Charadrius nivosus nivosus*	T	N	Low
Reptiles and Amphibians				
Southwestern Pond Turtle	*Actinemys pallida*	PT	N	Low
Western Spadefoot	*Spea hammondii*	PT	N	Low
Insects				
Monarch Butterfly	*Danaus plexippus*	PT	N	Moderate
Crustaceans				
San Diego Fairy Shrimp	*Branchinecta sandiegonensis*	E	N	Zero
Plants				
Nevin's Barberry	*Berberis nevinii*	E	E	Low
Salt Marsh Bird's-beak	*Cordylanthus maritimus ssp maritimus*	E	N	Low
San Diego Button-celery	*Eryngium aristulatum var parishii*	E	E	Zero
Ventura Marsh Milk-vetch	*Astragalus pycnostachyus var lanosissimus*	E	E	Zero

Source: USFWS IPaC: https://ipac.ecosphere.fws.gov/, Calflora: https://www.calflora.org/

N- Not listed

E- Endangered

T- Threatened

PT- Potentially Threatened

Critical Habitats

No designated critical habitats were identified within the vicinity of the Local SiP area. An official critical habitat designation does not affect land ownership, allow the government to take or manage private property, establish a conservation area, or allow the government or public access to private land. Critical habitat designations also do not impact the activities of private landowners if there is no federal nexus.

Bald and Golden Eagles

According to the IPaC, both Bald (*Haliaeetus leucocephalus*) and Golden eagles (*Aquila chrysaetos*) are potentially found in the study areas. The Bald and Golden Eagle Protection Act (BGEPA), enacted in 1940, specifically prohibits the take of bald eagles and golden eagles, including feathers, eggs, and nests, without a permit.

Golden eagles are typically found near mountains, canyonlands, and bluff areas adjacent to grassland, chapparal, and shrubland habitats. The study area is not typical of the Golden eagle's range, nor does it contain suitable foraging habitat. Most Golden eagles in California are permanent residents, with others migrating into California for winter.

The IPaC report indicates that there is likely a presence of Bald eagles within the study area. Bald eagles occur throughout the United States and are commonly associated with river courses or large bodies of water that provide foraging opportunities. Bald eagles eat fish, waterfowl, and carrion, and tend to build large nests in proximity to rivers/lakes.

The proposed alternatives are in urban/developed areas. While the coastal areas near the Local SiP may provide hunting areas for bald and golden eagles, it is unlikely that the study area will provide nesting opportunities for these species.

Migratory Birds

The Migratory Bird Treaty Act (MBTA) of 1918 represents an assemblage of international conservation treaties intended to ensure the sustainability of populations of protected migratory bird species. The MBTA prohibits the take, including killing, capturing, selling, trading, and transport, of protected migratory bird species without prior authorization by the USFWS. The MBTA is applicable to migratory bird species native to the United States and US territories, listing more than 1,000 species. The species described in Table 7-2 were indicated through the IPaC report to potentially utilize the Local SiP study area. The probability of occurrence for each species is based on USFWS survey data recorded within the 10 km grid cell(s) containing the Local SiP boundary.

Table 7-2 Migratory Bird Resources, Study Area Polygons, Orange County, California

Scientific Name	Common Name	Breeding Season	Probability of Presence[1]
Allen's Hummingbird	*Selasphorus sasin*	Feb. 1 - Jul. 15	Jan. - Dec.
Bald Eagle	*Haliaeetus leucocephalus*	Jan. 1 - Aug. 31	Oct. - Nov., Jan.
Belding's Savannah Sparrow	*Passerculus sandwichensis beldingi*	Apr. 1 - Aug. 15	Jan. - Dec.
Black Oystercatcher	*Haematopus bachmani*	Apr. 15 - Oct. 31	Jan., Apr. - Sep.
Black Skimmer	*Rynchops niger*	May 20 - Sep. 15	Jan. - Dec.
Black Swift	*Cypseloides niger*	Jun. 15 - Sep. 10	May, Nov.
Black Tern	*Chlidonias niger surinamenisis*	May 15 - Aug. 20	Jul. - Oct.
Black Turnstone	*Arenaria melanocephala*	Breeds elsewhere	Feb. - Dec.
Black-chinned Sparrow	*Spizella atrogularis*	Apr. 15 - Jul. 31	Sep.
Brandt's Cormorant	*Urile penicillatus*	Apr. 15 - Sep. 15	Jan. - Dec.
Bullock's Oriole	*Icterus bullockii*	Mar. 21 - Jul. 25	Jan. - Dec.
California Gull	*Larus californicus*	Mar. 1 - Jul. 31	Jan. - Dec.
California Thrasher	*Toxostoma redivivum*	Jan. 1 - Jul. 31	Sep. - May
Clark's Grebe	*Aechmophorus clarkii*	Jun. 1 - Aug. 31	Jan. - Dec.
Common Yellowthroat	*Geothlypis trichas sinuosa*	May 20 - Jul. 31	Jan. - Dec.
Elegant Tern	*Thalasseus elegans*	Apr. 5 - Aug. 5	Mar. - Nov.
Golden Eagle	*Aquila chrysaetos*	Jan. 1 - Aug. 31	Dec.
Gull-billed Tern	*Gelochelidon nilotica*	May 1- Jul. 31	Mar. - Aug.
Heermann's Gull	*Larus heermanni*	Mar. 15 - Aug. 31	Jan. - Dec.
Lawrence's Goldfinch	*Spinus lawrencei*	Mar. 20 - Sep. 20	Feb. - Jun.
Long-eared Owl	*Asio otus*	Mar. 1 - Jul. 15	Jan.
Marbled Godwit	*Limosa fedoa*	Breeds elsewhere	Jan. - Dec.
Mountain Plover	*Charadrius montanus*	Breeds elsewhere	Nov. - Mar.
Northern Harrier	*Circus hudsonius*	Apr. 1 - Sep. 15	Jan. - Dec.
Nuttall's Woodpecker	*Dryobates nuttallii*	Apr. 1 - Jul. 20	Jan. - Dec.
Oak Titmouse	*Baeolophus inornatus*	Mar. 15 - Jul. 15	Jul., Sep. - Oct.
Olive-sided Flycatcher	*Contopus cooperi*	May 20 - Aug. 31	Apr. - May, Aug. - Oct.
Red Knot	*Calidris canutus roselaari*	Breeds elsewhere	Jan. - Dec.
Santa Barbara Song Sparrow	*Melospiza melodia graminea*	Mar. 1 - Sep. 5	Jan. - Dec.

Scientific Name	Common Name	Breeding Season	Probability of Presence[1]
Scripps's Murrelet	*Synthliboramphus scrippsi*	Feb. 20 - Jul. 31	Aug.
Short-billed Dowitcher	*Limnodromus griseus*	Breeds elsewhere	Jan. - Dec.
Tricolored Blackbird	*Agelaius tricolor*	Mar. 15 - Aug. 10	Jan., May
Western Grebe	*Aechmophorus occidentalis*	Jun. 1 - Aug. 31	Jan. - Dec.
Western Gull	*Larus occidentalis*	Apr. 21 - Aug. 25	Jan. - Dec.
Willet	*Tringa semipalmata*	Breeds elsewhere	Jan. - Dec.
Wrentit	*Chamaea fasciata*	Mar. 15 - Aug. 10	Jan. - Dec.

Source: USFWS IPaC: https://ipac.ecosphere.fws.gov/

[1] Probability of Presence – months with the highest probability of presence as reported in IPaC resource list.

Of the 36 migratory bird species identified by the IPaC report, most are more likely to be found within nearby protected marsh habitats than within the Local SiP boundary. The Newland, Magnolia, and Brookhurst Marshes are owned and managed by the Huntington Beach Wetlands Conservancy, and are located less than 0.5 miles from the Local SiP route. All appropriate best practices should be employed to reduce potential impacts in areas closest to these marshes, particularly Newland Marsh, which lies just south of Wells 1 and 2.

The presence of all these species, including mitigation measures to eliminate or reduce impacts, will be further analyzed during the CEQA/NEPA process.

7.1.1.2 Potential Significant Impacts to Public Health

Discussion whether, and to what extent, the proposed water reclamation, recycling or desalination project will have potentially significant impacts on public health or safety.

Construction and operation of either Alternative 1 or 2 for Mesa Water District could adversely impact public health and safety. The potential for public health and safety impacts would be confirmed during the CEQA review process. Based on preliminary evaluation, it is anticipated that significant impacts to public health and safety can be avoided or reduced to a less than significant level through the development and implementation of appropriate mitigation measures.

7.1.1.3 Potential Significant Impacts to Natural Resources

Discussion whether, and to what extent, the proposed water reclamation, recycling or desalination project will have potentially significant impacts on natural resources.

Refer to Section 2.4 for a detailed description of the Local SiP's impact on water quality.

The potential for significant impacts to natural resources can be confirmed during the CEQA review process. Based on preliminary evaluation, it is anticipated that significant impacts to natural resources can be avoided or reduced to a less than significant level through development and implementation of appropriate mitigation measures.

7.1.1.4 Potential Significant Impacts to Regulated Waters of the United States

Discussion whether, and to what extent, the proposed water reclamation, recycling or desalination project will have potentially significant impacts on regulated waters of the United States.

Prior to implementation and construction of either Alternatives 1 or 2 for the Mesa Water District, preliminary jurisdictional delineations of waters crossed by the proposed project or otherwise potentially affected by project activities would be performed. Statutes within the Clean Waters Act (CWA), California Fish and Game Commission (CFGC), and California Poter-Cologne Act protect wetlands and riparian habitat. USACE has regulatory authority over wetlands and waters of the United States (WOTUS) under Section 404 of the CWA. The Regional Water Quality Control Boards (RWQCBs) ensure water quality protection in California pursuant to Section 401 of the CWA, and Section 13263 of the Porter-Cologne Act. The CDFW regulates waters of the State as it relates to sensitive biological resources under the CFGC Section 1600 (et seq.). A search of the USFWS National Wetlands Inventory (NWI) June 2025, identified the Santa Ana River roughly 260 feet from the proposed pipe route for Alternatives 1 and 2. The pipeline appears to cross a manmade channel between Wells 3 and 4.

The potential for significant impacts to regulated waters can be confirmed during the CEQA review process. Based on preliminary evaluation, it is anticipated that significant impacts to regulated waters can be avoided or reduced to a less than significant level through development and implementation of appropriate mitigation measures.

7.1.2 Potential Significant Environmental Impacts

Discussion whether, and to what extent, the project will have potentially significant environmental effects, or will involve unique or undefined environmental risks.

In addition to the discussed impacts of the Local SiP discussed above, there may be additional effects in areas such as greenhouse gas emissions, noise, vibration, drought risks, drawdown concerns, ecosystem impacts, transportation and traffic, and others. The CEQA/NEPA document will analyze impacts to all resource areas as determined by appropriate regulations. It is anticipated that the Local SiP will have minimal to no impacts based on the preliminary review presented in this report. If any impacts are identified, mitigation would be implemented to eliminate or reduce them to a less than significant level.

Groundwater extraction in the Talbert Gap has the potential to cause localized drawdown in the confined Talbert Aquifer. Lowering water levels in highly compressible soils (e.g., confining units) can induce subsidence. While the aquifer lies within a coarse, high-transmissivity unit that may reduce the risk of compaction, the risk of land subsidence cannot be entirely ruled out, particularly in areas where the aquifer is overlain by thick units comprised compressible fine-grained sediments.

Groundwater modeling results indicate that under higher extraction scenarios (e.g., 6 to 8 MGD), localized drawdown near production wells may drop below historically low water levels, introducing risk of decreased pore pressure to offset overburden strain. While the shallow depth and unconfined nature of some sediments in this zone reduce the likelihood of deep compaction, subsidence cannot be ruled out, particularly if prolonged drawdown propagates within the compressible clay-rich units. As a result, further investigation into characterizing and mitigating the risk of land subsidence is recommended.

Land subsidence mitigation strategies include the following:

- Defining operational thresholds for minimum water levels
- Monitoring of land elevations

- Staged production ramp-up to detect early signals of land subsidence
- Considering alternative well technologies to distribute the impacts of drawdown (Refer to Subsection 4.6.1)

The CEQA/NEPA analyses will evaluate options to minimize the above-mentioned impacts. Mitigation measures or changes to the project design or operation will be implemented to minimize or avoid potential negative impacts.

7.1.3 Status of Required Environmental Compliance Measures

Description of the status of required Federal, state, tribal, and/or local environmental compliance measures for the proposed water reclamation, recycling, or desalination project, including copies of any documents that have been prepared, or results of any relevant studies.

The Local SiP may require permits, surveys, or reviews from various agencies, including, but not limited to, USACE, USFWS, California Department of Fish and Wildlife (CDFS), Santa Ana RWQCB, and the State Historic Preservation Office (SHPO). Appropriate right-of-way easements and permits may also be required for any construction staging areas, or if access roads or driveways are needed. No CEQA or NEPA documentation has been prepared for any of the alternatives at this time.

The following is recommended for Alternatives 1 and 2, and may be required for the CEQA/NEPA review:

- Wetland Delineation
- Endangered Species Act consultation
- Cultural Resource surveys
- Brine Waste Disposal Study
- Mixing/Dilution Study
- Public outreach/involvement programs
- Geotechnical Report
- Phase I Environmental Assessment

This subsection does not contain all the permits and surveys that may be required. Depending on which alternative option is chosen, additional studies may be required in the CEQA/NEPA analysis.

For the purposes of this feasibility study, Mesa Water has begun a preliminary assessment of permits that would be needed for the project. Coordination with regulatory agencies will begin during the detailed design phase.

7.1.4 Additional Information

Any other information available to the study lead that would assist with assessing the measures that will be necessary to comply with NEPA, and other applicable Federal, state, or local environmental laws such as the Endangered Species Act or the Clean Water Act.

During the groundwater treatment, minimal odor can be generated from the process treatment, which disperses naturally into the surrounding environment. These odors may impact nearby areas, which can lead to complaints and public opposition. Mesa Water District actively participates in several programs that address impacts to water supplies including:

- Hosting Water Issues Study groups for community members.
- Providing educational experiences, like STEM Night, at local schools, which discuss the importance of water quality.
- Actively work with organizations like Orange County Water District to implement groundwater protection programs.
- Adhere to their transparency policy and support policies that balance the benefits and cost of new mandates, that includes government transparency and accountability.

7.1.5 Regional Effects on Water Supply and Water Quality

Discussion of how the proposed water reclamation, recycling, or desalination project will affect water supply and water quality from the perspective of a regional, watershed, aquifer, or river basin condition.

The Local SiP intends to provide long-term water sustainability for the project stakeholders and their consumers. As noted in Section 1.1.1, groundwater is Mesa Water District's sole water source. The current water supply for the Mesa Water District is pumped from the OC Basin via nine wells. Water from the Santa Ana River, imported water from MWD, and product water from the GWRS are used to replenish the basin. Water from the Mesa Water Reliability Facility (MWRF) is also used to supplement groundwater.

The proposed brackish groundwater project has the potential to influence both water supply reliability and water quality conditions within the Orange County Groundwater Basin, particularly in its coastal region.

From a water supply standpoint, the project introduces a new, locally controlled, and drought-resilient source of potable supply by recovering brackish groundwater from the seaward portion of the Talbert Aquifer. This zone, located between the Talbert Barrier and the Pacific Ocean, contains impaired groundwater with chloride concentrations exceeding 10,000 mg/L—water that is not currently extracted for beneficial use. By targeting this underutilized resource, the project supports regional supply diversification without increasing reliance on imported water. However, model results also suggest that some portion of the water extracted by the project may include injected water from the Talbert Barrier, which otherwise would have migrated inland to contribute to replenishing the basin.

While this interception of barrier water may reduce its intended protective benefit, it also presents an opportunity: by capturing injected water before it mixes with higher salinity seawater, the project may enhance treatment efficiency and reduce salinity loading. This tradeoff will be evaluated in coordination with OCWD to ensure alignment with basin management objectives.

With respect to water quality, groundwater modeling indicates that the project could provide hydraulic benefit to the basin by reducing the burden on the inland Talbert Barrier system in its role of providing protection to the basin from seawater intrusion.

Additional evaluations regarding the Local SiP's effects on water supplies and water quality, will be conducted as part of the CEQA/NEPA review process during preliminary design. Mitigation measures or changes to the project design or operation will be implemented to minimize or avoid potential negative impacts.

7.1.6 Feasibility Study Public Involvement

Discussion of the extent to which the public was involved in the feasibility study, and a summary of comments received, if any.

Mesa Water has been actively working with stakeholders to prepare information for water resource alternatives for its customers. The Local SiP analyzed in this report has not yet been presented.

Mesa Water holds regular monthly board meetings and committee meetings. When an alternative is chosen for the Local SiP, it is reasonable to conclude that it would be presented to the public during a regularly scheduled Board and/or council meeting. An option to sign up for a community letter is available as well.

Mesa Water has developed an Urban Water Management Plan and a Water Shortage Contingency Plan that have been made available through their website. The plans provide public education and outreach programs and provide information about local organizations and groups they work with in the community.

Mesa Water includes updates through their website about construction or improvement projects that impact their customers. If an alternative is chosen, it will be reasonable to conclude that it will publicly share this information through their website. Their social media pages are used to inform the community of upcoming events and proposed projects.

Mesa Water is fully committed to public engagement throughout the planning phase to ensure transparency and keep community members informed. Public outreach will remain an important component of Local SiP as it advances through planning, design, construction, and operation. The public will continue to have opportunities to engage with Mesa Water District through the CEQA/NEPA process.

7.1.7 Potential Effects on Historic Properties

Description of the potential effects the project will have on historic properties. Discussion must include potential mitigation measures, the potential for adaptive reuse of facilities, an analysis of historic preservation costs, and the potential for heritage education, if necessary.

The following summary is based on a review of publicly available databases, including the National Register of Historic Places (NRHP), and the California Register of Historic Resources (CRHR). There are no properties currently listed on the NRHP within the Local SiP Area as currently defined. There are at least two NRHP and two CRHR listed properties within 1-mile of the Local SiP Area.

The closest NRHP listed properties to any construction activities are the Huntington Beach Public Library on Triangle Park, and the Helme-Worthy Store and Residence. Both properties are approximately 0.9-miles northwest of the proposed Well One. These properties are separated from the proposed Local SiP area by dense urban development. The Helme-Worthy Store and Residence is also listed on the CRHR.

Additionally, the Fairview Indian Site is an NRHP listed property in Costa Mesa. The location of the Fairview Indian Site is not available in public databases, but consultation with the California Historical Resource Information System (CHRIS) would identify the proximity of the site to the Local SiP area. The Diego Sepúlveda Adobe is a California Historical Landmark listed on the CRHR approximately 0.8-mile east of the proposed pipeline in Costa Mesa. The proposed Local SiP Area is separated from the city of Costa Mesa by dense development and the Santa Ana River. Because of visual buffers separating the project area from listed properties, it is unlikely the NRHP and CRHR listed properties will be affected by project construction.

Orange County is located in an area traditionally inhabited by the Tongva and the Acjachemen indigenous peoples. The Tongva people primarily inhabited the northern area of Orange County, and the Acjachemen people typically inhabited southern Orange County. Both the Tongva and Acjachemen lived in villages and seasonal camps to procure resources that were available during certain seasons. Villages near the coast also relied on fish and shellfish for subsistence. Sites were often situated near freshwater sources, and in ecotones where plant and animal life were diverse and abundant. The nearby Lupukngna and Genga large village sites are located on bluffs overlooking the Santa Ana River. In the late 18th century, Spanish exploration and mission settlements encroached the Orange County area. Many native villages are identified on Spanish missions and ranchos maps of the area. Orange County has since been heavily developed.

Activities associated with the Local SiP could potentially disturb cultural resources. A cultural resource evaluation in accordance with CEQA/NEPA, and Section 106 of the National Historic Preservation Act (NHPA) will be conducted to avoid cultural resources wherever possible and mitigate disturbance if not. This would include a review of the publicly available NRHP and CRHR, a review of the CHRIS to identify previously recorded cultural resources within the project Area, local consultation, a survey of the project Area, and the identification of appropriate measures to address potential impacts to historic properties, if applicable. These measures may include, but will not be limited to, an archaeological excavation, archaeological and/or Native American monitoring, and/or Historic American Building Survey/Historic American Engineering Record documentation, as appropriate. A paleontological assessment will also be conducted to identify potential impacts to paleontological resources.

At this time, Alternatives 1 and 2 will involve construction activities that involve substantial ground disturbance in previously disturbed areas. Excavation in undisturbed areas could potentially impact buried and aboveground cultural and/or tribal resources. Native American consultation under Assembly Bill 52 of 2014 will be conducted. It is anticipated that appropriate avoidance or mitigation measures can be developed during the Native American consultation and CEQA/NEPA review process to reduce impacts to tribal cultural resources to a less than significant level, if needed.

7.2 NEPA Compliance

If, at a later date, Reclamation provides funds for construction, all appropriate NEPA and other environmental and cultural compliance must be completed prior to any ground disturbing activities beginning in order for the project to be eligible.

Mesa Water District recognizes that no ground-disturbing activities (including grading, clearing, and other preliminary activities) can begin on the Local SiP until environmental compliance is fully achieved, and Reclamation authorizes the work to proceed under Title XVI funding. This requirement applies to all aspects of the proposed project, including those covered by the non-Federal sponsors.

8.0 Legal and Institutional Requirements

The water reclamation, recycling or desalination feasibility study shall identify any legal or institutional requirements, or barriers to implementing the proposed project.

8.1 Potential Water Right Issues

Analysis of any water rights issues potentially resulting from implementation of the proposed water reclamation, recycling desalination project. All proposed water reclamation, recycling or desalination projects must comply with state water law.

The Local SiP will require compliance with the State Water Resources Control Board (SWRCB) and the state law regarding the extraction and treatment of groundwater. The project must align with OCWD's groundwater management framework outlined in the Groundwater Management Plan (GWMP) and Groundwater Sustainability Plan Alternative in compliance with the California Sustainable Groundwater Management Act. The Local SiP facility's brine discharge is planned to be conveyed to the OC San Interplant Trunkline. The project must comply with all applicable OC San operational, environmental, and regulatory requirements.

8.2 Potential Legal and Institutional Requirements with Potential to Impact Implementation

Discussion of legal and institutional requirements (e.g., contractual water supply obligations, Indian trust responsibilities, water rights settlements, regional water quality control board requirements), state, and/or local requirements with the potential to affect implementation of the project. Water reclamation, recycling or desalination projects using Reclamation project water must address contractual requirements as described in RM D&S, Reuse of Bureau of Reclamation Project Water (PEC 05-09).

The implementation of the Local SiP potentially will have to meet legal requirements under the Bureau of Reclamation's Reclamation Manual Directive and Standards (RM D&S) Policy and Environmental Compliance 05-09 (PEC 05-09) as well as legal requirements to OCWD. Under PEC 05-09, the reuse of Reclamation project water, such as desalinated brackish groundwater, requires formal agreements that address water rights, usage, pricing, and environmental compliance. All conditions must be met and approved by Reclamation to ensure responsible and authorized water reuse. In addition, because OCWD manages the groundwater basin that will be drawn for supply, Mesa Water may be subject to replenishment or basin management fees and requirements. These combined federal and local requirements could have an impact on the overall financial feasibility of the project. Early coordination with Reclamation, OCWD, and any other institutions will be critical to manage regulatory and cost impacts.

8.3 Multi-Jurisdictional or Interagency Agreements

Discussion of the need for multi-jurisdictional or interagency agreements, any coordination undertaken, and any planned coordination activities.

For the Local SiP, the non-federal project sponsors would need to enter into an agreement that details the financial and operational responsibility of all parties for construction, maintenance, and operations.

Mesa Water would independently construct and operate the Local SiP treatment facility and groundwater wells; however it would be required to enter into a discharge connection agreement with OC San in order to connect to and discharge brine through the Interplant Trunkline.

8.4 Implementation Permitting Procedures

Discussion of permitting procedures required for the implementation of water reclamation projects in the study area, and any measures that the non-Federal project sponsor can implement that could speed the permitting process.

Implementation of the Local SiP will require permits and other forms of approval from Federal, State, and local agencies, as described in Table 8-1. While these permits have not been obtained yet, efforts to initiate the permitting process will begin as early as possible during the design process. Ongoing coordination with permitting agencies will be essential for permit approval.

Table 8-1 Potential Permits

Potential Permit Type	Issuing Agency
Encroachment/Construction Permits	City of Fountain Valley City of Huntington Beach OC Public Works
Building Permit	City of Fountain Valley City of Huntington Beach
Air Quality Permit	South Coast Air Quality Management District
NPDES Permit	RWQCB
Waste Discharge Requirements	RWQCB
Drinking Water Permit	SWRCB
Discharge Agreement	Orange County Sanitation

8.5 Unresolved Issues for Implementation

Discussion of any unresolved issues associated with implementing the proposed water reclamation and reuse project, how and when such issues will be resolved, and how the project would be affected if such issues are not resolved.

One unresolved issue for the implementation of the Local SiP includes land acquisition for the groundwater wells and the treatment facility. An approximately 1.6-acre site will be needed for the treatment facility. It is assumed the property would be purchased in the Fountain Valley industrial zoned area; however, a specific site has not been identified or purchased. Additionally, five groundwater well sites in Huntington Beach outside of the coastal commission zone will need to be acquired. While approximate locations have been identified, formal property acquisition is required.

Further investigation is needed to fully assess subsidence risk associated with drawdown from higher production rates. Site-specific subsurface evaluations and refined modeling will help determine safe extraction rates and wellfield design to avoid infrastructure impacts.

The groundwater model, while sufficient for feasibility-level evaluation, should be updated with recent geologic data and conceptual model refinements. These updates will improve predictions of chloride concentrations, source water contributions from seawater, inland basin groundwater, and injected barrier water, as well as better characterize drawdown impacts. Without these refinements, uncertainties could affect wellfield performance and treatment design, potentially increasing project costs or requiring operational adjustments.

In addition, coordination among project stakeholders and OCWD will be necessary to address management of extracted water that may include previously injected recycled water. Establishing accounting frameworks and financial agreements will be critical for final basin management approvals. Failure to resolve these issues could delay implementation but is not expected to prevent project advancement with appropriate additional analysis and coordination.

8.6 Waste Discharge Requirements

Identification of current and projected wastewater discharge requirements resulting from the proposed Title XVI project (e.g., brine disposal).

As discussed in previous sections, brine generated from the reverse osmosis process is planned to discharge to the OC San Interplant Trunkline to Plant 2 and the ultimately to the existing ocean outfall 5 miles off the coast of Huntington Beach. Discharge to the OC San Ocean Outfall must comply with the Waste Discharge Requirements (WDRs) and OC San's current National Pollutant Discharge Elimination System (NPDES) Permit. Mesa Water will be required to comply with constituent limits established in the NPDES permit and the discharge agreements with OC San.

8.7 Wastewater Discharge Rights

Description of rights to wastewater discharges resulting from implementation of the proposed water reclamation, recycling, or desalination project.

This section is not applicable to the Local SiP. The project will generate brine effluent discharged to the Pacific Ocean.

9.0 Financial Capability of Sponsor

At the water reclamation, recycling or desalination feasibility study stage, Reclamation must request enough information to determine that the non-Federal project sponsor is likely to demonstrate financial capability if the project moves to construction. Reclamation will request more detailed information to make a determination that the non-Federal project sponsor is financially capable of funding the non-Federal share of the project's costs before a funding agreement covering construction can be executed. Accordingly, the following information is required to be included in the water reclamation, recycling or desalination feasibility study report.

9.1 Implementation Schedule

Proposed schedule for project implementation.

Implementation of the Local SiP requires preliminary investigations, design, permitting, and construction of the facility. The anticipated Local SiP schedule milestone dates and timeline is shown in Table 9-1.

Table 9-1 Anticipated Project Schedule

Milestone	Completion Date
Preliminary Investigations	Jan 2027
Facility Design	Jan 2029
Permitting	Jan 2031
Construction	Jan 2032
Testing and Startup	July 2032

9.2 Project Sponsor Willingness to Pay

Discussion of the willingness of the non-Federal project sponsor to pay for its share of capital costs and the full operation, maintenance, and replacement costs.

The non-Federal cost share for the Local SiP will be funded through Mesa Water's capital budget, and contributions from Huntington Beach, and Newport Beach. Mesa Water, Newport Beach, and Huntington Beach are AAA bond-rated, which reflects their financial stability and readiness to support the project. Mesa Water is committed to constructing and operating the groundwater treatment plant for the life of the project. Additionally, they will take all necessary actions to pay for the construction, operation, maintenance, and replacement costs. Mesa Water, Huntington Beach, and Newport Beach will gain long-term benefits from the Local SiP, as it will secure a sustainable and resilient water future for generations ahead. Therefore, they are willing and committed to funding the project.

9.3 Funding Plan

A plan for funding the proposed water reclamation, recycling or desalination project's construction, operation, maintenance, and replacement costs, including an analysis of how the non-Federal project sponsor will pay construction and annual operation, maintenance, and replacement costs.

The funding for the Local SiP would be secured by Mesa Water taking a leading role in coordinating any collaborative funding efforts with the other project stakeholders. Outside funding from federal and state sources will be critical to implement this project without putting a great burden on the local communities.

A combination of grants, low interest loans, and cost-sharing contributions amongst the project stakeholders are anticipated to fully fund the project.

One potential local funding program is MWD's Local Resources Program (LRP). The LRP provides funding for the development of water recycling, groundwater recovery, and seawater desalination supplies that offset existing demand on Metropolitan's imported water deliveries through either direct replacement of imported water or increased regional groundwater production. If the Local SiP secures LRP funding, it could be used for O&M costs because the funding only becomes available once the facility is in operation.

Mesa Water and project stakeholders will continue to investigate and pursue future funding opportunities to assist with project costs.

9.4 Funding Sources

Description of all Federal and non-Federal sources of funding and any restrictions on such sources, for example, minimum or maximum cost-share limitations. Generally, for water reclamation, recycling or desalination projects, the Federal cost share is limited to 25 percent, or $20,000,000, whichever is less.

Funding through outside state and federal programs has not been secured yet for the Local SiP. Mesa Water is actively researching both grant and low interest loan opportunities to reduce project costs and potential impacts to local rate payers amongst the project stakeholders.

Mesa Water anticipates pursuing federal funding through Reclamation's Title XVI Water Reclamation and Reuse program for up to $20,000,000 of the project cost, in accordance with the Title XVI funding limits.

10.0 Research Needs

At a minimum, the report must include a statement on whether the proposed water reclamation, recycling or desalination project includes basic research needs, and the extent that the proposed project will use proven technologies and conventional system components. The following information is required only if further research is necessary to implement the proposed water reclamation, recycling or desalination project:

10.1 Research Needs

Description of research needs associated with the proposed water reclamation, recycling or desalination project, including the objectives to be accomplished through research; There are elements of the Local SiP that require additional research, analysis, and approvals before project implementation.

Various components of the Local SiP will require further investigation and refinement before the project can proceed to implementation.

One key area for further investigation is the risk of land subsidence associated with brackish groundwater extraction. This includes evaluating subsidence potential in the project area, particularly in relation to compressible clay layers and critical infrastructure. Proposed efforts include targeted field studies, subsurface characterization, and development of a subsidence risk model. These analyses will help determine appropriate operational thresholds and inform mitigation strategies, such as monitoring benchmarks and adaptive pumping plans.

In parallel, the groundwater flow and transport model could be refined to better represent critical hydrogeologic dynamics. Updated modeling is needed to:

- Improve predictions of relative source contributions (seawater versus basin water),
- Assess local drawdown magnitudes and gradients, and
- Reduce uncertainty in chloride concentrations and brackish water yield.

The current evaluation indicates uncertainty in the projected inflow sources and salinity levels at proposed well sites. Additional modeling enhancements should also enable the simulation of alternative well configurations, such as slant wells, to evaluate their effect on capture efficiency, drawdown distribution, and barrier interaction.

Further water quality evaluations are necessary to finalize the treatment design, optimize pretreatment costs and better characterize distribution system quality requirements. In addition to further definition of feed water quality, it is also recommended to define finished water requirements for compatibility with the regional distribution system. As part of this analysis stability parameters will be finalized and blending analysis should be performed to estimate disinfection byproduct formation and determine if mitigation strategies are necessary.

As described in Section 3.6, a preliminary siting analysis was conducted using known chloride contours and aquifer transmissivity data to identify the potential well locations. This was followed by detailed groundwater modeling. Later, monitoring well data was cross referenced to the blending water results and it was revealed that boron and bromide levels were unusually high in the monitoring wells. This could be the result of groundwater impacts from a nearby landfill. Currently, a two-pass system was designed due to the elevated boron concentrations at Well 3. Due to water quality concerns related to Well 3 and prod

uction concerns at Well 5, future investigations should be conducted to determine if the 2nd pass can be eliminated to further reduce treatment costs.

Additional analysis is needed to optimize pipeline routing, minimize the project footprint, and reduce site procurement expenses. These research and investigation efforts are expected to result in final design project refinements.

10.2 Basis for Reclamation Participation in Research

Description of the basis for Reclamation participation in the identified research.

Reclamation involvement is not necessary for any additional analysis or research needed to implement the Local SiP.

10.3 Parties Administering and Conducting Research

Identification of the parties who will administer and conduct necessary research.

Mesa Water, Black & Veatch, and INTERA will continue to advance the project through the planning and design phase of the project. Specific parties have not been identified to conduct the required research. Details are anticipated to be determined in early 2026 when the RFP for design is released.

10.4 Research Timeframe

Identification of the timeframe necessary for completion of necessary research.

All research required for the project design is anticipated to be completed by 2027. The final design is anticipated to start in January 2027 and complete in January of 2029.

11.0 References

Calflora. *https://www.calflora.org/*.California Department of Water Resources. 2003. California's Groundwater Bulletin No. 118.

California Department of Water Resources. Disadvantage Communities Mapping Tool. *DAC Mapping Tool*. Accessed June 30, 2025.

California State Parks. California Register of Historic Resources. *California Historical Resources (ca.gov)*. Accessed June 12, 2025.

CDM Smith. 2003. Interim Report (Draft) Model Refinement and Calibration Talbert Gap Barrier Model, Orange County, California. Prepared for Orange County Water District, Fountain Valley, California.

Fitch Ratings. https://www.fitchratings.com/. Accessed September 17, 2025.

Local Groundwater Supply Improvement Project Desalination Feasibility Study. February 23, 2023. WaterSMART: Water Recycling and Desalination Planning Grant.

National Drought Mitigation Center. U.S. Drought Monitor. *http://www.droughtmonitor.unl.edu*. Accessed June 30, 2025.

National Register of Historic Places. Available: *National Register of Historic Places (nps.gov)*. Accessed June 11, 2025.

Orange County Water District. 2017. Basin 8-1 Alternative: Orange County Water District's Alternative to a Groundwater Sustainability Plan for the Coastal Plain of Orange County Groundwater Basin (DWR Basin 8-1). Submitted to California Department of Water Resources. Fountain Valley, California. Available at: *www.ocwd.com*.

Orange County Water District. January 2, 2024. *Coastal Aquifer Mergence Zones and Chloride Concentration v20241217*.

U.S. Fish & Wildlife Service. Information for Planning and Consultation. *https://ipac.ecosphere.fws.gov/*.

Appendix A. Class 5 Opinion of Probable Construction Costs (OPCC)

Local Groundwater SIP
Mesa Water District
Opinion of Probable Construction Cost - ROM

Project name	Local Groundwater SIP - Preliminary Design
Estimator	Shawn Steward
Labor rate table	CA-PS OPCC-24
Equipment rate table	Bluebook-24
Job size	5.35 MGD
Project	Water Treatment
QC Reviewer:	Steve Hull
QC Date:	4-11-25
Report format	Sorted by 'Area/SubArea/System/MF95Lvl02/Element' 'Detail' summary

Local SiP - 5.35 MGD - OPCC

Spreadsheet Level	Takeoff Quantity	Labor Man Hrs	Labor Amount	Material Amount	Equip Amount	Sub Amount	Other Amount	Total Cost/Unit	Total Amount
0100 Groundwater Wells									
0100.010 Water Well Locations									
005.165 Buried Utilities - Site Electrical-Medium Voltage Duct banks	1,250.00 LF					356,250		285.00 /LF	356,250
010.055 Sitewide - Site Finishes - Paving & Surfacing	*1.00* LS	219	18,625	64,574	7,262	60,220		150,680.71 /LS	150,681
010.100 Drilling of Water Supply Wells	6.00 EA					2,628,750		438,125.00 /EA	2,628,750
080.010 Hydraulic Pump Systems - Vertical Turbine Pumps Line Shaft	6.00 EA	1,776	186,991	1,460,537	42,454			281,663.73 /EA	1,689,982
100.010 Buildings - CMU - Process	*2,000.00* SF	656	64,215	42,148	4,798	962,618	50	536.91 /SF	1,073,829
0100.010 Water Well Locations	*5.00* EA	2,651	269,831	1,567,259	54,515	4,007,838	50	1,179,898.49 /EA	5,899,492
0100.710 Electrical									
010.210 Sitewide - Generator w/ Load bank & ATS	10.00 EA	1,115	94,161	2,887,890	10,000			299,205.01 /EA	2,992,050
010.260 Sitewide - Electrical	*1.00* LS					2,184,000		2,184,000.00 /LS	2,184,000
0100.710 Electrical	*1.00* LS	1,115	94,161	2,887,890	10,000	2,184,000		5,176,050.14 /LS	5,176,050
0100.810 I&C									
010.270 Sitewide - Instrumentation and Controls	*1.00* LS	22	1,858	2,369		300,000		304,227.13 /LS	304,227
0100.810 I&C	*1.00* LS	22	1,858	2,369		300,000		304,227.13 /LS	304,227
0100 Groundwater Wells	*1.00* LS	3,788	365,849	4,457,518	64,515	6,491,838	50	11,379,769.74 /LS	11,379,770
0200 Feed Conveyance									
0200.010 Transmission Main - Wells to Facility, 24" CML&C									
005.005 Buried Utilities - Direct Buried Transmission Pipelines	22,800.00 LF	43,483	3,580,698	7,644,486	2,138,029	1,376,050	30,584	647.80 /LF	14,769,848
010.015 Sitewide - Site Prep & Clearing	*1.00* LS	85	6,697		4,252			10,948.86 /LS	10,949
010.055 Sitewide - Site Finishes - Paving & Surfacing	*1.00* LS	1,313	114,596	1,114,917	51,741	158,473		1,439,727.39 /LS	1,439,727
0200.010 Transmission Main - Wells to Facility, 24" CML&C	22,800.00 LF	44,881	3,701,991	8,759,403	2,194,022	1,534,523	30,584	711.43 /LF	16,220,524
0200.015 Transmission Main - Wells to Facility, 18" CML&C									
005.005 Buried Utilities - Direct Buried Transmission Pipelines	3,000.00 LF	4,035	338,892	801,857	208,673	101,815	14,340	488.53 /LF	1,465,577
010.015 Sitewide - Site Prep & Clearing	*1.00* LS	85	6,697		4,252			10,948.86 /LS	10,949
010.055 Sitewide - Site Finishes - Paving & Surfacing	*1.00* LS	172	15,035	146,280	6,789	20,792		188,896.08 /LS	188,896
0200.015 Transmission Main - Wells to Facility, 18" CML&C	3,000.00 LF	4,292	360,624	948,137	219,714	122,607	14,340	555.14 /LF	1,665,422
0200.020 Transmission Main - Wells to Facility, 16" CML&C									
005.005 Buried Utilities - Direct Buried Transmission Pipelines	2,800.00 LF	3,787	318,305	498,760	193,407	96,703	14,190	400.49 /LF	1,121,365
010.015 Sitewide - Site Prep & Clearing	*1.00* LS	85	6,697		4,252			10,948.86 /LS	10,949
010.055 Sitewide - Site Finishes - Paving & Surfacing	*1.00* LS	161	14,072	136,903	6,353	19,459		176,787.38 /LS	176,787
0200.020 Transmission Main - Wells to Facility, 16" CML&C	2,800.00 LF	4,033	339,074	635,663	204,012	116,162	14,190	467.54 /LF	1,309,101
0200.025 Transmission Main - Wells to Facility, 12" CML&C									
005.005 Buried Utilities - Direct Buried Transmission Pipelines	6,650.00 LF	7,433	610,064	804,506	384,062	220,305	17,205	306.19 /LF	2,036,142
010.015 Sitewide - Site Prep & Clearing	*1.00* LS	85	6,697		4,252			10,948.86 /LS	10,949
010.055 Sitewide - Site Finishes - Paving & Surfacing	*1.00* LS	383	33,444	325,379	15,100	46,249		420,172.76 /LS	420,173
0200.025 Transmission Main - Wells to Facility, 12" CML&C	6,650.00 LF	7,902	650,205	1,129,886	403,413	266,554	17,205	371.02 /LF	2,467,263
0200.027 Transmission Main - Wells to Facility, 6" CML&C									
005.005 Buried Utilities - Direct Buried Transmission Pipelines	3,100.00 LF	3,269	272,771	403,989	157,849	104,350	14,400	307.54 /LF	953,359
010.015 Sitewide - Site Prep & Clearing	*1.00* LS	85	6,697		4,252			10,948.86 /LS	10,949
010.055 Sitewide - Site Finishes - Paving & Surfacing	*1.00* LS	177	15,421	150,031	6,963	21,325		193,739.59 /LS	193,740
0200.027 Transmission Main - Wells to Facility, 6" CML&C	3,100.00 LF	3,532	294,889	554,020	169,063	125,675	14,400	373.56 /LF	1,158,048
0200.710 Electrical									
010.260 Sitewide - Electrical	1.00 LS					526,600		526,600.00 /LS	526,600
0200.710 Electrical	1.00 LS					526,600		526,600.00 /LS	526,600
0200.810 I&C									
010.270 Sitewide - Instrumentation and Controls	1.00 LS					96,600		96,600.00 /LS	96,600
0200.810 I&C	1.00 LS					96,600		96,600.00 /LS	96,600
0200 Feed Conveyance	*1.00* LS	64,640	5,346,784	12,027,109	3,190,225	2,788,721	90,719	23,443,558.26 /LS	23,443,558
0300 Site Procurement & Demolition									
0600.610 Demolition									
010.005 Sitewide - Site Demolition	*1.00* LS	1,699	133,483	600	99,229		11,495	244,807.22 /LS	244,807
010.010 Sitewide - Building/Structure Demolition	*1.00* LS	6,297	509,030		186,984		8,052	704,065.22 /LS	704,065
0600.610 Demolition	*1.00* LS	7,996	642,513	600	286,213		19,547	948,872.44 /LS	948,872

Spreadsheet Level	Takeoff Quantity	Labor Man Hrs	Labor Amount	Material Amount	Equip Amount	Sub Amount	Other Amount	Total Cost/Unit	Total Amount
0300 Site Procurement & Demolition	*1.00* LS	7,996	642,513	600	286,213		19,547	948,872.44 /LS	948,872
0400 Treatment									
0300.210 RO Treatment Bldg									
100.025 Buildings - Pre-Engineered - Process	29,620.00 SF					12,231,000		412.93 /SF	12,231,000
0300.210 RO Treatment Bldg	29,620.00 SF					12,231,000		412.93 /SF	12,231,000
0300.310 Reverse Osmosis Systems									
055.020 Water Membrane Systems - Reverse Osmosis (Low)	*8.00* MGD	2,600	263,604	8,937,860	33,900			1,154,420.47 /MGD	9,235,364
080.030 Hydraulic Pump Systems	12.00 EA	2,760	279,826	2,100,000	28,500			200,693.87 /EA	2,408,326
115.050 Balance of Plant - Process Piping	0.00					320,000		/LS	320,000
115.115 Equipment Pad and Containment	88.89 CY	646	63,680	25,233	665			1,007.75 /CY	89,578
0300.310 Reverse Osmosis Systems	*8.00* MGD	6,006	607,110	11,063,093	63,065	320,000		1,506,658.47 /MGD	12,053,268
0300.410 CIP & Neutralization System									
055.021 CIP and Neutralization Pumps & Tanks	8.00 MGD					1,344,000		168,000.00 /MGD	1,344,000
102.010 Structures - CIP Straight Wall Tanks & Vaults	1,541.22 CY	2,031	191,975	90,562	46,514	6,945	391	218.26 /CY	336,387
115.115 Equipment Pad and Containment	44.45 CY	323	31,840	12,617	332			1,007.74 /CY	44,789
0300.410 CIP & Neutralization System	*8.00* MGD	2,355	223,815	103,178	46,846	1,350,945	391	215,646.99 /MGD	1,725,176
0400.430 RO Feed Tank									
005.040 Buried Utilities - Drainage & Containment Collection Pipelines	200.00 LF	41	3,094	2,212	1,742			35.24 /LF	7,047
005.100 Buried Utilities - Yard Piping-Pressure Process Mains	*1.00* LS	307	29,577	28,114	24,668			82,359.06 /LS	82,359
080.015 Hydraulic Pump Systems - Vertical Turbine Pumps Line Shaft w/Can	3.00 EA	724	72,611	1,268,681	8,593		4,200	451,361.52 /EA	1,354,085
080.110 Hydraulic Pump Systems - Submersible Non-Clog Pumps	3.00 EA	97	9,752	110,980	1,334	670		40,912.20 /EA	122,737
102.010 Structures - CIP Straight Wall Tanks & Vaults	*205.33* CY	2,447	230,960	107,466	53,647	8,713	483	1,954.26 /CY	401,268
0400.430 RO Feed Tank	*1.00* LS	3,616	345,994	1,517,452	89,984	9,384	4,683	1,967,495.30 /LS	1,967,495
0400.440 Brine Receiving Station									
005.040 Buried Utilities - Drainage & Containment Collection Pipelines	200.00 LF	41	3,094	2,212	1,742			35.24 /LF	7,047
005.100 Buried Utilities - Yard Piping-Pressure Process Mains	*1.00* LS	74	5,703	29,186	2,668			37,557.68 /LS	37,558
080.015 Hydraulic Pump Systems - Vertical Turbine Pumps Line Shaft w/Can	3.00 EA	564	56,430	268,481	8,593		4,200	112,567.78 /EA	337,703
080.110 Hydraulic Pump Systems - Submersible Non-Clog Pumps	3.00 EA	97	9,752	110,980	1,334	670		40,912.20 /EA	122,737
102.010 Structures - CIP Straight Wall Tanks & Vaults	*99.73* CY	1,217	114,992	52,755	27,908	4,167	234	2,005.99 /CY	200,057
0400.440 Brine Receiving Station	*1.00* LS	1,994	189,971	463,613	42,246	4,837	4,434	705,102.01 /LS	705,102
0400.450 Hydrated Lime System									
005.100 Buried Utilities - Yard Piping-Pressure Process Mains	1.00 LS					55,000		55,000.00 /LS	55,000
065.005 Chemical Systems - Lime	*8.00* GPM	712	71,602	2,890,264	13,584	27,250		375,337.46 /GPM	3,002,700
102.005 Structures - Structural Slab On Grade	189.00 SF	118	11,859	12,211	92			127.85 /SF	24,163
0400.450 Hydrated Lime System	*1.00* LS	830	83,461	2,902,475	13,676	82,250		3,081,862.50 /LS	3,081,863
0400.460 Chemical System									
005.100 Buried Utilities - Yard Piping-Pressure Process Mains	1.00 LS					80,000		80,000.00 /LS	80,000
065.010 Chemical Systems - NaOCl (Sodium Hypochlorite aka Bleach)	*1.00* LS	164	16,488	71,654	1,348	25,882		115,371.76 /LS	115,372
065.015 Chemical Systems - NaOH (Sodium Hydroxide aka Caustic Soda)	1.00 LS					1,005,000		1,005,000.00 /LS	1,005,000
065.025 Chemical Systems - C6H8O7 (Citric Acid)	1.00 LS					1,320,000		1,320,000.00 /LS	1,320,000
065.080 Chemical Systems - Antiscalent	1.00 LS					196,000		196,000.00 /LS	196,000
065.140 Chemical Systems - LAS (Liquid Ammonium Sulfate)	1.00 LS					725,000		725,000.00 /LS	725,000
102.005 Structures - Structural Slab On Grade	2,875.00 SF	325	32,539	39,173	307	82,500		53.75 /SF	154,519
0400.460 Chemical System	*1.00* LS	488	49,027	110,827	1,655	3,434,382		3,595,891.02 /LS	3,595,891
0400.470 Carbon Dioxide System									
005.100 Buried Utilities - Yard Piping-Pressure Process Mains	1.00 LS					67,500		67,500.00 /LS	67,500
065.155 Chemical Systems - CO2 Carbon Dioxide	*1.00* EA	165	16,515	693,698	2,696	9,320		722,228.60 /EA	722,229
102.005 Structures - Structural Slab On Grade	135.00 SF	76	7,692	7,320	55			111.60 /SF	15,067
0400.470 Carbon Dioxide System	*1.00* LS	241	24,206	701,018	2,751	76,820		804,795.23 /LS	804,795
0400.480 Canopies									
100.025 Buildings - Pre-Engineered - Process	21,600.00 SF					4,469,000		206.90 /SF	4,469,000
0400.480 Canopies	*1.00* LS					4,469,000		4,469,000.00 /LS	4,469,000
0500.420 Chlorine Contact Tank (CCT)									
005.040 Buried Utilities - Drainage & Containment Collection Pipelines	200.00 LF	41	3,094	2,212	1,742			35.24 /LF	7,047

Spreadsheet Level	Takeoff Quantity	Labor Man Hrs	Labor Amount	Material Amount	Equip Amount	Sub Amount	Other Amount	Total Cost/Unit	Total Amount
060.015 Disinfection - Chlorine Contact (in Channel)	5.35 MGD	217	21,864	236,160	1,348	8,373		50,045.73 /MGD	267,745
080.015 Hydraulic Pump Systems - Vertical Turbine Pumps Line Shaft w/Can	3.00 EA	564	56,430	268,481	8,593		4,200	112,567.78 /EA	337,703
080.110 Hydraulic Pump Systems - Submersible Non-Clog Pumps	3.00 EA	97	9,752	110,980	1,334	670		40,912.20 /EA	122,737
102.010 Structures - CIP Straight Wall Tanks & Vaults	485.67 CY	870	83,662	42,275	22,203	2,712	161	310.94 /CY	151,014
0500.420 Chlorine Contact Tank (CCT)	5.35 MGD	1,789	174,802	660,107	35,220	11,756	4,361	165,653.44 /MGD	886,246
0500.710 Electrical									
010.260 Sitewide - Electrical	1.00 LS					16,327,000		16,327,000.00 /LS	16,327,000
0500.710 Electrical	1.00 LS					16,327,000		16,327,000.00 /LS	16,327,000
0500.810 I&C									
010.270 Sitewide - Instrumentation and Controls	1.00 LS	600	50,669			3,061,000		3,111,669.28 /LS	3,111,669
0500.810 I&C	1.00 LS	600	50,669			3,061,000		3,111,669.28 /LS	3,111,669
0600.620 Sitework & Yard Piping									
010.065 Sitework	1.00 LS					750,000		750,000.00 /LS	750,000
0600.620 Sitework & Yard Piping	1.00 LS					750,000		750,000.00 /LS	750,000
0600.630 Yard Piping									
005.100 Buried Utilities - Yard Piping-Pressure Process Mains	1.00 LS					1,930,000		1,930,000.00 /LS	1,930,000
0600.630 Yard Piping	1.00 LS					1,930,000		1,930,000.00 /LS	1,930,000
0600.640 Electrical Duct Banks									
005.170 Buried Utilities - Site Electrical-Low Voltage Duct banks	750.00 LF	721	61,541	52,680	1,958			154.91 /LF	116,180
0600.640 Electrical Duct Banks	1.00 LS	721	61,541	52,680	1,958			116,180.10 /LS	116,180
0600.660 Stormwater EQ Basin									
102.010 Structures - CIP Straight Wall Tanks & Vaults	250.00 CY					400,000		1,600.00 /CY	400,000
0600.660 Stormwater EQ Basin	1.00 LS					400,000		400,000.00 /LS	400,000
0400 Treatment	1.00 LS	18,640	1,810,598	17,574,444	297,401	44,458,374	13,869	64,154,685.00 /LS	64,154,685
0500 Finished Water Distribution									
0200.040 Transmission Main - Facility to Distribution Tie-in, 20" CML&C									
005.005 Buried Utilities - Direct Buried Transmission Pipelines	12,000.00 LF	24,270	1,878,531	3,403,438	1,381,246	332,275	10,387	583.82 /LF	7,005,878
010.015 Sitewide - Site Prep & Clearing	1.00 LS	43	3,349		2,126			5,474.45 /LS	5,474
010.055 Sitewide - Site Finishes - Paving & Surfacing	1.00 LS	552	48,190	468,847	21,758	66,701		605,496.23 /LS	605,496
0200.040 Transmission Main - Facility to Distribution Tie-in, 20" CML&C	12,000.00 LF	24,865	1,930,069	3,872,285	1,405,130	398,977	10,387	634.74 /LF	7,616,848
0500 Finished Water Distribution	1.00 LS	24,865	1,930,069	3,872,285	1,405,130	398,977	10,387	7,616,848.28 /LS	7,616,848
0600 Brine Disposal									
0200.030 Transmission Main - Facility to Brine Discharge Tie-in, 24" CML&C									
005.005 Buried Utilities - Direct Buried Transmission Pipelines	1,000.00 LF	2,184	174,065	301,090	127,864	52,000	1,200	656.22 /LF	656,219
010.055 Sitewide - Site Finishes - Paving & Surfacing	1.00 LS	59	5,129	49,904	2,316	8,723		66,072.06 /LS	66,072
0200.030 Transmission Main - Facility to Brine Discharge Tie-in, 24" CML&C	1,000.00 LF	2,243	179,194	350,994	130,180	60,723	1,200	722.29 /LF	722,291
0600 Brine Disposal	1.00 LS	2,243	179,194	350,994	130,180	60,723	1,200	722,291.16 /LS	722,291

Estimate Totals

Description	Amount	Totals	Hours	Rate
Labor	10,275,006		122,171.878	
Material	38,282,950			
Subcontract	54,198,633			
Equipment	5,373,663		102,081.282	
Other	135,773			
TOTAL DIRECT COST	***108,266,025***	***108,266,025***		
ALLOWANCES				
Mobilization/De-mobilization	2,165,321			2.000 %
TOTAL DIRECT COST W/ ALLOWANCE	***2,165,321***	***110,431,346***		
SUBCONTRACTOR MARK-UP'S				
Subcontractor-General Conditions	4,087,844			8.000 %
Subcontractor-Overhead	3,065,883			6.000 %
Subcontractor-Fee	3,065,883			6.000 %
Subcontractor-Bond/Insurance	1,277,451			2.500 %
Subcontactor-Div 16/17 Premium	2,614,818			10.000 %
TOTAL DIRECT COST	***14,111,879***	***124,543,225***		
RISK ASSESSMENT MARK-UP's				
Construction Contingency	43,590,128			35.000 %
Market Factor Adjustment	12,454,322			10.000 %
Escalation to Midpoint (April 2030 @ 5%/yr)	31,135,806			25.000 %
TOTAL INCLUDING RISK	***87,180,256***	***211,723,481***		
GENERAL REQUIREMENTS				
General Conditions Management	12,174,100			5.750 %
General Conditions Subsistance	4,234,470			2.000 %
General Conditions Temp Facilities	2,117,235			1.000 %
General Conditions Equipment	1,058,617			0.500 %
General Conditions Start-up	3,175,852			1.500 %
General Conditions Permits	1,058,617			0.500 %
Sales Tax	4,160,277			9.500 %
TOTAL INCLUDING GC'S	***27,979,168***	***239,702,649***		
CONTRACTOR FEE				
General & Administrative Costs	14,382,159			6.000 %
Profit (Fee)	16,612,868			6.000 %
TOTAL INCLUDING FEE	***30,995,027***	***270,697,676***		
INSURANCES & BOND				
Builders All Risk Insurance	2,030,233			0.750 %
General Liability Insurance	1,384,406			0.500 %
Payment & Performance Bond	2,768,811			1.000 %
TOTAL CONSTRUCTION COST	***6,183,450***	***276,881,126***		
Total		**276,881,126**		

This project has been reviewed per Black & Veatch quality control standards by Steve Hull on 4-11-25

Local Groundwater SIP
Mesa Water District
Opinion of Probable Construction Cost - ROM

Project name	Local Groundwater SIP - Preliminary Design
Estimator	Shawn Steward
Labor rate table	CA-PS OPCC-24
Equipment rate table	Bluebook-24
Job size	2.65 MGD
Project	Water Treatment
QC Reviewer:	Steve Hull
QC Date:	4-11-25
Report format	Sorted by 'Area/SubArea/System/MF95Lvl02/Element' 'Detail' summary Allocate addons

Local SiP - 2.65 MGD - OPCC

Spreadsheet Level	Takeoff Quantity	Labor Man Hrs	Labor Amount	Material Amount	Equip Amount	Sub Amount	Other Amount	Total Cost/Unit	Total Amount
0100 Groundwater Wells									
0100.010 Water Well Locations									
005.165 Buried Utilities - Site Electrical-Medium Voltage Duct banks	1,250.00 LF					356,250		285.00 /LF	356,250
010.055 Sitewide - Site Finishes - Paving & Surfacing	*1.00* LS	219	18,625	64,574	7,262	60,220		150,680.71 /LS	150,681
010.100 Drilling of Water Supply Wells	*8.00* MGD					2,178,750		272,343.75 /MGD	2,178,750
080.010 Hydraulic Pump Systems - Vertical Turbine Pumps Line Shaft	10.00 EA	1,703	179,958	1,032,622	39,085			125,166.47 /EA	1,251,665
100.010 Buildings - CMU - Process	*2,000.00* SF	656	64,215	42,148	4,798	962,618	50	536.91 /SF	1,073,829
0100.010 Water Well Locations	*5.00* EA	2,578	262,798	1,139,343	51,145	3,557,838	50	1,002,234.96 /EA	5,011,175
0100.710 Electrical									
010.210 Sitewide - Generator w/ Load bank & ATS	10.00 EA	1,115	94,161	2,262,390	10,000			236,655.01 /EA	2,366,550
010.260 Sitewide - Electrical	*1.00* LS					1,456,000		1,456,000.00 /LS	1,456,000
0100.710 Electrical	*1.00* LS	1,115	94,161	2,262,390	10,000	1,456,000		3,822,550.14 /LS	3,822,550
0100.810 I&C									
010.270 Sitewide - Instrumentation and Controls	*1.00* LS	22	1,858	2,369		270,000		274,227.13 /LS	274,227
0100.810 I&C	*1.00* LS	22	1,858	2,369		270,000		274,227.13 /LS	274,227
0100 Groundwater Wells	*1.00* LS	3,715	358,816	3,404,102	61,145	5,283,838	50	9,107,952.06 /LS	9,107,952
0200 Feed Conveyance									
0200.010 Transmission Main - Wells to Facility, 16" CML&C									
005.005 Buried Utilities - Direct Buried Transmission Pipelines	22,800.00 LF	27,946	2,291,338	4,566,961	1,435,223	1,426,050	30,584	427.64 /LF	9,750,157
010.015 Sitewide - Site Prep & Clearing	*1.00* LS	85	6,697		4,252			10,948.86 /LS	10,949
010.055 Sitewide - Site Finishes - Paving & Surfacing	*1.00* LS	1,313	114,596	1,114,917	51,741	158,473		1,439,727.39 /LS	1,439,727
0200.010 Transmission Main - Wells to Facility, 16" CML&C	22,800.00 LF	29,344	2,412,632	5,681,878	1,491,216	1,584,523	30,584	491.26 /LF	11,200,833
0200.015 Transmission Main - Wells to Facility, 14" CML&C									
005.005 Buried Utilities - Direct Buried Transmission Pipelines	3,000.00 LF	3,447	277,869	358,850	186,697	101,815	3,840	309.69 /LF	929,071
010.015 Sitewide - Site Prep & Clearing	*1.00* LS	85	6,697		4,252			10,948.86 /LS	10,949
010.055 Sitewide - Site Finishes - Paving & Surfacing	*1.00* LS	172	15,035	146,280	6,789	20,792		188,896.08 /LS	188,896
0200.015 Transmission Main - Wells to Facility, 14" CML&C	3,000.00 LF	3,704	299,602	505,130	197,737	122,607	3,840	376.31 /LF	1,128,916
0200.020 Transmission Main - Wells to Facility, 12" CML&C									
005.005 Buried Utilities - Direct Buried Transmission Pipelines	2,800.00 LF	2,837	230,695	415,353	147,969	96,703	3,690	319.43 /LF	894,410
010.015 Sitewide - Site Prep & Clearing	*1.00* LS	85	6,697		4,252			10,948.86 /LS	10,949
010.055 Sitewide - Site Finishes - Paving & Surfacing	*1.00* LS	161	14,072	136,903	6,353	19,459		176,787.38 /LS	176,787
0200.020 Transmission Main - Wells to Facility, 12" CML&C	2,800.00 LF	3,083	251,464	552,256	158,574	116,162	3,690	386.48 /LF	1,082,146
0200.025 Transmission Main - Wells to Facility, 8" CML&C									
005.005 Buried Utilities - Direct Buried Transmission Pipelines	6,650.00 LF	6,648	542,123	976,274	340,873	220,305	17,205	315.31 /LF	2,096,779
010.015 Sitewide - Site Prep & Clearing	*1.00* LS	85	6,697		4,252			10,948.86 /LS	10,949
010.055 Sitewide - Site Finishes - Paving & Surfacing	*1.00* LS	383	33,444	325,379	15,100	46,249		420,172.76 /LS	420,173
0200.025 Transmission Main - Wells to Facility, 8" CML&C	6,650.00 LF	7,116	582,264	1,301,653	360,225	266,554	17,205	380.14 /LF	2,527,901
0200.027 Transmission Main - Wells to Facility, 6" CML&C									
005.005 Buried Utilities - Direct Buried Transmission Pipelines	3,100.00 LF	3,269	272,771	403,989	157,849	104,350	14,400	307.54 /LF	953,359
010.015 Sitewide - Site Prep & Clearing	*1.00* LS	85	6,697		4,252			10,948.86 /LS	10,949
010.055 Sitewide - Site Finishes - Paving & Surfacing	*1.00* LS	177	15,421	150,031	6,963	21,325		193,739.59 /LS	193,740
0200.027 Transmission Main - Wells to Facility, 6" CML&C	3,100.00 LF	3,532	294,889	554,020	169,063	125,675	14,400	373.56 /LF	1,158,048
0200.710 Electrical									
010.260 Sitewide - Electrical	1.00 LS					526,600		526,600.00 /LS	526,600
0200.710 Electrical	1.00 LS					526,600		526,600.00 /LS	526,600
0200.810 I&C									
010.270 Sitewide - Instrumentation and Controls	1.00 LS					96,600		96,600.00 /LS	96,600
0200.810 I&C	1.00 LS					96,600		96,600.00 /LS	96,600
0200 Feed Conveyance	*1.00* LS	46,780	3,840,850	8,594,937	2,376,815	2,838,721	69,719	17,721,043.46 /LS	17,721,043
0300 Site Procurement & Demolition									
0600.610 Demolition									
010.005 Sitewide - Site Demolition	0.00	850	66,742	300	49,615		5,748	/LS	122,404
010.010 Sitewide - Building/Structure Demolition	0.00	6,297	509,030		186,984		8,052	/LS	704,065
0600.610 Demolition	*1.00* LS	7,147	575,771	300	236,598		13,800	826,468.83 /LS	826,469

Spreadsheet Level	Takeoff Quantity	Labor Man Hrs	Labor Amount	Material Amount	Equip Amount	Sub Amount	Other Amount	Total Cost/Unit	Total Amount
0300 Site Procurement & Demolition	*1.00* LS	7,147	575,771	300	236,598		13,800	826,468.83 /LS	826,469
0400 Treatment									
0300.210 RO Treatment Bldg									
100.025 Buildings - Pre-Engineered - Process	22,415.00 SF					9,268,125		413.48 /SF	9,268,125
0300.210 RO Treatment Bldg	22,415.00 SF					9,268,125		413.48 /SF	9,268,125
0300.310 Reverse Osmosis Systems									
055.020 Water Membrane Systems - Reverse Osmosis (Low)	*4.00* MGD	2,070	209,869	7,514,000	33,150			1,939,254.68 /MGD	7,757,019
080.030 Hydraulic Pump Systems	12.00 EA	2,208	223,861	1,680,000	28,500			161,030.10 /EA	1,932,361
115.050 Balance of Plant - Process Piping	*1.00* LS					260,000		260,000.00 /LS	260,000
115.115 Equipment Pad and Containment	88.89 CY	646	63,680	25,233	665			1,007.75 /CY	89,578
0300.310 Reverse Osmosis Systems	*4.00* MGD	4,924	497,410	9,219,233	62,315	260,000		2,509,739.36 /MGD	10,038,957
0300.410 CIP and Neutralization Systems									
055.021 CIP and Neutralization Pumps & Tanks	4.00 MGD					604,800		151,200.00 /MGD	604,800
102.010 Structures - CIP Straight Wall Tanks & Vaults	*117.23* CY	1,443	136,919	65,753	32,239	5,111	275	2,049.80 /CY	240,298
115.115 Equipment Pad and Containment	44.45 CY	323	31,840	12,617	332			1,007.74 /CY	44,789
0300.410 CIP and Neutralization Systems	*1.00* LS	1,767	168,759	78,369	32,572	609,911	275	889,886.53 /LS	889,887
0400.430 RO Feed Tank									
005.040 Buried Utilities - Drainage & Containment Collection Pipelines	170.00 LF	35	2,630	1,880	1,480			35.24 /LF	5,990
005.100 Buried Utilities - Yard Piping-Pressure Process Mains	*1.00* LS	242	23,129	41,947	19,430			84,505.69 /LS	84,506
080.015 Hydraulic Pump Systems - Vertical Turbine Pumps Line Shaft w/Can	3.00 EA	632	68,402	620,681	8,593		4,200	233,958.52 /EA	701,876
080.110 Hydraulic Pump Systems - Submersible Non-Clog Pumps	2.00 EA	65	6,501	73,987	890	447		40,912.20 /EA	81,824
102.010 Structures - CIP Straight Wall Tanks & Vaults	*128.33* CY	1,539	145,421	70,265	33,529	5,446	302	1,986.77 /CY	254,963
0400.430 RO Feed Tank	*1.00* LS	2,514	246,084	808,759	63,921	5,893	4,502	1,129,158.72 /LS	1,129,159
0400.440 Brine Receiving Station									
005.040 Buried Utilities - Drainage & Containment Collection Pipelines	170.00 LF	35	2,630	1,880	1,480			35.24 /LF	5,990
005.100 Buried Utilities - Yard Piping-Pressure Process Mains	*1.00* LS	74	5,703	29,186	2,668			37,557.68 /LS	37,558
080.015 Hydraulic Pump Systems - Vertical Turbine Pumps Line Shaft w/Can	3.00 EA	427	42,561	208,481	8,593		4,200	87,944.58 /EA	263,834
080.110 Hydraulic Pump Systems - Submersible Non-Clog Pumps	2.00 EA	65	6,501	73,987	890	447		40,912.20 /EA	81,824
102.010 Structures - CIP Straight Wall Tanks & Vaults	*66.49* CY	816	77,165	36,294	18,606	2,778	156	2,030.37 /CY	134,999
0400.440 Brine Receiving Station	*1.00* LS	1,417	134,560	349,827	32,237	3,225	4,356	524,205.18 /LS	524,205
0400.450 Hydrated Lime System									
005.100 Buried Utilities - Yard Piping-Pressure Process Mains	1.00 LS					46,750		46,750.00 /LS	46,750
065.005 Chemical Systems - Lime	*2.68* GPM	554	55,583	1,625,400	13,584	27,250		643,669.74 /GPM	1,721,817
102.005 Structures - Structural Slab On Grade	132.30 SF	82	8,301	8,548	65			127.84 /SF	16,913
0400.450 Hydrated Lime System	*1.00* LS	636	63,884	1,633,947	13,648	74,000		1,785,479.66 /LS	1,785,480
0400.460 Chemical System									
005.100 Buried Utilities - Yard Piping-Pressure Process Mains	1.00 LS					68,000		68,000.00 /LS	68,000
065.010 Chemical Systems - NaOCl (Sodium Hypochlorite aka Bleach)	*1.00* LS	99	9,974	47,246	1,348	15,132		73,699.44 /LS	73,699
065.015 Chemical Systems - NaOH (Sodium Hydroxide aka Caustic Soda)	1.00 LS					753,750		753,750.00 /LS	753,750
065.025 Chemical Systems - C6H8O7 (Citric Acid)	1.00 LS					990,000		990,000.00 /LS	990,000
065.080 Chemical Systems - Antiscalent	1.00 LS					166,600		166,600.00 /LS	166,600
065.140 Chemical Systems - LAS (Liquid Ammonium Sulfate)	1.00 LS					543,750		543,750.00 /LS	543,750
102.005 Structures - Structural Slab On Grade	2,012.50 SF	227	22,778	27,421	215	57,750		53.75 /SF	108,164
0400.460 Chemical System	*1.00* LS	327	32,751	74,667	1,563	2,594,982		2,703,963.42 /LS	2,703,963
0400.470 Carbon Dioxide System									
005.100 Buried Utilities - Yard Piping-Pressure Process Mains	1.00 LS					57,375		57,375.00 /LS	57,375
065.155 Chemical Systems - CO2 Carbon Dioxide	*2.68* GPM	149	14,892	455,698	2,696	9,320		180,077.02 /GPM	482,606
102.005 Structures - Structural Slab On Grade	94.50 SF	53	5,384	5,124	39			111.60 /SF	10,547
0400.470 Carbon Dioxide System	*2.68* MGD	202	20,276	460,822	2,735	66,695		205,420.92 /MGD	550,528
0400.480 Canopies									
100.025 Buildings - Pre-Engineered - Process	15,120.00 SF					3,128,300		206.90 /SF	3,128,300
0400.480 Canopies	*1.00* LS					3,128,300		3,128,300.00 /LS	3,128,300
0500.420 Chlorine Contact Tank (CCT)									
005.040 Buried Utilities - Drainage & Containment Collection Pipelines	200.00 LF	41	3,094	2,212	1,742			35.24 /LF	7,047

Spreadsheet Level	Takeoff Quantity	Labor Man Hrs	Labor Amount	Material Amount	Equip Amount	Sub Amount	Other Amount	Total Cost/Unit	Total Amount
060.015 Disinfection - Chlorine Contact (in Channel)	2.68 MGD	169	17,078	157,327	1,348	8,373		68,703.84 /MGD	184,126
080.015 Hydraulic Pump Systems - Vertical Turbine Pumps Line Shaft w/Can	3.00 EA	564	56,430	268,481	8,593		4,200	112,567.78 /EA	337,703
080.110 Hydraulic Pump Systems - Submersible Non-Clog Pumps	2.00 EA	65	6,501	73,987	890	447		40,912.20 /EA	81,824
102.010 Structures - CIP Straight Wall Tanks & Vaults	298.07 CY	618	59,554	30,555	18,782	1,620	104	371.10 /CY	110,615
0500.420 Chlorine Contact Tank (CCT)	2.68 MGD	1,458	142,658	532,561	31,354	10,440	4,304	269,147.88 /MGD	721,316
0500.710 Electrical									
010.260 Sitewide - Electrical	3.00 LS					8,573,000		2,857,666.67 /LS	8,573,000
0500.710 Electrical	3.00 LS					8,573,000		2,857,666.67 /LS	8,573,000
0500.810 I&C									
010.270 Sitewide - Instrumentation and Controls	3.00 LS	600	50,669			1,627,600		559,423.09 /LS	1,678,269
0500.810 I&C	3.00 LS	600	50,669			1,627,600		559,423.09 /LS	1,678,269
0600.620 Sitework & Yard Piping									
010.065 Sitework	1.00 LS					562,500		562,500.00 /LS	562,500
0600.620 Sitework & Yard Piping	1.00 LS					562,500		562,500.00 /LS	562,500
0600.630 Yard Piping									
005.100 Buried Utilities - Yard Piping-Pressure Process Mains	1.00 LS					1,255,800		1,255,800.00 /LS	1,255,800
0600.630 Yard Piping	1.00 LS					1,255,800		1,255,800.00 /LS	1,255,800
0600.640 Electrical Duct Banks									
005.170 Buried Utilities - Site Electrical-Low Voltage Duct banks	750.00 LF	469	40,002	34,242	1,273			100.69 /LF	75,517
0600.640 Electrical Duct Banks	1.00 LS	469	40,002	34,242	1,273			75,516.98 /LS	75,517
0600.660 Stormwater EQ Basin									
102.010 Structures - CIP Straight Wall Tanks & Vaults	250.00 CY					240,000		960.00 /CY	240,000
0600.660 Stormwater EQ Basin	1.00 LS					240,000		240,000.00 /LS	240,000
0400 Treatment	1.00 LS	14,314	1,397,053	13,192,429	241,617	28,280,470	13,437	43,125,006.59 /LS	43,125,007
0500 Finished Water Distribution									
0200.040 Transmission Main - Facility to Distribution Tie-in, 14" CML&C									
005.005 Buried Utilities - Direct Buried Transmission Pipelines	12,000.00 LF	16,114	1,215,535	1,316,139	1,013,070	332,275	10,387	323.95 /LF	3,887,406
010.015 Sitewide - Site Prep & Clearing	1.00 LS	43	3,349		2,126			5,474.45 /LS	5,474
010.055 Sitewide - Site Finishes - Paving & Surfacing	1.00 LS	552	48,190	468,847	21,758	66,701		605,496.23 /LS	605,496
0200.040 Transmission Main - Facility to Distribution Tie-in, 14" CML&C	12,000.00 LF	16,709	1,267,073	1,784,986	1,036,954	398,977	10,387	374.86 /LF	4,498,377
0500 Finished Water Distribution	1.00 LS	16,709	1,267,073	1,784,986	1,036,954	398,977	10,387	4,498,376.94 /LS	4,498,377
0600 Brine Disposal									
0200.030 Transmission Main - Facility to Brine Discharge Tie-in, 16" CML&C									
005.005 Buried Utilities - Direct Buried Transmission Pipelines	1,000.00 LF	1,696	130,887	202,500	108,975	52,000	1,200	495.56 /LF	495,561
010.055 Sitewide - Site Finishes - Paving & Surfacing	1.00 LS	59	5,129	49,904	2,316	8,723		66,072.06 /LS	66,072
0200.030 Transmission Main - Facility to Brine Discharge Tie-in, 16" CML&C	1,000.00 LF	1,754	136,016	252,404	111,291	60,723	1,200	561.63 /LF	561,633
0600 Brine Disposal	1.00 LS	1,754	136,016	252,404	111,291	60,723	1,200	561,633.22 /LS	561,633

Estimate Totals

Description	Amount	Totals	Hours	Rate
Labor	7,575,580		90,418.760	
Material	27,229,158			
Subcontract	36,862,729			
Equipment	4,064,421		72,913.091	
Other	108,593			
TOTAL DIRECT COST	***75,840,481***	***75,840,481***		
ALLOWANCES				
Mobilization/De-mobilization	1,516,810			2.000 %
TOTAL DIRECT COST W/ ALLOWANCE	***1,516,810***	***77,357,291***		
SUBCONTRACTOR MARK-UP'S				
Subcontractor-General Conditions	2,843,853			8.000 %
Subcontractor-Overhead	2,132,890			6.000 %
Subcontractor-Fee	2,132,890			6.000 %
Subcontractor-Bond/Insurance	888,704			2.500 %
Subcontactor-Div 16/17 Premium	1,554,673			10.000 %
TOTAL DIRECT COST	***9,553,010***	***86,910,301***		
RISK ASSESSMENT MARK-UP's				
Construction Contingency	30,418,605			35.000 %
Market Factor Adjustment	8,691,030			10.000 %
Escalation to Midpoint (April 2030 @ 5%/yr)	21,727,575			25.000 %
TOTAL INCLUDING RISK	***60,837,210***	***147,747,511***		
GENERAL REQUIREMENTS				
General Conditions Management	8,495,482			5.750 %
General Conditions Subsistance	2,954,950			2.000 %
General Conditions Temp Facilities	1,477,475			1.000 %
General Conditions Equipment	738,738			0.500 %
General Conditions Start-up	2,216,213			1.500 %
General Conditions Permits	738,738			0.500 %
Sales Tax	2,983,206			9.500 %
TOTAL INCLUDING GC'S	***19,604,802***	***167,352,313***		
CONTRACTOR FEE				
General & Administrative Costs	10,041,139			6.000 %
Profit (Fee)	11,598,544			6.000 %
TOTAL INCLUDING FEE	***21,639,683***	***188,991,996***		
INSURANCES & BOND				
Builders All Risk Insurance	1,417,440			0.750 %
General Liability Insurance	966,545			0.500 %
Payment & Performance Bond	1,933,091			1.000 %
TOTAL CONSTRUCTION COST	***4,317,076***	***193,309,072***		
Total		**193,309,072**		

This project has been reviewed per Black & Veatch quality control standards by Steve Hull on 4-11-25

Appendix B. Operational Expenses (OPEX) Summary

Appendix B provides an overview of the projected annual operational costs for the 2.65 MGD and 5.35 MGD project alternatives. Chemical dosing estimates are broken down into continuous use and intermittent use dosing in Table B and Table B.

Table B-1 Continuous Use Chemical Dosing Operational Costs

Chemical	Application	2.65 MGD Annual Cost ($/yr)	5.35 MGD Annual Cost ($/yr)
Sodium Hypochlorite	Oxidation of Fe/Mn	$350,900	$701,800
Sodium Bisulfite	RO Feed Quenching	$65,400	$130,800
Antiscalant	Inorganic Scale Prevention	$128,400	$212,700
Sodium Hydroxide	Boron Rejection. In 2nd Pass	$80,200	$157,800
Hydrated Lime	Stabilization	$158,800	$317,500
Carbon Dioxide	Stabilization	$111,500	$222,500
Sodium Hypochlorite	Disinfection	$117,300	$234,700
Liquid Ammonium Sulfate	Chloramination	$15,630	$31,300

Table B-2 Intermittent Use Chemical Dosing Operational Costs

Chemical	Application	2.65 MGD Annual Cost ($/yr)	5.35 MGD Annual Cost ($/yr)
Citric Acid	CIP Makeup & Base Neutralization	$51,920	$77,000
Sodium Hydroxide	CIP Makeup & Acid CIP Neutralization	$2,080	$3,120

The following assumptions were incorporated into the chemical analysis:

- CIP frequency of four per year per train
- Minimum chemical storage duration of 30 days on average

Annual energy costs of $0.13 per kWh were assumed for the following equipment:

- Major Pumps (Outside of Process Building)
    - Raw Water Contact Tank Pumps
    - RO Feed Tank Pumps
    - Finished Water Pumps
    - Brine Receiving Station Pumps

- Major Process Pumps (Inside Process Building)
    - 1st Pass Feed Pumps
    - 1st Pass Interstage Booster Pumps
    - 2nd Pass Feed Pumps
- RO CIP, Flush, and Neutralization Pumps
- Pumping Energy for the Wells

Table B-3 outlines the annual costs for process consumables including cartridge filter replacements and RO membrane replacements.

Table B-3 Process Consumables

Item	2.65 MGD Annual Cost ($/yr)	5.35 MGD Annual Cost ($/yr)
Cartridge Filters	$1,800	$3,900
SWRO Membrane Replacements	$60,420	$119,700
BWRO Membrane Replacements	$17,850	$34,650

Table B-4 presents the anticipated additional fees for the Local SiP including the Replenishment Assessment and brine disposal fees. The unit costs are from the year 2025.

Table B-4 Additional Fees

Item	2.65 MGD Annual Cost ($/yr)	5.35 MGD Annual Cost ($/yr)
Replenishment Assessment Unit Cost ($/AF)	$206	
Replenishment Assessment Annual Cost	$924,900	$1.850 M
Brine Disposal Unit Cost ($/AF)	$90	
Brine Disposal Annual Cost	$120,100	$240,300

Table B presents the annual costs for anticipated spare parts and maintenance.

Table B-5 Spare Parts and Maintenance Operational Costs

Item	2.65 MGD Annual Cost ($/yr)	5.35 MGD Annual Cost ($/yr)
Mechanical, Electrical, and I&C Costs (5% of Total Construction Costs)	$9.665 M	$13.84 M
Spare Parts (1.5% of M/E/I&C)	$145,000	$207,700
Maintenance (2.0% of M/E/I&C)	$193,300	$276,900

Three FTEs were assumed for both alternatives. The total annual labor cost is presented in Table B-6.

Table B-6 Labor Operational Costs

Item	2.65 MGD Annual Cost ($/yr)	5.35 MGD Annual Cost ($/yr)
Additional FTEs	$338,000	$338,000

The resulting annual operational costs are presented in Table B.

Table B-7 Opinion of Annual Operational Costs

Category	2.65 MGD Annual Cost ($/yr)	5.35 MGD Annual Cost ($/yr)
Chemical	$1.08 M	$2.09 M
Energy	$1.89 M	$3.71 M
Process Consumables	$80.1 K	$158 K
Replenishment Assessment	$925 K	$1.85 M
Brine Disposal	$120 K	$249 K
Spare Parts & Maintenance	$338 K	$485 K
Labor	$338 K	$338 K
Total OPEX	**$4.77 M**	**$8.87 M**

TECHNICAL MEMORANDUM

To: Andrew D. Wiesner, PE – District Engineer
Mesa Water District

From: Ryan Gallagher, PE – Project Manager | MKN
Alex Maher, PE – Project Engineer | MKN

Date: September 26th, 2025

Re: Newport Water Supply Conceptual Evaluation

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List of Abbreviations

%	Percent
$/CFS	Dollars per Cubic Feet per Second
$/CF/Day	Dollars per Cubic Feet per Day
$/AF	Dollars per acre-foot
$M/Year	Millions of Dollars per Year
AF	acre-feet
AFY	Acre-feet per year
BEA	Basin Equity Assessment
BPP	Basin Production Percentage
cfs / CFS	cubic feet per second
City / CNB-	City of Newport Beach or CNB-MWD Interconnection
CIP	Capital Improvement Program
CM-	City of Newport Beach and Mesa Water Interconnection
Ft	feet
FY	Fiscal Year
gpm	gallons per minute
HGL	Hydraulic Grade Line
IRWD	Irvine Ranch Water District
Mesa Water	Mesa Water District
MG	Million Gallons
MGD	Million Gallons per Day
MKN	Michael K. Nunley and Associates
MWD	Metropolitan Water District of Southern California
MWDOC	Municipal Water District of Orange County
MWRF	Mesa Water Reliability Facility
O&M	Operation and Maintenance
OCWD	Orange County Water District
OC San	Orange County Sanitation District
RA	Replenishment Assessment
RTS	Readiness to Serve
TM	Technical Memorandum
UWMP	Urban Water Management Plan

1.0 Introduction and Objective

1.1 Background

Mesa Water District (Mesa Water) is evaluating the conceptual feasibility of providing a supplemental water supply to the City of Newport Beach (City) using existing Mesa Water infrastructure, including its groundwater production wells and the Mesa Water Reliability Facility (MWRF). The MWRF, which began operation in 2013, treats water from a deep, confined aquifer using a two-stage nanofiltration process and has a production capacity of approximately 8 million gallons per day. Mesa Water pays the Replenishment Assessment (RA) for this pumping but is exempt from the Basin Equity Assessment (BEA) for the MWRF supply.

Currently, Mesa Water utilizes approximately 25% of the MWRF's total capacity on an annual basis and maintains a groundwater production system that generally exceeds local demand. Additionally, Mesa Water and the City are connected via several existing interconnections, which were evaluated in a joint study completed in 2012.

Given these conditions, Mesa Water is exploring opportunities to maximize the value of its local water assets by assessing the viability of supplying its available water capacity to the City.

1.2 Objective

The objective of this study is to perform a conceptual-level evaluation of Mesa Water's ability to deliver water to the City using existing facilities and interconnections. This Technical Memorandum (TM) presents a summary of:

- Mesa Water's available water supply capacity from its wells and the MWRF;
- The City's historical and projected imported water demands;
- Hydraulic and physical constraints at interconnection points; and
- A comparative financial analysis of local supply versus imported water costs.

The TM concludes with an assessment of conceptual feasibility and recommendations for potential next steps should Mesa Water and the City choose to proceed with a more detailed evaluation.

2.0 Supply and Demand

2.1 Mesa Water Production Capacity

Mesa Water is unique among Orange County water agencies in that it is able to meet customer demands entirely with local groundwater supplies. Mesa Water operates seven (7) groundwater wells (referred to as "Clear Wells") and two (2) amber-tinted wells within its service area (referred to as "Amber Wells"), located in the northwestern portion of the Mesa Water Distribution System, near northwest Costa Mesa and southern Santa Ana. The total capacity of the active wells is approximately 33.4 MGD. Five (5) of the clear wells are approximately 600 feet deep and have a combined capacity of 13.2 MGD. Additionally, two (2) of the clear wells, Chandler Well No. 12 and Croddy Well No. 14 are approximately 1,000 feet deep and have a capacity

of approximately 11.5 MGD. Wells 12 and 14 were brought online in November 2023 and May 2023, respectively.

The two (2) amber-tinted wells are approximately 1,200 feet deep and are part of the Mesa Water Reliability Facility (MWRF) which treats the water to remove the amber color and disinfects it for distribution. The MWRF has a total capacity of approximately 8.6 MGD and a recovery rate of approximately 98%. For the purposes of this analysis and to capture unknown future performance considerations, MKN has assumed a recovery rate of 95%.

Table 2-1 summarizes the groundwater production wells currently operated by Mesa Water, including Clear Wells and amber-tinted wells treated through the MWRF.

Table 2-1: Well Capacity[1]

Supply Source	Description	Capacity (gpm)	Capacity (MGD)	Capacity (AFY)
Clear Wells	Well 1B	2,300	3.31	3,710
	Well 3B	1,600	2.30	2,581
	Well 5	2,200	3.17	3,549
	Well 7	1,300	1.87	2,097
	Well 9B	1,800	2.59	2,903
	Well 12[2]	4,000	5.76	6,452
	Well 14[2]	4,000	5.76	6,452
	Subtotal – Clear Wells	**17,200**	**24.77**	**27,744**
MWRF	Well 6	3,000	4.32	4,839
	Well 11	3,000	4.32	4,839
	Subtotal – Amber Wells	**6,000**	**8.64**	**9,678**
	Brine Discharge to OC San[3]	300	0.43	484
	Production Less Brine	**5,700**	**8.21**	**9,194**
	Total	**22,900**	**32.98**	**36,938**

Notes:

1. *Table 2-1 reflects the stable, optimal production capacities for each well as reported in Tables 3-1 and 3-2 of the* Water Supply, Energy, and Supply Chain Reliability Assessment Technical Memorandum *(Brown and Caldwell, 2020) with additional clarification and revisions from Mesa Water.*
2. *Well 12 became Operational in November 2023 and Well 14 Became Operational in May 2023.*
3. *MWRF recovery rate of 95% is assumed.*

2.2 Mesa Water Historical Well Capacity

To evaluate available capacity for the Clear Wells and Amber Wells, historical well production was compared to the capacity values shown in **Table 2-1**. This analysis covers the period from fiscal year 2023 (FY) through FY2025 using production data provided by Mesa Water.

The Clear Wells and Amber Wells were analyzed separately due to their distinct operational roles. Clear Wells draw from a shallow aquifer in the Orange County Groundwater Basin, which is managed by the Orange County Water District (OCWD). The Clear Wells are governed by the Basin Production Percentage (BPP), which defines the portion of an agency's demand that can be met with groundwater without triggering a Basin Equity Assessment (BEA).

Figures 2-1 through 2-6 illustrate monthly well production relative to capacity, with trend lines showing the progression of available cumulative capacity over time. The following summarizes key findings from the figures for both well systems.

Clear Well Demand (Figure 2-1 through Figure 2-3) Analysis:

- **Commissioning of New Wells Has Increased Capacity:** The addition of Wells 14 (in mid-2023) and 12 (in late 2023) significantly increased overall supply capacity. It should be noted that, although annual water supply capacity has increased, the design of the system is intended to increase reliability during maximum demand periods.
- **Production-to-Capacity Ratios Are Declining:** Despite increased capacity, actual well production has not increased proportionally, resulting in a declining production-to-capacity ratio—from approximately 80% before Well 14 to 72%, then dropping further to 42% after Well 12.
- **System is Operating Well Below Capacity:** By FY2025, the system is operating at roughly 48% of available production capacity, indicating ample unused capacity and operational flexibility.

Amber Well Demand (Figure 2-4 through Figure 2-6) Analysis:

- **Amber Wells Serve as Supplemental Supply:** These wells are used intermittently to meet demand above the Basin Pumping Percentage (BPP), which is currently set at 85%. As a result, their operation is less consistent than the Clear Wells.
- **High Available Capacity Throughout the Year:** Across FY2023 to FY2025, the Amber Wells consistently maintain high available capacity, averaging 75–77% monthly, indicating they are used only when needed and mostly remain idle.

  Utilization is Intermittent and Seasonal: Usage is concentrated in specific months—typically summer and early fall—with minimal to no use during the rest of the year, reflecting their role in meeting peak or off-BPP demand. The graph for FY2024 shows some non-typical operational cycles due to operational changes occurring during that time period. Wells 12 and 14 were brought online, and Amber Wells were no longer required to meet peak demands; however, Amber Wells were still utilized to meet BPP requirements. There is a return to form in FY2025 after some operational modifications.

Figure 2-1: FY2023 Available Clear Well Supply

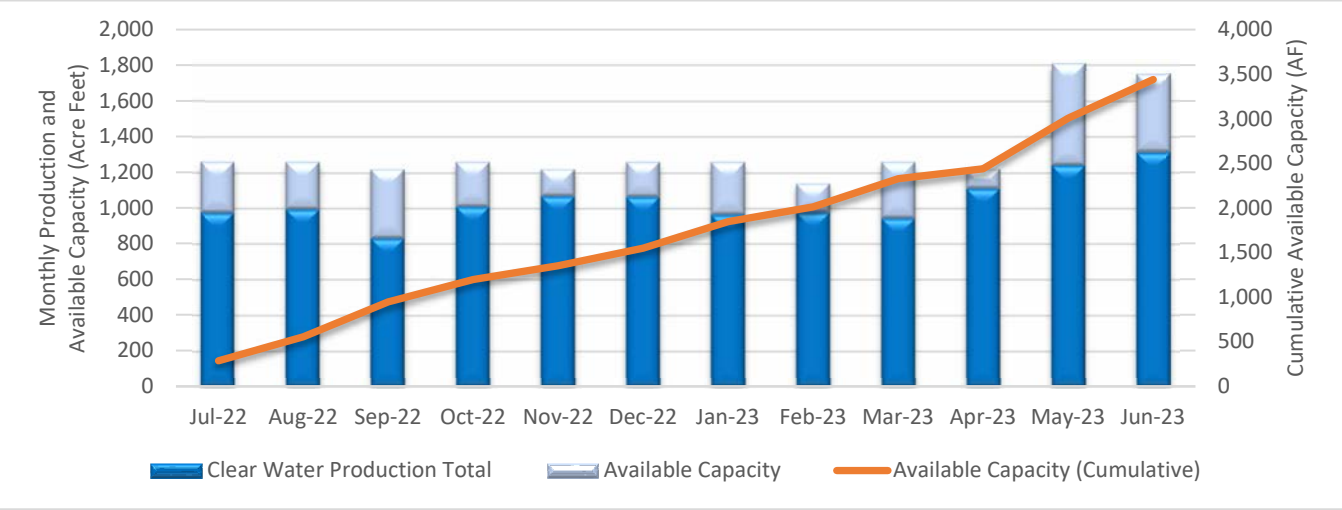


Figure 2-2: FY2024 Available Clear Well Supply

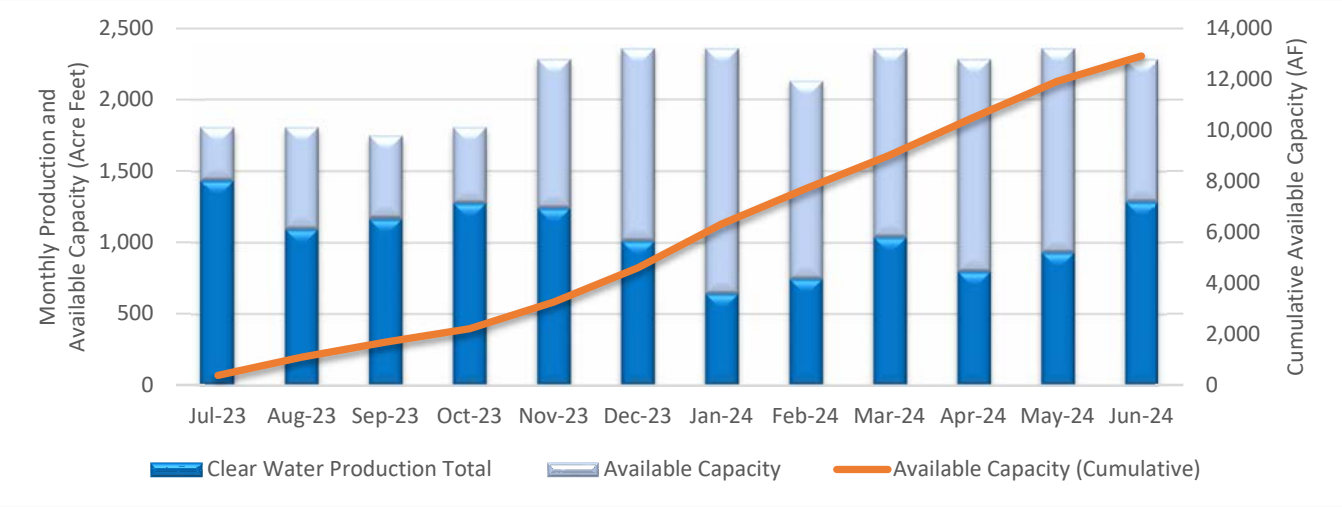


Figure **2-3**: FY2025 Available Clear Well Supply

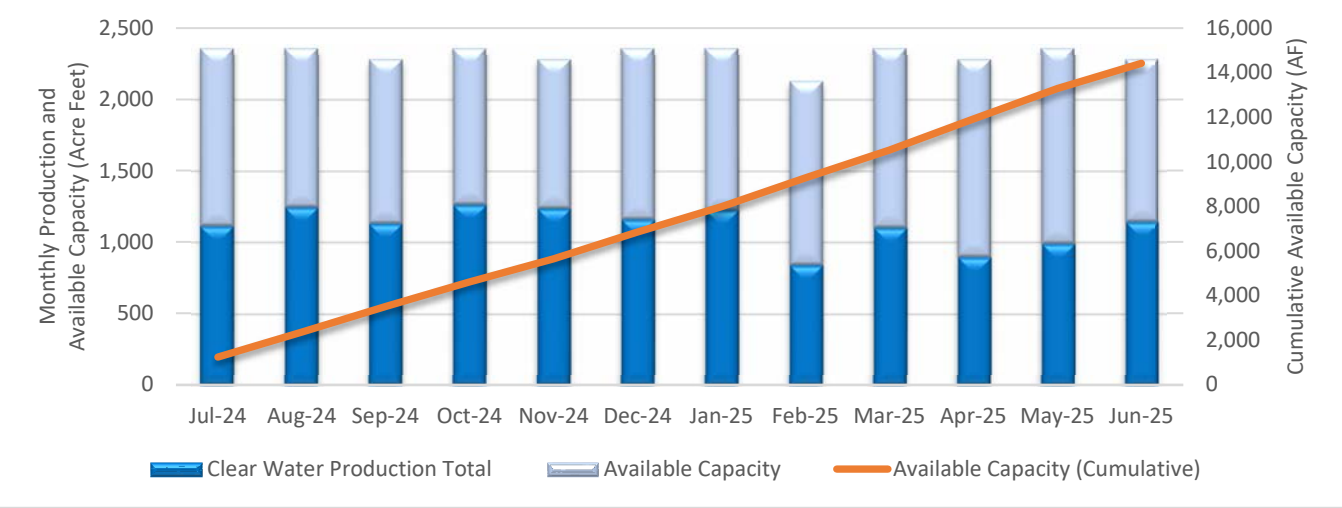


Figure 2-4: FY2023 Available **Amber Well Supply**

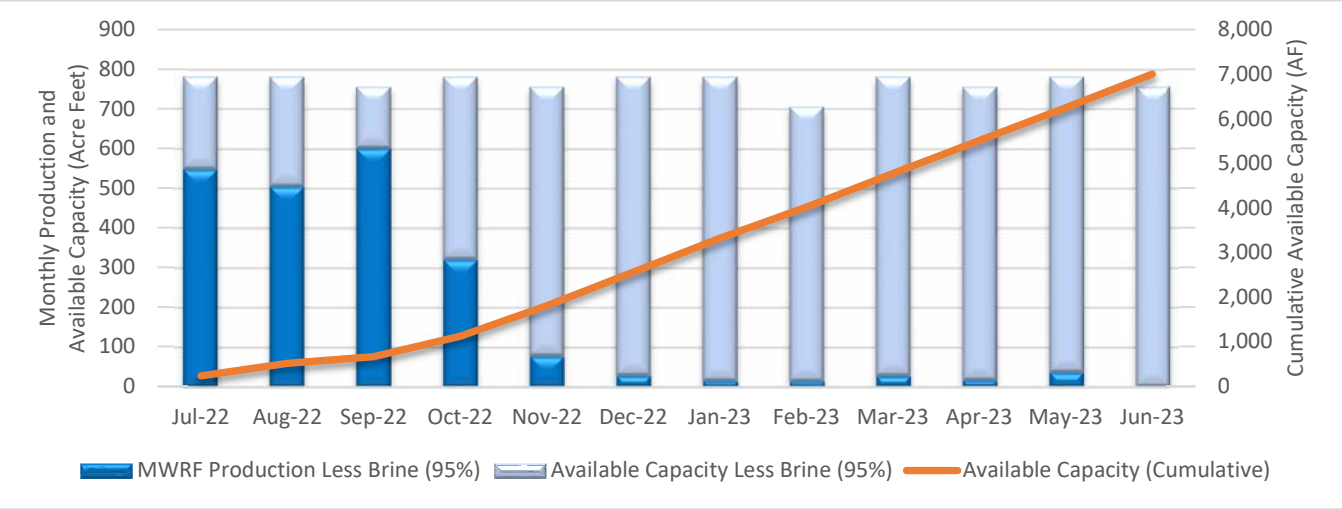


Figure 2-5: FY2024 Available **Amber Well Supply**

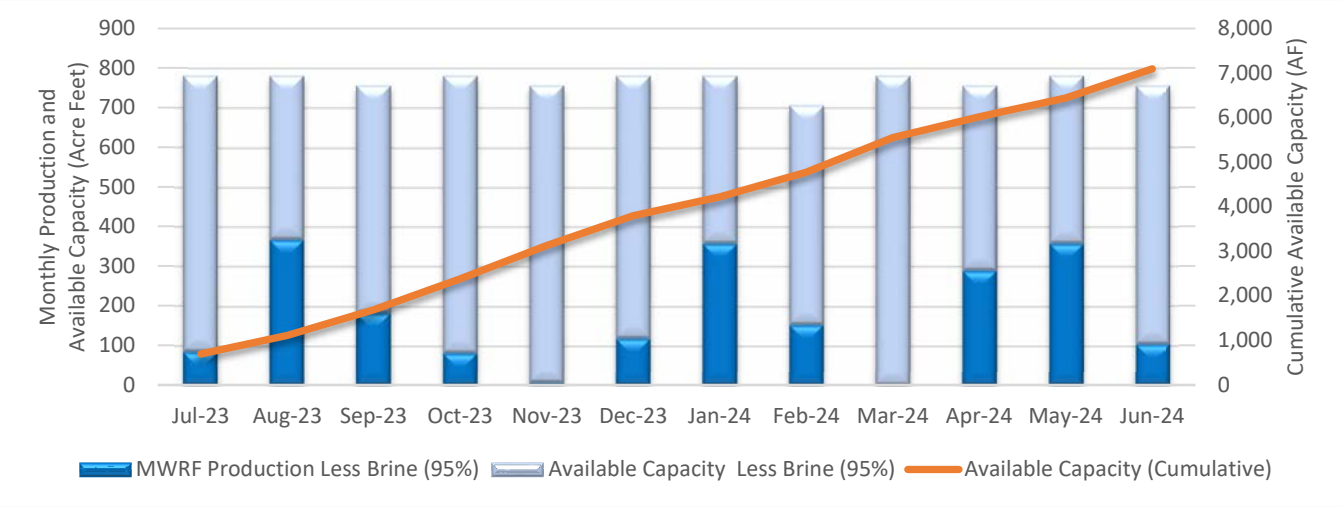


Figure 2-6: FY2025 Available **Amber Well Supply**

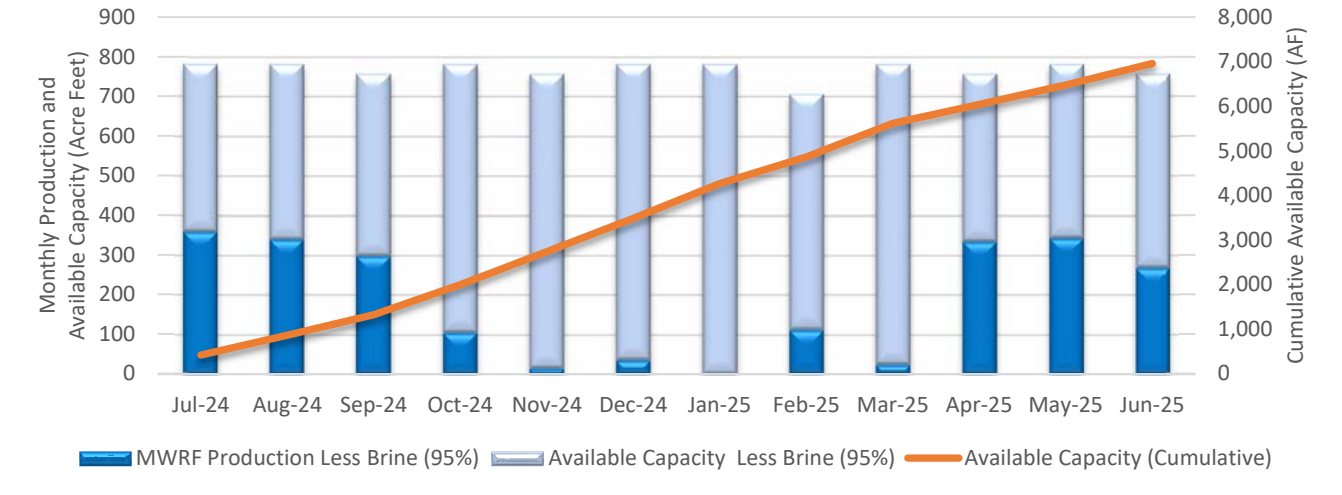


Table 2-2 provides a summary of the historical available capacity.

Table 2-2: Historical Available Capacity			
Description	**FY2023 (AFY)**	**FY2024 (AFY)**	**FY2025 (AFY)**
Clear Well Demand	12,473	12,647	13,317
Amber Well Demand	2,258	2,169	2,301
Total Demand	14,732	14,816	15,618
Remaining Clear Well Capacity[1]	8,818	15,097	14,427
Remaining Amber Well Capacity[2]	7,420	7,509	7,377
Total Remaining Capacity	16,238	22,606	21,803

Notes:

1. *Clear Well Capacity is based on the largest available capacity within the fiscal year, Well 14 became operational in May of 2023, capacity for FY2023 includes Well 14. Well 12 became operational in November 2023, capacity for FY2024 and FY2025 includes Wells 12 and 14. See **Table 2-1** for a breakdown of each well's capacity.*
2. *Amber Well Capacity set at 9,484 AFY per **Table 2-1**.*

2.3 Mesa Water Future Well Capacity

While historical production versus capacity analysis provides valuable insight, it is incomplete without consideration of future demand projections and their implications on total production capacity. To support this forward-looking evaluation, MKN reviewed water demand projections presented in the January 2025 Capital Improvement Program (CIP) Update, which covers the period from 2022 through 2035. To extend the planning horizon to 2045, MKN extrapolated demand estimates for 2040 and 2045 using a linear growth assumption based on the CIP data. **Table 2-3** presents the original demand projections from the 2025 CIP Update along with MKN's extrapolated values.

Table 2-3: Mesa Water 2045 Demand Projections[1]					
Demand Source	**2025 (AFY)**	**2030 (AFY)**	**2035 (AFY)**	**2040 (AFY)**	**2045 (AFY)**
Residential Demand	10,988	11,361	11,921	12,733	13,841
Commercial Demand	5,467	5,467	5,467	5,467	5,467
Total Demand	16,455	16,828	17,388	18,200	19,308

Note:

1. *Demand projections through 2035 are sourced from the January 2025 CIP Update, demand projections for 2040 and 2045 are linearly extrapolated from the CIP Update (1.88%/year).*

To translate future annual demand projections into monthly estimates, an average historical monthly distribution factor is applied. Additionally, estimating available well capacity to meet these monthly demands requires assumptions regarding operational strategies—specifically, the targeted allocation between Clear Wells and Amber Wells. **Table 2-4** summarizes the calculated historical monthly demand distribution (based on FY2023–2025 data) and the estimated allocation of demand between the two well systems.

Table 2-4: Monthly Demand and Clear Well Allocation Assumptions													
Description	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Total**
FY23-25 average (AF)	1,513	1,526	1,413	1,356	1,213	1,139	1,070	949	1,044	1,152	1,289	1,352	15,016
Monthly Percent of Total	10%	10%	9%	9%	8%	8%	7%	6%	7%	8%	9%	9%	100%
Clear Well Component	70%	70%	75%	75%	95%	100%	100%	100%	100%	80%	80%	75%	85%
Amber Well Component	30%	30%	25%	25%	5%	0%	0%	0%	0%	20%	20%	25%	15%

Table 2-5 provides a comparison between the demand projections presented in **Table 2-3** and the historical capacity identified in **Table 2-2**. For a more direct comparison the maximum available capacity, including wells 12 and 14, was used when calculating historical/current available capacity in FY23-25. The calculation results identify that there is more than 17,000 AFY between the Amber Wells and the Clear Wells that can be made available for water transfer through the year 2045.

Table 2-5: Mesa Water Production Available With Future Demand Projections					
	Avg FY23-25	**2030**	**2035**	**2040**	**2045**
Clear Well Capacity (AFY)	27,744	27,744	27,744	27,744	27,744
Amber Well Capacity (AFY)	9,484	9,484	9,484	9,484	9,484
Demand (AFY)[1]	15,055	16,828	17,388	18,200	19,308
Available Clear Well Capacity (AFY)	15,184	13,706	13,238	12,561	11,637
Available Amber Well Capacity (AFY)	6,985	6,690	6,598	6,463	6,279

Note:

1. *Demand projections are assumed to be split according to 85% BPP requirements to avoid BEA, 85% for Clear Wells and 15% for Amber Wells.*

Figures 2-7 and 2-8 apply the monthly Amber Well and Clear Well allocations provided in **Table 2-4** against the demand projections in **Table 2-3**. The figures illustrate the estimated near-term available of Amber Well capacity by month for the future demands scenarios through 2045.

Figure 2-7: Future Clear Well Available Capacity

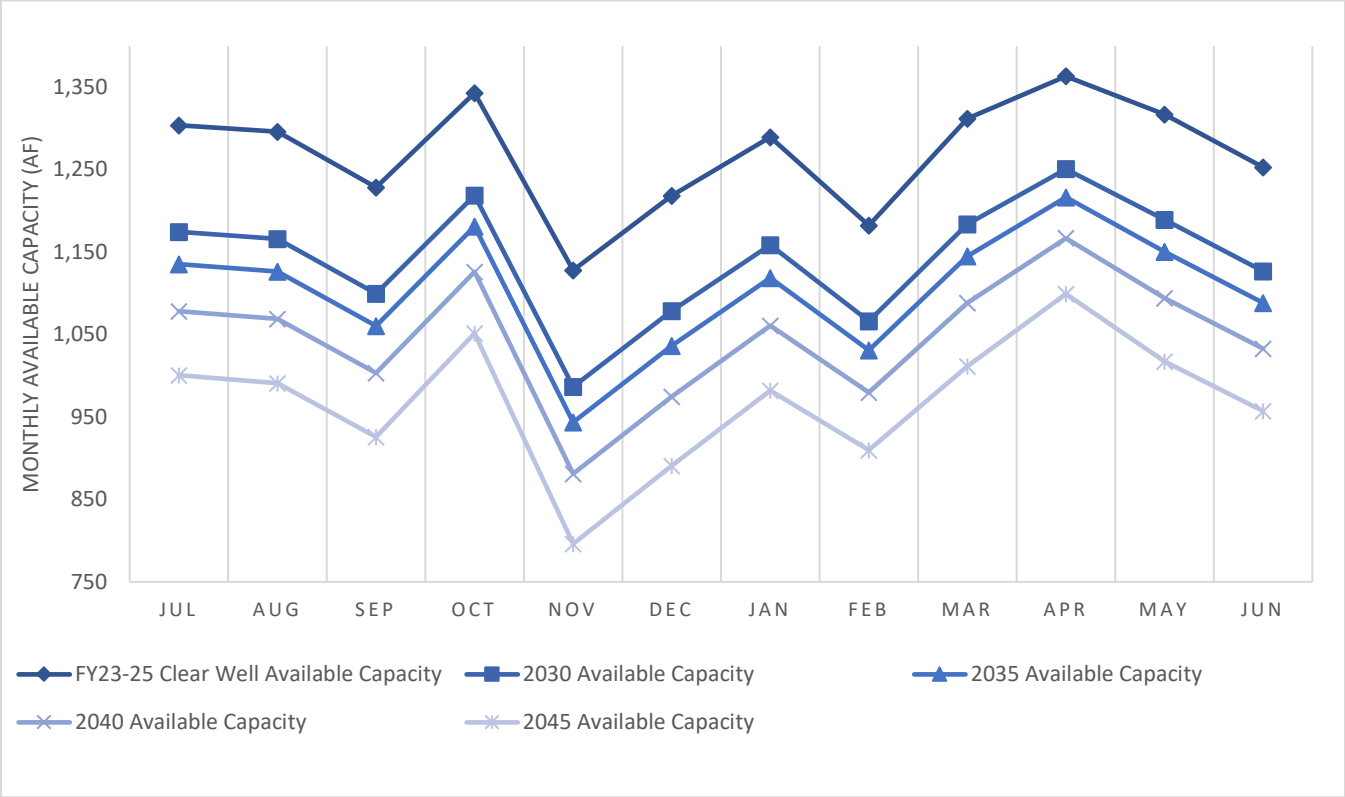
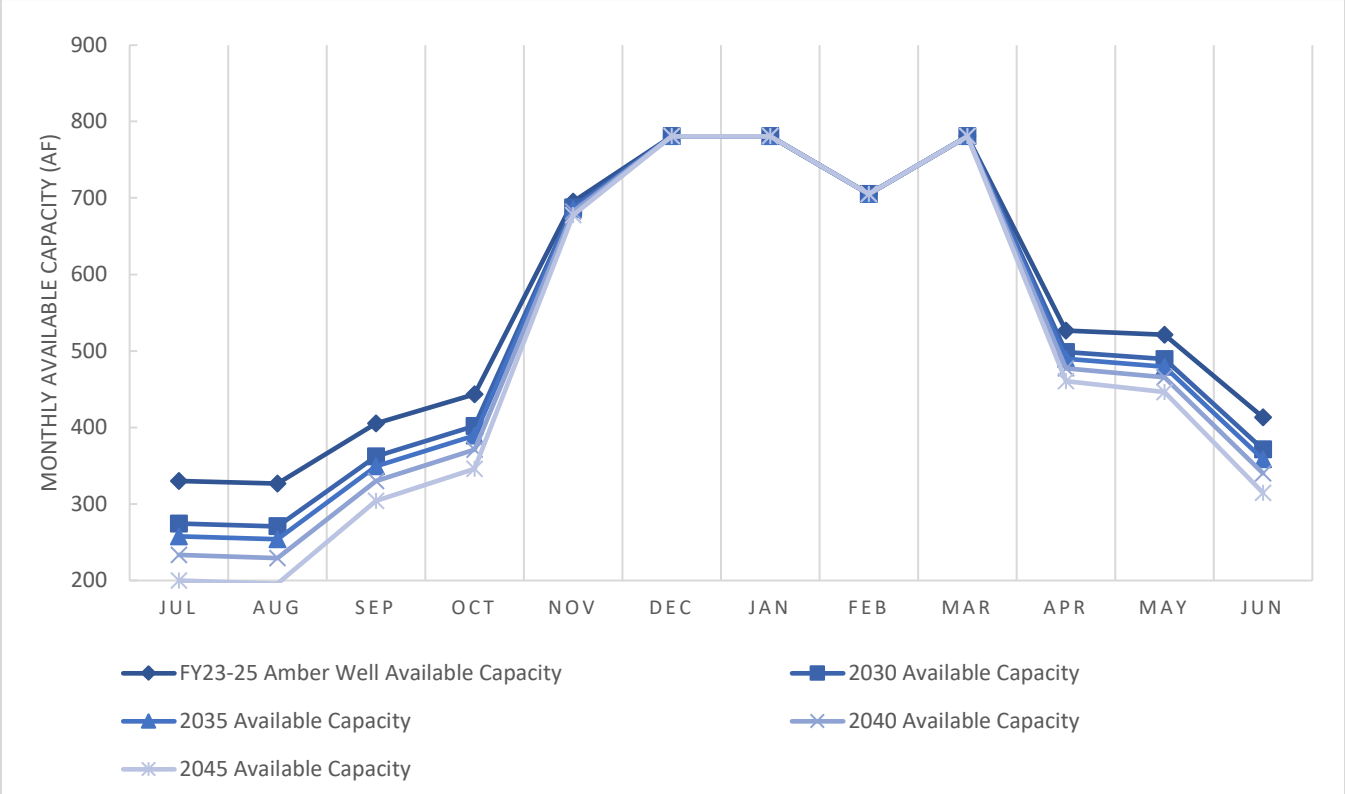


Figure 2-8: Future Amber Well Available Capacity



Accounting for future demand projections against current production capacity limitation shows that there is a significant available capacity to Mesa Water for a number of contingent uses. The capacity for the Clear Wells is sufficient to account for the largest well out of service and still have some remaining capacity. Similarly, one of the Amber Wells could be offline and still meet future demand requirements. **Figures 2-9 and 2-10** depict Mesa Water's supply capacity reflected against future demand responsibilities. The figures also identify how capacities are affected with one well out of service.

Figure 2-9: Clear Well Capacity with Future Demand Projections

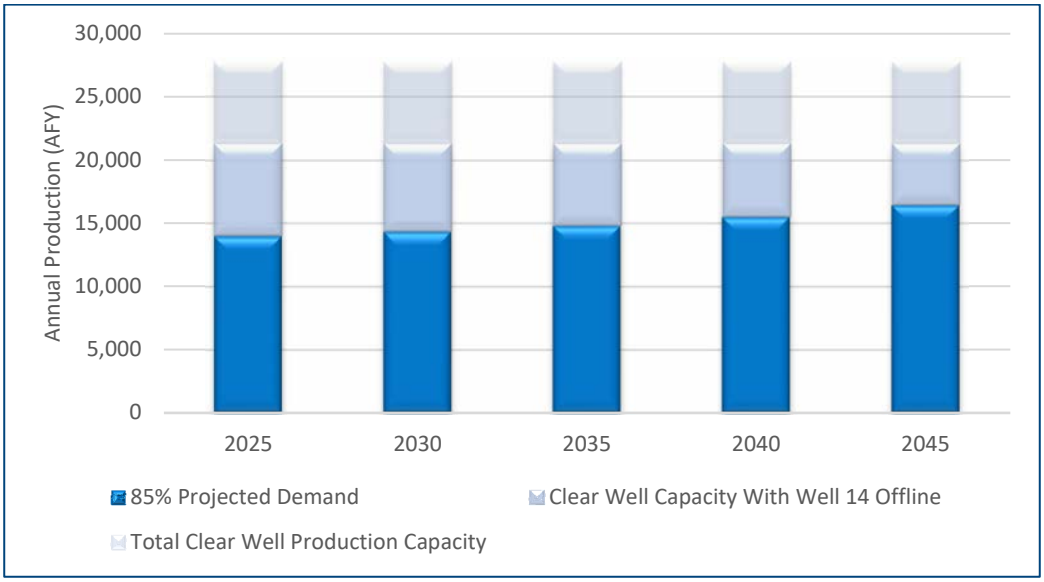
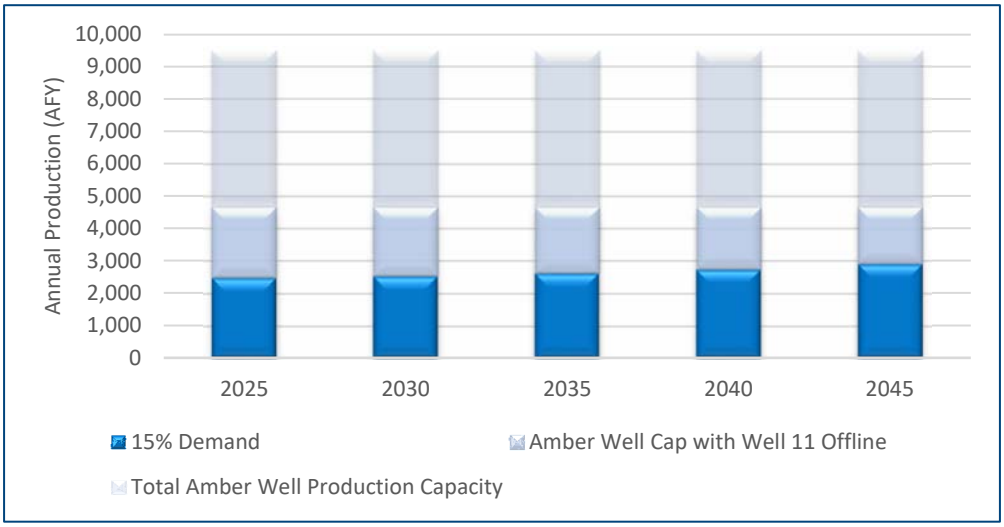


Figure 2-10: Amber Well Capacity with Future Demand Projections



Analysis shows that Mesa Water has sufficient production capacity to meet current and future demands with a significant amount of available supply. The cost breakdown will be conducted as part of **Section 3**.

2.4 City of Newport Beach Demand and Interconnections

City Imported Water Demand

The City of Newport Beach maintains seven (7) import water interconnections with MWD along the 36-inch Orange County Feeder Pipeline. Connection points begin at the northern boarder between the City of Newport Beach and the City of Irvine with the furthest downstream connection point being approximately one mile east of Balboa Island.

The focus of this analysis is on imported water demand, as this would be the preferred replacement with Mesa Water. The anticipated imported water demand for the City is based on projections presented in the City's 2020 Urban Water Management Plan (UWMP), prepared by Arcadis and adopted in June 2021. According to the UWMP, imported water is expected to remain a supplemental supply source for the City, complementing groundwater and recycled water to meet total potable demands. In FY 2019-20, the City imported approximately 4,255 acre-feet (AF) of water—representing 28.5% of its total water supply. Looking forward, the UWMP projects that by 2045, imported water will account for approximately 14.5% of the City's total water supply, equating to around 2,265 AF annually. This downward trend reflects the City's strategy to increase reliance on local groundwater and maintain recycled water use.

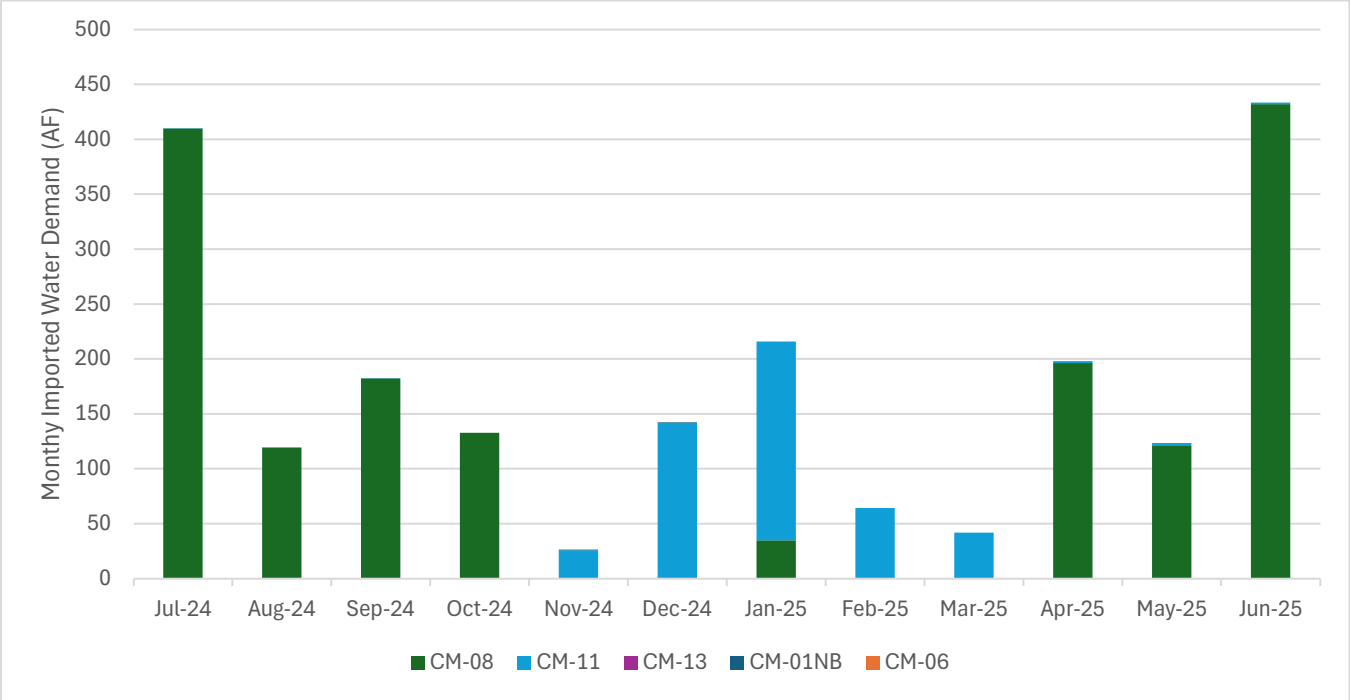
The City provided a tabulation of the imported water from FY2024 and FY2025, which shows the city-wide total annual imported water demand is approximately 2,712 AF and 2,590 AF, respectively. **Table 2-6** summarizes the City's imported water needs delivered through each interconnection. The total imported water demands for each year are trending downward which is consistent with the 2020 UWMP projection of 2,149 AF for 2025.

Table 2-6: Annual City Imported Water Demand by Interconnection

Turnout	FY2024	FY2025
CM-01NB	74.3	1.4
CM-06	6.3	0.0
CM-08	1,666.2	1,628.2
CM-11	867.2	460.6
CM-13	98.3	0.0
RC-OC-TR4	0.0	500.0
Total	**2,712.3**	**2,590.2**

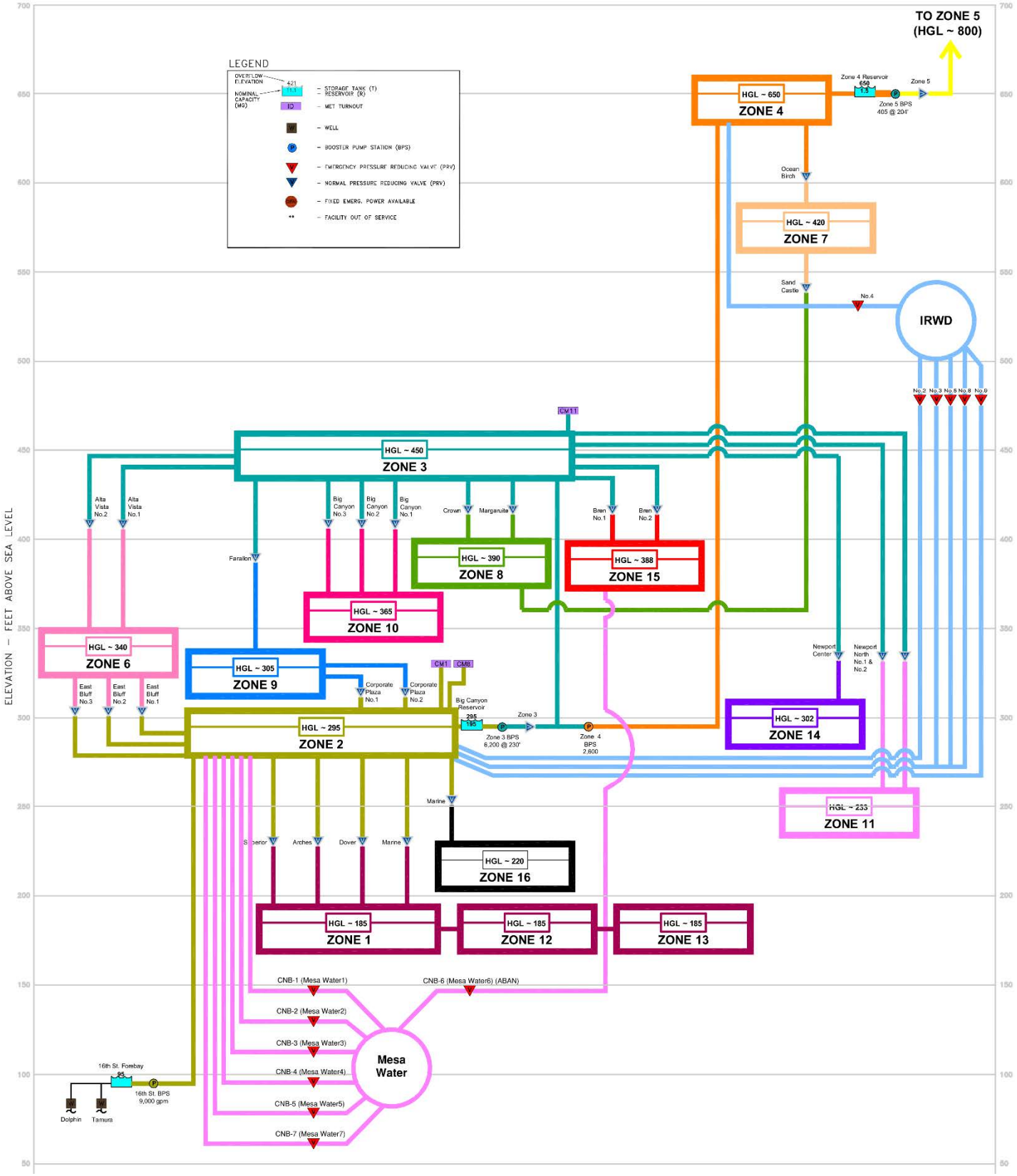
Understanding how the total demands are distributed throughout the year will help contribute to determining if import water demands can be met using City-Mesa Water interconnections. Using the most recent full year of data provided by the City, **Figure 2-11** was prepared, which identifies the monthly breakdown of FY2024 imported water demand through each interconnection.

Figure 2-11: FY2025 Monthly City Imported Water Demand by Interconnection



As demonstrated by **Figure 2-11**, the majority of imported water supply is provided through connections CM-08 and CM-11. Based on information provided by the City, CM-08 discharges into the City's Zone 2 and CM-11 discharges directly into Zone 3. Zone 3 has hydraulic grade line (HGL) of 450 feet and can supply multiple other zones (e.g. Zone 6, 9, 10, 8, 15, 14, and 11) through various pressure reducing valves. Zone 2, which contains the City's groundwater wells, provides supply to a large portion of the system, through pressure reducing valves, Zone 3 pump station, and Zone 4 pump station. **Figure 2-12** provides a hydraulic schematic of the City's distribution system. The distribution system hydraulic schematic is an older figure adopted for this report and is meant to identify how interconnections are included in the City's water system.

Figure 2-12: City Water System Hydraulic Schematic



Source: Multi-Agency Interconnection Study (RBF, 2012)

City Interconnections with Mesa Water

Mesa Water and the City currently maintain six (6) existing emergency interconnections. These existing interconnections are primarily located in the northwest region of the City's water distribution system and the southeastern portion of Mesa Water's system and would facilitate the contracted water from the water transfer program. **Table 2-7** summarizes the characteristics of each interconnection.

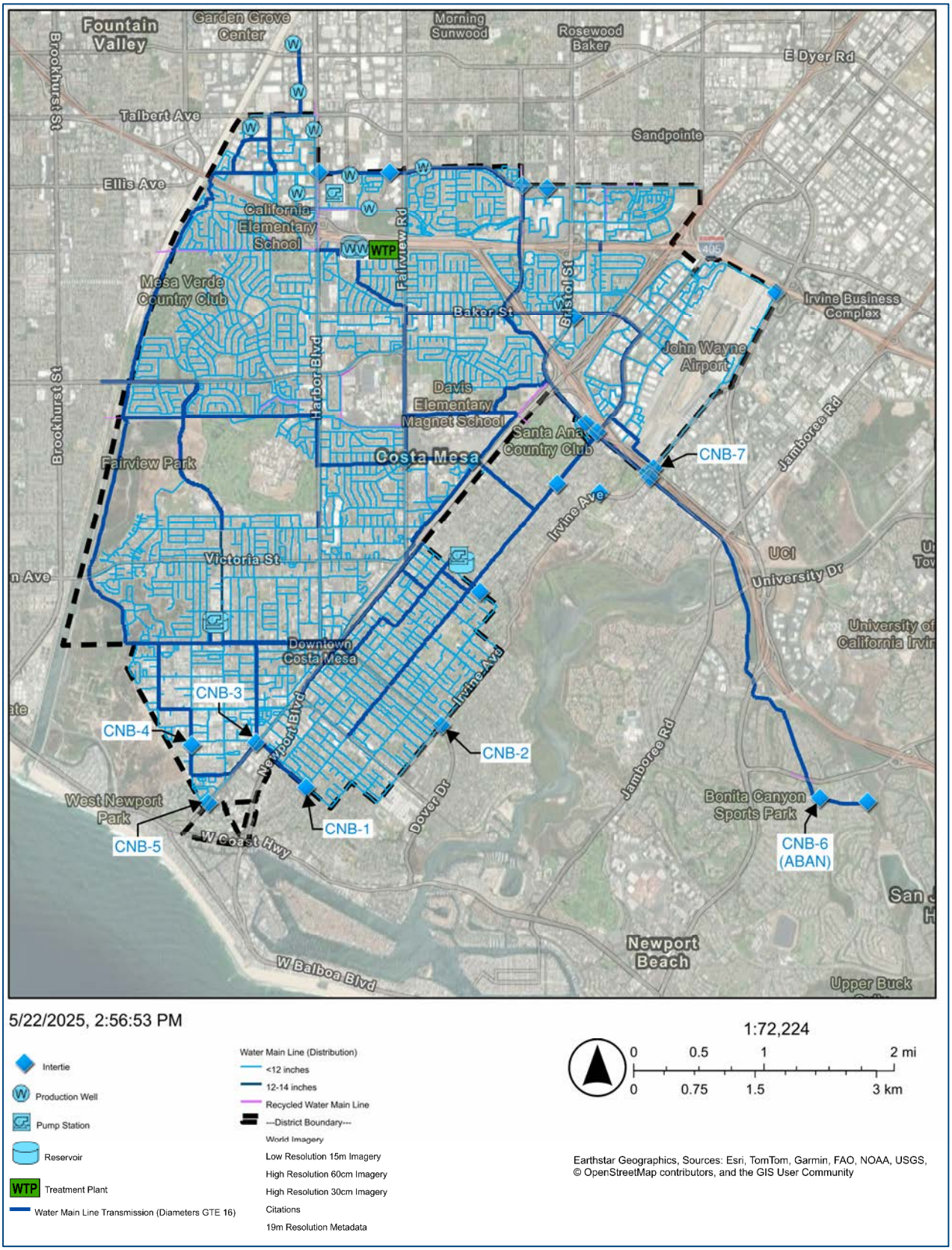
Table 2-7: Existing Mesa Water and City Interconnects

No.	Mesa Water Name	City of Newport Beach Name	Mesa Water Pipe Dia. (in)	Mesa Water HGL (ft)	City Pipe Dia. (in)	City HGL (ft)	Design Flow (gpm)	Location
16	CNB-1	Mesa Water 5	12	243	12	306	1,350	E. 15th St (southeast of Santa Ana Ave)
17	CNB-2	Mesa Water 2	8	243	16	278	1,800	Irvine Ave (northeast of E. 19th St)
18	CNB-3	Mesa Water 1	16	243	14 & 30	309	3,100	Superior Ave& W. 16th St
19	CNB-4	Mesa Water	16	243	14 & 24	302	1,350	Monrovia Ave & W. 16th St
20	CNB-5	Mesa Water 3	16	243	12	349	1,350	Superior Ave (south of Hospital Rd)
21	CNB-6	ABANDONED						
22	CNB-7	Mesa Water 7	16	247	16	283	6,700	N. Bristol St & Campus Dr

** Table information is from Table 4.4 of the Emergency Interconnection Study: Santa Ana, Mesa Water, Newport Beach, and IRWD*

CNB-6, not included in **Table 2-7**, was noted to be abandoned by Mesa Water in 2021. As shown in **Table 2-7**, the difference in operating HGL between the two systems would require a new pump station to deliver flow from Mesa Water to the City during normal operating conditions. The locations of the interconnections detailed in **Table 2-7** are illustrated in **Figure 2-13**.

Figure 2-13 Mesa Water and City Interconnect Map



2.5 Supply Feasibility Assessment

Based on the FY2024 and FY2025 imported water demand data, the city-wide total annual imported water demand is approximately 2,712 AF and 2,590 AF, respectively. Using FY2024 as the more conservative outlook for import water demands, **Table 2-8** was developed to present the estimated monthly demand and estimate the average flow rate for each interconnection.

Table 2-8: Monthly Import Water Demands FY2024

	2023						2024					
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
CM-01NB	-	-	-	-	-	-	-	-	74.3	-	-	-
CM-06	-	-	-	-	-	-	-	-	6.3	-	-	-
CM-08	10.9	230.20	65.6	43.6	126.1	105.7	194.6	164.3	45.5	132.4	305.6	241.7
CM-11	3.3	-	0.8	1.9	291.2	241.2	0.3	80.1	208.8	35.5	3.2	0.9
CM-13	-	-	-	-	-	-	-	-	98.3	-	-	-
RC-OC-TR4	-	-	-	-	-	-	-	-	-	-	-	-
Total (AF)	**14.2**	**230.2**	**66.4**	**45.5**	**417.3**	**346.9**	**194.9**	**244.4**	**433.2**	**167.9**	**308.8**	**242.6**
Average Flow (gpm)	**104**	**1,680**	**501**	**332**	**3,147**	**2,532**	**1,423**	**1,907**	**3,162**	**1,266**	**2,254**	**1,830**

**Flow through interconnections is measured in acre feet.*

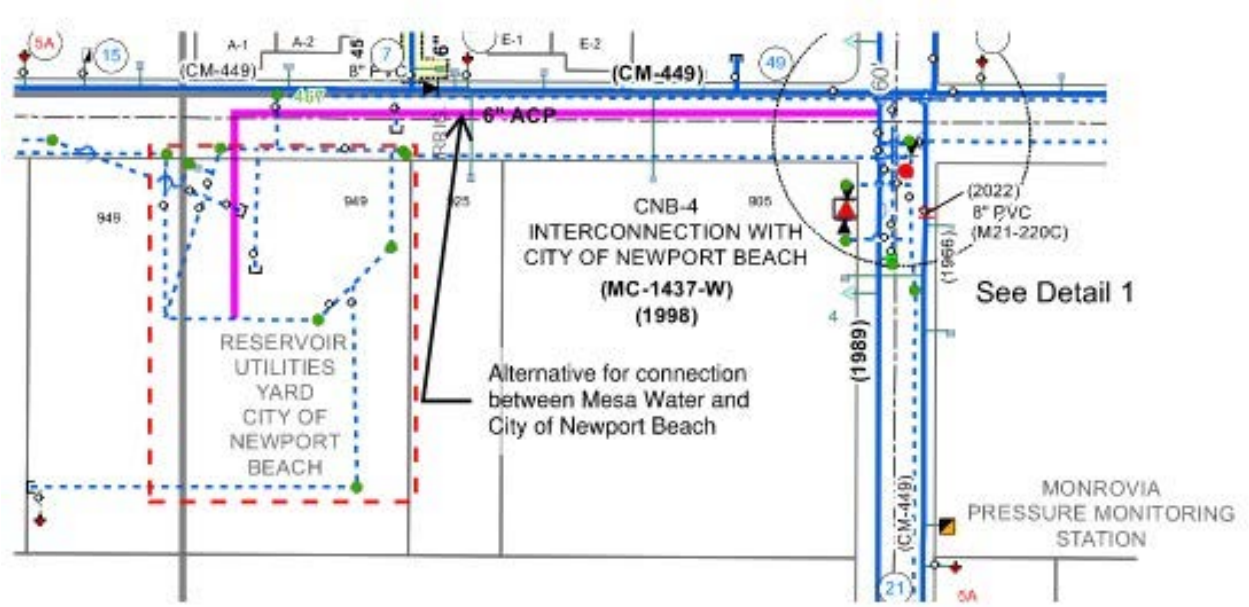
***MWD's Capacity Charge is based on peak flows during the period between May 1 and September 30. These months are designated with gray shading.*

Table 2-8 identifies that the highest average flow rate in any individual month is approximately 3,200 gpm. Based on anticipated capacity at each turnout, as shown in Table 2-7, this magnitude of capacity appears to be available at two existing turnouts, CNB-3 and CNB-7. While the flow capacity is available through the interconnections, it can only be delivered during emergency conditions when the City's hydraulic grade is reduced to the point where service can be provided by gravity. The Big Canyon Reservoir in the City's Zone 2 has an HGL of 295 feet, which is approximately 52 feet higher than Mesa Water's normal operation hydraulic grade.

There are several opportunities that could be explored to address this difference in operating grade:

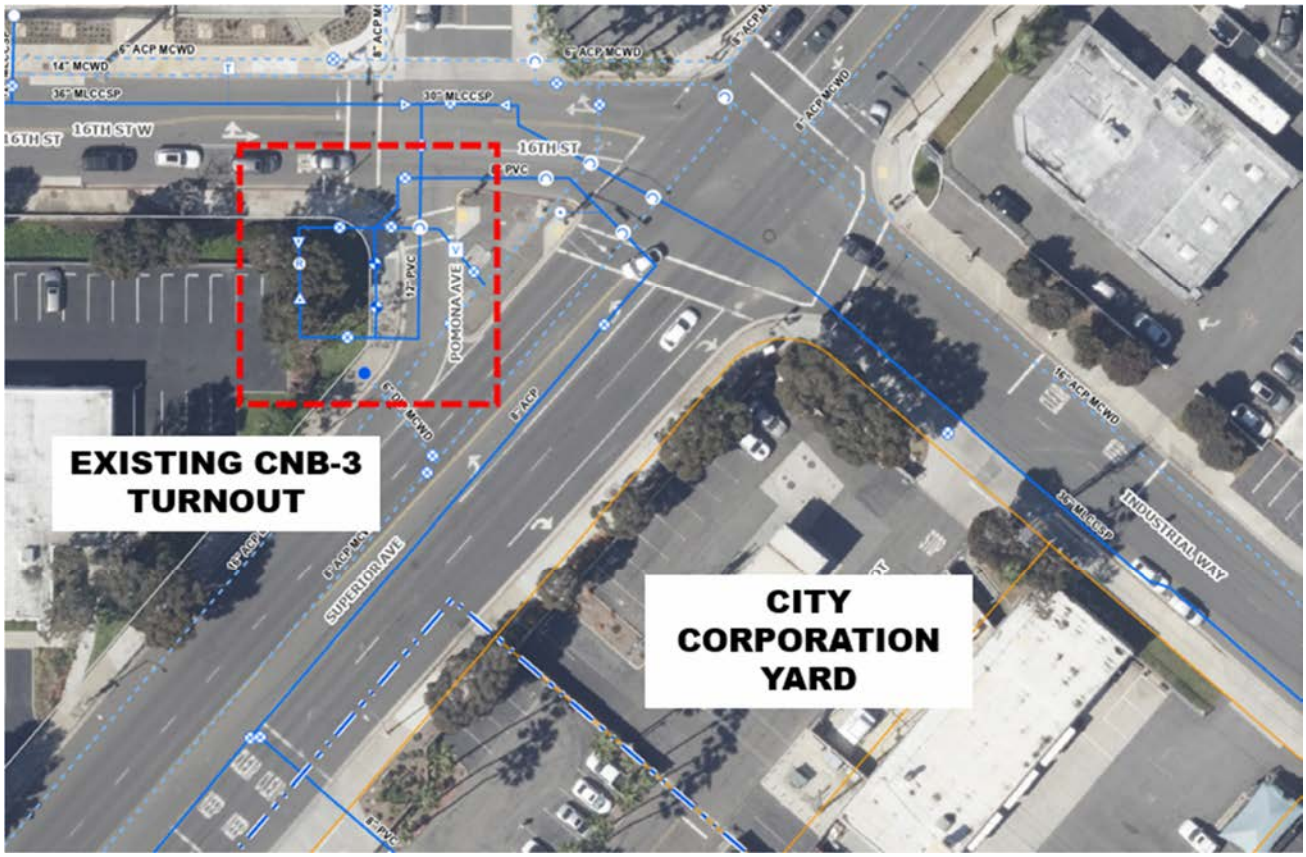
- **CNB-4 to City's 16th Street Pump Station.** Located near the intersection of Monrovia Ave. and W. 16th St. this interconnection includes both the appropriate size pipe for larger flows and is in close proximity to the 16th Street Pump Station. It may be possible to extend the approximately 1,000 feet from the interconnect location to the 16th Street Pump Station Wet Well. From this pump station, the supply could be delivered to upper zones via the 16th Street Pump Station into Zone 2 and then to higher zones through the Zone 3 Booster Pump Station. The main limitation here is that the capacity of CNB-4 is noted as 1,350 gpm. **Figure 2-14** shows an approximation of how where the connections may be made.

Figure 2-14 CNB-4 to City's 16th Street Pump Station Turnout Location



- **New Turnout to 16th Street Pump Station.** Locate a new turnout on 16th Street directly adjacent to the 16th Street Pump Station. This would require confirmation of Mesa Water infrastructure and capacity in 16th Street, near the City's facility.
- **New Pump Station at CNB-3.** As noted, existing hydraulic capacity identifies this as a potential turnout with adequate capacity. A new pump station near this turnout could be constructed to provide necessary hydraulic grade to serve the City system. **Figure 2-15** provides an aerial image of this turnout location and the adjacent City Corporation Yard.

Figure 2-15 CNB-3 Turnout Location



While this is not an exhaustive list of opportunities, they represent two basic options. Option 1 – connect to the supply side of 16th Street Pump Station, and Option 2 – Build a New Pump Station. Mesa Water system pressure is about 60-70 psi here.

3.0 Financial Evaluation

MKN conducted a financial evaluation to consider the costs and benefits associated with the water transfer program. Assumptions and findings for the financial evaluation are summarized in this section.

3.1 Evaluation Assumptions

The following summarize the assumptions utilized for the financial evaluation.

Mesa Water Supply Scenarios

Based on the City's imported water use, three "tiers" were established and evaluated. The three supply tiers consist of the following:

- Tier 1: 100 AFY – Approximately 4% of total import water
- Tier 2: 1,000 AFY – Approximately 40% of total import water
- Tier 3: 2,000 AFY – Approximately 74% of total import water

The noted percentages are based on approximate current imported water demand of 2,500 AFY.

Newport Demand Projections

The City's future water import needs are published in the City's 2020 UWMP. Values are provided in 5-year increments through 2045, MKN extrapolated between each 5-year span to accurately predict the City's future water demands and import needs on a yearly basis.

Imported Water Cost

The City receives imported water from Municipal Water District of Orange County (MWDOC) which is a wholesale provider of Metropolitan Water District of Southern California (MWD). MWDOC publishes a full service treated volumetric cost in dollars per acre-foot that includes the supply rate, system access rate, system power rate, and treatment surcharge.

MWDOC also charges its member agencies a Readiness to Serve (RTS), which uses the most recently completed four-year rolling average. The four-year rolling average is based on the four previous full year service purchases (i.e., for fiscal year 2025-26, the four-year average uses FY2020-21 through FY2024-25 to calculate the charge). Since this fee is dependent on the percentage of total use amongst all member agencies it can be difficult to predict what this charge will be moving forward. MKN used the sample four-year rolling average provided in Exhibit A of Resolution No. 2157 MWDOC Establishing Water Rates (MWDOC Exhibit A Rates), and the projections from the 2020 UWMP to determine the demand increase year-to-year for the total member agency future import demand. The MWDOC Exhibit A Rates methodology and calculations are included in **Appendix C**.

Similarly, MWDOC publishes a capacity charge in dollars per square foot. The Capacity Charge is applied to each member agency as a fixed charge based on each member agency's highest peak day flow between May 1 and September 30 of each year for the previous three-year period. Referencing Exhibit B of Resolution No. 2157 MWDOC Establishing Water Rates (MWDOC Exhibit B Rates), the City has a three-year peak day flow of 9.6 cfs and is therefore responsible for 2.5% of the total member agency rate of $4,089,000, the member agency rate is calculated using the MWD capacity charge multiplied by the largest single day of water imported

to member agencies (i.e. in 2025 the Capacity Charge is $14,500/cfs and there was a peak import flow rate of 282 cfs to MWD). MKN estimates that the peak flow of import water will increase by the same average factor MWDOC 2020 UWMP, approximately 0.6% per year. For the purposes of this analysis MKN assumes that the City's required peak flow rate of import water will decrease by the percentage of total import water that is proposed to be served by Mesa Water (e.g. in 2025 the City has a 4-year rolling average import water demand of 2,346 AFY, if the City reduces that demand by 100 AFY, that is a reduction of 4.3%; therefore, it is assumed that the three-year peak flow rate will decrease by 4.3%). MKN considers the 4% reduction to be conservative, because the amount of total flow has less impact than when the flow is delivered. Based on the way that MWDOC's fee schedule is determined, this is a variable component affected by actual use and operation.

MWDOC publishes rate increases through 2034 for the full-service treated costs, RTS, and Capacity Chare which are highly variable, ranging from 4% to 32%. The rate increases that MKN uses in the financial analysis diverge from the MWDOC published rates. Instead, MKN will use treated imported water inflation rates, developed by Mesa Water, determined as part of its Local Supply Improvement Study. A 9% rate increase will be applied from 2025 through 2035 and 7.2% will be used from 2036 through 2045. **Table 3-1** contains a summary in 5-year increments of the RTS and Capacity Charge organized by total flow taken from Mesa Water. A full yearly summary of the calculations is provided in **Appendix A.**

Table 3-1: City of Newport Beach Future Water Import Needs, RTS and Capacity Charges

	Calendar Year	2022	2023	2024	2025	2030	2035	2040	2045
	City of Newport Beach Water Demand (AFY) (1)	14,949	14,921	14,893	14,324	14,829	14,975	15,140	15,103
City Import from MWDOC	Percentage of MWDOC Import to Total Demand	25.1%	15.1%	18.2%	15.0%	15.0%	15.0%	15.0%	15.0%
	Volume of MWDOC Import (AFY) (2)	3,747	2,249	2,712	2,149	2,224	2,246	2,271	2,265
	MWDOC Import with 100 AFY from Mesa Water (AFY)	-	-	-	2,049	2,124	2,146	2,171	2,165
	MWDOC Import with 1,000 AFY from Mesa Water (AFY)	-	-	-	1,149	1,224	1,246	1,271	1,265
	MWDOC Import with 2,000 AFY from Mesa Water (AFY)	-	-	-	149	224	246	271	265
MWDOC Peak Flow Rate	Increase in Peak Flow Rate (%) (3)	-	-	-	0.6%	0.6%	0.6%	0.6%	0.6%
	Peak Flow Rate of MWDOC Import (CFS) (4)	8.1	9.6	7.9	9.6	9.9	10.2	10.6	10.9
	Peak Flow Rate of MWDOC Import with 100 AFY from Mesa Water (CFS)	-	-	-	9.2	9.5	9.8	10.1	10.4
	Peak Flow Rate of MWDOC Import with 1,000 AFY from Mesa Water (CFS)	-	-	-	5.1	5.5	5.7	5.9	6.1
	Peak Flow Rate of MWDOC Import with 2,000 AFY from Mesa Water (CFS)	-	-	-	0.7	1.0	1.1	1.3	1.3
MWDOC Capacity Charge	Capacity Charge Annual Rate Increase (%) (5)	-	-	-	-	9.0%	9.0%	7.2%	7.2%
	Member Agencies Total Capacity Charge ($M/Year) (6)	-	-	-	$4.09	$6.29	$9.68	$13.70	$19.40
	Member Agencies Summation of Total Peak Flow (CFS) (6)	-	-	-	384.5	397.0	409.9	423.2	437.0
	Newport Beach Capacity Charge ($/CF/Day)	-	-	-	$29.14	$43.42	$64.70	$88.71	$121.63
MWDOC Readiness To Serve	RTS Annual Rate Increase (%) (5)	-	-	-	-	9.0%	9.0%	7.2%	7.2%
	Member Agencies Total RTS ($M/Year) (7)	-	-	-	$17.60	$27.08	$41.67	$58.99	$83.51
	Member Agencies Total Flow (AFY) (7)	185,594	135,592	99,738	140,334	122,627	122,595	122,967	122,953
	Newport Beach RTS Charge ($/AF)	-	-	-	$125.42	$220.83	$339.87	$479.70	$679.19

Notes

1 City of Newport Beach water demands are identified in the 2020 UWMP in five-year increments from 2025 through 2045. Extrapolation calculated for intermediate years.

2 Volume of MWDOC import water is identified in the 2020 UWMP in five-year increments from 2025 through 2045. Extrapolation calculated for intermediate years.

3 Increase in peak flow rate based on anticipated increase in total member agency demands as identified in the MWDOC 2020 UWMP

4 Maximum flow rate of the previous 3-year peak flows recorded between May and September, escalated by 0.6% per year to match the MWDOC member agency average flow increase between 2025 and 2045 in the MWDOC 2020 UWMP

5 Calculated using the Mesa Water Local Supply Improvement Study treated imported water inflation rate

6 2025 Total member agency capacity charge and 3-year peak flow identified in Exhibit B of Resolution No. 2157 Municipal Water District of Orange County Establishing Water Rates

7 City of Newport Beach water demands are identified in the 2020 UWMP in five-year increments from 2025 through 2045. Extrapolation calculated for intermediate years.

Orange County Water District Rates

The Orange County Water District (OCWD) is used to estimate Mesa Water's groundwater costs associated with operating the MWRF. OCWD publishes replenishment assessments out to a five-year projection, most recent projections through 2030 increase at approximately 3.5% per year. MKN assumes that the 3.5% per year will continue through 2045.

Orange County Sanitation District, Chemicals and Energy

Mesa Water discharges the brine water from the MWRF into the Orange County Sanitation District's (OC San) wastewater collection system. In the 12-month period between July 1st 2024 and June 30th 2025 the total cost for brine disposal including industrial Biochemical Oxygen Demand (BOD) and Total Suspended Solids (TSS) averaged $14,170.13 per 3-month billing cycle. Based on the discharge volume of 4.4 MG (15.73 AF) identified in each period, the estimated discharge cost is $1,048 per AF of treated water, and the assumed efficiency of the MWRF is 95%; therefore, the cost is approximately $52/AF of water produced by the MWRF. Cost projections for brine disposal are estimated to increase at 3.5% per year.

Additionally, for costs to Mesa Water during water production operations, the same rate of 3.5% is used for inflationary costs of the treatment chemicals and energy use.

Newport Beach Costs and Savings

Based on the assumptions used to determine the water rates and rate increases, the total costs and cost savings were calculated for the City. For each year, the difference in cost between imported water and Mesa Water was calculated and then applied to the three purchase tiers. The calculations do not include any cost for new infrastructure, as these costs are unknown.

Mesa Water District Revenue

For this initial conceptual study, a wheeling rate of 12% was assumed for the potential water transfer program and incorporated into the total cost estimate for MWRF supply. If the program advances, this rate may be subject to negotiation between the City and Mesa Water.

3.2 Financial Evaluation

Based on the assumptions detailed in Section 3.1, **Table 3-2** and **Figure 3-1** were prepared to calculate and then present the potential cost implications for both the City and Mesa Water. **Table 3-2** is presented in 5-year increments, a full yearly summary of the calculations is provided in **Appendix B**.

Table 3-2: MWDOC and Mesa Water District Fees, City of Newport Beach Savings, Mesa Water District Revenue

Supply	Description	2025	2030	2035	2040	2045
MWD	Treated Domestic Water Cost ($/AF) (1)	$1,395	$2,146	$3,302	$4,675	$6,619
	Increase in Treated Domestic Water Cost (%) (1)	-	9%	9%	7.2%	7.2%
	Member Agency Capacity Charge ($/CFS) (1)	$13,000	$20,002	$30,776	$43,569	$61,682
	Newport Beach Capacity Charge ($/CFS*Day) (2)	$29	$43	$65	$89	$122
	3-Year Peak CFS (BASE)	9.6	9.9	10.2	10.6	10.9
	3-Year Peak at 100 CFS	9.2	9.5	9.8	10.1	10.4
	3-Year Peak at 1,000 CFS	5.1	5.5	5.7	5.9	6.1
	3-Year Peak at 2,000 CFS	0.7	1.0	1.1	1.3	1.3
	Member Agency Readiness To Serve ($/AF) (1)	$181	$278	$428	$607	$859
	Newport Beach RTS ($/AF) (3)	$125	$221	$340	$480	$679
	4-Year Average AFY (BASE)	2,149	2,224	2,246	2,271	2,265
	4-Year Average at 100 AFY	2,049	2,086	2,135	2,159	2,168
	4-Year Average at 1,000 AFY	1,149	1,186	1,235	1,259	1,268
	4-Year Average at 2,000 AFY	149	186	235	259	268
	Capacity Charge Annual Increase (calculated) (1)	-	9.0%	9.0%	7.2%	7.2%
	RTS Annual Increase (Calculated) (1)	-	9.0%	9.0%	7.2%	7.2%
	Total MWDOC Costs ($/AF) (4)	$1,567.92	$2,437.84	$3,749.95	$5,305.70	$7,511.97
Mesa Water	Replenishment Assessment ($/AF) (5)	$688	$809	$961	$1,141	$1,355
	Chemical Costs ($/AF)	$201	$239	$284	$337	$400
	Energy Costs ($/AF)	$224	$266	$316	$375	$446
	Inflation and OC San Rate Increase (6)	-	3.5%	3.5%	3.5%	3.5%
	Brine Discharge to OC San ($/AF production) (7)	$52	$62	$74	$88	$104
	Mesa Water Wheeling ($/AF) (8)	$140	$165	$196	$233	$277
	MWRF Production ($/AF) (9)	$1,258	$1,485	$1,764	$2,095	$2,488
Newport Savings (Annual)	100 AF	$30,983	$95,273	$198,609	$321,080	$502,388
	1,000 AF	$309,831	$952,728	$1,986,095	$3,210,796	$5,023,881
	2,000 AF	$619,662	$1,905,457	$3,972,190	$6,421,592	$10,047,761
Newport Savings (Cumulative)	100 AF	$30,983	$368,480	$1,134,231	$2,475,302	$4,596,673
	1,000 AF	$309,831	$3,684,805	$11,342,308	$24,753,020	$45,966,730
	2,000 AF	$619,662	$7,369,610	$22,684,617	$49,506,039	$91,933,461
Mesa Water Revenue	100 AF	$13,985	$16,512	$19,611	$23,292	$27,664
	1,000 AF	$139,851	$165,123	$196,115	$232,923	$276,639
	2,000 AF	$279,701	$330,246	$392,229	$465,845	$553,278
Mesa Water Revenue (Cumulative)	100 AF	$13,985	$91,358	$183,004	$291,851	$421,126
	1,000 AF	$139,851	$913,582	$1,830,040	$2,918,506	$4,211,261
	2,000 AF	$279,701	$1,827,163	$3,660,081	$5,837,012	$8,422,523

Notes

1 Calculated using the Mesa Water Local Supply Improvement Study treated imported water inflation rate

2 Calculated using the ratio between the City's and the member agencies anticipated 3-year peak flow rate, and the member agencies total capacity charge, see Table 3-1 and Appendix A.

3 Calculated using the ratio between the City's and member agencies anticipated 4-year average flow rate, and the member agencies total RTS, see Table 3-1 and Appendix A.

4 Calculated using the Treated Water Costs, Newport Beach RTS, and Newport Beach Capacity Charge. Newport Beach Capacity charge is converted from $/CFS*Day to $/AF using the 3-year Peak Flow, 365 days in a year, and the average base flow rate

5 Calculated using the OCWD Replenishment Assessment Rate Increase spreadsheet through 2030. Rate increase after 2030 is assumed to be 3.5%

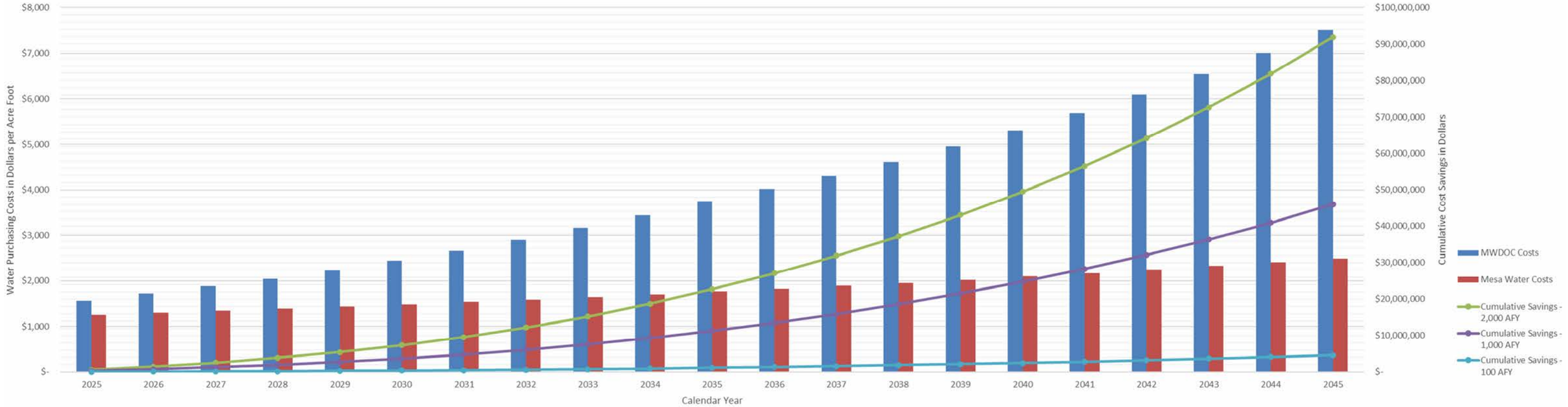
6 Estimated inflation used for Replenishment Assessment, Chemical Costs, Energy Costs, and OC San Rate Increase

7 Calculated using 12 months of OC San billing data for brine discharge from MWRF, includes factor for reducing product water to brine discharge water at 95% recovery rate

8 Assumed water wheeling rate of 12%

9 Calculated through summation of Replenishment Assessment, Chemical Costs, Energy Costs, Brine Discharge, and Water Wheeling

Figure 3-1: City of Newport Beach Cost Savings



4.0 Conclusions

This conceptual evaluation confirms the technical and financial feasibility of Mesa Water providing supplemental water supply to the City using existing groundwater production and treatment infrastructure. The MWRF, currently operating at only 25% of its capacity, offers significant untapped supply potential. Coupled with multiple interconnection points between the two agencies, this underutilized resource presents a strategic opportunity to enhance regional water supply reliability while reducing imported water dependence.

Key findings from this study include:

- **Substantial Available Capacity:** Mesa Water maintains a reliable and available production capability—exceeding 17,000 AFY in available capacity even under future demand projections through 2045.
- **Interconnection Potential:** Existing emergency interconnections between Mesa Water and City could be adapted to support normal operation transfers with relatively minor infrastructure enhancements, such as pump stations or turnout modifications.
- **Financial Benefits:** In 2025 alone, the program could generate up to approximately **$279,701 in net revenue** for Mesa Water and yield **$619,662 in cost savings** for the City, with continued long-term benefit projected through 2045. (If NB could get BEA exempt water.)
- **Scalability:** The existing capacity could also support similar water transfers to other regional agencies, such as the Laguna Beach County Water District, Santa Ana or City of Huntington Beach, further maximizing Mesa Water's local resource value.

Key considerations for future evaluation include:

1. **Water Quality Compatibility:** Assess the implications of differing disinfection strategies (e.g., chlorinated versus chloraminated water), as blending these supplies may pose water quality risks.
2. **MWRF Supply Transferability:** Coordinate with OCWD to confirm the conditions under which MWRF supply may be delivered to outside agencies while continuing to pay only the Replenishment Assessment. Evaluate the long-term impact of any production caps under the current agreement and determine whether preserving MWRF capacity for Mesa Water use is preferable.
3. **Infrastructure Requirements:** Conduct a hydraulic modeling and alternatives analysis to identify the preferred interconnection(s), including capital improvements and long-term O&M considerations.
4. **Operational Strategy:** Collaborate with the City to define the delivery approach (e.g., on-demand versus steady-state flow), as each has different implications for infrastructure sizing, operational coordination, and cost.
5. **Partnership Structure:** Initiate discussions with the City to establish potential water purchase agreements, define delivery volumes, and formalize terms of the transfer program.

Appendix A

City of Newport Beach Future Water Import Needs, RTS and Capacity Charges

APPENDIX A

City of Newport Beach Future Water Import Needs, RTS and Capacity Charges

	Calendar Year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
	City of Newport Beach Water Demand (AFY) (1)	14,949	14,921	14,893	14,324	14,424	14,524	14,625	14,727	14,829	14,858	14,887	14,917	14,946	14,975	15,008	15,041	15,074	15,107	15,140	15,133	15,126	15,118	15,111	15,103
City Import from MWDOC	Percentage of MWDOC Import to Total Demand	25.1%	15.1%	18.2%	15.0%	15.0%	15.0%	15.0%	15.0%	15.0%	15.0%	15.0%	15.0%	15.0%	15.0%	15.0%	15.0%	15.0%	15.0%	15.0%	15.0%	15.0%	15.0%	15.0%	15.0%
	Volume of MWDOC Import (AFY) (2)	3,747	2,249	2,712	2,149	2,164	2,179	2,194	2,209	2,224	2,228	2,233	2,237	2,242	2,246	2,251	2,256	2,261	2,266	2,271	2,270	2,269	2,267	2,266	2,265
	MWDOC Import with 100 AFY from Mesa Water (AFY)	-	-	-	2,049	2,064	2,079	2,094	2,109	2,124	2,128	2,133	2,137	2,142	2,146	2,151	2,156	2,161	2,166	2,171	2,170	2,169	2,167	2,166	2,165
	MWDOC Import with 1,000 AFY from Mesa Water (AFY)	-	-	-	1,149	1,164	1,179	1,194	1,209	1,224	1,228	1,233	1,237	1,242	1,246	1,251	1,256	1,261	1,266	1,271	1,270	1,269	1,267	1,266	1,265
	MWDOC Import with 2,000 AFY from Mesa Water (AFY)	-	-	-	149	164	179	194	209	224	228	233	237	242	246	251	256	261	266	271	270	269	267	266	265
MWDOC Peak Flow Rate	Increase in Peak Flow Rate (%) (3)	-	-	-	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%
	Peak Flow Rate of MWDOC Import (CFS) (4)	8.1	9.6	7.9	9.6	9.7	9.7	9.8	9.8	9.9	10.0	10.0	10.1	10.2	10.2	10.3	10.4	10.4	10.5	10.6	10.6	10.7	10.8	10.8	10.9
	Peak Flow Rate of MWDOC Import with 100 AFY from Mesa Water (CFS)	-	-	-	9.2	9.2	9.3	9.3	9.4	9.5	9.5	9.6	9.7	9.7	9.8	9.8	9.9	10.0	10.0	10.1	10.2	10.2	10.3	10.4	10.4
	Peak Flow Rate of MWDOC Import with 1,000 AFY from Mesa Water (CFS)	-	-	-	5.1	5.2	5.3	5.3	5.4	5.5	5.5	5.5	5.6	5.6	5.7	5.7	5.8	5.8	5.9	5.9	5.9	6.0	6.0	6.1	6.1
	Peak Flow Rate of MWDOC Import with 2,000 AFY from Mesa Water (CFS)	-	-	-	0.7	0.7	0.8	0.9	0.9	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.2	1.2	1.2	1.3	1.3	1.3	1.3	1.3	1.3
MWDOC Capacity Charge	Capacity Charge Annual Rate Increase (%) (5)	-	-	-	-	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	7.2%	7.2%	7.2%	7.2%	7.2%	7.2%	7.2%	7.2%	7.2%	7.2%
	Member Agencies Total Capacity Charge ($M/Year) (6)	-	-	-	$ 4.09	$ 4.46	$ 4.86	$ 5.30	$ 5.77	$ 6.29	$ 6.86	$ 7.47	$ 8.15	$ 8.88	$ 9.68	$ 10.38	$ 11.12	$ 11.93	$ 12.78	$ 13.70	$ 14.69	$ 15.75	$ 16.88	$ 18.10	$ 19.40
	Member Agencies Summation of Total Peak Flow (CFS) (6)	-	-	-	384.5	387.0	389.5	392.0	394.5	397.0	399.6	402.1	404.7	407.3	409.9	412.5	415.2	417.9	420.5	423.2	426.0	428.7	431.5	434.2	437.0
	Newport Beach Capacity Charge ($/CF/Day)	-	-	-	$ 29.1	$ 31.6	$ 34.2	$ 37.0	$ 40.1	$ 43.4	$ 47.0	$ 50.9	$ 55.2	$ 59.7	$ 64.7	$ 68.9	$ 73.4	$ 78.2	$ 83.3	$ 88.7	$ 94.5	$ 100.6	$ 107.2	$ 114.2	$ 121.6
MWDOC Readiness To Serve	RTS Annual Rate Increase (%) (5)	-	-	-	-	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	7.2%	7.2%	7.2%	7.2%	7.2%	7.2%	7.2%	7.2%	7.2%	7.2%
	Member Agencies Total RTS ($M/Year) (7)	-	-	-	$ 17.60	$ 19.18	$ 20.91	$ 22.79	$ 24.84	$ 27.08	$ 29.52	$ 32.17	$ 35.07	$ 38.23	$ 41.67	$ 44.67	$ 47.88	$ 51.33	$ 55.03	$ 58.99	$ 63.23	$ 67.79	$ 72.67	$ 77.90	$ 83.51
	Member Agencies Total Flow (AFY) (7)	185,594	135,592	99,738	140,334	123,852	120,958	126,304	122,839	122,627	123,086	122,426	122,469	122,576	122,595	122,785	122,845	122,892	122,947	122,967	122,978	122,985	122,981	122,970	122,953
	Newport Beach RTS Charge ($/AF)	-	-	-	$ 125	$ 155	$ 173	$ 180	$ 202	$ 221	$ 240	$ 263	$ 286	$ 312	$ 340	$ 364	$ 390	$ 418	$ 448	$ 480	$ 514	$ 551	$ 591	$ 633	$ 679

Notes

1 City of Newport Beach water demands are identified in the 2020 UWMP in five-year increments from 2025 through 2045. Extrapolation calculated for intermediate years.
2 Volume of MWDOC import water is identified in the 2020 UWMP in five-year increments from 2025 through 2045. Extrapolation calculated for intermediate years.
3 Increase in peak flow rate based on anticipated increase in total member agency demands as identified in the MWDOC 2020 UWMP
4 Maximum flow rate of the previous 3-year peak flows recorded between May and September, escalated by 0.6% per year to match the MWDOC member agency average flow increase between 2025 and 2045 in the MWDOC 2020 UWMP
5 Calculated using the Mesa Water Local Supply Improvement Study treated imported water inflation rate
6 2025 Total member agency capacity charge and 3-year peak flow identified in Exhibit B of Resolution No. 2157 Municipal Water District of Orange County Establishing Water Rates
7 2025 Total member agency readiness to serve and 4-year average flow identified in Exhibit A of Resolution No. 2157 Municipal Water District of Orange County Establishing Water Rates

Appendix B

MWDOC and Mesa Water District Fees, City of Newport Beach Savings, Mesa Water District Revenue

MWDOC and Mesa Water District Fees, City of Newport Beach Savings, Mesa Water District Revenue

Supply	Description	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
MWD	Treated Domestic Water Cost ($/AF) (1)	$ 1,395	$ 1,521	$ 1,657	$ 1,807	$ 1,969	$ 2,146	$ 2,340	$ 2,550	$ 2,780	$ 3,030	$ 3,302	$ 3,540	$ 3,795	$ 4,068	$ 4,361	$ 4,675	$ 5,012	$ 5,373	$ 5,760	$ 6,174	$ 6,619
	Increase in Treated Domestic Water Cost (%) (1)	-	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	7.2%	7.2%	7.2%	7.2%	7.2%	7.2%	7.2%	7.2%	7.2%	7.2%
	Member Agency Capacity Charge ($/CFS) (1)	$ 13,000	$ 14,170	$ 15,445	$ 16,835	$ 18,351	$ 20,002	$ 21,802	$ 23,765	$ 25,903	$ 28,235	$ 30,776	$ 32,992	$ 35,367	$ 37,913	$ 40,643	$ 43,569	$ 46,706	$ 50,069	$ 53,674	$ 57,539	$ 61,682
	Capacity Charge Annual Increase (calculated) (1)	-	9.0%	9%	9%	9%	9%	9%	9%	9%	9%	9%	7.2%	7.2%	7.2%	7.2%	7.2%	7.2%	7.2%	7.2%	7.2%	7.2%
	Newport Beach Capacity Charge ($/CFS*Day) (2)	$ 29	$ 32	$ 34	$ 37	$ 40	$ 43	$ 47	$ 51	$ 55	$ 60	$ 65	$ 69	$ 73	$ 78	$ 83	$ 89	$ 94	$ 101	$ 107	$ 114	$ 122
	3-Year Peak CFS (BASE)	9.6	9.7	9.7	9.8	9.8	9.9	10.0	10.0	10.1	10.2	10.2	10.3	10.4	10.4	10.5	10.6	10.6	10.7	10.8	10.8	10.9
	3-Year Peak at 100 CFS	9.2	9.2	9.3	9.3	9.4	9.5	9.5	9.6	9.7	9.7	9.8	9.8	9.9	10.0	10.0	10.1	10.2	10.2	10.3	10.4	10.4
	3-Year Peak at 1,000 CFS	5.1	5.2	5.3	5.3	5.4	5.5	5.5	5.5	5.6	5.6	5.7	5.7	5.8	5.8	5.9	5.9	5.9	6.0	6.0	6.1	6.1
	3-Year Peak at 2,000 CFS	0.7	0.7	0.8	0.9	0.9	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.2	1.2	1.2	1.3	1.3	1.3	1.3	1.3	1.3
	Member Agency Readiness To Serve ($/AF) (1)	$ 181	$ 197	$ 215	$ 234	$ 255	$ 278	$ 304	$ 331	$ 361	$ 393	$ 428	$ 459	$ 492	$ 528	$ 566	$ 607	$ 650	$ 697	$ 747	$ 801	$ 859
	RTS Annual Increase (Calculated) (1)	-	9.0%	9%	9%	9%	9%	9%	9%	9%	9%	9%	7.2%	7.2%	7.2%	7.2%	7.2%	7.2%	7.2%	7.2%	7.2%	7.2%
	Newport Beach RTS ($/AF) (3)	$ 125	$ 155	$ 173	$ 180	$ 202	$ 221	$ 240	$ 263	$ 286	$ 312	$ 340	$ 364	$ 390	$ 418	$ 448	$ 480	$ 514	$ 551	$ 591	$ 633	$ 679
	4-Year Average AFY (BASE)	2,149	2,164	2,179	2,194	2,209	2,224	2,228	2,233	2,237	2,242	2,246	2,251	2,256	2,261	2,266	2,271	2,270	2,269	2,267	2,266	2,265
	4-Year Average at 100 AFY	2,049	2,689	2,268	2,226	2,071	2,086	2,101	2,114	2,123	2,131	2,135	2,139	2,144	2,149	2,154	2,159	2,164	2,167	2,169	2,169	2,168
	4-Year Average at 1,000 AFY	1,149	2,464	1,818	1,551	1,171	1,186	1,201	1,214	1,223	1,231	1,235	1,239	1,244	1,249	1,254	1,259	1,264	1,267	1,269	1,269	1,268
	4-Year Average at 2,000 AFY	149	2,214	1,318	801	171	186	201	214	223	231	235	239	244	249	254	259	264	267	269	269	268
	Total MWDOC Costs ($/AF) (4)	$ 1,567.92	$ 1,726.88	$ 1,885.95	$ 2,047.29	$ 2,236.65	$ 2,437.84	$ 2,656.20	$ 2,896.50	$ 3,156.91	$ 3,440.56	$ 3,749.95	$ 4,019.12	$ 4,308.04	$ 4,617.76	$ 4,949.73	$ 5,305.70	$ 5,687.75	$ 6,097.33	$ 6,536.45	$ 7,007.24	$ 7,511.97
Mesa Water	Replenishment Assessment ($/AF) (5)	$ 688	$ 711	$ 736	$ 759	$ 783	$ 809	$ 837	$ 867	$ 897	$ 928	$ 961	$ 994	$ 1,029	$ 1,065	$ 1,103	$ 1,141	$ 1,181	$ 1,222	$ 1,265	$ 1,310	$ 1,355
	Chemical Costs ($/AF)	$ 201	$ 208	$ 215	$ 223	$ 231	$ 239	$ 247	$ 256	$ 265	$ 274	$ 284	$ 293	$ 304	$ 314	$ 325	$ 337	$ 349	$ 361	$ 373	$ 386	$ 400
	Energy Costs ($/AF)	$ 224	$ 232	$ 240	$ 248	$ 257	$ 266	$ 275	$ 285	$ 295	$ 305	$ 316	$ 327	$ 338	$ 350	$ 363	$ 375	$ 388	$ 402	$ 416	$ 431	$ 446
	Inflation and OC San Rate Increase (6)	-	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%
	Brine Discharge to OC San ($/AF production) (7)	$ 52	$ 54	$ 56	$ 58	$ 60	$ 62	$ 64	$ 67	$ 69	$ 71	$ 74	$ 77	$ 79	$ 82	$ 85	$ 88	$ 91	$ 94	$ 97	$ 101	$ 104
	Mesa Water Wheeling ($/AF) (8)	$ 140	$ 145	$ 150	$ 155	$ 160	$ 165	$ 171	$ 177	$ 183	$ 189	$ 196	$ 203	$ 210	$ 217	$ 225	$ 233	$ 241	$ 250	$ 258	$ 267	$ 277
	MWRF Production ($/AF) (9)	$ 1,258	$ 1,301	$ 1,347	$ 1,391	$ 1,436	$ 1,485	$ 1,537	$ 1,591	$ 1,647	$ 1,704	$ 1,764	$ 1,826	$ 1,889	$ 1,956	$ 2,024	$ 2,095	$ 2,168	$ 2,244	$ 2,323	$ 2,404	$ 2,488
Newport Savings (Annual)	100 AF	$ 30,983	$ 42,596	$ 53,937	$ 65,668	$ 80,024	$ 95,273	$ 111,911	$ 130,561	$ 151,033	$ 173,636	$ 198,609	$ 219,354	$ 241,856	$ 266,215	$ 292,567	$ 321,080	$ 351,952	$ 385,321	$ 421,380	$ 460,329	$ 502,388
	1,000 AF	$ 309,831	$ 425,959	$ 539,373	$ 656,678	$ 800,236	$ 952,728	$ 1,119,106	$ 1,305,609	$ 1,510,334	$ 1,736,358	$ 1,986,095	$ 2,193,537	$ 2,418,557	$ 2,662,150	$ 2,925,672	$ 3,210,796	$ 3,519,524	$ 3,853,214	$ 4,213,799	$ 4,603,293	$ 5,023,881
	2,000 AF	$ 619,662	$ 851,918	$ 1,078,745	$ 1,313,356	$ 1,600,473	$ 1,905,457	$ 2,238,213	$ 2,611,219	$ 3,020,668	$ 3,472,717	$ 3,972,190	$ 4,387,074	$ 4,837,113	$ 5,324,300	$ 5,851,344	$ 6,421,592	$ 7,039,049	$ 7,706,428	$ 8,427,597	$ 9,206,586	$ 10,047,761
Newport Savings (Cumulative)	100 AF	$ 30,983	$ 73,579	$ 127,516	$ 193,184	$ 273,208	$ 368,480	$ 480,391	$ 610,952	$ 761,986	$ 935,621	$ 1,134,231	$ 1,353,585	$ 1,595,440	$ 1,861,655	$ 2,154,222	$ 2,475,302	$ 2,827,254	$ 3,212,576	$ 3,633,956	$ 4,094,285	$ 4,596,673
	1,000 AF	$ 309,831	$ 735,790	$ 1,275,162	$ 1,931,840	$ 2,732,077	$ 3,684,805	$ 4,803,911	$ 6,109,521	$ 7,619,855	$ 9,356,213	$ 11,342,308	$ 13,535,845	$ 15,954,402	$ 18,616,552	$ 21,542,224	$ 24,753,020	$ 28,272,544	$ 32,125,758	$ 36,339,557	$ 40,942,850	$ 45,966,730
	2,000 AF	$ 619,662	$ 1,471,580	$ 2,550,325	$ 3,863,681	$ 5,464,153	$ 7,369,610	$ 9,607,823	$ 12,219,042	$ 15,239,710	$ 18,712,427	$ 22,684,617	$ 27,071,690	$ 31,908,804	$ 37,233,104	$43,084,448	$ 49,506,039	$ 56,545,088	$ 64,251,517	$ 72,679,114	$ 81,885,700	$ 91,933,461
Mesa Water Revenue	100 AF	$ 13,985	$ 14,462	$ 14,969	$ 15,460	$ 15,970	$ 16,512	$ 17,090	$ 17,688	$ 18,308	$ 18,948	$ 19,611	$ 20,298	$ 21,008	$ 21,744	$ 22,505	$ 23,292	$ 24,107	$ 24,951	$ 25,825	$ 26,728	$ 27,664
	1,000 AF	$ 139,851	$ 144,616	$ 149,691	$ 154,599	$ 159,702	$ 165,123	$ 170,902	$ 176,884	$ 183,075	$ 189,483	$ 196,115	$ 202,979	$ 210,083	$ 217,436	$ 225,046	$ 232,923	$ 241,075	$ 249,512	$ 258,245	$ 267,284	$ 276,639
	2,000 AF	$ 279,701	$ 289,231	$ 299,382	$ 309,198	$ 319,404	$ 330,246	$ 341,805	$ 353,768	$ 366,150	$ 378,965	$ 392,229	$ 405,957	$ 420,166	$ 434,871	$ 450,092	$ 465,845	$ 482,150	$ 499,025	$ 516,491	$ 534,568	$ 553,278
Mesa Water Revenue (Cumulative)	100 AF	$ 13,985	$ 28,447	$ 43,416	$ 58,876	$ 74,846	$ 91,358	$ 108,448	$ 126,137	$ 144,444	$ 163,393	$ 183,004	$ 203,302	$ 224,310	$ 246,054	$ 268,558	$ 291,851	$ 315,958	$ 340,909	$ 366,734	$ 393,462	$ 421,126
	1,000 AF	$ 139,851	$ 284,466	$ 434,157	$ 588,756	$ 748,458	$ 913,582	$ 1,084,484	$ 1,261,368	$ 1,444,443	$ 1,633,926	$ 1,830,040	$ 2,033,019	$ 2,243,102	$ 2,460,537	$ 2,685,583	$ 2,918,506	$ 3,159,581	$ 3,409,093	$ 3,667,339	$ 3,934,623	$ 4,211,261
	2,000 AF	$ 279,701	$ 568,932	$ 868,315	$ 1,177,513	$ 1,496,917	$ 1,827,163	$ 2,168,968	$ 2,522,736	$ 2,888,886	$ 3,267,852	$ 3,660,081	$ 4,066,038	$ 4,486,203	$ 4,921,075	$ 5,371,167	$ 5,837,012	$ 6,319,161	$ 6,818,186	$ 7,334,677	$ 7,869,245	$ 8,422,523

Notes

1 Calculated using the Mesa Water Local Supply Improvement Study treated imported water inflation rate

2 Calculated using the ratio between the City's and the member agencies anticipated 3-year peak flow rate, and the member agencies total capacity charge, see Table 3-1 and Appendix A.

3 Calculated using the ratio between the City's and member agencies anticipated 4-year average flow rate, and the member agencies total RTS, see Table 3-1 and Appendix A.

4 Calculated using the Treated Water Costs, Newport Beach RTS, and Newport Beach Capacity Charge. Newport Beach Capacity charge is converted from $/CFS*Day to $/AF using the 3-year Peak Flow, 365 days in a year, and the average base flow rate

5 Calculated using the OCWD Replenishment Assessment Rate Increase spreadsheet through 2030. Rate increase after 2030 is 3.5%

6 Estimated inflation used for Replenishment Assessment, Chemical Costs, Energy Costs, and OC San Rate Increase

7 Calculated using 12 months of OC San billing data for brine discharge from MWRF, includes factor for reducing product water to brine discharge water at 95% recovery rate

8 Assumed water wheeling rate of 12%

9 Calculated through summation of Replenishment Assessment, Chemical Costs, Energy Costs, Brine Discharge, and Water Wheeling

Appendix C

Exhibit A of Resolution No. 2157 MWDOC
Establishing Water Rates

RESOLUTION NO. 2157

MUNICIPAL WATER DISTRICT OF ORANGE COUNTY

ESTABLISHING WATER RATES

WHEREAS, pursuant to Water Code sections 71610, 71614 and 71616, the Municipal Water District of Orange County (MWDOC) is authorized to establish water rates and charges for water which will result in revenues sufficient to meet the operating expenses of the District to provide for repairs and depreciation of works, provide a reasonable surplus for improvements, extensions and enlargements, and cover principal and interest payments and costs associated with bonded debt; and,

WHEREAS, the District currently imports water from the Metropolitan Water District of Southern California (Metropolitan). Metropolitan adopted rates for water service consisting of a water supply rate, and separate unbundled rates for system access, system power, water treatment, and fixed charges for the Capacity Charge and Readiness-to-Serve Charge, which are imposed on MWDOC as a condition of receiving water deliveries from Metropolitan; and,

WHEREAS, pursuant to Section 1117 of the MWDOC Administrative Code, the MWDOC Board of Directors adopted Ordinance No. 55 establishing classes of water service, and terms and conditions of such service, and intends to adopt this Resolution fixing the rates and charges for said classes of water service (including Choice services in Section 6); and,

WHEREAS, the Board of Directors has reviewed the cost of water, including its current water supply costs and other charges imposed on MWDOC by Metropolitan, and with respect to the projected MWDOC operating expenses and financial needs, and has determined that it is necessary and appropriate to establish new rates and charges for water service and programs provided by MWDOC; and,

WHEREAS, the Board of Directors has reviewed the water supply, water demand and

replenishment conditions in the Orange County Water District (OCWD) Basin and the impact these conditions will have on MWDOC's imported water purchases from Metropolitan; and,

WHEREAS, MWDOC's Administration and Finance Committee and Board reviewed the issue of tiered or melded water rates for Tier-1 and Tier-2 purchases from Metropolitan in November 2004, and retained the establishment of a melded rate, with a provision for further review should the OCWD's basin pumping percentage fall below 60% in the future; and,

WHEREAS, Metropolitan continues to levy its Standby Charge within the MWDOC service area, which will be credited against Metropolitan's Readiness-to-Serve Charge and will provide an equivalent offset on the Metropolitan charges imposed on MWDOC; and,

WHEREAS, Metropolitan assesses a Capacity Charge to MWDOC based on MWDOC's highest cumulative peak day delivery rate in cubic feet per second (CFS) between May 1 and September 30 in the three preceding calendar years, ending on the year prior to the year of the charge being imposed; and,

WHEREAS, MWDOC engaged Raftelis Financial Consultants, Inc. to prepare a cost of service allocation and rate study (Rate Study) for MWDOC's rates and charges in 2016 and 2021; and,

WHEREAS, the 2021 Core Service Allocation Study affirmed MWDOC's Retail Meter Charge, and modified the Groundwater Customer Charge effective with the fiscal year 2021-22 rates and charges; and,

WHEREAS, beginning with the budget year commencing July 1, 2011 through June 30, 2012, the MWDOC Board approved changing the format of the budget and how certain "Choice" services are to be funded by those MWDOC member agencies and the cities of Anaheim, Fullerton and Santa Ana (3 Cities) electing to receive such services; and,

WHEREAS, the MWDOC Board has approved the "Choice" services, the associated budgets, and the methods for allocating such costs to the member agencies and 3 Cities, and

has directed staff to bill for those costs pursuant to Section 10 of this Resolution as part of MWDOC's water rates and charges; and,

WHEREAS, there is a need to charge for costs associated with the transfer or wheeling of water into the MWDOC service area by any member agency as is provided for in this Resolution.

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of the Municipal Water District of Orange County that, subject to the terms and conditions set forth herein, the rates and charges for the classes of water service provided by MWDOC to MWDOC's member agencies shall be as follows:

SECTION 1. RATES FOR CLASSES OF WATER SERVICE.

The rates per acre-foot of water sold or delivered by MWDOC to its member agencies shall be as follows:

(a) For Full Service, including water delivered for domestic, municipal, and agricultural purposes, including seawater barrier and groundwater replenishment.

Rate Component	July 1 through December 31, 2025	Beginning January 1, 2026
Untreated Full Service	**$912.00**	**$984.00**
Treated Full Service	**$1,395.00**	**$1,528.00**
Unbundled Rate By Component:		
System Access Rate	$463.00	$492.00
System Power Rate	$159.00	$179.00
MWDOC Melded Supply Rate	$290.00	$313.00
Subtotal Untreated Full Service:	**$912.00**	**$984.00**
Treatment Surcharge	$483.00	$544.00
Total Treated Full Service:	**$1,395.00**	**$1,528.00**

* In November of 2021 the Metropolitan Board directed staff to recover demand management costs via the supply rate,

(b) MWDOC Drought Allocation Surcharge

Rates for a Drought Allocation Surcharge are established by Board action in accordance with the MWDOC Water Supply Allocation Plan (WSAP), as required.

(c) MWDOC Melded Supply Rate

The MWDOC Melded Supply Rate is established by Board action to recover Metropolitan's Tier 1 supply rate plus any additional water costs, fees, charges, and rates that benefit the District's service area. At this time, the MWDOC

Melded Supply Rate is equal to Metropolitan's Tier 1 Supply Rate.

SECTION 2. **MWDOC READINESS-TO-SERVE CHARGE**.

(a) Amount Due to Metropolitan from MWDOC

Metropolitan has notified MWDOC that for fiscal year 2025-26 Metropolitan estimates that the amount of Metropolitan's Readiness-to-Serve (RTS) Charge applicable to MWDOC, which exceeds the standby charges collected in MWDOC's service area (Net RTS) is $17,600,208. The Net RTS Charge will be allocated among the MWDOC member agencies, as provided herein and invoiced as a fixed charge to each MWDOC member agency. Metropolitan will bill MWDOC for the Net RTS Charge on a monthly installment basis. The MWDOC Net RTS Charge will be invoiced to each MWDOC member agencies on a monthly basis.

(b) Apportionment of Net Metropolitan RTS Charge to MWDOC's Member Agencies

The MWDOC method of apportioning the Net RTS Charge to the MWDOC member agencies uses the most recently completed four-year rolling average of fiscal year full service purchases of water ending one year prior to the year of the charge being imposed (i.e., for fiscal year 2025-26 charges, the four-year average shall be based on fiscal years 2020-21 through 2023-24). The Net RTS Charge to MWDOC shall be apportioned to the MWDOC member agencies based on the four-year average of full service sales, which would include all cyclic, wheeled, and transferred water.

(c) Fiscal Year 2025-26 MWDOC RTS Charge

For fiscal year 2025-26, MWDOC will charge the MWDOC member agencies total Net RTS Charges of $17,600,208. The amount of the Net RTS Charge to be apportioned to each of the MWDOC member agencies is set forth in **Exhibit A**, attached hereto and by this reference incorporated herein made an operative part hereof.

(d) Adjustment of RTS Charge

Metropolitan determines its Net RTS Charge to each member agency based on the estimated revenue derived from the Metropolitan Standby Charge within each member agency (less delinquencies and administrative costs). The projected Net Standby Charge revenue for MWDOC in fiscal year 2025-26 is set forth in **Exhibit A**. Once the actual Net Standby Charge revenue is known, Metropolitan may adjust the amount of the Net RTS Charge for the prior year through an additional charge or credit. Any adjustment necessary to reconcile the estimated Net RTS Charge with the actual Net RTS Charge will be charged or credited to each MWDOC member agency in the next regularly scheduled water billing following the preparation of the reconciliation report by Metropolitan.

SECTION 3. MWDOC CAPACITY CHARGE

(a) Amount due to Metropolitan from MWDOC

Metropolitan has notified MWDOC that for calendar year 2026, the amount of the Metropolitan Capacity Charge to be imposed on MWDOC will be $4,089,000. The Metropolitan Capacity Charge will be allocated among the MWDOC member agencies as provided herein and invoiced as a fixed charge to each member agency. Metropolitan will bill MWDOC for the Capacity Charge on a monthly installment basis. The MWDOC Capacity Charge will be invoiced to the MWDOC member agencies on a monthly basis.

(b) Apportionment of Metropolitan's Capacity Charge to MWDOC's Member Agencies

The MWDOC method of apportioning the Capacity Charge to the MWDOC member agencies uses each member agency's highest peak day flow for delivery of full service water, which includes wheeled and transferred water, during the period of May 1 through September 30 of each year for the three-year period ending one year prior to the year of the charge being imposed (i.e., for calendar year 2026 charges, the highest peak day flow shall be based on

May 1 through September 30, 2022, 2023, and 2024). The peak day flow for each MWDOC member agency is used to apportion the Capacity Charge based upon the ratio of each agency's highest peak day flow to the sum of all member agencies' highest peak day flows. The amount of the 2026 Capacity Charge apportioned to each member agency is set forth in **Exhibit B**, attached hereto and by this reference incorporated herein and made an operative part hereof.

SECTION 4. MWDOC'S RETAIL METER CHARGE.

The annual charge to be imposed by MWDOC on each member agency except for Orange County Water District (OCWD) for each retail water meter served by such MWDOC member agency which is in service as of January 1 of each year (MWDOC's Retail Meter Charge) shall be **$15.25**. MWDOC's Retail Meter Charge shall be collected in accordance with Section 10 of this Resolution. Annually, or at such time as determined to be necessary, MWDOC will request supporting documentation from each member agency to verify the number of retail meters within their service area, and such documentation shall be signed by a representative of the member agency. MWDOC is also authorized to conduct random on-site visits with the member agencies to verify the data on the number of retail meters.

SECTION 5. MWDOC GROUNDWATER CUSTOMER CHARGE

The annual charge to be imposed on OCWD for Core services provided by MWDOC for fiscal year 2025-26 shall be **$414,371**. MWDOC's Groundwater Customer Charge to be imposed on OCWD shall be collected in accordance with Section 10 of this Resolution.

The Groundwater Customer Charge is calculated based on OCWD's proportionate share of all of MWDOC's cost centers of MWDOC's fiscal year 2025-26 general fund core budget; excluding the WEROC cost center. OCWD's proportionate share is calculated as one

twenty-sixth of all core cost centers except for WEROC.

SECTION 6. CHOICE SERVICES TO THE MWDOC MEMBER AGENCIES 2025-26

The Choice services to the member agencies shall be provided and charged for as follows for Fiscal Year 2025-26. Each Choice service is voluntary and provided at the option of the member agency, and the costs for such Choice services are not "imposed" for purposes of article XIII C, section 1(e) of the California constitution:

(a) Water Use Efficiency Program – The cost of MWDOC's Water Use Efficiency Program shall be allocated to those agencies electing to participate in the program. The costs shall be apportioned to the participants in proportion to the benefits received from Metropolitan and/or any other outside sources of funding in calendar year 2024. There may be other costs allocated over and above these costs for participation in certain water use efficiency program efforts in various parts of Orange County that are separate from this basic program. Anything beyond the basic program will be implemented separately by agreement or memorandum of understanding with each participating agency. The costs to be charged shall reflect any carry-over or deficit funds from the preceding fiscal year.

(b) The MWDOC Elementary School Program provides comprehensive water education for Orange County elementary school students in Grades K-5. Through this program, each participating agency may set a target number of sessions to offer in their service area. In grades K-2, the MWDOC Elementary School Program charges participating agencies per school assembly, at a cost based on the size of the school assembly. In grades 3-5, the MWDOC Elementary School Program charges each participating agency at a cost per

session based on the actual number of sessions provided.

(c) The MWDOC Middle School Program provides comprehensive water education for Orange County middle school students in Grades 6-8. Through this program, each participating agency may set a target number of sessions to offer in their service area. The MWDOC Middle School Program charges each participating agency at a cost per session based on the actual number of sessions provided.

(d) The MWDOC High School Program provides comprehensive water education for Orange County high school students in Grades 9-12. Through this program, each participating agency may set a target number sessions to offer in their service area. The MWDOC High School Program charges each participating agency at a cost per session based on the actual number of sessions provided.

(e) Blank

(f) The Water Loss Control Program provides a complement of technical assistance and shared service through consultants and in-house operations to retail agencies in Orange County. The costs for the program varies per agency according to the level of professional and technical service selected by each participating agency. The costs to be charged shall reflect any carry-over or deficit funds from the preceding fiscal year.

The details on these Choice options and charges to each agency are included in Section 10 and are set forth in **Exhibit C**, attached hereto and by this reference incorporated herein and made an operative part hereof.

SECTION 7. RATES AND CHARGES FOR WHEELED, EXCHANGED OR TRANSFERRED WATER

Unless otherwise specified by written agreement with MWDOC, MWDOC shall charge the member agencies for water wheeled, exchanged, or transferred through exchanges with Metropolitan into the MWDOC service area in accordance with the provisions below. Wheeled, exchanged, or transferred water will also be assessed, unless otherwise specified by written agreement, at the then-applicable rates for wheeling services set by Metropolitan's Board of Directors from time to time pursuant to its Administrative Code for the use of Metropolitan's facilities to transport water not owned or controlled by Metropolitan to Metropolitan's member agencies. Metropolitan's rates for "wheeling service" are defined in the Metropolitan Administrative Code. Metropolitan's rate for wheeling service does not include power utilized for delivery, which the wheeling party must provide or pay directly at its own cost (if power can be scheduled by Metropolitan) or pay to Metropolitan at Metropolitan's actual (not system average) cost.

In addition to these charges, MWDOC shall assess the following charges related to costs, pursuant to applicable law:

(a) A one-time administrative charge, based on actual time spent to account for the staff time and legal counsel required for preparation of an agreement or agreements to establish the legal and administrative framework for water to be wheeled or transferred through exchanges with Metropolitan.

(b) Unless otherwise specified by written agreement with MWDOC, an annual charge will be assessed, based on actual time spent in any year in which water is wheeled or transferred through exchanges with Metropolitan, to cover staff time to account for and bill for the water.

(c) Other charges established by written agreement between MWDOC and a member agency that reflect additional costs of wheeling water.

SECTION 8. MWDOC WATER SUPPLY ALLOCATION PLAN (WSAP)

In the event that a regional water shortage is declared, the MWDOC Board can implement, adjust, or adopt an updated Water Supply Allocation Plan (Plan). This Plan, as adopted in 2009, updated in 2014 and 2016, and as amended from time to time, established procedures allowing MWDOC to assess an allocation surcharge to its member agencies in the event MWDOC is assessed an allocation surcharge under Metropolitan's own "Water Supply Allocation Plan." Under MWDOC's Plan, surcharges may be assessed according to a particular member agency's prorated share of it's over usage relative to the MWDOC surcharge amount assessed by Metropolitan. However, the rates set forth in this Resolution do not include or otherwise account for potential surcharges that may be assessed by MWDOC under its Water Supply Allocation Plan, and nothing contained herein is intended to preclude MWDOC from charging such surcharges as authorized in the Water Supply Allocation Plan.

SECTION 9. EFFECTIVE DATE.

The rates set forth in this Resolution shall become effective as of July 1, 2025 or thereafter as specified and shall remain in effect until changed by subsequent Resolution of the Board of Directors.

SECTION 10. BILLING AND PAYMENT.

Billing Schedule. MWDOC member agencies shall be billed for water delivered and for other charges as follows:

(a) MWDOC's cost of acquisition of the water shall be billed in the month following delivery of the water;

(b) MWDOC's Retail Meter Charge shall be billed once annually on or after July 1st of each year, for each retail water service meter within each member agency's service area;

(c) the MWDOC Readiness-to-Serve Charge shall be billed in monthly installments on the water billing in accordance with **Exhibit A**, the MWDOC Capacity Charge shall be billed in monthly installments on the water billing in accordance with **Exhibit B;** and

(d) the MWDOC Choice services shall be billed once annually on or after July 1st of each year or as otherwise during the fiscal year in accordance with **Exhibit C** and/or as may be adjusted during the fiscal year in discussions with and as agreed to by the Choice Program participants.

(e) The fixed annual Groundwater Customer Charge to OCWD, as set forth in MWDOC's Water Rate Ordinance No. 55 and referred to in Section 5 hereof, shall be billed to OCWD annually at the beginning of the fiscal year on July 1st.

All such billings shall be due on receipt by the member agency and shall be delinquent if payment is not received by MWDOC by the 15th day of the month following the mailing of the billing or within 30 days of mailing of such billing, whichever date is later.

SECTION 11. EXEMPTION FROM CEQA.

The Board of Directors finds that the adoption of the rates and charges as set forth in this Resolution are exempt from the California Environmental Quality Act under Section 21080(b)(8) of the Public Resources Code in that the water rates established herein are for

the purpose of meeting operating expenses of MWDOC, including employee wages and fringe benefits, purchasing or leasing of supplies, equipment and materials, meeting financial reserve needs and requirements and, obtaining funds for capital projects necessary to maintain service within existing service areas.

SECTION 12. REASONABLE COST.

The Board of Directors finds that the water rates established herein are in accordance with the adopted fiscal year 2025-26 budget, and that said rates do not exceed the reasonable cost of providing water service and other services and regulatory functions for which they are charged.

SECTON 13. SUPERSEDES PRIOR RESOLUTIONS.

All resolutions, ordinance, or administrative actions by the Board or parts thereof that are inconsistent with any provision of this Resolution are hereby superseded only to the extent of such inconsistency.

SECTION 14. RATES SUBJECT TO ORDINANCE.

The rates for water service established herein are subject to Ordinance No. 55 as it may be amended from time to time.

SECTION 15. IMPLEMENTATION.

The General Manager is directed to establish procedures to implement this Resolution.

BE IT FURTHER RESOLVED that a copy of this Resolution be sent to each of MWDOC's member agencies.

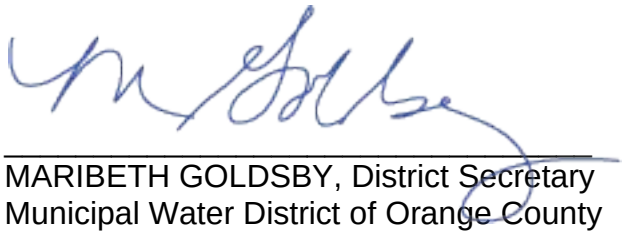
Said Resolution No. 2157 was adopted on April 16, 2025 by the following roll call vote:

AYES: Directors Nederhood, McVicker, Seckel & Crane

NOES: None

ABSENT: Directors Dick, Thomas & Yoo Schneider

ABSTAIN: None



MARIBETH GOLDSBY, District Secretary
Municipal Water District of Orange County

EXHIBIT A

Readiness-to-serve Charge for MWDOC Client Agencies for FY 2025-26

Metropolitan Readiness-to-Serve (RTS) Charge to MWDOC for FY 2025/26 =	**$ 25,200,162**
Expected Standby Revenue Less Metropolitan Administrative Charge Plus Delinquencies & Uncollectables FY 2025/26 =	**$ (7,599,954)**
Net MWD RTS Charge =	**$ 17,600,208**

Final

Agency	2020-21	2021-22	2022-23	2023-24	4-Yr Ave	AF Share (%)	Net RTS	RTS Adjustment	Net RTS	Monthly Charge July - December	Monthly Charge January - June
Brea	34	254	5	477	193	0.14%	$ 24,170.96	$ -	$ 24,170.96	$ 1,971.95	$ 2,056.55
Buena Park	1,475	1,650	1,302	665	1,273	0.91%	$ 159,669.35	$ -	$ 159,669.35	$ 13,026.36	$ 13,585.20
East Orange County Water District	3,014	5,713	5,040	3,389	4,289	3.06%	$ 537,934.74	$ -	$ 537,934.74	$ 43,886.50	$ 45,769.29
El Toro Water District	7,392	7,244	5,530	6,588	6,689	4.77%	$ 838,855.40	$ -	$ 838,855.40	$ 68,436.61	$ 71,372.62
Fountain Valley	0	0	0	0	-	0.00%	$ -	$ -	$ -	$ -	$ -
Garden Grove	5,318	5,297	3,642	4	3,565	2.54%	$ 447,126.06	$ -	$ 447,126.06	$ 36,478.03	$ 38,042.98
Golden State Water Company	7,451	8,709	8,714	7,469	8,086	5.76%	$ 1,014,107.15	$ -	$ 1,014,107.15	$ 82,734.23	$ 86,283.63
Huntington Beach	4,040	4,841	3,469	3,320	3,918	2.79%	$ 491,336.12	$ -	$ 491,336.12	$ 40,084.83	$ 41,804.52
Irvine Ranch Water District	17,134	25,245	16,773	12,085	17,809	12.69%	$ 2,233,569.32	$ -	$ 2,233,569.32	$ 182,222.01	$ 190,039.55
La Habra	562	565	222	60	352	0.25%	$ 44,174.94	$ -	$ 44,174.94	$ 3,603.94	$ 3,758.55
La Palma	0	120	4	0	31	0.02%	$ 3,887.92	$ -	$ 3,887.92	$ 317.19	$ 330.80
Laguna Beach County Water District	3,054	3,350	2,552	2,993	2,987	2.13%	$ 374,657.70	$ -	$ 374,657.70	$ 30,565.82	$ 31,877.13
Mesa Water District	67	3	0	0	17	0.01%	$ 2,182.25	$ -	$ 2,182.25	$ 178.04	$ 185.67
Moulton Niguel Water District	24,785	24,305	19,894	19,420	22,101	15.75%	$ 2,771,823.29	$ -	$ 2,771,823.29	$ 226,134.56	$ 235,836.00
Newport Beach	677	3,747	2,249	2,712	2,346	1.67%	$ 294,265.26	$ -	$ 294,265.26	$ 24,007.14	$ 25,037.07
Orange	6,707	11,796	3,296	1,535	5,833	4.16%	$ 731,594.18	$ -	$ 731,594.18	$ 59,685.89	$ 62,246.48
Orange County Water District	9	22,996	19,458	0	10,616	7.56%	$ 1,331,420.47	$ -	$ 1,331,420.47	$ 108,621.71	$ 113,281.71
San Clemente	7,671	7,535	6,464	6,301	6,993	4.98%	$ 877,002.28	$ -	$ 877,002.28	$ 71,548.76	$ 74,618.29
Santa Margarita Water District (ID9)	6,063	5,679	5,482	4,564	5,447	3.88%	$ 683,136.08	$ -	$ 683,136.08	$ 55,732.51	$ 58,123.50
Santa Margarita Water District	25,314	24,303	20,398	19,740	22,439	15.99%	$ 2,814,203.67	$ -	$ 2,814,203.67	$ 229,592.09	$ 239,441.86
Seal Beach	1,102	606	590	631	732	0.52%	$ 91,845.88	$ -	$ 91,845.88	$ 7,493.09	$ 7,814.55
Serrano Water District	1,394	1,109	819	0	831	0.59%	$ 104,158.68	$ -	$ 104,158.68	$ 8,497.61	$ 8,862.17
South Coast Water District	5,000	4,812	4,142	4,475	4,607	3.28%	$ 577,829.83	$ -	$ 577,829.83	$ 47,141.28	$ 49,163.70
Trabuco Canyon Water District	2,421	2,901	1,800	1,170	2,073	1.48%	$ 259,982.19	$ -	$ 259,982.19	$ 21,210.21	$ 22,120.15
Westminster	0	1	1,046	0	262	0.19%	$ 32,815.31	$ -	$ 32,815.31	$ 2,677.18	$ 2,792.04
Yorba Linda Water District	9,727	12,815	2,699	2,138	6,845	4.88%	$ 858,458.96	$ -	$ 858,458.96	$ 70,035.94	$ 73,040.56
Sum of MWDOC Agencies	**140,411**	**185,594**	**135,592**	**99,738**	**140,334**	**100%**	**$ 17,600,208.00**	**$ -**	**$ 17,600,208.00**	**$ 1,435,883.48**	**$ 1,497,484.57**

*totals may not foot due to rounding

EXHIBIT B

DRAFT Capacity Charge for MWDOC Member Agencies for CY 2026

Final 4/1/2025

	2022	2023	2023	Peak
MWDOC's Peak to MWD (cfs)	282.0	233.6	258.5	**282.0**
Date	8/15/2022	8/9/2023	8/2/2024	8/15/2022

Metropolitan Capacity Charge to MWDOC for CY 2025 **$ 4,089,000** *

Agency	Capacity Charge Eligible Flows (CFS) 2022	2023	2024	3-Yr Peak	CFS Share (%)	Annual Capacity Charge	Monthly Capacity Charge
City of Brea	1.3	7.7	15.1	**15.1**	3.93%	$ 160,582	**$ 13,382**
City of Buena Park	4.3	4.5	4.6	**4.6**	1.20%	$ 48,919	**4,077**
East Orange County Water District	18.2	17.2	17.5	**18.2**	4.73%	$ 193,550	**16,129**
El Toro Water District	17.1	13.7	12.0	**17.1**	4.45%	$ 181,851	**15,154**
City of Fountain Valley	0.0	0.0	0.0	**0.0**	0.00%	$ -	**-**
City of Garden Grove	22.3	0.0	10.7	**22.3**	5.80%	$ 237,151	**19,763**
Golden State Water Company	12.5	15.0	17.4	**17.4**	4.53%	$ 185,042	**15,420**
City of Huntington Beach	21.9	15.2	16.4	**21.9**	5.70%	$ 232,898	**19,408**
Irvine Ranch Water District	55.4	35.0	54.9	**55.4**	14.41%	$ 589,156	**49,096**
City of La Habra	4.1	2.1	3.1	**4.1**	1.07%	$ 43,602	**3,633**
City of La Palma	0.7	0.0	0.0	**0.7**	0.18%	$ 7,444	**620**
Laguna Beach County Water District	7.5	7.4	7.6	**7.6**	1.98%	$ 80,823	**6,735**
Mesa Water District	0.0	0.0	0.0	**0.0**	0.00%	$ -	**-**
Moulton Niguel Water District	43.1	32.6	34.2	**43.1**	11.21%	$ 458,351	**38,196**
City of Newport Beach	8.1	9.6	7.9	**9.6**	2.50%	$ 102,092	**8,508**
Orange County Water District	0.0	0.0	0.0	**0.0**	0.00%	$ -	**-**
City of Orange	21.0	13.6	18.3	**21.0**	5.46%	$ 223,326	**18,611**
City of San Clemente	22.0	18.9	18.9	**22.0**	5.72%	$ 233,961	**19,497**
Santa Margarita Water District (ID9)	13.0	16.8	9.5	**16.8**	4.37%	$ 178,661	**14,888**
Santa Margarita Water District	55.0	38.0	39.1	**55.0**	14.30%	$ 584,902	**48,742**
City of Seal Beach	7.5	0.1	6.0	**7.5**	1.95%	$ 79,759	**6,647**
Serrano Water District	0.0	0.0	0.0	**0.0**	0.00%	$ -	**-**
South Coast Water District	8.4	8.4	10.1	**10.1**	2.63%	$ 107,409	**8,951**
Trabuco Canyon Water District	4.6	4.2	4.8	**4.8**	1.25%	$ 51,046	**4,254**
City of Westminster	0.3	0.0	0.0	**0.3**	0.08%	$ 3,190	**266**
Yorba Linda Water District	9.9	8.7	8.0	**9.9**	2.57%	$ 105,282	**8,774**
			Total	**384.5**	**100%**	**$ 4,089,000**	**$ 340,750**
				MWDOC Capacity Charge Per CFS:		**$ 10,635**	

* Based on MWDOC's aggregate peak flow of 282 cfs on 8/15/2022 charge at MET's 2026 rate of $14,500 per cfs

Exhibit C

MWDOC Member Agency Choice Services Program Summary

DRAFT

Cost Allocations by Agencies for FY 2025-26

Retail Agency	Water Use Efficiency [1]	School Education (K-2)[2]	School Education (3-5)[2]	School Education (6-8)[2]	School Education (9-12)[2]	Water Loss Control Program [3]	Total Choice Allocation [4]
Brea	$ 24,957.85	$ 5,000.00	$ 10,000.00	$ 10,000.00	$ 2,500.00		**$ 52,458**
Buena Park	$ 20,304.31	$ 5,191.20	$ 5,420.16	$ 3,271.98	$ 1,090.66	Pending	**$ 35,278**
East Orange County WD	$ 231.01	$ 1,623.28	$ -	$ -	$ 2,181.32		**$ 4,036**
El Toro WD	$ 101,932.68	$ 7,000.00	$ 4,000.00	$ 2,500.00	$ 1,200.00	Pending	**$ 116,633**
Fountain Valley	$ 15,815.57	$ 2,484.00	$ 2,778.00	$ 4,364.00	$ 6,546.00		**$ 31,988**
Garden Grove	$ 34,856.84	$ 10,000.00	$ 10,000.00	$ 10,000.00	$ 10,000.00	Pending	**$ 74,857**
Golden State Water Company	$ 10,348.50	$ -	$ -	$ -	$ -		**$ 10,349**
Huntington Beach	$ 69,729.26	$ 15,759.00	$ 15,808.65	$ 10,906.57	$ 8,725.25	Pending	**$ 120,929**
Irvine Ranch WD	$ 258,362.45	$ -	$ -	$ -	$ -		**$ 258,362**
La Habra	$ 43,477.03	$ 4,000.00	$ 4,000.00	$ 7,000.00	$ -	Pending	**$ 58,477**
La Palma	$ 1,666.97	$ -	$ -	$ -	$ -		**$ 1,667**
Laguna Beach County WD	$ 1,898.88	$ -	$ -	$ -	$ -	Pending	**$ 1,899**
Mesa Water	$ 47,751.84	$ -	$ -	$ -	$ -		**$ 47,752**
Moulton Niguel WD	$ 207,328.24	$ 11,500.00	$ 9,000.00	$ 2,200.00	$ 4,400.00	Pending	**$ 234,428**
Newport Beach	$ 15,073.33	$ -	$ -	$ -	$ -		**$ 15,073**
Orange	$ 62,422.08	$ 4,391.92	$ 2,777.79	$ -	$ -	Pending	**$ 69,592**
Orange County WD	$ -	$ -	$ -	$ -	$ -		**$ -**
San Clemente	$ 24,716.98	$ 6,588.00	$ 1,852.00	$ 1,098.00	$ 1,091.00	Pending	**$ 35,346**
Santa Margarita WD	$ 119,324.70	$ 8,750.00	$ 8,750.00	$ 8,750.00	$ 8,750.00	Pending	**$ 154,325**
Seal Beach	$ 7,209.07	$ 1,209.22	$ 1,388.90	$ -	$ -		**$ 9,807**
Serrano WD	$ 287.28	$ -	$ 2,000.00	$ -	$ -	Pending	**$ 2,287**
South Coast WD	$ 58,703.28	$ 2,840.00	$ 2,800.00	$ 1,100.00	$ 4,400.00		**$ 69,843**
Trabuco Canyon WD	$ 26,360.46	$ 1,623.28	$ 462.96	$ 1,090.66	$ -	Pending	**$ 29,537**
Tustin	$ 16,984.55	$ 8,911.56	$ 6,944.47	$ 7,634.60	$ 6,543.94		**$ 47,019**
Westminster	$ 29,779.70	$ 5,000.00	$ 10,000.00	$ 12,000.00	$ 8,000.00	Pending	**$ 64,780**
Yorba Linda WD	$ 50,882.79	$ 3,000.00	$ 6,000.00	$ 10,000.00	$ 5,000.00		**$ 74,883**
Anaheim	$ 967.65	$ 9,500.00	$ 9,500.00	$ 9,500.00	$ 9,500.00	Pending	**$ 38,968**
Fullerton	$ 558.03	$ 4,000.00	$ 3,000.00	$ 5,000.00	$ -		**$ 12,558**
Santa Ana	$ 209.66	$ 20,000.00	$ 30,000.00	$ 15,000.00	$ 15,000.00	Pending	**$ 80,210**
Orange County Total	**$ 1,252,141**	**$ 138,371**	**$ 146,483**	**$ 121,416**	**$ 94,928**	**$ -**	**$ 1,753,339**

TBD: Pending Each Agency's Level of Service

Note: Totals may not foot due to rounding.

**** These numbers are draft and subject to change**

[1] Preliminary Cost Allocation for the Choice Water Use Efficiency Program for FY 2025-26.

[2] FY 2025-26 costs dependent upon selection of vendor and each agency's level of participation.

[3] For FY 2025-26 the Water Loss Control Program includes Technical Assistance (Year XI) and the Water Loss Control Shared Services (Year VII). Agency costs will vary based on the selection of technical assistance and shared services.

[4] Actual costs for the programs will be reflected based on agency selections, roll-over of funds from prior fiscal years, and any changes an agency may make throughout the fiscal year.

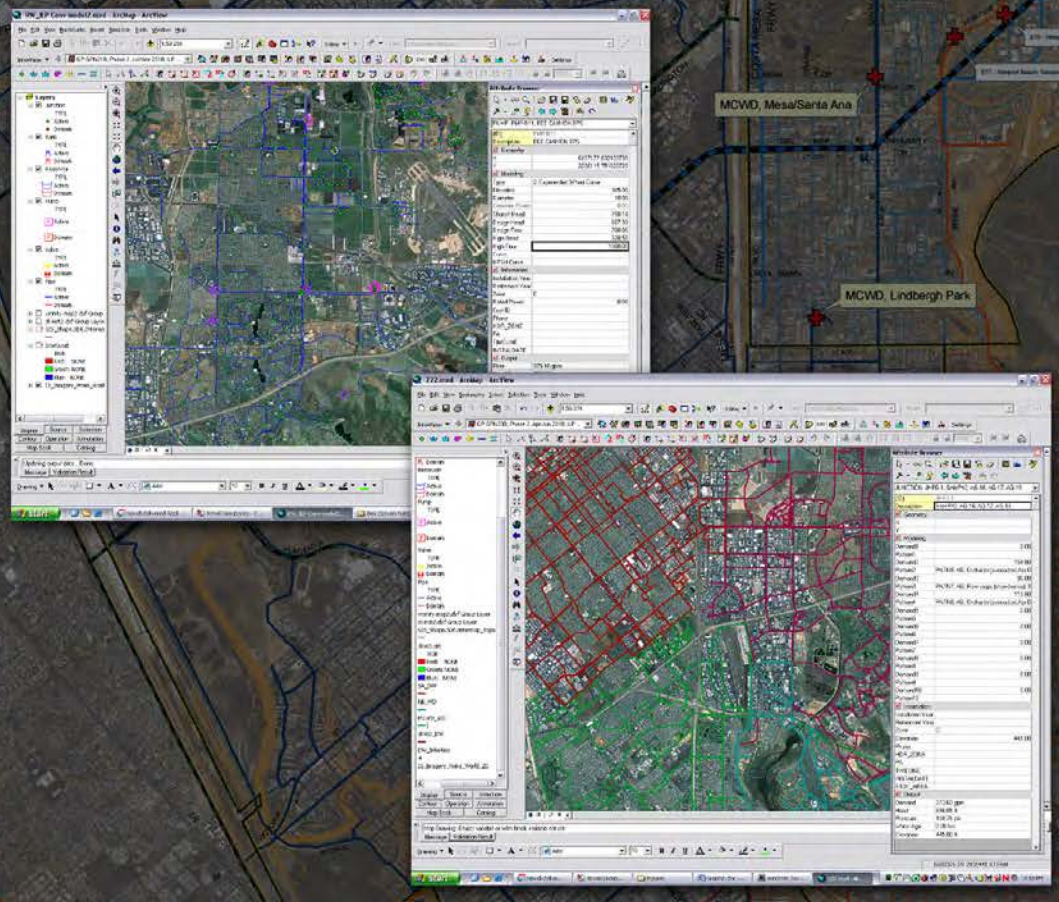
Appendix D

Emergency Interconnection Study

Mesa Consolidated Water District

Emergency Interconnection Study

Santa Ana, MCWD, Newport Beach and IRWD



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Chapter 1

Executive Summary

Chapter 1 – Executive Summary

1.1 Introduction

The Irvine Ranch Water District (IRWD), Mesa Consolidated Water District (MCWD), the City of Newport Beach and City of Santa Ana are contiguous water purveyors in central Orange County. All four agencies have similar sources for their potable water supplies. MCWD, Newport Beach, Santa Ana and a portion of IRWD's service area are within the Orange County Water District's groundwater basin. In addition, all four agencies receive imported surface water through the Metropolitan Water District of Southern California's (MWD's) conveyance systems.

In addition to these local and imported supply sources, all four agencies have existing emergency interconnections with neighboring agencies, including the other agencies in this study. In an effort to be more prepared for emergency outages, wild fire situations, and extreme drought conditions, the agencies would like to inventory and analyze the adequacy of these existing interconnections. In addition, a goal of the agencies is to define operational requirements for each interconnection and to quantify the availability of water supply from each agency in various scenarios.

While it is believed that the existing interconnections are useful to supply water to smaller, isolated service areas for a limited duration, the agencies would like to study opportunities to use these and future interconnections more strategically.

In addition, several of the agencies plan to develop and/or expand their local water supplies within the next twenty five years. The agencies would like to analyze any new water distribution facilities required to efficiently transport the new water supply to their neighboring agencies during an emergency. In order to meet these goals, this Emergency Interconnection Study was initiated.

1.2 Domestic Water Demands and Supplies

Before the domestic water distribution systems and existing interconnections are hydraulically analyzed to evaluate the ability of each agency to deliver water to another agency, each agencies surplus water supply is estimated. Since this study considers both current and future conditions, each agencies surplus water supply infrastructure is estimated for the most current year and twenty five years in the future.

To estimate the surplus domestic water for each agency, the average day and maximum day water demands are subtracted from the available water supplies. When analyzing water supply outage scenarios, it will be important to understand the source of supply. Therefore, water supply sources are identified and subtotaled by local and imported sources.

The computations show that each agency has surplus water available during average and maximum day demands. The surplus supply by agency during maximum day demands varies from approximately 38,000 gpm to 44,000 gpm, with a total surplus supply for the four agencies of approximately 164,000 gpm in the current year. If all planned water supply projects are operational before 2035, the future water supply surplus will decrease during maximum day demands to approximately 145,000 gpm, as the new water supply sources will be less than the projected increases in future demands.

1.3 Existing Interconnections

In addition to their local and imported supply sources, all four agencies have existing emergency interconnections with neighboring agencies, including the other agencies in this study. Most of these interconnections can only accommodate a small flow rate. Some of the existing interconenctions are un-metered, and most are not maintained. The four agencies' 22 emergency interconnections are inventoried and each's adequacy during an emergency is analyzed.

1.4 Potential Emergency and Supply Outage Scenarios

Each of the four participating agencies identified two potential emergency demand and/or emergency supply outage scenarios to analyze in this study. IRWD's emergency scenarios are 1) a Diemer WFP outage, and 2) a Dyer Road Wellfield Pipeline outage. MCWD's emergency scenarios are 1) an outage of Wells 5, 7 and 8, and 2) a large fire at South Coast Plaza. Newport Beach's emergency scenarios are 1) a failure of their 36-inch well supply transmission main, and 2) an Orange County Feeder pipeline outage. Santa Ana's emergency scenarios are a city-wide power outage, and 2) a large fire near MacArthur Boulevard and SR-55.

1.5 Hydraulic Model

A skeletonized hydraulic model has been created for the four agencies. This model combines existing models provided by IRWD, MCWD and Newport Beach. Santa Ana does not have a hydraulic model. However, they have GIS water piping and land use shape files that are used to create a skeletonized model.

The combined hydraulic model is used to evaluate the existing interconnections during normal operations, the effectiveness of the existing interconnections during the identified emergency scenarios, and the predicted performance of the potential new interconnections during the identified emergency scenarios.

1.6 Potential Interconnection Improvements

Most of the existing interconnections are for local areas to alleviate only localized emergency water supply and demand conditions. As part of this study, potential interconnections are identified that would provide more regional benefit. Potential interconnections have been identified for all agencies participating in this study. These include potential interconnections between IRWD, and MCWD, Newport Beach and Santa Ana. Potential interconnections are also identified between MCWD, and Newport Beach and Santa Ana. Table 1.1 provides a summary of the nine potential interconnections.

Table 1.1: Summary of Potential Interconnections

	Description	Agency	HGL (ft)	Agency	HGL (ft)
P01	Segerstrom to Sunflower along Bear	IRWD	330	MCWD	258
P02	Bonita Canyon near Mesa View	IRWD	355	MCWD	460 - 550
P03	University near MacArthur	IRWD	355	Newport Beach	295 - 450
P04	Old Ford Road near Bonita Canyon Sports Park	IRWD	355	Newport Beach	450
P05	Segerstrom and Bear Intersection	IRWD	330	Santa Ana	260
P06	Red Hill and Warner Intersection	IRWD	290	Santa Ana	250
P07	19th St. between Balboa and Whittier	MCWD	250	Newport Beach	100
P08	Bear and Sunflower Intersection	MCWD	258	Santa Ana	250
P09	Segerstrom to Sunflower along Bear	MCWD	258	Santa Ana	250

The hydraulic model is used to evaluate the effectiveness of each potential interconnection during the emergency scenarios. Preliminary engineers' estimates of probable construction costs are then computed for each of the identified potential emergency interconnections. The preliminary cost estimates are provided in Table 1.2.

Table 1.2: Preliminary Estimate of Probable Cost by Interconnection

Connection	Agency	Agency	Benefitting Agency	Preliminary Cost
P01	IRWD	MCWD	MCWD	$ 1,793,000
P02	IRWD	MCWD	IRWD	$ 189,000
P03	IRWD	Newport Beach	Both	$ 918,000
P04	IRWD	Newport Beach	IRWD	$ 178,000
P05	IRWD	Santa Ana	Santa Ana	$ 189,000
P06	IRWD	Santa Ana	Santa Ana	$ 186,000
P07	MCWD	Newport Beach	Newport Beach	$ 189,000
P08	MCWD	Santa Ana	Both	$ 189,000
P09	MCWD	Santa Ana	Both	$ 1,800,000

Chapter 2

Introduction

Chapter 2 - Introduction

2.1 Purpose of the Study

The Irvine Ranch Water District (IRWD), Mesa Consolidated Water District (MCWD), the City of Newport Beach and City of Santa Ana are contiguous water purveyors in central Orange County. All four agencies have similar sources for their potable water supplies. MCWD, Newport Beach, Santa Ana and a portion of IRWD's service area are within the Orange County Water District. As such, the agencies are able to pump from the Orange County groundwater basin to the Basin Production Percentage (BPP). All four agencies pump groundwater from the middle, or principal, aquifer. In addition, IRWD and MCWD pump water from the deep aquifer.

IRWD, MCWD and Newport Beach are member agencies of the Municipal Water District of Orange County (MWDOC). Santa Ana and MWDOC are member agencies of the Metropolitan Water District of Southern California (MWD). Being member agencies of MWD, all four agencies are able to receive imported surface water through MWD's conveyance systems.

In addition to these local and imported supply sources, all four agencies have existing emergency interconnections with neighboring agencies, including the other agencies in this study. Most of these interconnections can only accommodate a small flow rate. Many are un-metered, and most have not been maintained.

In an effort to be more prepared for emergency outages, wild fire situations, and extreme drought conditions, the agencies would like to inventory and analyze the adequacy of these existing interconnections. In addition, a goal of the agencies is to define operational requirements for each interconnection and quantify the availability of water supply from each agency in various scenarios.

While it is believed that the existing interconnections are useful to supply water to smaller, isolated areas for a limited duration, the agencies would like to study opportunities to use these and future interconnections more strategically.

In addition, several of the agencies plan to develop and/or expand their local water supplies in the next twenty five years. The agencies would like to analyze the new water distribution facilities required to efficiently transport the new water supply to their neighboring agencies during an emergency. In order to meet these goals, this Emergency Interconnection Study was initiated.

2.2 Participating Agencies

2.2.1 Irvine Ranch Water District

Irvine Ranch Water District (IRWD) was established in 1961 as a California Water District. IRWD's service area encompasses approximately 179 square miles, and serves the city of Irvine and portions of Costa Mesa, Lake Forest, Newport Beach, Tustin, Santa Ana, and Orange and unincorporated Orange County. IRWD provides potable water to a population of 330,000 through a water distribution system of over 1,200 miles of pipelines.

Groundwater has been developed both in the Irvine Sub-Basin and in the Main Orange County Groundwater Basin's principal and deep aquifers. In addition, IRWD is planning to develop more groundwater supply capacity in each of these basins. With other local agencies in southern Orange County, IRWD is developing a new local surface water and imported raw water supply source, called the Baker Treatment Plant facility. Lastly IRWD is studying new local supplies from inland well fields in the Anaheim area.

In addition to its local and imported water supplies, IRWD has emergency interconnections with the City of Newport Beach, East Orange County Water District, Santa Margarita Water District, Trabuco Canyon Water District, City of Tustin, Mesa Consolidated Water District, the City of Orange and El Toro Water District.

2.2.2 Mesa Consolidated Water District

Mesa Consolidated Water District (MCWD) was formed on January 1, 1960 as a result of the merger of four water agencies. MCWD's primary purpose is to manage and deliver water and water-related services to customers within its service area. MCWD distributes a combination of imported water, local groundwater and recycled water to approximately 23,500 retail accounts in an 18 square mile area. MCWD serves a population of over 100,000 in the City of Costa Mesa, parts of the City of Newport Beach and unincorporated Orange County, including the John Wayne Airport.

MCWD's distribution system is a single pressure zone system with approximately 350 miles of pipelines, two storage reservoirs with booster pump stations, eight wells, one pressure reducing station, seven flow control stations, four imported water connections, two metered interconnections and

fifteen emergency interconnections. The interconnections are with the City of Huntington Beach and IRWD.

In addition to the MWDOC imported water connections and the interconnection with the City of Huntington Beach, MCWD has four emergency interconnections with the City of Santa Ana, seven emergency interconnections with the City of Newport Beach and five emergency interconnections with IRWD.

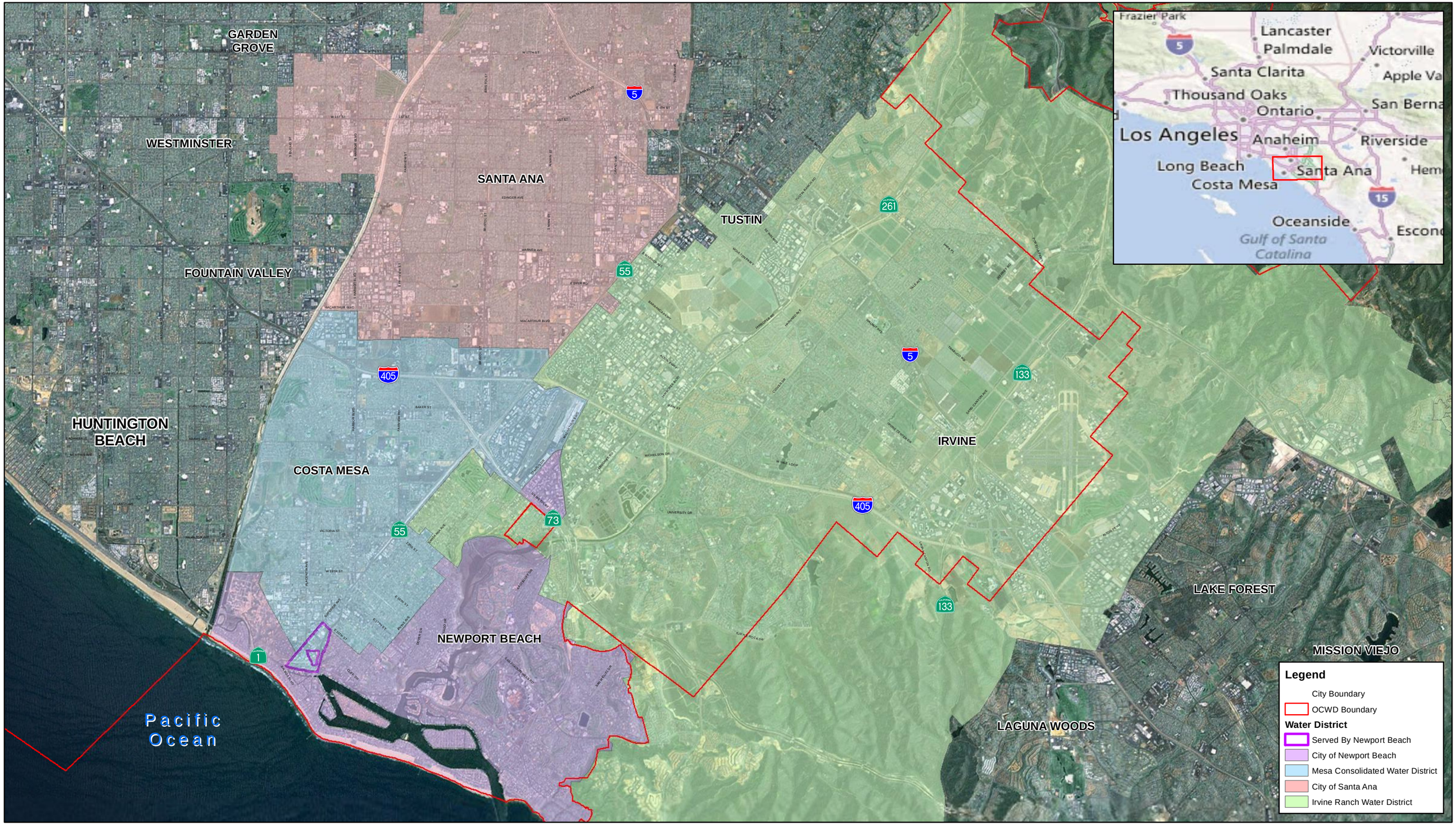
2.2.3 City of Newport Beach

The City of Newport Beach was incorporated in 1906 and includes an area of approximately 51.5 square miles. The water service area is entirely within the City's boundaries and covers approximately 35.77 square miles. Newport Beach delivers potable water through its water distribution system which consists of approximately 284 miles of pipelines ranging in size from 4-inch to 30-inch. Newport Beach's distribution system includes five pressure zones and six connections along the Orange County Feeder and the East Orange County Feeder No. 2. Newport Beach also operates four wells in the City of Fountain Valley.

2.2.4 City of Santa Ana

The City of Santa Ana serves a population of approximately 347,000 over an area of approximately 27.43 square miles. Santa Ana joined MWD in 1928 as one of its original cities. Santa Ana has two water pressure zones, with the majority of the system in one zone. Groundwater wells are distributed throughout Santa Ana's service area, but are more concentrated in the northern portion of the City. Santa Ana maintains 444 miles of transmission and distribution mains, eight reservoirs with a storage capacity of 49.3 million gallons, seven pumping stations, twenty-one wells and seven import connections. Santa Ana has four emergency interconnections with MCWD.

Figure 2-1 shows the service area of each of the four participating agencies and their physical relationship to each other.



M:\Mdata\0107078\GISEx 2-1 Service Area.mxd 3/26/12 DJ

0 1 2 Miles

Source: ESRI Online, IRWD

Service Areas of Participating Agencies

Figure 2-1

Chapter 3

Domestic Water Demands and Supplies

Chapter 3 – Domestic Water Demands and Supplies

3.1 Introduction

Before the domestic water systems and existing interconnections are hydraulically analyzed to evaluate the ability of each agency to deliver water to another agency, each agencies surplus water supply must be estimated. Since this study considers both current and future conditions, each agencies surplus water supply infrastructure should be estimated for the most current year and twenty five years in the future.

Since this study is in the context of an emergence scenario, the estimated surpluses will be based on capacities of the facilities. They will not be based on the BPP or contractual limits with the Municipal Water District of Orange County or Metropolitan Water District of Southern California.

To estimate the surplus domestic water for each agency, the average day and maximum day water demands will be subtracted from the available water supplies. When analyzing water supply outage scenarios, it will be important to understand the source of supply. Therefore, water supply sources will be identified and subtotaled by local and imported sources.

3.2 Domestic Water Demands

Table 3.1 shows the existing (2010) and future (2035) average day potable water demands for each agency.

Table 3.1: Average Day Water Demands by Agency

Agency	Average Day Demand - 2010		Average Day Demand - 2035	
	(AFY)	(cfs)	(AFY)	(cfs)
Irvine Ranch Water District	57,400	79.3	87,100	120.3
Mesa Consolidated Water District	18,350	25.3	18,350	25.3
Newport Beach, City of	15,246	21.1	18,501	25.6
Santa Ana, City of	39,000	53.9	50,400	69.6
Total Average Day Demand	129,996	179.6	174,351	240.8

3.3 Domestic Water Supplies

All four water agencies currently have diverse sources of domestic water supply including both local and imported supplies. In addition, several of the agencies plan to expand their sources of supply in the near future. For this study, the near future is defined as 2035.

3.3.1 Current (2010) Water Supplies

A. Current Local Water Supplies

MCWD, Newport Beach, Santa Ana and a portion of IRWD's service area are within the Orange County Water District (OCWD) boundaries. As such, the agencies are able to pump from the Orange County Groundwater Basin to the Basin Production Percentage (BPP) for the portions of their service areas that are within the OCWD boundaries. All four agencies pump groundwater from the middle, or principal, aquifer. In addition, MCWD and IRWD pump a portion of their supplies from the deep aquifer.

IRWD

IRWD has developed groundwater in the Irvine Sub-Basin, and in the principal and deep aquifers of the Orange County Groundwater Basin. The wells in the Irvine Sub-Basin are part of the Irvine Desalter Project and are located in the center of IRWD's service area. The wells in the principal aquifer of the Main Orange County Groundwater Basin are in Santa Ana at the Dyer Road Well Field (DRWF). Through their Deep Aquifer Treatment System (DATS), IRWD has developed a water supply source in the deeper aquifer. Table 3.2 provides a listing of IRWD's current local water supplies by well.

Table 3.2: IRWD – Local Water Supplies by Well

Well No.	Year Drilled	Depth (feet)	Average Capacity (gpm)
DRWF1	1979	1,320	1,725
DRWF2	1981	1,445	2,340
DRWF3	1994	1,000	1,500
DRWF4	1983	1,025	2,280
DRWF5	1997	1,350	2,400
DRWF6	1998	1,648	3,280
DRWF7	1992	2,770	1,450
DRWF10	1994	1,000	2,370
DRWF11	1986	880	2,350
DRWF12	1980	1,210	1,980
DRWF13	1983	1,085	2,170
DRWF14	1983	980	2,545
DRWF15	1991	1,010	2,550
DRWF16	1996	1,000	1,640
DRWF17	1994	1,000	1,950
DRWF18	1983	1,085	1,800
C-8 (DATS)	2000	1,830	2,500[a]
C-9 (DATS)	2000	1,830	2,500[a]
Irvine Sub-Basin			3,600
110 (IDP)	2003	1,064	700
115(IDP)	2006		900
107(IDP)	2011	1,050	900
77(IDP)	2003	1,003	700
76(IDP)	2003	944	700

a. Flow rate shown is the net production rate.

The Dyer Road Wellfield includes a system of sixteen wells. When all wells are operating, the headlosses in the Dyer Road transmission main are high. This causes every well pump to shift left on its pump curve, reducing each's capacity. To account for this pumping situation, Table 3.3 provides the total capacity of each type of IRWD current local water supply.

Table 3.3: IRWD – Current Local Water Supplies

Well Type	Average Capacity (gpm)
Dyer Road Wellfield	35,900
Deep Aquifer Treatment System (DATS)	4,500
Irvine Sub-Basin	3,600
Irvine Desalter Project (IDP)	3,800
Total	**47,800**

MCWD

Mesa Consolidated Water District has eight active wells. Wells 6 and 11 are colored water wells. These wells produce groundwater from the lower aquifer. The clear water wells include Wells 1, 3 and 9. Wells 5, 7 and 8 produce a blend of clear and colored water. The color in Wells 7 and 8 has increased ove time. Well 10 was drilled, but abandoned after pump testing due to low yield. Well 2 and Well 4 have been abandoned from production. Data for the MCWD wells is summarized in Table 3.4.

Table 3.4: MCWD – Current Local Water Supplies

Well No.	Year Drilled	Depth (feet)	Average Capacity (gpm)
1	1994	610	2,400
3	1989	600	1,400
5	1980	960	2,400
6	1983	1,200	3,000[a]
7	1986	580	1,400
8	1991	600	1,600
9	1993	610	1,600
11	1999	1,200	3,000[a]
Total			**16,800**

a Well capacity shown is the net production rate. Assuming a two percent non-reclaimable waste from the Colored Water Treatment Plant, the average well pump rate will be approximately 3,060 gpm.

City of Newport Beach

The City of Newport Beach has four wells in the Orange County Groundwater Basin. These wells, located in the City of Foutain Valley are called the Dolphin Shallow, Dolphin Deep, Tamera Shallow and Tamera Deep. Data for the Newport Beach wells is shown in Table 3.5.

Table 3.5: Newport Beach – Current Local Water Supplies

Well Name	Year Drilled	Depth (feet)	Average Capacity (gpm)
Dolphin Shallow	1997	610	2,500
Dolphin Deep	1997	670	3,000
Tamera Shallow	1997	600	2,300
Tamera Deep	1997	710	3,200
Total			**11,000**

City of Santa Ana

The City of Santa Ana has 21 wells located throughout the City. Thirteen of the City wells pump into small reservoirs with booster stations pumping the water into the distribution system. The remaining wells pump directly into the City's distribution system. Data for the City of Santa Ana's current local water supplies is summaraized in Table 3.6.

Table 3.6: City of Santa Ana – Current Local Water Supplies

Well No.	Year Drilled	Depth (feet)	Average Capacity (gpm)
16	1932	978	1,425
18	1956	654	1,729
20	1962	981	3,060
21	1962	986	2,795
24	1965	688	1,214
26	1967	1,186	1,659
27	1976	1,152	2,805
28	1976	990	1,951
29	1980	1,090	2,141
30	1982	989	2,800
31	1984	1,260	2,500
32	1985	1,030	0
33	1986	1,080	2,706
34	1990	830	1,496
35	1992	1,500	2,700
36	1987	1,310	3,264
37	1992	1,506	2,700
38	1992	1,300	2,447
39	2002	1,310	3,265
40	2008	1,320	2,267
41	2008	1,000	2,728
Total			**47,652**

Table 3.7 summarizes the current local water supplies for each of the four agencies.

Table 3.7: Current Local Water Supplies by Agency

Agency	Average Capacity (gpm)
Irvine Ranch Water District	47,800
Mesa Consolidated WD	16,800
Newport Beach	11,000
Santa Ana	47,652
Total	**123,252**

B. Current Imported Water Supplies

Each agency receives imported water from the Metropolitan Water District of Southern California (MWD). IRWD, MCWD and the City of Newport Beach are member agencies of the Municipal Water District of Orange County (MWDOC). MWDOC and the City of Santa Ana are member agencies of MWD. Being member agencies of MWD, all four agencies are able to receive imported surface water. For these agencies, imported water can be supplied from the Weymouth Filtration Plant through the Orange County Feeder (OCF) and from the Diemer Filtration Plant (DFP) through the East Orange County Feeder No. 2 (EOCF #2). In addition, IRWD receives imported water from Diemer through the Allen-McColloch Pipeline (AMP).

IRWD

The majority of IRWD's imported domestic water is supplied by a single source; the MWD DFP located north of Yorba Linda. Typically, DFP receives a blend of Colorado River water from Lake Matthews through the MWD lower feeder and State Water Project water through the Yorba Linda Feeder.

The two major transmission pipelines that deliver DFP water to IRWD are the AMP and EOCF #2. IRWD owns 64.7 cfs capacity in the AMP and 41.4 cfs capacity in all reaches of the EOCF #2 down to Coastal Junction. In addition to DFP imported water, IRWD also receives up to 18.0 cfs of domestic water from the Weymouth Filtration Plant. The Weymouth Filtration Plant can deliver 8.0 cfs of product water via turnout OC 7 from the OCF, which was acquired through IRWD's consolidation with Santa Ana Heights Mutual

Water Company, and 10.0 cfs in the Coastal Supply Line (CSL), which is an extension of the OCF that serves the coastal area. A summary of IRWD's available imported water supplies is provided in Table 3.8.

Table 3.8: Irvine Ranch Water District - Current Imported Water Supplies

Turnout No.	Supply Pipeline	Supply Source	Turnout Capacity (cfs)	Reach Capacity (cfs)
OC 7	OCF[a]	Weymouth	8.0	8.0
CSL	OCF[a]	Weymouth	10.0	10.0
OC 38	EOCF#2[a]	Diemer	14.0	
OC 39	EOCF#2[a]	Diemer	40.0	
OC 57	EOCF#2[a]	Diemer	20.0	41.4
OC 58	EOCF#2	Diemer	10.0	
OC 63	EOCF#2[a]	Diemer	20.0	
OC 68	AMP	Diemer	5.0	
OC 71	AMP	Diemer	12.5	
OC 72	AMP	Diemer	50.0	
OC 73	AMP	Diemer	10.0	64.7
OC 73A	AMP	Diemer	30.0	
OC 74	AMP	Diemer	30.0	
OC 75	AMP	Diemer	10.0	
		Total	269.5	124.1

a. Turnout is located downstream of the Santa Ana Cross Feeder. Therefore, this turnout can be supplied from either the Orange County Feeder or East Orange County Feeder No. 2.

MCWD

MCWD imports domestic water from four MWDOC water connections, called CM-2, CM-6, OC-14 and OC-44. The imported water connection OC-44 does not connect directly into MCWD's water distribution system. Water from this connection is conveyed through the OC-44 transmission pipeline from OC-44, east of MCWD, through MCWD's service area to the west end where the City of Huntington Beach has a metered connection. The transmission pipeline is jointly owned by MCWD and the City of Huntington Beach. MCWD has seven connections, or turnouts, to the OC-44 transmission pipeline. Four of these turnouts are metered and the other three are inactive. There is one pressure reducing station that reduces the pressure within the OC-44 transmission pipeline. A summary of MCWD's current imported water supplies is provided in Table 3.9.

Table 3.9: Mesa Consolidated Water District - Current Imported Water Supplies

Turnout No.	Supply Pipeline	Supply Source	Turnout Capacity (cfs)	Reach Capacity (cfs)
CM-2	OCF[a]	Weymouth	15.0	15.0
CM-6	OCF[a]	Weymouth	4.0	4.0
OC 14	OCF[a]	Weymouth	10.0	10.0
OC 44	EOCF#2	Diemer	60.0[b]	60.0[b]
		Total	89.0	89.0

a. Turnout is located downstream of the Santa Ana Cross Feeder. Therefore, this turnout can be supplied from either the Orange County Feeder or East Orange County Feeder No. 2.
b. The turnout capacity is 75.0 cfs. However, the City of Huntington Beach has rights to 15.0 cfs of this capacity.

Newport Beach

Newport Beach has six connections along the Orange County Feeder and the East Orange County Feeder No. 2. Most of these connections are located in the northern and northeast portions of Newport Beach's service area. A summary of Newport Beach's imported water supplies is provided in Table 3.10.

Table 3.10: Newport Beach - Current Imported Water Supplies

Turnout No.	Supply Pipeline	Supply Source	Turnout Capacity (cfs)	Reach Turnout Capacity (cfs)	HGL (Feet)
CM-1	OCF [a]	Diemer	15.0	15.0	283
CM-6	OCF [a]	Diemer	4.0	4.0	305
CM-8	OCF [a]	Diemer	40.0	40.0	292
CM-9	OCF [a]	Diemer	7.5	7.5	280
CM-11	Irvine Cross Feeder		30.0	30.0	436
CM-13	OCF [a]	Diemer	7.5	7.5	305
		Total	104.0	104.0	

a. Turnout is located downstream of the Santa Ana Cross Feeder. Therefore, this turnout can be supplied from either the Orange County Feeder or East Orange County Feeder No. 2.

Santa Ana

Santa Ana maintains seven imported water connections that can receive water through MWD's Orange County Feeder and East Orange County

Feeder No. 2 pipelines. The seven turnouts have a combined capacity of 100.0 cfs. A summary of Santa Ana's current imported water supplies is provided in Table 3.11.

Table 3.11: Santa Ana – Current Imported Water Supplies

Turnout No.	Supply Pipeline	Supply Source	Turnout Capacity (cfs)	Reach Capacity (cfs)
SA-1	OCF	Weymouth	10.0	10.0
SA-2	OCF	Weymouth	10.0	10.0
SA-3	OCF	Weymouth	10.0	10.0
SA-4	OCF	Weymouth	15.0	15.0
SA-5	OCF[a]	Weymouth	10.0	10.0
SA-6	EOCF#2	Diemer	20.0	20.0
SA-7	EOCF#2[a]	Diemer	25.0	25.0
		Total	100.0	100.0

Table 3.12 provides a summary of current imported water supplies by MWD treatment plant and by agency.

Table 3.12: Current Imported Water Supplies by Agency

Agency	Weymouth Supply Source (cfs)	Diemer Supply Source (cfs)	Total Turnout Capacity (cfs)
Irvine Ranch Water District	18.0	106.1	124.1
Mesa Consolidated Water	29.0	60.0	89.0
Newport Beach	0	104.0	104.0
Santa Ana	55.0	45.0	100.0
Total	102.0	315.1	417.1

3.3.2 Future (2035) Water Supplies

In addition to their existing supplies, several of the agencies have plans to expand their water supplies in the near future. These planned water supply improvement projects are described below.

IRWD

Expansion of IRWD's Groundwater Production Capacity (Local)

IRWD is planning to develop more groundwater supply capacity through the equipping and constructing of Well Nos. 51, 52, 53 in the cities of Irvine and Tustin; wells within the Legacy Park Development (formerly MCAS-Tustin) in the City of Tustin; expansion of the IDP through the drilling and equipping of a new IDP well (Well 106); and expanded Orange Park Acres (OPA) well pumping.

IRWD Joint Anaheim Well Field (Local)

IRWD is studying a joint project with the City of Anaheim, called the Inland Well Fields. This project will be located in the Orange County groundwater basin forebay area, near the recharge facilities in Anaheim.

Baker Filtration Plant (Imported)

In a partnership between IRWD, Santa Margarita Water District, Moulton Niguel Water District and El Toro Water District, IRWD is currently designing a new surface water microfiltration plant to be located in the City of Lake Forest. Although the supply source will be Irvine Lake, a local resource, the majority of the water supplied to Irvine Lake will be imported raw water from MWD. Therefore, this water supply source is considered an imported water supply.

MCWD

Expansion of MCWD Colored Water Treatment Plant (Local)

MCWD has been operating a colored water treatment plant since 2000. In 2010, the existing plant was demolished and a new plant is under construction. When the plant is operational next year, the plant capacity will increase from 4,000 gpm to 6,000 gpm. This plant will allow MCWD to fully utilize the production capabilities of Well 6 and Well 11. Although this project will not increase future supplies, it will allow MCWD to fully utilize its well pumping capacity.

Newport Beach

Huntington Beach Seawater Desalination Facility (Local)

Poseidon Resources has permits and plans to construct a 50 million gallons per day (mgd) seawater desalination plant in the City of Huntington Beach. The City of Newport Beach has submitted a leter of interest to Poseidon Resources to purchase finished water from this plant.

With these planned water supply projects, the annual water production will increase by approximately 26,000 gpm, or 47,000 AFY. With the assumption that all projects will be completed by 2035, the future water supply projects are presented in Table 3.13.

Table 3.13: Future Water Supply Projects

Agency / Project	Average Capacity (gpm)
Irvine Ranch Water District	
Local	
Well 106	774
Joint Anaheim Well Field	6,074
Wells 109, 112, 114	2,322
Well 51	1,620
Well 53	1,800
Tustin Legacy	2,430
Well TL-1a (52)	1,620
Expanded OPA Well Pumping	2,520
IRWD Local Subtotal	19,160
Imported	
Baker Water Treatment Plant	4,252
IRWD Subtotal	23,412
Newport Beach	
Huntington Beach Seawater Desalination	2,244
Total	**25,656**

Assuming that all currently planned future local water supply projects are fully implemented by 2035, the future local water supplies by agency are presented in Table 3.14.

Table 3.14: Future Local Water Supplies by Agency

Agency	Average Capacity (gpm)
Irvine Ranch Water District	66,960
Mesa Consolidated WD	16,800
Newport Beach	13,244
Santa Ana	47,652
Total	**144,656**

Assuming that the Baker Treatment Plant is fully operational before 2035, the future imported water supplies by agency are presented in Table 3.15.

Table 3.15: Future Imported Water Supplies by Agency

Agency	Average Capacity (gpm)
Irvine Ranch Water District	55,700
Mesa Consolidated WD	39,946
Newport Beach	48,922
Santa Ana	44,883
Total	**189,451**

3.4 Surplus Domestic Water Supplies Available

3.4.1 Current (2010) Surplus Domestic Water Supplies Available

The current domestic water demands by agency are shown in Table 3.1. The current local and imported water supplies by agency are shown in Table 3.7 and Table 3.12, respectively. Based on this data, surplus water supplies are available for each agency that could be used in an emergency by other agencies. The

estimated current water supply surpluses during average day demands by agencyare presented in Table 3.16.

Table 3.16: Current (2010) Water Supply Surplus by Agency – Average Day

Agency	Average Demand (gpm)	Local Supply (gpm)	Imported Supply (gpm)	Total Supply (gpm)	Surplus Supply (gpm)
IRWD	35,586	47,800	55,700	103,500	67,914
MCWD	11,376	16,800	39,946	56,746	45,370
Newport Beach	9,452	11,000	46,678	57,678	48,226
Santa Ana	24,178	47,652	44,883	92,535	68,357
Total	80,592	123,252	187,207	310,459	229,867

The estimated current water supply surpluses during maximum day demands by agency are presented in Table 3.17.

Table 3.17: Current (2010) Water Supply Surplus by Agency – Maximum Day

Agency	Maximum Day Demand (gpm)	Local Supply (gpm)	Imported Supply (gpm)	Total Supply (gpm)	Surplus Supply (gpm)
IRWD	64,054	47,800	55,700	103,500	39,446
MCWD	18,780	16,800	39,946	56,746	37,966
Newport Beach	13,366	11,000	46,678	57,678	44,313
Santa Ana	50,000	47,652	44,883	92,535	42,535
Total	146,200	123,252	187,207	310,459	164,259

3.4.2 Future (2035) Surplus Domestic Water Supplies Available

The future average day water demands by agency are shown in Table 3.1. The future local and imported water supplies by agency are shown in Table 3.14 and Table 3.15, respectively. Based on this data, surplus water supplies are available for each agency that could be used in an emergency by other agencies. The estimated future water supply surpluses during average day demands by agency are presented in Table 3.18.

Table 3.18: Future (2035) Water Supply Surplus by Agency – Average Day

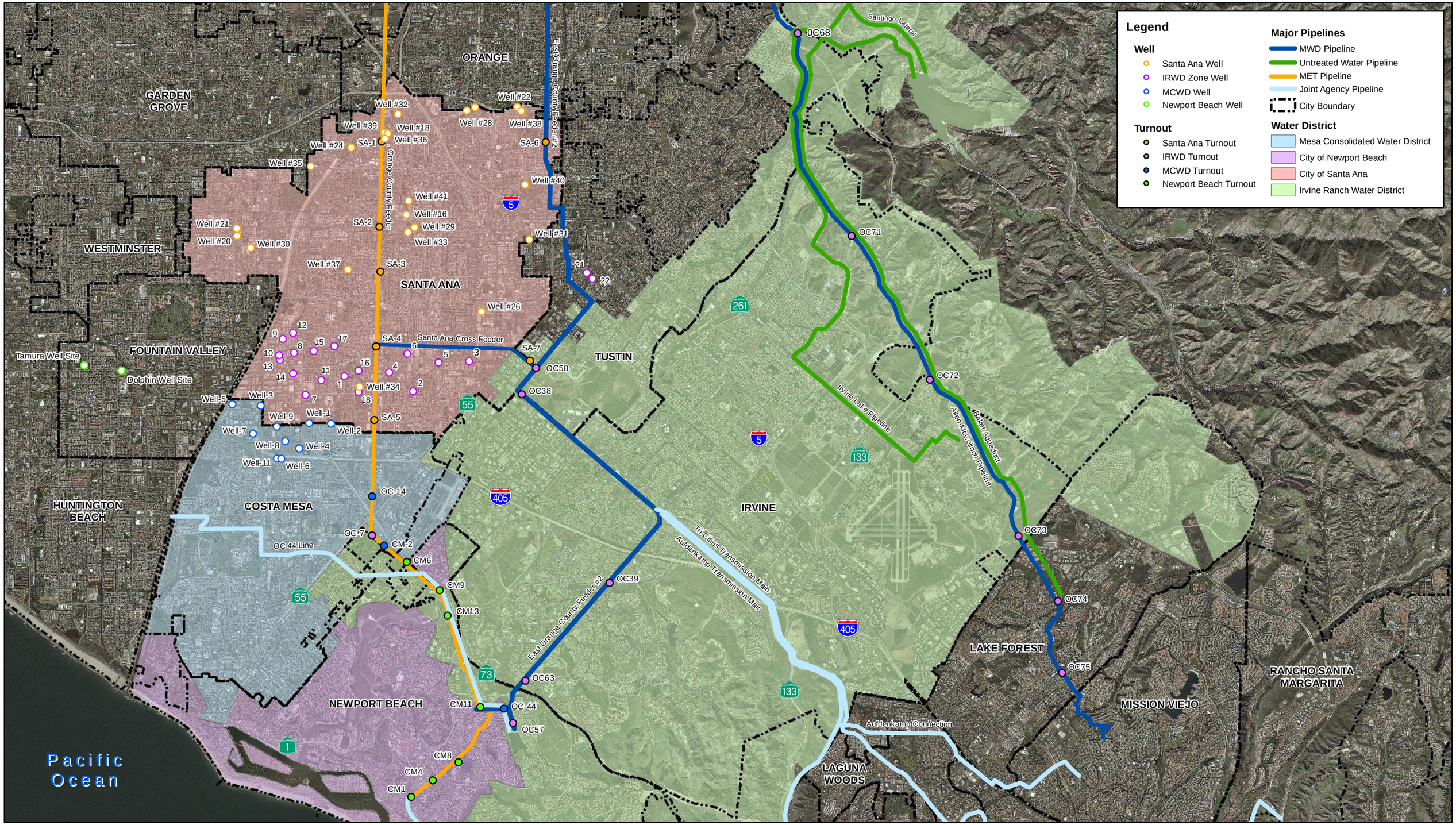
Agency	Average Demand (gpm)	Local Supply (gpm)	Imported Supply (gpm)	Total Supply (gpm)	Surplus Supply (gpm)
IRWD	53,998	66,960	59,952	126,912	72,913
MCWD	11,376	16,800	39,946	56,746	45,370
Newport Beach	11,470	13,244	46,678	59,922	48,452
Santa Ana	31,246	47,652	44,883	92,535	61,289
Total	108,091	144,656	191,459	336,115	228,024

The estimated future water supply surpluses by agency during maximum day demands are presented in Table 3.19.

Table 3.19: Future (2035) Water Supply Surplus by Agency – Maximum Day

Agency	Maximum Demand (gpm)	Local Supply (gpm)	Imported Supply (gpm)	Total Supply (gpm)	Surplus Supply (gpm)
IRWD	97,197	66,960	59,952	126,912	29,715
MCWD	18,780	16,800	39,946	56,746	37,966
Newport Beach	14,834	13,244	46,678	59,922	45,088
Santa Ana	60,000	47,652	44,883	92,535	32,535
Total	190,812	144,656	191,459	336,115	145,303

This intent of this emergency interconnection study is to transport excess water supply from one agency to another during a short-term or long-term emergency. To accomplish this, it is important to understand the geographic locations of the significant supply sources. Figure 3-1 shows the locations of all four agencies' current and future water supply sources.



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Source: Eagle Aerial, IRWD

Water Supply Locations

Figure 3-1

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Chapter 4

Existing Interconnections

Chapter 4 - Existing Interconnections

In addition to their local and imported water supply sources, all four agencies have existing emergency interconnections with neighboring agencies, including the other agencies in this study. Most of these interconnections can only accommodate a small flow rate. In an effort to be more prepared in emergency outages, wild fire situations and extreme drought conditions, the agencies would like to inventory and analyze the adequacy of these existing interconnections.

The four agencies have 22 emergency interconnections. Table 4.1 provides a count of each agency's interconnections.

Table 4.1: Number of Existing Emergency Interconnections

Agency/Agency	IRWD	MCWD	Newport Beach	Santa Ana	Total
IRWD	-	5	6		11
MCWD	5	-	7	4	15
Newport Beach	6	7	-		13
Santa Ana		4		-	4
Total	11	15	13	4	22[#]

Since each interconnection is counted by each agency, the total number of existing interconnections is equal to one half of the total of 44, or 22.

4.1 Existing Interconnections between IRWD and MCWD

IRWD and MCWD currently have five interconnections. Four of the five emergency interconnections include water meters. Also, four of the five interconnections were originally between MCWD and the Santa Ana Heights Mutual Water Company (SAH). The former SAH system was a smaller system with small diameter pipelines. In addition, the system is relatively isolated from the majority of the IRWD water distributions system. Therefore, the existing MCWD and IRWD interconnections cannot transfer a large flow rate of water between systems. Since IRWD's HGL is higher than MCWD's when OC-7 is open, the flow would normally go from IRWD to MCWD. When OC-7 is closed, flow direction would reverses. The major benefit of the existing interconnections is for a local emergency in close proximity to the interconnections. A summary of the IRWD and MCWD interconnections is provided in Table 4.2. The "Design Flow" provided in the table was obtained from the agencies' master plans or atlas maps. The average flow provided is the flow rate predicted by the hydraulic model during normal maximum day demand conditions.

TABLE 4.2: Existing Interconnections between IRWD and MCWD

IRWD			MCWD					
Name	Pipe Dia. (in)	HGL[b] (ft)	Name	Pipe Dia. (in)	HGL[b] (ft)	Design Flow[a] (gpm)	Avg. Flow[b] (gpm)	Location
E1	12	295	IR-1	12	255	3,300	1,260	18601 MacArthur Blvd.
E15	12	224[c] 289[d]	IR-3	12	248[c] 248[d]	1,800	360[c] 2,830[d]	250 Bristol Street
E16	6	219[c] 282[d]	Karl Kemp Reservoir	6	243[c] 243[d]	2,000	2,000	2340 Orange Avenue (MCWD Reservoir No. 2)
E20	10	229[c] 287[d]	IR-2	10	246[c] 246[d]	2,250	280[c] 2,040[d]	Bristol St. @ Irvine Avenue
E23	6	218[c] 282[d]	IR-5	6	243[c] 243[d]	1,350	300[c] 690[d]	23rd St. (northwest of La Linda Pl.)

a. Obtained from MCWD Water Distribution System Plan.
b. Based on hydraulic network analysis during maximum day demands.
c. When OC-7 is closed.
d. When OC-7 is open.

4.2 Existing Interconnections between IRWD and Newport Beach

IRWD and Newport Beach currently have six interconnections. All of these interconnections are metered. For five of the interconnections, the static HGLs on both sides of the facilities are similar. Therefore, flow could go in either direction. Two of the interconnections are in the Newport Coast area, and two are near the former SAH water distribution system. A summary of the IRWD and Newport Beach interconnections is provided in Table 4.3.

TABLE 4.3: Existing Interconnections Between IRWD and Newport Beach

IRWD			Newport Beach							
Name	Pipe Dia. (in)	HGL (ft)[b]	Name	Pipe Dia. (in)	HGL[b] (ft)	Design Flow[a] (gpm)	Avg. Flow[b] (gpm)	Meter Size (in)	Meter Type	Location
E2	12	273[c] 295[d]	IRWD3	12	283	3,300	360[c] 560[d]	12	2 Way	MacArthur Blvd.@ Campus Drive
E3	12	258[c] 289[d]	IRWD4	16	284	3,300	810[c] 280[d]	12	2 Way	MacArthur Blvd.@ Jamboree Road
E9	12	876	IRWD6	16	641	-	3,500	8	2 Way	San Joaquin Hills Rd. @ Spy Glass Hill Road
E10	8	290	IRWD5	6	291	-	70	8	2 Way	Cameo Shores Rd. @ Gorham Drive
E17	6	225[c] 286[d]	IRWD7	16	283	-	675[c] 140[d]		2 Way	Newport Trade Center
E18	8	228[c] 287[d]	IRWD1	8	283	-	700[c] 180[d]	8	1 Way	Orchard @ Irvine Avenue

a. Obtained from IRWD Atlas Maps.

b. Based on hydraulic network analysis during maximum day demands.
c. When OC-7 is closed.
d. When OC-7 is open.

4.3 Existing Interconnections between MCWD and Newport Beach

MCWD and the City of Newport Beach have seven existing emergency interconnections. Most of these interconnections are in the northwest region of Newport Beach's water distribution system and the southeast portion of MCWD's distribution system. Since MCWD's static HGL is significantly lower than Newport Beach's, the Newport Beach service area would need to experience an approximate 30 psi pressure drop for water to flow from MCWD to Newport Beach.

TABLE 4.4: Existing Interconnections Between MCWD and Newport Beach

MCWD			Newport Beach							
Name	Pipe Dia. (in)	HGL (ft)[b]	Name	Pipe Dia. (in)	HGL (ft)[b]	Design Flow[a] (gpm)	Avg. Flow[b] (gpm)	Meter Size (in)	Meter Type	Location
CNB-1	12	243	MCWD5	12	306	1,350	3,320	12	2 Way	E. 15th Street (southeast of Santa Ana Avenue)
CNB-2	8	243	MCWD2	16	278	1,800	2,260	12	2 Way	Irvine Avenue (northeast of E. 19th Street)
CNB-3	16	243	MCWD1	14 & 30	309	3,100	3,330	12	2 Way	Superior Avenue & W. 16th Street
CNB-4	16	243	MCWD4	14 & 24	302	1,350	3,380	-	Non-metered	Monrovia Avenue & W. 16th Street
CNB-5	6	243	MCWD3	12	349	1,350	1,840	-	Non-metered	Superior Avenue (south of Hospital Road)
CNB-6	42	252	MCWD	8	388	1,800	1,800	-	Non-metered	Newport Hills Drive (between Port Cardiff Pl & Ford Drive)
CNB-7	16	247	MCWD 7	16	283	6,700	1,830	16	2 Way	N. Bristol Street & Campus Drive

a. Obtained from MCWD Water Distribution System Plan.
b. Based on hydraulic network analysis during maximum day demands.

4.4 Existing Interconnections between MCWD and Santa Ana

MCWD and the City of Santa Ana have four existing interconnections. Since it is the boundary between agencies, all four interconnections are located along Sunflower Avenue. Both agencies have 12-inch diameter waterlines along this street. The interconnections consist of 8-inch or 12-inch pipelines with two closed gate valves

and without any water meters. The existing interconnections are described in Table 4.5.

TABLE 4.5: Existing Interconnections Between MCWD and Santa Ana

MCWD			Santa Ana					
Name	Pipe Dia. (in)	HGL[b] (ft)	Name	Pipe Dia. (in)	HGL[b] (ft)	Design Flow[a] (gpm)	Avg. Flow[b] (gpm)	Location
CSA-1	12	250	MCWD-1	12	239	3,100	530	3390 Sunflower Avenue (Harbor Boulevard)
CSA-2	12	247	MCWD-2	12	243	3,100	230	Sunflower Avenue & Bear Street
CSA-3	18	250	MCWD-3	12	239	3,100	540	Sunflower Ave. w/o of Greenville Banning Channel
CSA-4	12	247	MCWD-4	12	243	3,100	170	3333 Bristol St. (Sunflower Ave.)

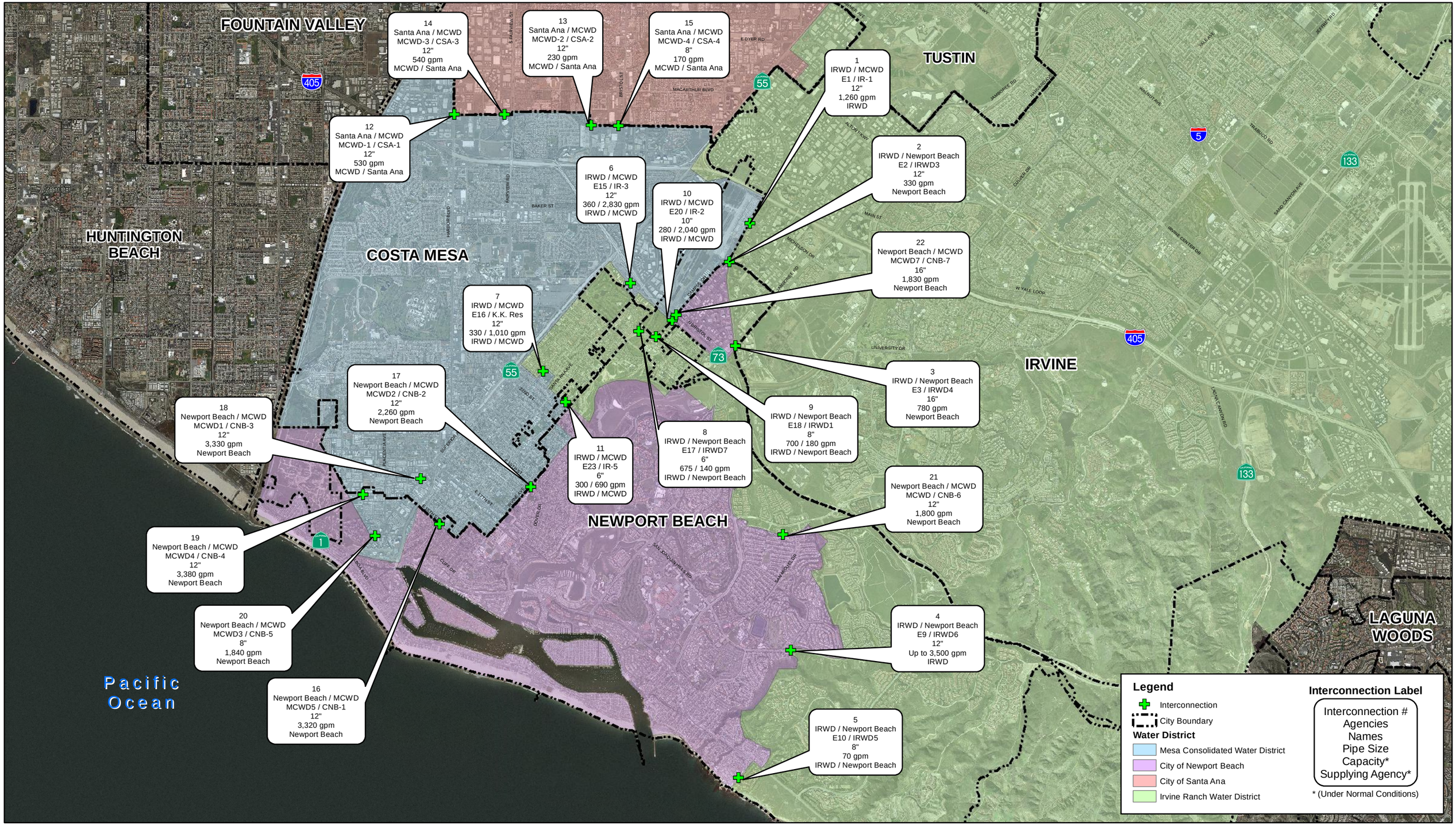
a. Obtained from MCWD Water Distribution System Plan.
b. Based on hydraulic network analysis during maximum day demands.

Table 4.6 provides a summary of all 22 existing interconnections. Figure 4-1 shows the location of each existing interconnection. The labels for each existing interconnection show the two agencies, the name that each agency calls the interconnection, the size of the interconnection, the flow rate through the interconnection under normal operating conditions, and the agency that supplies water during normal operating conditions.

TABLE 4.6: Inventory of Existing Interconnections

No.	Agency	Name	Pipe Dia. (in)	HGL (ft)[a]	Agency	Name	Pipe Dia. (in)	HGL (ft)[a]	Location
1	IRWD	E1	12	290	MCWD	IR-1	12	225	18601 MacArthur Blvd.
2	IRWD	E2	12	290	Newport Beach	IRWD3	12	295	MacArthur Blvd.@ Campus Drive
3	IRWD	E3	12	290	Newport Beach	IRWD4	16	295	MacArthur Blvd.@ Jamboree Road
4	IRWD	E9	12	876	Newport Beach	IRWD6	16	650	San Joaquin Hills Rd. @ Spy Glass Hill Road
5	IRWD	E10	8	290	Newport Beach	IRWD5	6	295	Cameo Shores Rd. @ Gorham Drive
6	IRWD	E15	12	290	MCWD	IR-3	12	225	250 Bristol Street
7	IRWD	E16	12/6	290	MCWD	KK Res	6	225	2340 Orange Avenue (MCWD Reservoir No. 2)
8	IRWD	E17	6	290	Newport Beach	IRWD7	16	295	Newport Trade Center
9	IRWD	E18	8	290	Newport Beach	IRWD1	8	295	Orchard @ Irvine Avenue
10	IRWD	E20	10	290	MCWD	IR-2	10	225	Bristol St. @ Irvine Avenue
11	IRWD	E23	6	290	MCWD	IR-5	6	226	23rd St. (northwest of La Linda Pl.)
12	Santa Ana	MCWD-1	12	260	MCWD	CSA-1	12	235	3390 Sunflower Avenue (Harbor Boulevard)
13	Santa Ana	MCWD-2	12	260	MCWD	CSA-2	12	228	Sunflower Avenue & Bear Street
14	Santa Ana	MCWD-3	12	260	MCWD	CSA-3	12	235	Sunflower Ave. w/o of Greenville Banning Channel
15	Santa Ana	MCWD-4	8	260	MCWD	CSA-4	8	227	3333 Bristol St. (Sunflower Ave.)
16	Newport Beach	MCWD5	16	295	MCWD	CNB-1	12	227	E. 15th Street (southeast of Santa Ana Avenue)
17	Newport Beach	MCWD2	12	295	MCWD	CNB-2	8	225	Irvine Avenue (northeast of E. 19th Street)
18	Newport Beach	MCWD1	16	295	MCWD	CNB-3	16	228	Superior Avenue & W. 16th Street
19	Newport Beach	MCWD4	24	295	MCWD	CNB-4	6	228	Monrovia Avenue & W. 16th Street
20	Newport Beach	MCWD3	12	295	MCWD	CNB-5	12	228	Superior Avenue (south of Hospital Road)
21	Newport Beach	MCWD	12	388	MCWD	CNB-6	12	252	Newport Hills Drive (between Port Cardiff Pl & Ford Drive)
22	Newport Beach	MCWD 7	16	295	MCWD	CNB-7	16	225	N. Bristol Street & Campus Drive

a. Based on static HGL of pressure zone.



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0 1 2 Miles

Source: Eagle Aerial, IRWD

Existing Interconnection Locations

Figure 4-1

Chapter 5

Potential Emergency and Supply Outage Scenarios

Chapter 5 - Potential Emergency and Supply Outage Scenarios

Each of the four participating agencies was asked to identify potential emergency demand and/or emergency supply outage scenarios to analyze in this study. Two potential emergency demand and/or supply outage scenarios are identified for each agency.

5.1 IRWD Emergency Scenarios

In July 2008, IRWD completed a Water Supply Reliability Study to determine the level of adequacy of their system's reliability and supply's reliability. The study identified the two water supply faculties that would be the most challenging to IRWD if a water supply outage were to occur. These two supply facilities are the Metropolitan Water District of Southern California's Diemer Water Filtration Plant (WFP) in Yorba Linda and the Dyer Road Well Field (DRWF) Pipeline.

5.1.1 Diemer WFP Outage

The Diemer WFP supplies potable water to the East Orange County Feeder No. 2 (EOCF No. 2) and the Allen-McColloch Pipeline (AMP). As described in Chapter 3, IRWD's turnout capacities from EOCF No. 2 and the AMP are 41.4 cfs and 64.7 cfs, respectively. If the Diemer WFP were to suffer an outage, these turnouts would be unavailable. The only imported water available to IRWD would be turnouts from the Orange County Feeder (OCF), which receives its water from Weymouth Water Filtration Plant. As shown in Chapter 3, IRWD's turnout capacity from OCF is 18 cfs.

However, the south Orange County water agencies are more dependent on imported than IRWD. If a Diemer WFP outage were to occur, the south Orange County agencies would need more water from Weymouth through the Orange County Feeder. The Water Supply Reliability Study concluded that IRWD's water supply from OCF would be reduced to 5 cfs. Therefore, our analysis assumes that OCF's capacity is reduced to 5 cfs during this emergency outage scenario.

5.1.2 Dyer Road Well Field Pipeline Outage

As shown in Table 3.2, IRWD obtains a significant portion of its water supply from the 16 wells that make up the Dyer Road Well Field. These wells are located along Dyer Road, west of IRWD's service area in Santa Ana. The

water produced by these wells is delivered to IRWD's Zone 1 water distribution system through the Dyer Road Well Field pipeline. If this pipeline were to fail, no water supply from the DRWF would be available to IRWD. This outage is the second scenario studied.

5.2 Mesa Consolidated Water District Emergency Scenarios

MCWD was asked to identify their emergency water supply and demand scenarios. The potential water supply threat identified by MCWD is a temporary shutdown of their three wells that occasionally experience water quality issues. Their second scenario is a large fire demand at South Coast Plaza.

5.2.1 Wells 5, 7 and 8 Outage

As described in Chapter 3, MCWD operates six domestic water wells from Orange County's principal aquifer, in addition to its wells in the deep aquifer. Three of the wells in the principal aquifer experience water quality issues at times. Therefore, an outage scenario is a shut-down of Wells 5, 7 and 8 due to water quality issues.

5.2.2 Large Fire at South Coast Plaza

South Coast Plaza is a very large retail mall located near the boundary of MCWD and in close proximity to Santa Ana's distribution system. MCWD's second emergency scenario is a large fire at South Coast Plaza.

5.3 Newport Beach Emergency Scenarios

The City of Newport Beach was asked to identify their water supply sources that are critical to their system and that may be interrupted in an emergency situation. The City concluded that the most significant water supply outages would be a failure along the 36-inch transmission main that is routed through Fountain Valley, Huntington Beach and along a drainage channel from the City's four wells to its water distribution system, and an outage of the Orange County Feeder.

5.3.1 36-inch Transmission Main Failure

In the 1990's, the City of Newport Beach constructed four domestic water wells in the City of Fountain Valley as described in Chapter 3. These four wells are connected to Newport Beach's distribution system by a five mile

36-inch water transmission main. If this transmission main were to fail, Newport Beach would not be able to receive water supply from these wells. This potential outage is one of the outage scenarios modeled as part of this study.

5.3.2 Orange County Feeder Outage

The Orange County Feeder supplies all of Newport Beach's imported water. If this supply source were to fail, Newport Beach would be dependent on its wells and locally stored water. Outage of Newport Beach's turnouts from the Orange County Feeder is their second outage scenario.

5.4 Santa Ana Emergency Scenarios

As shown in Table 3.16, the City of Santa Ana has sufficient well capacity to supply average day demands. Therefore, imported water outages are not as major of a concern to the City. However, since the City's service area is relatively flat without hills to operate storage tanks, most of the water supply is pumped into the distribution system. While some of the City's wells and pump stations are equipped with back-up power generators, most are not. Therefore, a City-wide power outage would create a critical water supply outage scenario. A second emergency scenario for Santa Ana would be a large fire near Santa Ana's edge of service area in the southeast part of Santa Ana.

5.4.1 City-wide Power Outage

In a Santa Ana city-wide power outage, the only local water supplies available would be all supplies from the Garthe plant and approximately 40% of the supplies from the Walnut plant. No other local supplies would be available.

5.4.2 Large Fire near MacArthur Boulevard and SR-55

A large, high-rise commercial center (Hutton Center) is located between Main Street, MacArthur Boulevard and the Costa Mesa Freeway (SR-55). This area is near the southeast boundary of Santa Ana's service area. It is also near IRWD's and MCWD's service areas. Santa Ana's emergency demand scenario to analyze is a large fire at this high-rise facility.

Table 5.1: Emergency Scenarios

Agency	Outage Scenario
Irvine Ranch Water District	Diemer WFP Outage, OCF flows reduced Dyer Road Well Field pipeline outage
Mesa Consolidated Water District	Three wells out of service (Wells 5, 7 & 8) Large fire at South Coast Plaza
Newport Beach	36-inch Transmission Main failure Orange County Feeder Outage
Santa Ana	Outage of groundwater supplies w/o back-up generators Large fire near MacArthur Blvd. & SR-55

Chapter 6

Hydraulic Model

Chapter 6 – Hydraulic Model

6.1 Available Data

6.1.1 Irvine Ranch Water District

RBF utilized a skeletonized model of IRWD's Zone 1 distribution system in MWH Soft's InfoWater. This model was recently calibrated based on actual flow data and includes boundary conditions.

6.1.2 Mesa Consolidated Water District

In November 2010, DCSE completed the preparation of a hydraulic model of MCWD's domestic water distribution system. This model was calibrated with field flow tests during 2010. The hydraulic model includes all pipelines and demands. It was prepared using MWHSoft's InfoWater.

6.1.3 City of Newport Beach

The City of Newport Beach has a hydraulic model that was originally prepared in 1999 to support the City's Master Plan Update. This hydraulic model was prepared using MWHSoft's H20Net. Over the past twelve years, the model has been updated to reflect infrastructure improvements and new development water demands. In the fall of 2010, the hydraulic model was re-calibrated by IDModeling to reflect flow tests performed in the summer of 2010. The hydraulic model includes all City waterlines.

6.1.4 City of Santa Ana

Although Santa Ana does not have a running hydraulic model of their water distribution system, they have GIS data available. Santa Ana has GIS pipe data and GIS land use information. They also have water demand information, but not estimated water demand factors in the recent past.

6.2 Description of Model

The City of Santa Ana's domestic water hydraulic model was built from the GIS data available. The GIS pipe data was used to built the distribution system. Using InfoWater's demand allocator feature and Santa Ana's GIS land use data, the water demands were distributed throughout the system. IRWD's water demand factors were used to allocate demands based on land use. However, the calculated estimated demands using IRWD's

demand factors were greater than the actual usage data based on their customer billings. Therefore, the demand factors were adjusted downward so that the model water demands would be equal to the actual water demands. This model was run as a stand-alone system.

RBF successfully ran the models of each of the four agencies water systems independently using MWH Soft's InfoWater hydraulic model. Once the individual models were running, they were combined to create a hydraulic model in sufficient detail to determine the flow rates that could be provided through each existing and potential interconnection.

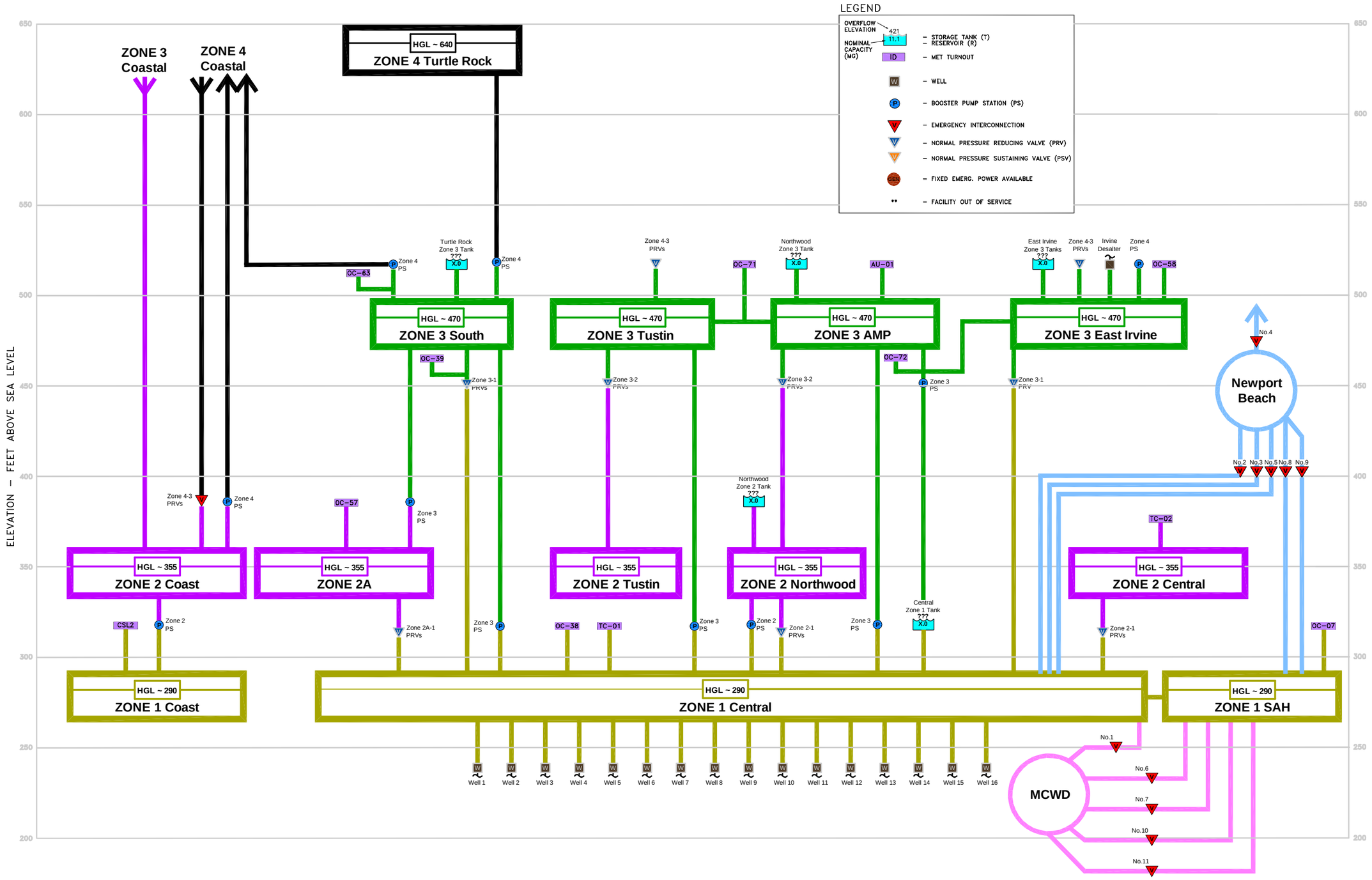
The four agency hydraulic model includes the existing interconnections, major supply sources, major transmission mains, necessary pump stations and potential interconnections. The skeletonized model only includes IRWD's pressure zones where interconnections exist or are recommended. Pressure reducing stations from higher zones and pump stations from lower zones are modeled appropriately as supply sources and mimic actual operations as closely as possible.

Hydraulic schematic diagrams for IRWD's Zone 1 distribution system, MCWD's distributions system, Newport Beach's system and Santa Ana's system are shown in Figures 6-1, 6-2, 6-3 and 6-4, respectively.

6.3 Scenarios Simulated

To evaluate the effectiveness of the existing emergency interconnections, the first scenarios assume maximum day demands with only one of the existing interconnections opened at a time. The flow rates and direction of flow during this scenario are shown in Figure 4-1, and in Table 4.2 through Table 4.5.

In addition to the maximum day demand scenarios, scenarios are created for the eight emergency supply and demand conditions identified in Chapter 5 and summarized in Table 5.1. The eight emergency conditions are each a modeling scenario. For each emergency condition scenario, each of the applicable existing 22 interconnections is opened, with only one open at a time. These scenarios are performed to evaluate the effectiveness of the existing interconnections.



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MULTI-AGENCY INTERCONNECTION STUDY

IRWD WATER SYSTEM
HYDRAULIC SCHEMATIC

FIGURE
6-1

JOB NUMBER 10107078

H:\PDATA\10107078\CADD\WATER\EXHIBITS\WAIS_HYDRAULIC SCHEMATIC.DWG BMESERLIAN 4/10/12 5:24 pm

ELEVATION – FEET ABOVE SEA LEVEL

350
300
250
200
150
100
50

Santa Ana

No.12 No.14 No.13 No.15

OC–44 OC–14 CM2 CM6

HGL ~ 260

Well 1 Well 3 Well 5 Well 7 Well 8 Well 9

PS
4,000 gpm

CWTF

Well 6 Well 11

CWTF: Color Water Treatment Facility

Reservoir No. 1
117.75
9.5

Res. No. 1 PS
9,500 gpm

Kemp Reservoir
81.7
18.7

Kemp PS
18,000 gpm

No.1 No.6 No.7 No.10 No.11

IRWD

No.16 No.17 No.18 No.19 No.20 No.21 No.22

Newport Beach

LEGEND

OVERFLOW ELEVATION
NOMINAL CAPACITY (MG)
421
11.1
– STORAGE TANK (T)
– RESERVOIR (R)
ID – MET TURNOUT
W – WELL
P – BOOSTER PUMP STATION (PS)
V – EMERGENCY INTERCONNECTION
V – NORMAL PRESSURE REDUCING VALVE (PRV)
V – NORMAL PRESSURE SUSTAINING VALVE (PSV)
GEN – FIXED EMERG. POWER AVAILABLE
** – FACILITY OUT OF SERVICE

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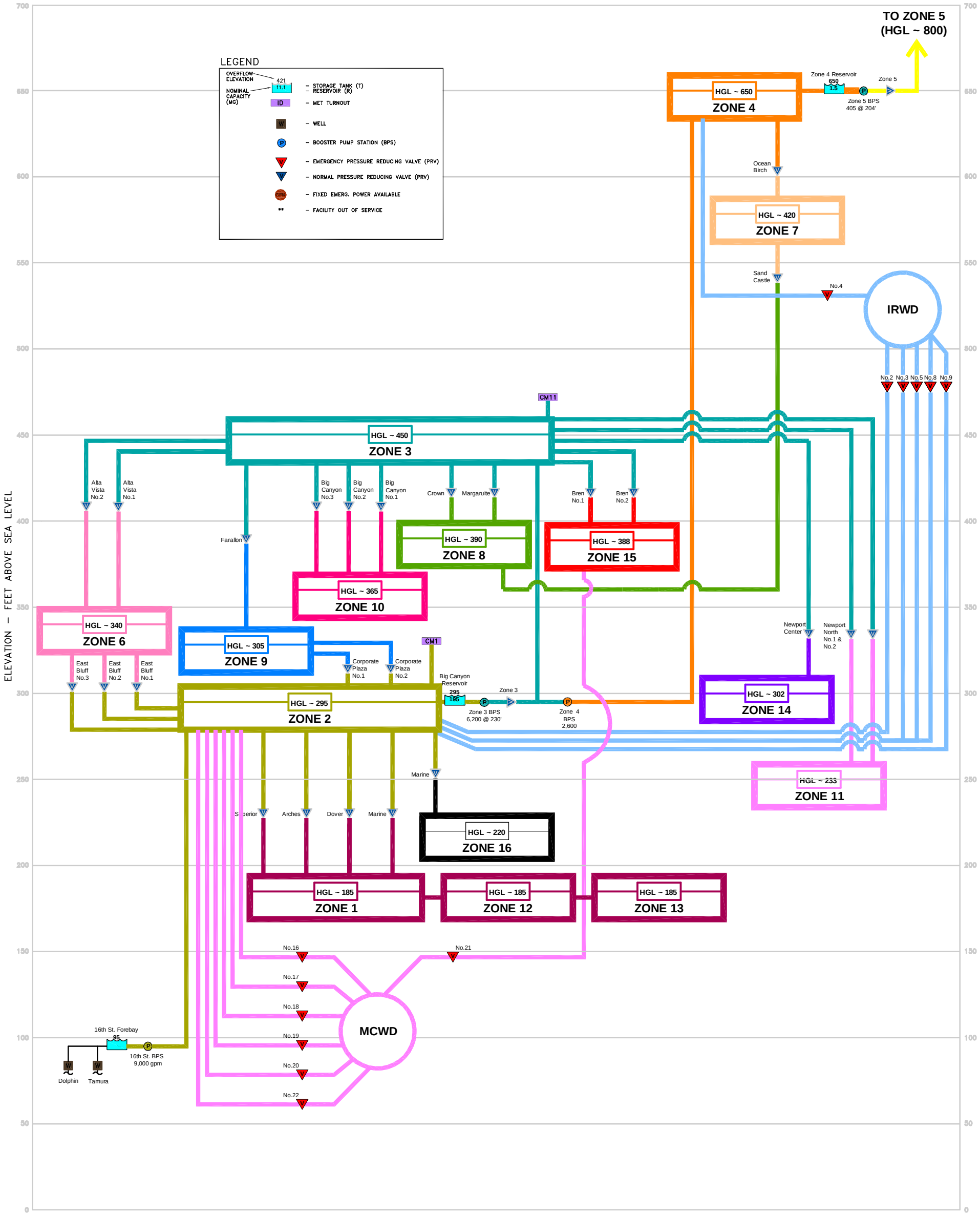
MULTI-AGENCY INTERCONNECTION STUDY

MESA CONSOLIDATED WATER DISTRICT
HYDRAULIC SCHEMATIC

FIGURE
6-2



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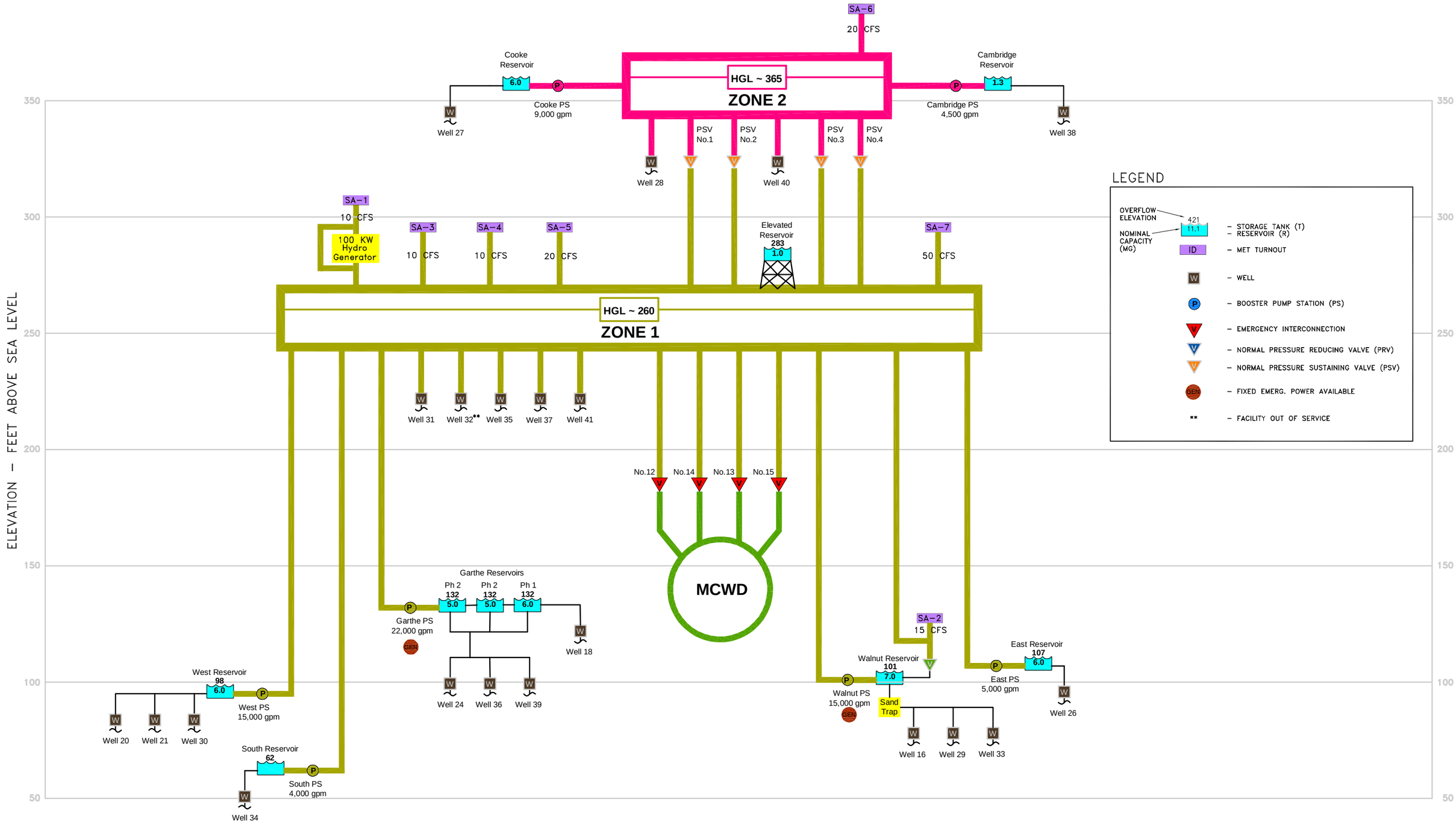
MULTI-AGENCY INTERCONNECTION STUDY

NEWPORT BEACH WATER SYSTEM HYDRAULIC SCHEMATIC

FIGURE 6-3



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MULTI-AGENCY INTERCONNECTION STUDY

SANTA ANA WATER SYSTEM
HYDRAULIC SCHEMATIC

FIGURE
6-4

In addition to the existing interconnections, the nine potential interconnections presented in Chapter 7 will be evaluated based on each one's ability to transfer water during the eight emergency supply and/or demand conditions. These emergency conditions will occur during future (2035) maximum day demands.

6.4 Modeling Results

6.4.1 Existing Emergency Interconnections

The 22 existing emergency interconnections are evaluated to determine the flow rate of water that the hydraulic model predicts could be transferred between agencies during the eight emergency scenarios. The flow rates during each of the emergency scenarios through the interconnections between IRWD, and MCWD and Newport Beach are provided in Table 6.1.

TABLE.6.1: Modeling Results of Existing IRWD Interconnections

Existing Interconnection			Emergency Scenario/ Flow (gpm)							
IRWD Name	Other Agency	Other Agency Name	IRWD 1	IRWD 2	MCWD 1	MCWD 2	CNB 1	CNB 2	Santa Ana 1	Santa Ana 2
E1	MCWD	IR-1	0	890[a]	1,730	3,000	-	-	-	-
E2	Newport Beach	IRWD3	0	2,100	-	-	920	560	-	-
E3	Newport Beach	IRWD4	800	2,300	-	-	370	280	-	-
E9	Newport Beach	IRWD6	0	0	-	-	3,650	3,500	-	-
E10	Newport Beach	IRWD5	0	0	-	-	1,000	70	-	-
E15	MCWD	IR-3	0	0	2,830	4,840	-	-	-	-
E16	MCWD		0	0	1,010	2,110	-	-	-	-
	MCWD	IR-5	0	0	–	-	800	140	-	-
E17	Newport Beach	IRWD7	0	0	-	-	900	180	-	-
E18	Newport Beach	IRWD1	0	0	2,050	3,830	-	-	-	-
E20	MCWD	IR-2	0	0	690	1,500	-	-	-	-

a. MCWD could supply up to 1,800 gpm if all MCWD wells operating during emergency.

The flow rates during each of the emergency scenarios through the interconnections between MCWD, and IRWD, Newport Beach and Santa Ana are provided in Table 6.2.

TABLE.6.2: Modeling Results of Existing MCWD Interconnections

Existing Interconnection			Emergency Scenario/ Flow (gpm)							
Mesa Name	Other Agency	Other Agency Name	IRWD 1	IRWD 2	MCWD 1	MCWD 2	CNB 1	CNB 2	Santa Ana 1	Santa Ana 2
IR-1	IRWD	E1	0	890[d]	1,730	3,000	-	-	-	-
IR-3	IRWD	E15	0	0	2,830	4,840	-	-	-	-
KK Res	IRWD	E16	0	0	1,010	2,110	-	-	-	-
IR-5	IRWD		0	0	690	1,500	-	-	-	-
IR-2	IRWD	E20	0	0	2,050	3,830	-	-	-	-
CSA-1	Santa Ana	MCWD-1	-	-	0	1,610	-	-	890[c]	890[c]
CSA-2	Santa Ana	MCWD-2	-	-	0	4,650[a]	-	-	890[c]	890[c]
CSA-3	Santa Ana	MCWD-3	-	-	0	1,730	-	-	890[c]	890[c]
CSA-4	Santa Ana	MCWD-4	-	-	0	2,460[a]	-	-	890[c]	890[c]
CNB-1	Newport Beach	MCWD5	-	-	3,320	5,000	390	3,320[b]	-	-
CNB-2	Newport Beach	MCWD2	-	-	2,260	3,980	280	2,260[b]	-	-
CNB-3	Newport Beach	MCWD1	-	-	3,330	5,000	430	3,330[b]	-	-
CNB-4	Newport Beach	MCWD4	-	-	3,380	5,000	440	3,380[b]	-	-
CNB-5	Newport Beach	MCWD3	-	-	1,840	2,500	290	1,840[b]	-	-
CNB-6	Newport Beach	MCWD	-	-	3,500	5,000	760	3,500[b]	-	-
CNB-7	Newport Beach	MCWD 7	-	-	1,830	3,640	30	1,830[b]	-	-

a. All MCWD wells and this open interconnection required to meet fire flow demand scenario.
b. Flow through interconnection would be in undesirable direction, i.e. away from the agency with the emergency. Therefore, this interconnection should remain closed during this emergency.
c. MCWD could supply up to 3,600 gpm if all MCWD wells operating during emergency.
d. MCWD could supply up to 1,800 gpm if all MCWD wells operating during emergency.

The flow rates during each of the emergency scenarios through the interconnections between Newport Beach, and IRWD and MCWD are provided in Table 6.3.

TABLE.6.3: Modeling Results of Existing Newport Beach Interconnections

Existing Interconnection			Emergency Scenario/ Flow (gpm)							
CNB Name	Other Agency	Other Agency Name	IRWD 1	IRWD 2	MCWD 1	MCWD 2	CNB 1	CNB 2	Santa Ana 1	Santa Ana 2
IRWD3	IRWD	E2	0	2,100	-	-	920	560	-	-
IRWD4	IRWD	E3	800	2,300	-	-	370	280	-	-
IRWD6	IRWD	E9	0	0	-	-	3,650	3,500	-	-
IRWD5	IRWD	E10	0	0	-	-	1,000	70	-	-
IRWD7	IRWD	E17	0	0	-	-	800	140	-	-
IRWD1	IRWD	E18	0	0	-	-	900	180	-	-
MCWD5	MCWD	CNB-1	-	-	3,320	5,000	390	3,320[a]	-	-
MCWD2	MCWD	CNB-2	-	-	2,260	3,980	280	2,260[a]	-	-
MCWD1	MCWD	CNB-3	-	-	3,330	5,000	430	3,330[a]	-	-
MCWD4	MCWD	CNB-4	-	-	3,380	5,000	440	3,380[a]	-	-
MCWD3	MCWD	CNB-5	-	-	1,840	2,500	290	1,840[a]	-	-
MCWD	MCWD	CNB-6	-	-	3,500	5,000	760	3,500[a]	-	-
MCWD 7	MCWD	CNB-7	-	-	1,830	3,640	30	1,830[a]	-	-

a. Flow through interconnection would be in undesirable direction, i.e. away from the agency with the emergency. Therefore, this interconnection should remain closed during this emergency.

The flow rates during each of the emergency scenarios through the interconnections between Santa Ana and MCWD are provided in Table 6.4.

TABLE.6.4: Modeling Results of Existing Santa Ana Interconnections

Existing Interconnection			Emergency Scenario/ Flow (gpm)							
Santa Ana Name	Other Agency	Other Agency Name	IRWD 1	IRWD 2	MCWD 1	MCWD 2	CNB 1	CNB 2	Santa Ana 1	Santa Ana 2
MCWD-1	MCWD	CSA-1	-	-	0	1,610	-	-	890[a]	890[a]
MCWD-2	MCWD	CSA-2	-	-	0	4,650[b]	-	-	890[a]	890[a]
MCWD-3	MCWD	CSA-3	-	-	0	1,730	-	-	890[a]	890[a]
MCWD-4	MCWD	CSA-4	-	-	0	2,460[b]	-	-	890[a]	890[a]

a. MCWD could supply up to 3,600 gpm if all MCWD wells operating during emergency.
b. All MCWD wells and this open interconnection required to meet fire flow demand scenario.

A summary of the flow rates during each of the emergency scenarios through each of the 22 interconnections is provided in Table 6.5.

TABLE.6.5: Flow Rates through Each Existing Interconnection during Emergency Conditions

Existing Interconnection					Emergency Scenario/ Flow (gpm)							
No.	Agency	Name	Agency	Name	IRWD 1	IRWD 2	Mesa 1	Mesa 2	CNB 1	CNB 2	Santa Ana 1	Santa Ana 2
1	IRWD	E1	MCWD	IR-1	0	890[a]	1,730	3,000	-	-	-	-
2	IRWD	E2	Newport Beach	IRWD3	0	2,100	-	-	920	560	-	-
3	IRWD	E3	Newport Beach	IRWD4	800	2,300	-	-	370	280	-	-
4	IRWD	E9	Newport Beach	IRWD6	0	0	-	-	3,650	3,500	-	-
5	IRWD	E10	Newport Beach	IRWD5	0	0	-	-	1,000	70	-	-
6	IRWD	E15	MCWD	IR-3	0	0	2,830	4,840	-	-	-	-
7	IRWD	E16	MCWD	KK Res	0	0	1,010	2,110	-	-	-	-
8	IRWD	E17	Newport Beach	IRWD7	0	0	-	-	800	140	-	-
9	IRWD	E18	Newport Beach	IRWD1	0	0	-	-	900	180	-	-
10	IRWD	E20	MCWD	IR-2	0	0	2,050	3,830	-	-	-	-
11	IRWD		MCWD	IR-5	0	0	690	1,500	-	-	-	-
12	Santa Ana	MCWD-1	MCWD	CSA-1	-	-	0	1,610	-	-	890[c]	890[c]
13	Santa Ana	MCWD-2	MCWD	CSA-2	-	-	0	4,650[d]	-	-	890[c]	890[c]
14	Santa Ana	MCWD-3	MCWD	CSA-3	-	-	0	1,730	-	-	890[c]	890[c]
15	Santa Ana	MCWD-4	MCWD	CSA-4	-	-	0	2,460[d]	-	-	890[c]	890[c]
16	Newport Beach	MCWD5	MCWD	CNB-1	-	-	3,320	5,000	390	3,320[b]	-	-
17	Newport Beach	MCWD2	MCWD	CNB-2	-	-	2,260	3,980	280	2,260[b]	-	-
18	Newport Beach	MCWD1	MCWD	CNB-3	-	-	3,330	5,000	430	3,330[b]	-	-
19	Newport Beach	MCWD4	MCWD	CNB-4	-	-	3,380	5,000	440	3,380[b]	-	-
20	Newport Beach	MCWD3	MCWD	CNB-5	-	-	1,840	2,500	290	1,840[b]	-	-
21	Newport Beach	MCWD	MCWD	CNB-6	-	-	3,500	5,000	760	3,500[b]	-	-
22	Newport Beach	MCWD 7	MCWD	CNB-7	-	-	1,830	3,640	30	1,830[b]	-	-

a. MCWD could supply up to 1,800 gpm if all MCWD wells operating during emergency.
b. Flow through interconnection would be in undesirable direction, i.e. away from the agency with the emergency. Therefore, this interconnection should remain closed during this emergency.
c. MCWD could supply up to 3,600 gpm if all MCWD wells operating during emergency.
d. All MCWD wells and this open interconnection required to meet fire flow demand scenario.

6.4.2 Potential Emergency Interconnections

The 9 potential emergency interconnections are presented in Chapter 7. The hydraulic performance of each is provided in Section 7.2 and Table 7.3.

Chapter 7

Potential Interconnection Improvements

Chapter 7 - Potential Interconnection Improvements

The existing emergency interconnections are described in Chapter 4. Most of these interconnections are for local areas to alleviate only localized emergency water supply and demand conditions. As part of this study, potential interconnections are identified that would provide more regional benefit. After indentifying the potential interconnections, the hydraulic model is used to evaluate the effectiveness of each potential interconnection in assisting during the eight emergency scenarios identified in Chapter 5. Preliminary engineers' estimates of probable construction costs are then computed for each of these potential interconnections.

7.1 Potential Interconnection Improvements

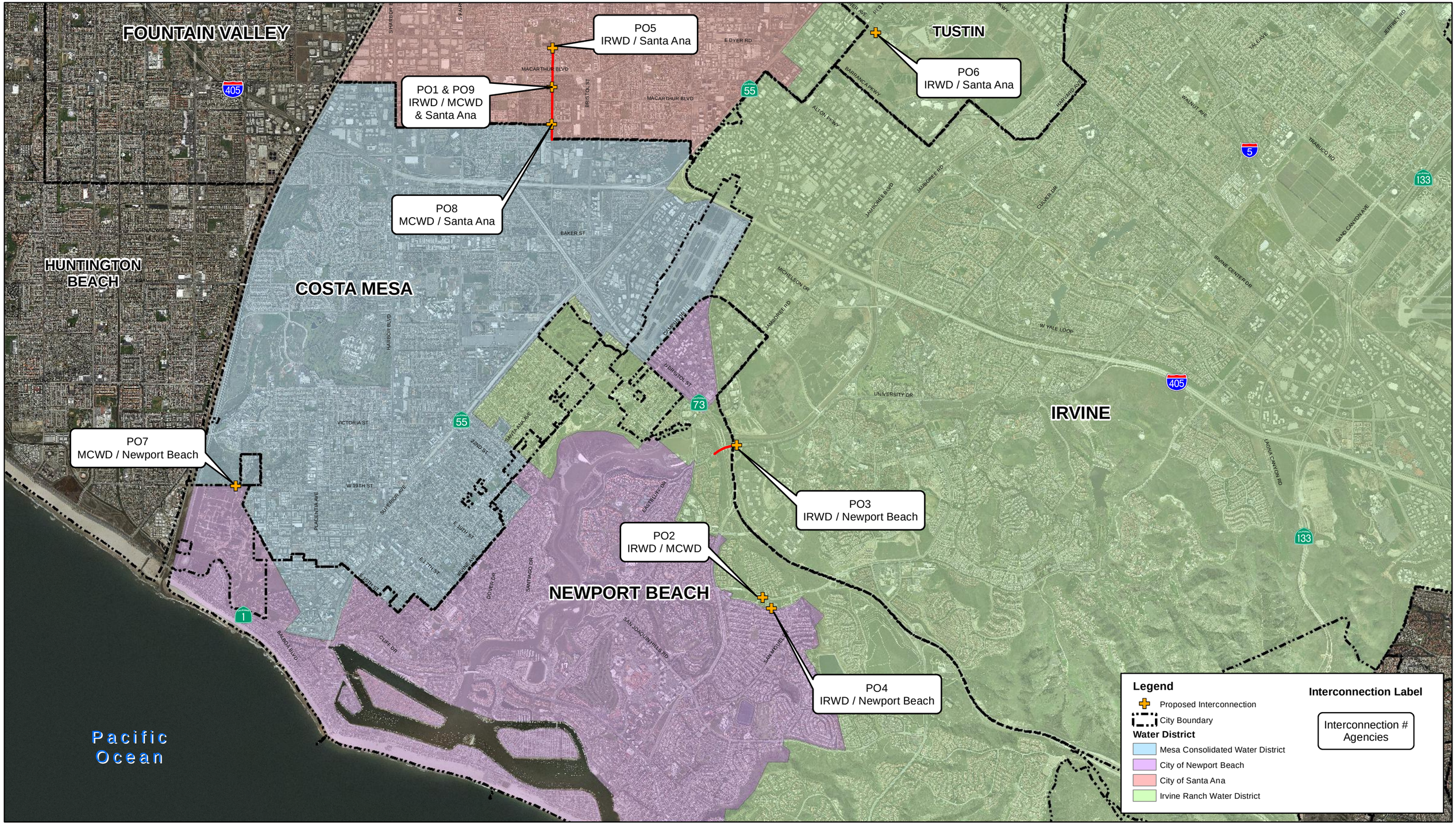
Potential interconnections have been identified for the four agencies participating in this study. These include potential interconnections between IRWD, and MCWD, Newport Beach and Santa Ana. Potential interconnections are also identified between MCWD, and Newport Beach and Santa Ana. Figure 7-1 provides a geographical representation of the nine identified potential emergency interconnections.

7.1.1 Potential Interconnections between IRWD and MCWD

A. **Segerstrom Avenue to Sunflower Avenue along Bear Street (P01)**
IRWD's Dyer Road Wellfield pipeline is routed through Santa Ana along Segerstrom Avenue, which changes its name to Dyer Road at Flower Street, and Dyer Road. This pipeline has a 36-inch diameter near Fairview Street and increases to 54-inches in diameter east of Greenville Street. This transmission main feeds the Dyer Road Wellfield water to IRWD's Zone 1 service area.

MCWD has an existing 18-inch diameter pipeline along Sunflower Avenue from Harbor Boulevard to Bear Street. A 12-inch diameter pipeline is routed easterly along Sunflower Avenue from Bear Street to Main Street. In addition, a 16-inch pipeline is routed southerly along Bear Street from Sunflower Avenue to Baker Street.

In addition to a flow meter, this potential interconnection would require approximately 4,750 lineal feet (LF) of new pipeline. Due to the operating pressure differential, a pressure regulation valve would also be required as the usual operating HGL of the IRWD pipeline is approximately 330 feet



M:\Mdata\1010708\GIS\Ex 7-1 Proposed Interconnection Locations.mxd 3/26/12 DJ

0 1 2 Miles

Source: Eagle Aerial, IRWD

Potential Interconnection Locations

Figure 7-1

while that of MCWD's distribution system in this vicinity is approximately 258 feet. If water were required to flow from MCWD to IRWD, a pump station or pump risers would be required. A schematic of the existing IRWD and MCWD facilities in the vicinity and the potential improvements is shown in Figure 7-2.

This potential interconnection would become more economically viable if it were a part of an interconnection between the city of Santa Ana and MCWD (P09).

B. **Bonita Canyon Drive near Mesa View Drive (P02)**
IRWD has a Zone 2 16-inch diameter pipeline routed along Bonita Canyon Drive between MacArthur Boulevard, where it dead ends, and northeast of Chambord Road. IRWD also has a 24-inch diameter Zone 2 transmission main that parallels the Orange County Feeder and the OC-44 pipeline in this proximity.

The OC-44 pipeline is routed from the East Orange County Feeder No. 2 to MCWD's service area and the City of Huntington Beach. The 42-inch pipeline crosses Bonita Canyon Road near its intersection with Mesa View Drive.

The Zone 2 IRWD pipelines have an HGL of approximately 355 feet. The OC-44 pipeline's HGL varies between 550 and 460 feet. Therefore, an emergency interconnection between these facilities would require a water meter and pressure reducing valve. This potential interconnection would beneficial to southwest portion of IRWD's service area. A schematic of the existing IRWD and MCWD facilities in the vicinity and the potential improvements is shown in Figure 7-3.

7.1.2 Potential Interconnections between IRWD and Newport Beach

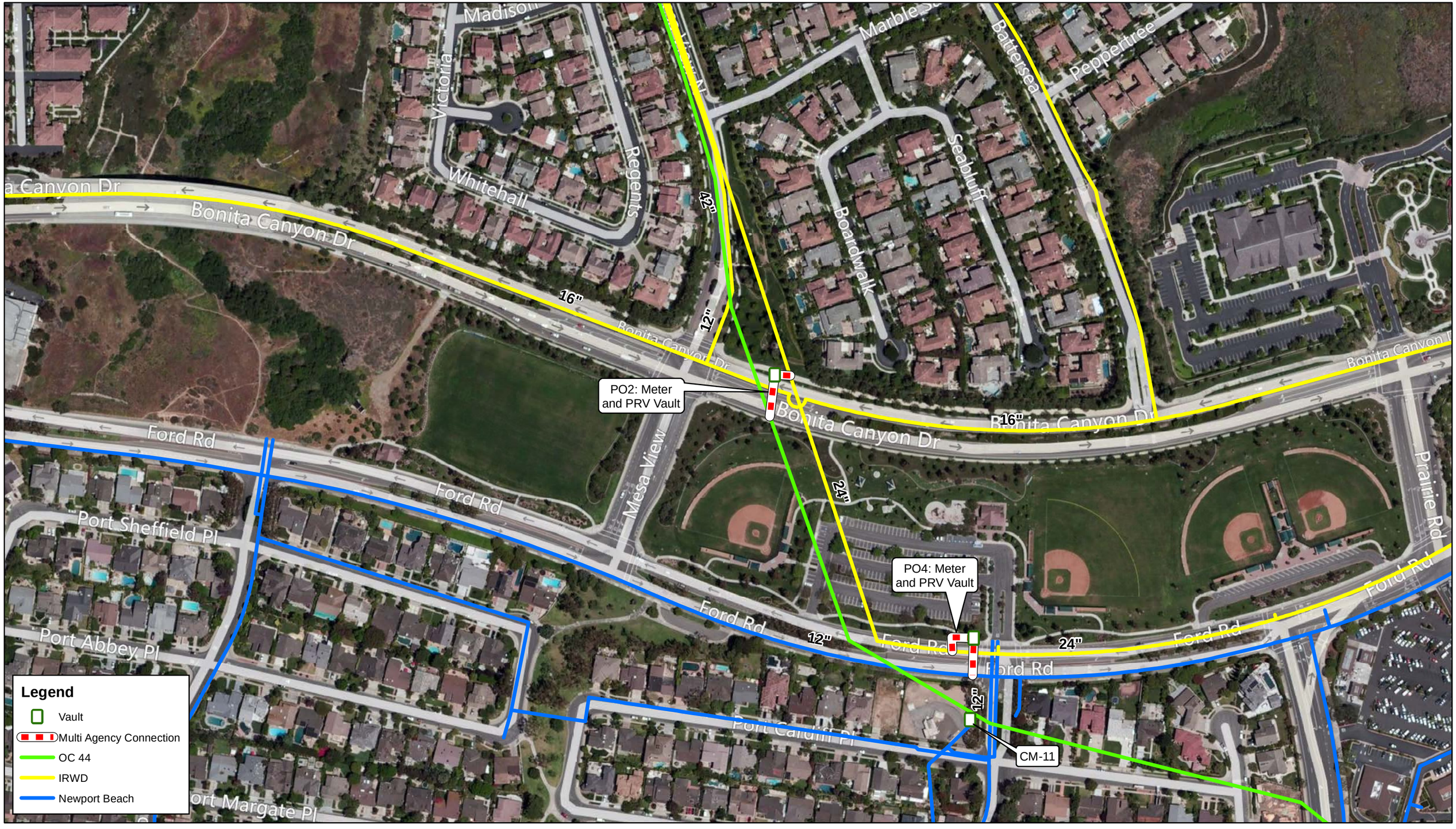
A. University Drive near MacArthur Boulevard (P03)
IRWD has a Zone 1 16-inch diameter pipelines along University Drive from MacArthur Boulevard to Campus Drive. A Zone 1 16-inch diameter pipeline is routed parallel to MacArthur Boulevard between University Drive and Jamboree Road.

M:\Mdata\10107078\GIS\Ex 7-2_PO1588.mxd 2/22/12 DJ

Source: Bing, IRWD, MCWD
Santa Ana Water District

Potential Interconnections PO1, PO5, PO8 & PO9

Figure 7-2



M:\Mdata\101070\GIS\Ex. 7-3 PO2_4.mxd 2/22/12 DJ

RBF CONSULTING A Baker Company GIS

0 200 400 Feet

Source: Bing, IRWD, City of Newport Beach

Potential Interconnections PO2 and PO4

Figure 7-3

IRWD also has a 24-inch Zone 2 pipeline routed parallel to MacArthur Boulevard to just south of University Drive. A Zone 2 to Zone 1 pressure reducing station is located between MacArthur Boulevard and its northerly on and off ramps.

Newport Beach has a turnout from the Orange County Feeder (CM-13) near University Drive and the northeast corner of Bonita Creek Park. A 20-inch diameter pipeline is routed southwesterly along University Drive from the MWD turnout. This pipeline can feed Newport Beach's Zone 2 and was supposed to be able to feed Zone 3. However, their latest Water Master Plan states that the HGL is not quite sufficient to feed Zone 3.

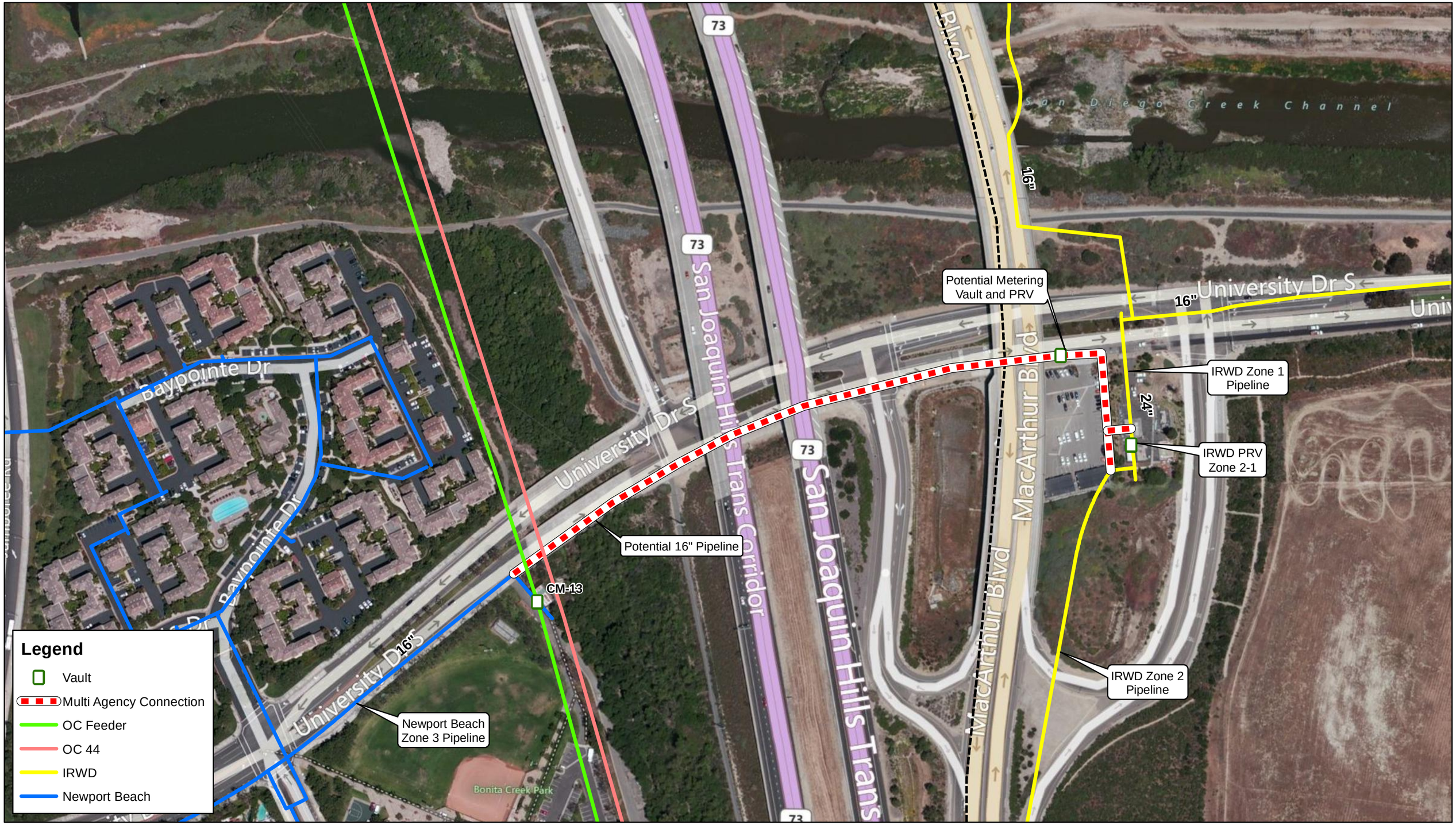
The IRWD and Newport Beach pipelines are approximately 1,300 LF apart from each other. Therefore, a new pipeline would be required between the existing pipelines. This proposed pipeline would be routed along University Drive and would go under the MacAthur Boulevard bridge, under the northbound and southbound SR-133 bridges and through the bridge over the wildlife corridor west of SR-73. A schematic of the existing IRWD and Newport Beach facilities in the vicinity and the potential improvements is shown in Figure 7-4.

The IRWD Zone 2 pipeline has an HGL of approximately355 feet. Newport Beach's Zone 2 has an HGL of approximately 295 feet, while its Zone 3 has an HGL of approximately 450 feet. Therefore, a pressure reducing station would be required, in addition to the flow meter. Water could flow from IRWD's Zone 2 to Newport Beach's Zone 2. Water could also flow from Newport Beach to IRWD's Zone 2 or Zone 1.

B. Old Ford Road near Bonita Canyon Sports Park (P04)

IRWD has a Zone 2 24-inch pipeline routed along Ford Road and through the Bonita Canyon Sports Park. They also have 16-inch diameter pipeline routed along Bonita Canyon Drive between MacArthur Boulevard, where it dead ends, and northeast of Chambord Road.

Newport Beach has a turnout from the Orange County Feeder (CM-11) near the intersection of Port Cardiff Place and Newport Hill Drive East. A 12-inch diameter pipeline is routed along Old Ford Road to MacArthur Boulevard. This pipeline feeds Newport Beach's Zone 3.



M:\IM\data\101070\8\GIS\Ex 7-4 PO3.mxd 3/26/12 DJ

RBF CONSULTING A Baker Company GIS

0 200 400 Feet

Source: Bing, IRWD, City of Newport Beach

Potential Interconnection PO3

Figure 7-4

Potential interconnection P04 would be located near the parking lot entrance for Bonita Canyon Sport Park.

The IRWD Zone 2 pipeline has an HGL of approximately 355 feet. Newport Beach's Zone 3 pipeline has an HGL of approximately 450 feet. Therefore, a pressure reducing station would be required, in addition to the flow meter for water to flow from Newport Beach to IRWD. A schematic of the existing IRWD and Newport Beach facilities in the vicinity and the potential interconnection improvements is shown in Figure 7-3.

7.1.3 Potential Interconnections between IRWD and Santa Ana

A. Segerstrom Avenue and Bear Street Intersection (P05)

IRWD's Dyer Road Wellfield pipeline is routed through Santa Ana along Segerstrom Avenue, which changes its name to Dyer Road at Flower Street, and Dyer Road. This pipeline has a 36-inch diameter near Fairview Street and increases to 54-inches in diameter east of Greenville Street. Therefore, at Bear Street, the transmission main has a diameter of 54-inches. This transmission main feeds the Dyer Road Wellfield water to IRWD's Zone 1 service area.

The City of Santa Ana has an 18-inch diameter pipeline along Segerstrom Avenue between the Orange County Flood Control District channel east of Bear Street and Bristol Street, and a 24-inch diameter pipeline along Segerstrom Avenue between the Orange County Flood Control District channel and Raitt Street. Santa Ana also has their South Reservoir and Pump Station and Well #34 northeast of the intersection of Alton Avenue and Bear Street. These facilities connect to the Santa Ana distribution system just west of the access road for the Orange County Flood Control District channel, near the intersection of Segerstrom Avenue and Bear Street. Therefore, the intersection of Segerstrom Avenue and Bear Street would be a beneficial location for an interconnection between IRWD and Santa Ana.

Due to the operating pressure differential, a pressure reducing station would also be required as the usual operating HGL of the IRWD pipeline is approximately 330 feet while that of Santa Ana's distribution system in the vicinity is approximately 260 feet. If water were required to flow from Santa Ana to IRWD, a pump station or pump risers would be required. A

schematic of the existing IRWD and Santa Ana facilities in the vicinity and the potential improvements is shown in Figure 7-2.

B. Red Hill Avenue and East Warner Avenue Intersection (P06)

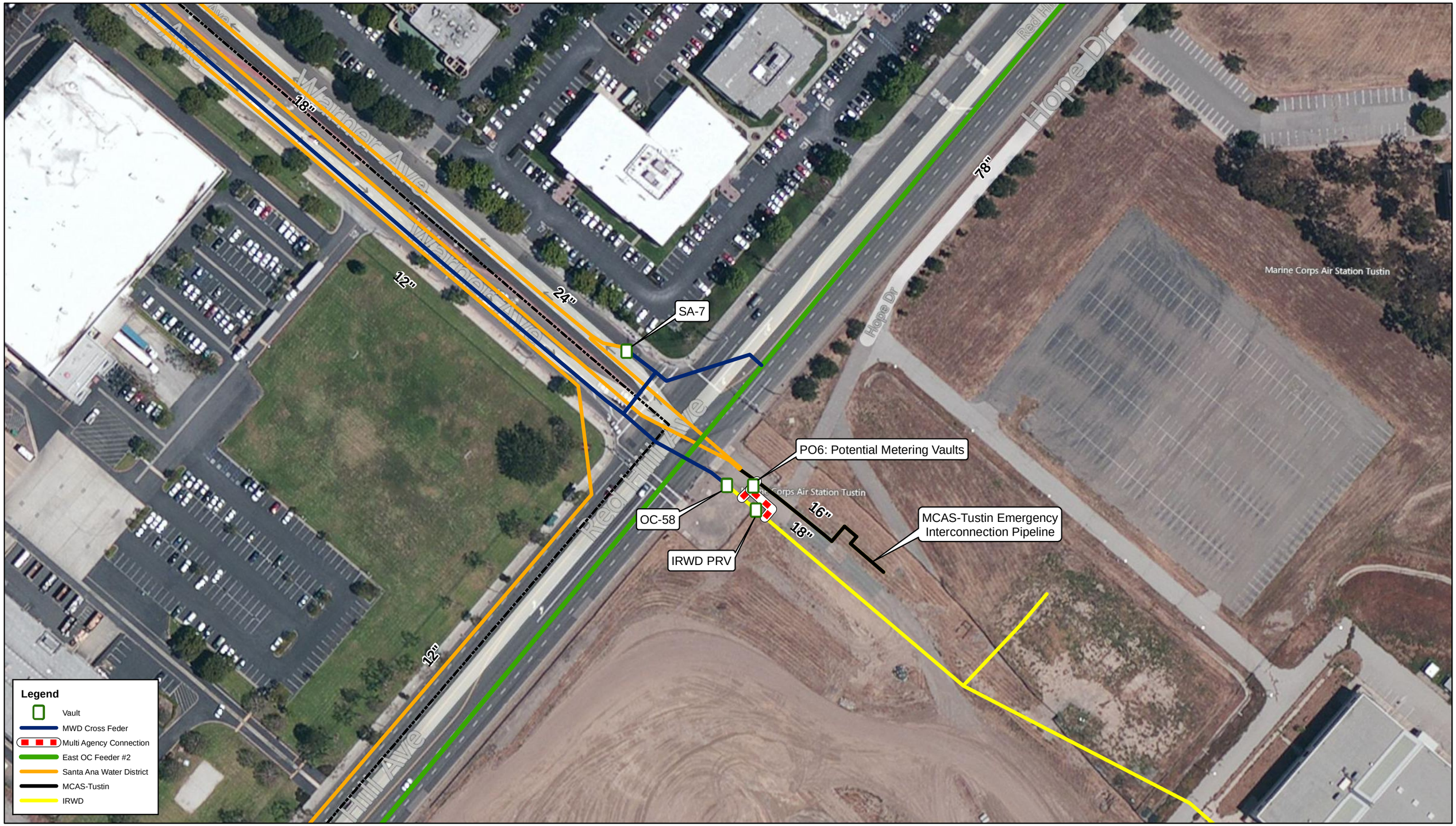
As shown in Figure 3-1, the East Orange County Feeder No. 2 is routed along Red Hill Avenue between Walnut Avenue and Barranca Parkway. Near the intersection of Red Hill Avenue and Warner Avenue, a 36-inch diameter pipeline from East Orange County Feeder No. 2 feed Santa Ana's SA-7, the 18-inch diameter MWD Cross Feeder and IRWD's OC-58.

IRWD reduces the water pressure from the MWD gradient to their Zone 1 gradient through a pressure reducing station located downstream of OC-58, southeast of the intersection of Warner Avenue and Red Hill Avenue. Downstream of this pressure reducing station is an 18-inch Zone 1 pipeline, called the "Navy Line." As development of the Tustin Legacy occurs, this pipeline will be replaced with networked 12-inch pipelines throughout the proposed development.

SA-7 is located just to the northwest of the intersection of Warner Avenue and Red Hill Avenue. Santa Ana has a 24-inch diameter high-pressure pipeline routed along Warner Avenue and through a parking lot to Ritchey Street, west of SR-55. A pressure reducing station located southeast of the bend in Ritchey Street reduces the HGL from MWD's gradient to Santa Ana's.

To supply water from IRWD to Santa Ana when SA-7 is closed, a pipeline and meter would be required that connect the IRWD 18-inch diameter Zone 1 pipeline downstream of the IRWD pressure reducing station to the Santa Ana 16-inch diameter pipeline that connects the 24-inch diameter Warner Avenue high pressure pipeline to the old MCAS – Tustin emergency inter-tie. If SA-7 were open, a booster pump would be required to match the MWD East Orange County Feeder No. 2 HGL.

To supply water from Santa Ana to IRWD when SA-7 is open, the piping and meter would join the IRWD system upstream of the IRWD pressure reducing station. If SA-7 were closed, a booster pump would be required to raise the HGL from 250 to 290 feet. This station would be located near the existing Santa Ana pressure reducing station at Ritchey Street. A schematic of the existing IRWD and Santa Ana facilities in the vicinity and the potential improvements is shown in Figure 7-5.



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RBF CONSULTING A Baker Company GIS

0 100 200 Feet

Source: Bing, MCWD, IRWD, Santa Ana Water District

Potential Interconnection PO6

Figure 7-5

7.1.4 Potential Interconnection between MCWD and Newport Beach

19th Street between Balboa Boulevard and Whittier Avenue (P07)
MCWD has a 30-inch transmission main routed along 19th Street from Balboa Boulevard to Fullerton Avenue, east of Newport Boulevard. The transmission main along 19th Street is connected to MCWD's 9.5 MG Reservoir No. 1 and to significant pipelines routed southerly along Pomona Avenue and northerly along Fullerton Avenue.

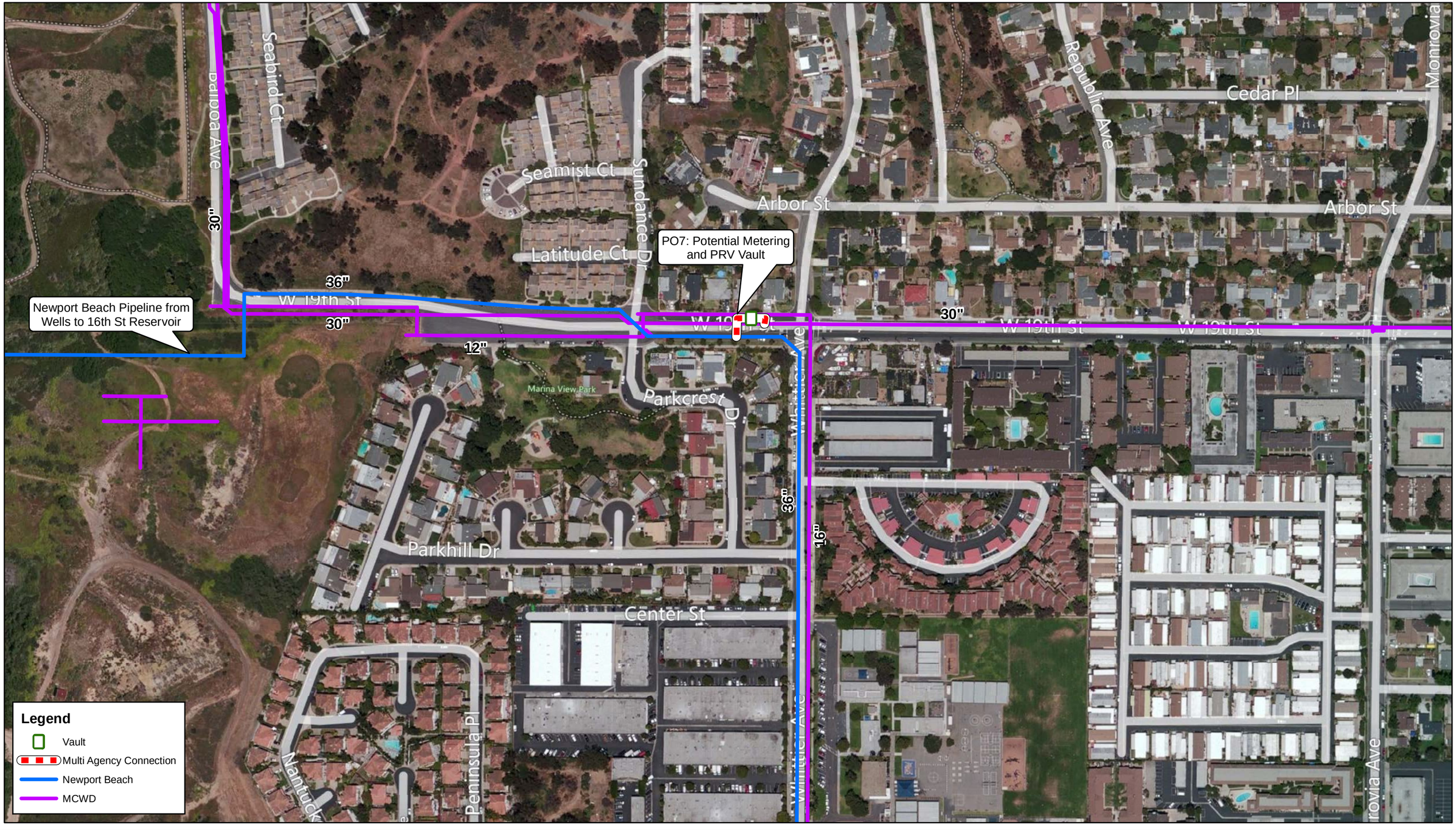
Newport Beach's four wells along Slater Avenue in the City of Fountain Valley pump into their 3.0 MG 16th Street Reservoir. This buried tank is located at the City's utilities yard at the terminus of 16th Street. The western portion of this 36-inch/30-inch transmission main is routed in the cities of Fountain Valley and Huntington Beach. The pipeline crosses the Santa Ana River between Banning Avenue in the City of Huntington Beach and 19th Street in the City of Costa Mesa. The 36-inch pipeline is routed along 19th Street to Whittier Avenue. The pipeline is then routed southerly along Whittier Avenue to Newhall Street.

An emergency interconnection at this location would allow Newport Beach to replace well supplies at the same location where the wells' supply normally enters their system. Since MCWD's static HGL is 250 feet and Newport Beach's static HGL is about 100 feet, the interconnection would require a pressure reducing station to flow from MCWD to Newport Beach. If the flow were required to flow from Newport Beach to MCWD, a pumping system would be required. A schematic of the existing MCWD and Newport Beach facilities in the vicinity and the potential improvements is shown in Figure 7-6.

7.1.5 Potential Interconnections between MCWD and Santa Ana

A. Bear Street and Sunflower Avenue Intersection (P08)

MCWD and Santa Ana have water transmission mains located along Sunflower Avenue, since this road is the boundary between their service areas. The agencies have existing 12-inch diameter pipelines along opposite sides of the street. Four existing emergency interconnections are located along Sunflower that each consists of one pipeline with two closed isolation valves. Flows cannot be monitored and the valves have not been exercised in many years.



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0 200 400 Feet

Source: Bing, MCWD, City of Newport Beach

Potential Interconnection PO7

Figure 7-6

The potential interconnection would be near South Coast Plaza and Crystal Court, which have high fire demands and are near MCWD's service area boundary. Since many of Santa Ana's wells are in the northern part of their service area, an interconnection in the southern area would be beneficial to Santa Ana as well. Although this potential interconnection is located in close proximity to existing CSA-2/MCWD-2, it is included in the study as the existing interconnection does not include a water meter and the isolation valves may be frozen closed as they have not been exercised in many years.

Santa Ana has 12-inch pipelines along Bear Street and Sunflower Avenue. MCWD has an existing 18-inch diameter pipeline along Sunflower Avenue from Harbor Boulevard to Bear Street. A 12-inch diameter pipeline is routed easterly along Sunflower Avenue from Bear Street to Main Street. In addition, a 16-inch pipeline is routed southerly along Bear Street from Sunflower Avenue to Baker Street.

The static HGLs of both agencies system are within ten feet of each other. Therefore, no pressure reducing stations or pumps would be required. A schematic of the existing MCWD and Santa Ana facilities in the vicinity and the potential improvements is shown in Figure 7-2.

B. Segerstrom Avenue to Sunflower Avenue along Bear Street (P09)

MCWD has an existing 18-inch diameter along Sunflower Avenue from Harbor Boulevard to Bear Street. A 12-inch diameter pipeline is routed easterly along Sunflower Avenue to Main Street. In addition, a 16-inch pipeline is routed southerly along Bear Street from Sunflower Avenue to Baker Street.

The City of Santa Ana has an 18-inch diameter pipeline along Segerstrom Avenue between the Orange County Flood Control District channel east of Bear Street and Bristol Street, and a 24-inch diameter pipeline along Segerstrom Avenue between the Orange County Flood Control District channel and Raitt Street. Santa Ana also has their South Reservoir and Pump Station and Well #34 northeast of the intersection of Alton Avenue and Bear Street. These facilities connect to the Santa Ana distribution system just east of the intersection of Segerstrom and Bear Street. Therefore, the intersection of Segerstrom Avenue and Bear Street would be a beneficial location for an interconnection between MCWD and Santa Ana.

In addition to a flow meter, this potential interconnection would require approximately 4,750 lineal feet (LF) of new pipeline. The static HGLs of both agencies system are within ten feet of each other. Therefore, no pressure reducing stations or pumps would be required. A schematic of the existing MCWD and Santa Ana facilities in the vicinity and the potential improvements is shown in Figure 7-2.

This potential interconnection would only be economically viable if it were a part of an interconnection with the IRWD (P01).

Table 7.1 provides a summary of the potential emergency interconnections.

Table 7.1: Potential Interconnections

	Description	Agency	HGL[a] (ft)	Agency	HGL[a] (ft)	Comments
P01	Segerstrom to Sunflower along Bear	IRWD	330	MCWD	258	Connects to IRWD Dyer Road Wellfield Pipeline
P02	Bonita Canyon near Mesa View	IRWD	355	MCWD	460 - 550	Connects to OC-44 pipeline
P03	University near MacArthur	IRWD	355	Newport Beach	295 - 450	
P04	Old Ford Road near Bonita Canyon Sports Park	IRWD	355	Newport Beach	450	
P05	Segerstrom and Bear Intersection	IRWD	330	Santa Ana	260	Connects to IRWD Dyer Road Wellfield Pipeline
P06	Red Hill and Warner Intersection	IRWD	290	Santa Ana	250	
P07	19th St. between Balboa and Whittier	MCWD	250	Newport Beach	100	Feeds Newport Beach 16th St. Reservoir
P08	Bear and Sunflower Intersection	MCWD	258	Santa Ana	250	Upgrade of existing interconnection
P09	Segerstrom to Sunflower along Bear	MCWD	258	Santa Ana	250	

a. Based on static HGL of pressure zone.

Although many of the potential interconnections' descriptions provide a summary of the facilities required for flow in either direction, this study's further analysis assumes that all potential interconnections would only flow by gravity. This study assumes that the construction for booster pump stations that would only be utilized to support emergency

conditions would be cost prohibitive. Therefore, the required facilities described in Table 7.2 do not include booster pumps or pump risers to reverse flows. Also, the hydraulic modeling is analyzed without any new booster pumps.

Table 7.2: Potential Interconnection Required Facilities

Connection Name	Agency	Agency	Proposed Connection Size (in)	Flow Direction	Proposed Maximum Flow Rate (cfs)	Required Facilities		
						16" Pipe (LF)	Meter (In)	PRV (In)
P01	IRWD	MCWD	16	IRWD to MCWD	10.0	4,750	8	12
P02	IRWD	MCWD	16	MCWD to IRWD	10.0	-	8	12
P03	IRWD	CNB	16	Both	10.0	1,300	8	12
P04	IRWD	CNB	12	NB to IRWD	7.0	-	6	8
P05	IRWD	CSA	16	IRWD to SA	10.0	-	8	12
P06	IRWD	CSA	16	IRWD to SA	10.0	50	8	-
P07	MCWD	CNB	16	MCWD to NB	10.0	-	8	12
P08	MCWD	CSA	12	Both	7.0	-	6	-
P09	MCWD	CSA	16	Both	10.0	4,750	8	-

7.2 Evaluation of Potential Interconnections

The nine potential emergency interconnections are presented in Section 7.1. To assist in evaluating the value to the agencies of each potential interconnection, the potential interconnection facilities were inserted into the four agency hydraulic model described in Chapter 6. The hydraulic model was set up to run for each of the eight emergency scenarios. Each emergency scenario was then run with each of the relevant potential emergency interconnections operational. Table 7.3 provides that approximate flow rate that would transfer water between agencies during each of the emergency supply and/or demand scenarios, as well as during normal maximum day demands.

Table 7.3: Performance of Potential Interconnections During Identified Emergencies

Connection Name	Agency	Agency	Maximum Day (gpm)	Emergency Scenario/ Flow Rate (gpm)							
				IRWD 1	IRWD 2	Mesa 1	Mesa 2	CNB 1	CNB 2	Santa Ana 1	Santa Ana 2
P01	IRWD	MCWD	3,560	0	0	3,560	6,270	-	-	-	-
P02	IRWD	MCWD	7,000	7,000	7,000	0	0	-	-	-	-
P03	IRWD	CNB	3,540	3,860	4,580	-	-	0	0	-	-
P04	IRWD	CNB	2,300	2,300	2,300	-	-	0	0	-	-
P05	IRWD	CSA	1,220	0	0	-	-	-	-	6,240	5,220
P06	IRWD	CSA	2,110	2,420	4,140	-	-	-	-	0	0
P07	MCWD	CNB	890	-	-	0	0	890[b]	890[b]	-	-
P08	MCWD	CSA	220	-	-	0	4,620			890[a]	890[a]
P09	MCWD	CSA	470	-	-	0	3,500			890[b]	890[b]

a. The flow rate from this potential interconnection would increase to approximately 2,000 gpm if MCWD operates all of their wells.
b. The flow rate from this potential interconnection would increase to approximately 3,600 gpm if MCWD operates all of their wells.

7.3 Preliminary Cost Estimates for Potential Improvements

The potential emergency interconnections and their required facilities are described in Section 7.1. Based on the required facilities, preliminary budgetary cost estimates have been prepared for each potential emergency interconnection.

All required pipelines would be located in existing paved roads. Therefore, the estimated costs include the pipeline installation, pavement removal and replacement, traffic control and pipeline appurtenances, such as combination air release, vacuum relief valves, blow-offs and isolation valves. For estimating total costs, this study uses a construction cost of $250 per linear foot for 16-inch diameter pipelines.

Yard piping would be required for each interconnection. This piping would join each agency's existing pipeline to the proposed metering vault. The estimated yard piping cost includes installation of the proposed piping, joining the existing piping and any ancillary work, such as draining, re-filling and disinfection of the existing pipelines. For estimating total costs, this study uses a construction cost of $25,000 for 16-inch diameter yard piping and $20,000 for 12-inch diameter yard piping.

All potential interconnections are assumed to include a magnetic flow meter, such as an ABB WaterMaster Electromagnetic flow meter. To obtain accurate flow measurements, this flow meter requires five pipe diameters upstream and zero diameters downstream. For bi-directional flow, this study assumes that five pipe diameters upstream and

downstream are required. Therefore, the study estimates a higher cost for the metering vaults with the ability for bi-directional flow. The estimated costs for all metering vaults includes earthwork, buried precast vaults, ladders, access hatches, telemetry, landscape removal and replacement, and sidewalk removal and replacement.

Due to the differing operating pressures, most of the potential emergency interconnections require pressure reduction. This study assumes that any required pressure reducing valves would be located in the same vault as the metering equipment. Therefore, the estimated cost for the "PRV Addition" includes the construction cost for the pressure reducing valve and the incremental increase to the cost for the metering vault and telemetry system. For 12-inch pressure reducing valves, an estimated cost of $15,000 is used. For 8-inch pressure reducing valves, an estimated cost of $12,000 is used.

Lastly, an amount is added to the preliminary estimate of probable construction cost to include construction contingencies, engineering and administrative costs. For this study, the Contingency, Engineering & Administration cost is equal to 35 percent of the subtotaled construction cost. Table 7.4 shows the cost opinions for the nine potential interconnections.

Table 7.4: Potential Interconnections Cost Opinions

Connection	Pipeline	Yard Piping	Metering Vault	PRV Addition	Subtotal	Contingency, Engin., Admin.	Total
P01	$ 1,188,000	$ 25,000	$ 100,000	$ 15,000	$1,328,000	$ 465,000	$ 1,793,000
P02		$ 25,000	$ 100,000	$ 15,000	$ 140,000	$ 49,000	$ 189,000
P03	$ 520,000	$ 25,000	$ 120,000	$ 15,000	$ 680,000	$ 238,000	$ 918,000
P04		$ 20,000	$ 100,000	$ 12,000	$ 132,000	$ 46,000	$ 178,000
P05		$ 25,000	$ 100,000	$ 15,000	$ 140,000	$ 49,000	$ 189,000
P06	$ 13,000	$ 25,000	$ 100,000		$ 138,000	$ 48,000	$ 186,000
P07		$ 25,000	$ 100,000	$ 15,000	$ 140,000	$ 49,000	$ 189,000
P08		$ 20,000	$ 120,000		$ 140,000	$ 49,000	$ 189,000
P09	$ 1,188,000	$ 25,000	$ 120,000		$ 1,333,000	$ 467,000	$ 1,800,000

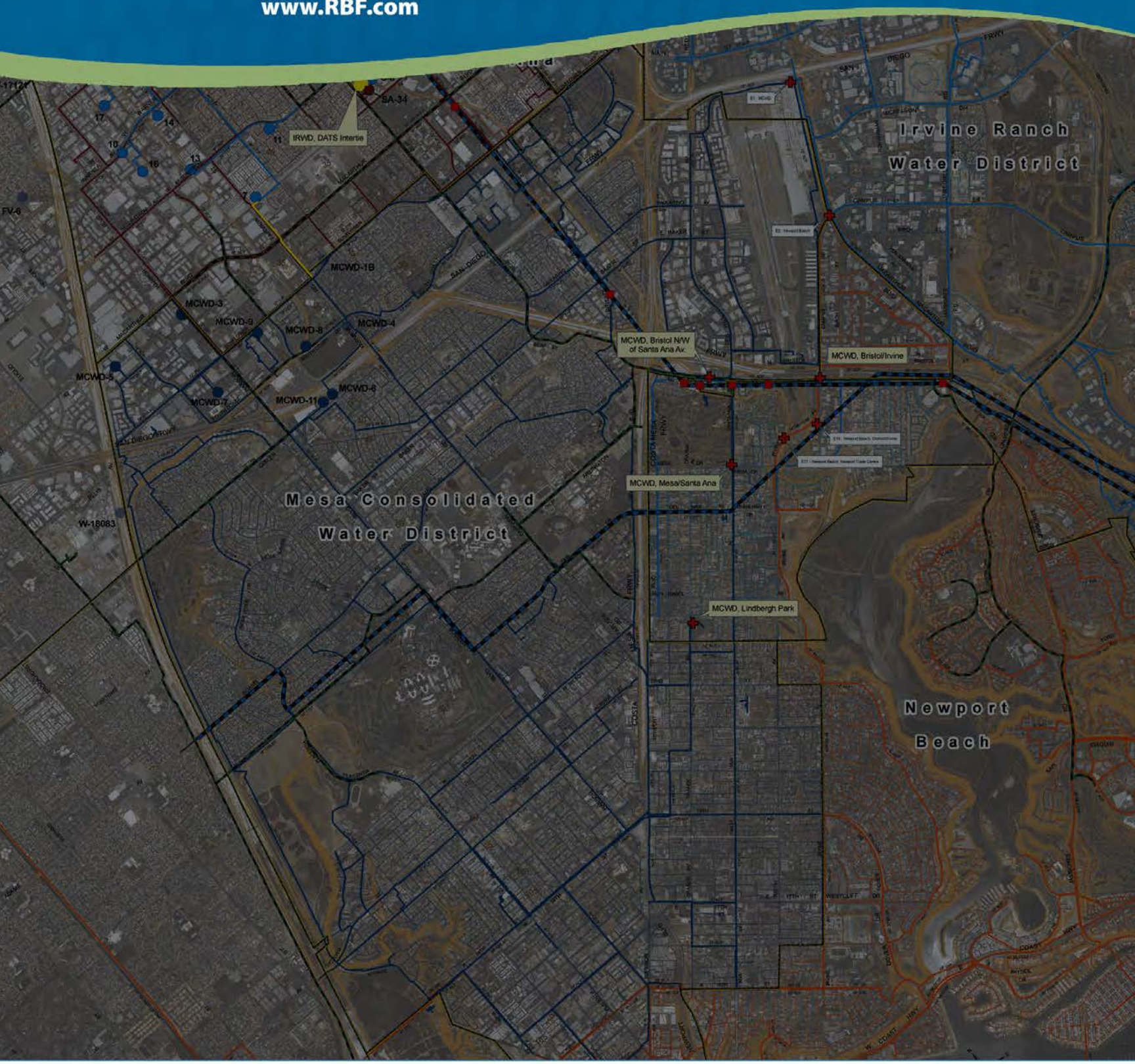
Appendix

Appendix

Existing Emergency Interconnections Record Drawings

RBF CONSULTING
14725 Alton Parkway
Irvine, CA 92618-2027
949.472.3505

www.RBF.com



MesaWater DISTRICT®

Dedicated to Satisfying our Community's Water Needs

MEMORANDUM

TO: Board of Directors
FROM: Stacy Taylor, Water Policy Manager
DATE: October 28, 2025
SUBJECT: South Orange County Emergency Water Project Proposal

RECOMMENDATION

This item is provided for discussion.

STRATEGIC PLAN

Goal #1: Provide an abundant, local, reliable and safe water supply.
Goal #3: Be financially responsible and transparent.
Goal #7: Actively participate in regional and statewide water issues.

PRIOR BOARD ACTION/DISCUSSION

At its April 23, 2025 workshop, the Board of Directors (Board) received a presentation regarding Regional Water Issues, including information about the "Groundwater Basin Emergency Interconnection Project" which is related to the subject item.

DISCUSSION

WHAT/WHERE: The South Orange County Emergency Water Project Proposal (Proposal) would transmit groundwater -- under specific emergency conditions -- from the Orange County Water District (OCWD) basin to Moulton Niguel Water District (MNWD) and possibly to more public water agencies located in South Orange County (although, to date, no other agencies have expressed interest). See the next page of this memo for a diagram of the proposed project.

WHEN: Under the Proposal, when a determination is made by the Metropolitan Water District of Southern California (Metropolitan) -- per its Administrative Code -- that Metropolitan is unable to provide water for a period expected to last longer than 7 days, then groundwater would be transmitted from the OCWD basin to MNWD (and possibly to other public water agencies in South Orange County).

HOW/HOW MUCH: Studies for the Proposal have identified the East Orange County Feeder No. 2 (EOCF#2) as the transmission pipeline, and the Santa Ana East Station as the location for pumping groundwater from OCWD's basin into the EOCF#2. Per the Proposal, up to 840 acre-feet of water would be transmitted over 30 days.

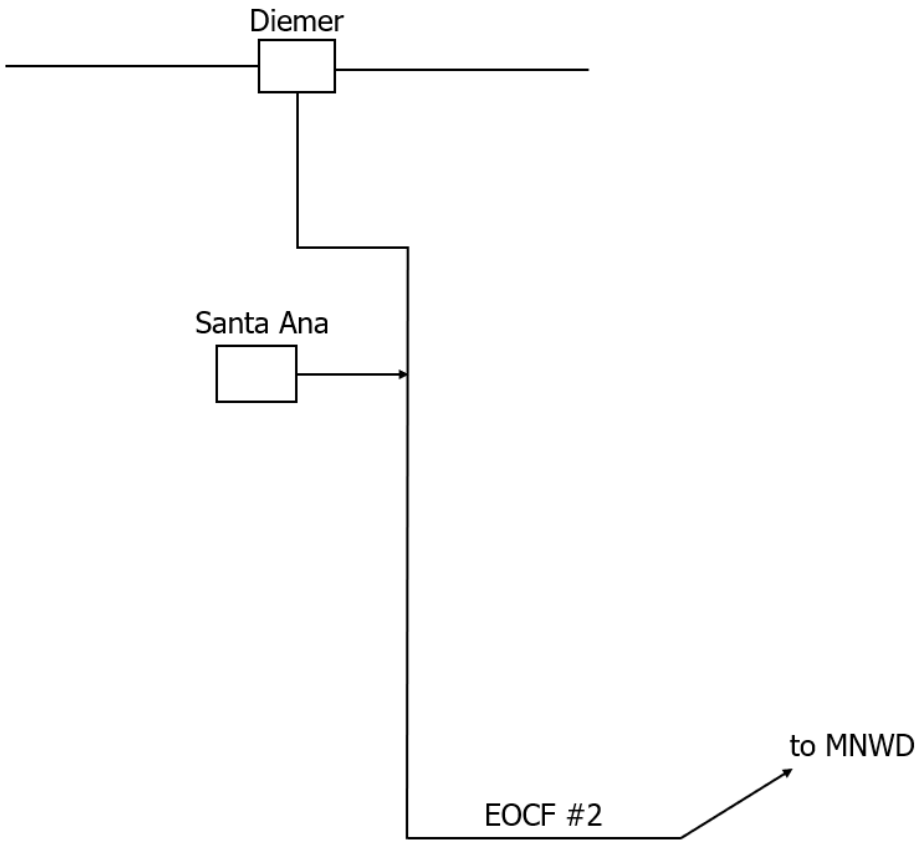
WHO: The EOCF#2 parties include Metropolitan, the Cities of Anaheim and Santa Ana, and 12 member agencies, including Mesa Water District (Mesa Water®), of the Municipal Water District of Orange County (MWDOC). These parties are members of a Joint Powers Agreement (JPA) for the Construction, Operation and Maintenance of the EOCF#2.

WHY: The Proposal's stated values are: avoiding significant costs for OCWD to implement PFAS treatment; causing no harm to OCWD's basin; enhancing countywide emergency response; leveraging regional collaboration for water supply resiliency; meeting Metropolitan's water quality standards; and providing significant funding for the City of Santa Ana to modernize its critical infrastructure (with new facilities to pump, treat -- including PFAS -- and convey groundwater).

MORE: The Proposal, if approved, would be concurrent with the OCWD Emergency Water Service Program (Program), which is an agreement (since 2006) between OCWD, MWDOC and the South Orange County agencies whereby if Metropolitan is unable to provide water for a period expected to last longer than 7 days, then up to 3,000 acre-feet of groundwater could be transmitted south from OCWD's basin for up to 30 days via an Irvine Ranch Water District pipeline. This Program is in place through December 2029 when it can be extended or terminated.

PROPOSAL STATUS: An initial stakeholders' meeting was hosted at MWDOC on July 30, 2025, when MNWD presented Proposal overview. Attendees included EOCF#2 JPA members, many OCWD Producers, and Proposal stakeholders. Concerns and questions were raised at this meeting regarding the Proposal's Draft Operating Plan Framework, as well as regarding administrative and institutional matters, particularly exploring if an amendment to the EOCF#2 JPA is needed. MNWD provided a follow-up overview presentation of the Proposal (see Attachment A) at the Water Advisory Committee of Orange County (WACO) meeting on October 3, 2025.

PROPOSAL NEXT STEPS: The next stakeholders' meeting will be October 20, 2025; Mesa Water staff will give a verbal report about this meeting at the Board's October 28, 2025 workshop.



FINANCIAL IMPACT

None.

ATTACHMENTS

Attachment A: MNWD's Presentation to WACO

Emergency Water Supplies to South Orange County

A Lifeline for Orange County

Water Advisory Committee of Orange County

October 3, 2025

History of OCWD Emergency Service Program

- 2006 agreement between OCWD, MWDOC, and South Orange County (SOC) agencies for emergency response.
- Program allows up to 50 cubic feet per second for 30 days (3,000 acre-feet) per incident when Metropolitan Water District of Southern California (MWD) is unable to provide water for a period expected to last longer than 7 days.
- Decision to extend or terminate – December 2029.
- Agreement contemplates continuation of program and development of additional projects to move locally produced water around in the regional distribution system.

Continuation of Previous Efforts

2004

MWDOC System Reliability Plan

2006/08

OCWD-MWDOC South OC Emergency Service Program (Phase I)

2018

MWDOC Water Reliability Study

2020

OCWD-MNWD EOCF#2 Connection Alternatives Study (Tetra Tech)

2022

OCWD-MNWD-COSA East Station Feasibility, Prelim Design, & CEQA

2025

OCWD-MNWD-COSA East Station Final Design & 3-Year Extension

Existing IRWD interconnection agreement expires at end of 2029.

Alternatives Study Key Findings

EOCF#2 Connection Alternatives Study

- Consultant: Tetra Tech
- Scope: Identify potential locations to pump groundwater into EOCF#2.
- Conclusion: Santa Ana East Station location selected for further evaluation.

Facility	Estimated Flow Rate (cfs)
Santa Ana – East Station	14
Santa Ana – Cambridge	10
Orange – City Yard	12
Orange – Batavia Plant	7
Tustin Walnut Well Site	3 to 5

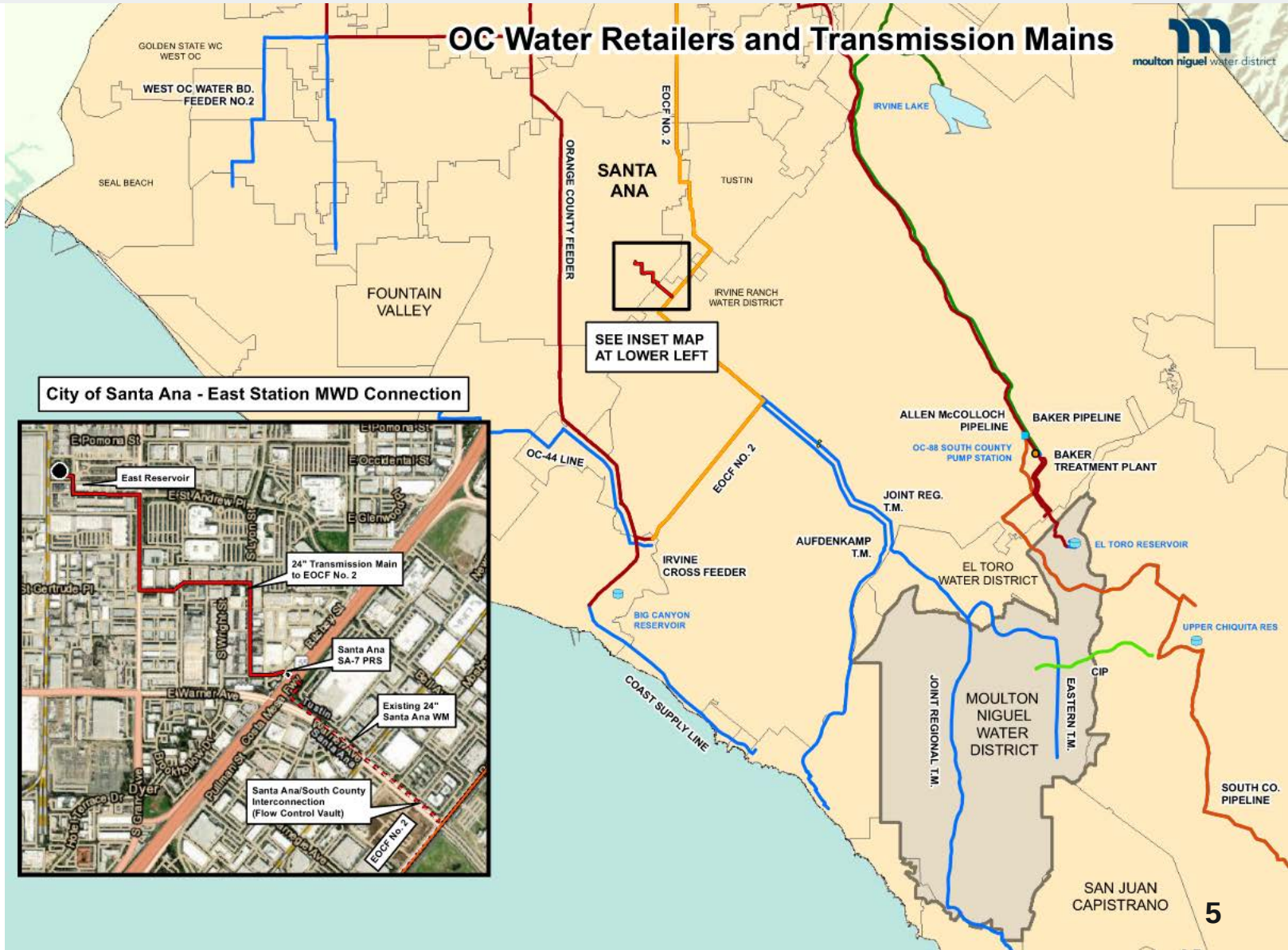
Santa Ana East Station Feasibility Assessment

- Consultant: Brown and Caldwell
- Scope: Conceptual site layout, water quality and hydraulic analyses, and cost estimate
- Coordination: MNWD, CSA, OCWD, MWDOC, and MET
- Conclusion: Project is feasible.

▸ Next Step: Preliminary Design & CEQA

Emergency Interconnection between MNWD and the City of Santa Ana

- Conveys groundwater from City of Santa Ana to SOC during emergencies.
- Up to 840 acre-feet over 30 days.
- Constructs new facilities to pump, treat (including PFAS), and convey groundwater.
- Water quality meets MWD standards.
- No impact to the basin.



Value of Project

- Enhances countywide emergency response.
- Leverages regional collaboration for water supply resiliency.
- Results in no harm to the basin.
- Provides significant funding for the City of Santa Ana to modernize critical infrastructure.
- Avoids significant cost for OCWD to implement PFAS treatment at site.

Project Status and Next Steps

- Evaluated and determined project is technically feasible.
- Continuing to advance project design.
- Engaging with stakeholders (OCWD groundwater producers and South Orange County agencies).
- Ongoing coordination with Metropolitan Water District of Southern California.
- Next stakeholders meeting on October 20, 2025.

MEMORANDUM

Dedicated to Satisfying our Community's Water Needs

TO: Board of Directors
FROM: Kaitlyn Norris, Public Affairs Supervisor
DATE: October 28, 2025
SUBJECT: Exterior Signage Upgrade

RECOMMENDATION

Direct staff to install a Mesa Water District logo on the second floor south-facing wall of the Headquarters Administration building.

STRATEGIC PLAN

Goal #4: Increase public awareness of Mesa Water.
Goal #6: Provide excellent customer service.

PRIOR BOARD ACTION/DISCUSSION

None.

DISCUSSION

Thousands of vehicles and pedestrians pass by Mesa Water District's (Mesa Water®) Headquarters located on Placentia Avenue. Currently, there is one identifying logo facing Placentia Avenue, but no logo facing south. Installing a logo on the second floor south-facing wall of the Headquarters Administration building provides an opportunity for those heading northbound to see the Mesa Water logo and to identify the District offices. Installation of a second logo will increase brand awareness of Mesa Water and also provide additional distinction of where the District's office is located. The cost of logo layout, fabrication and installation is quoted at $5,000.

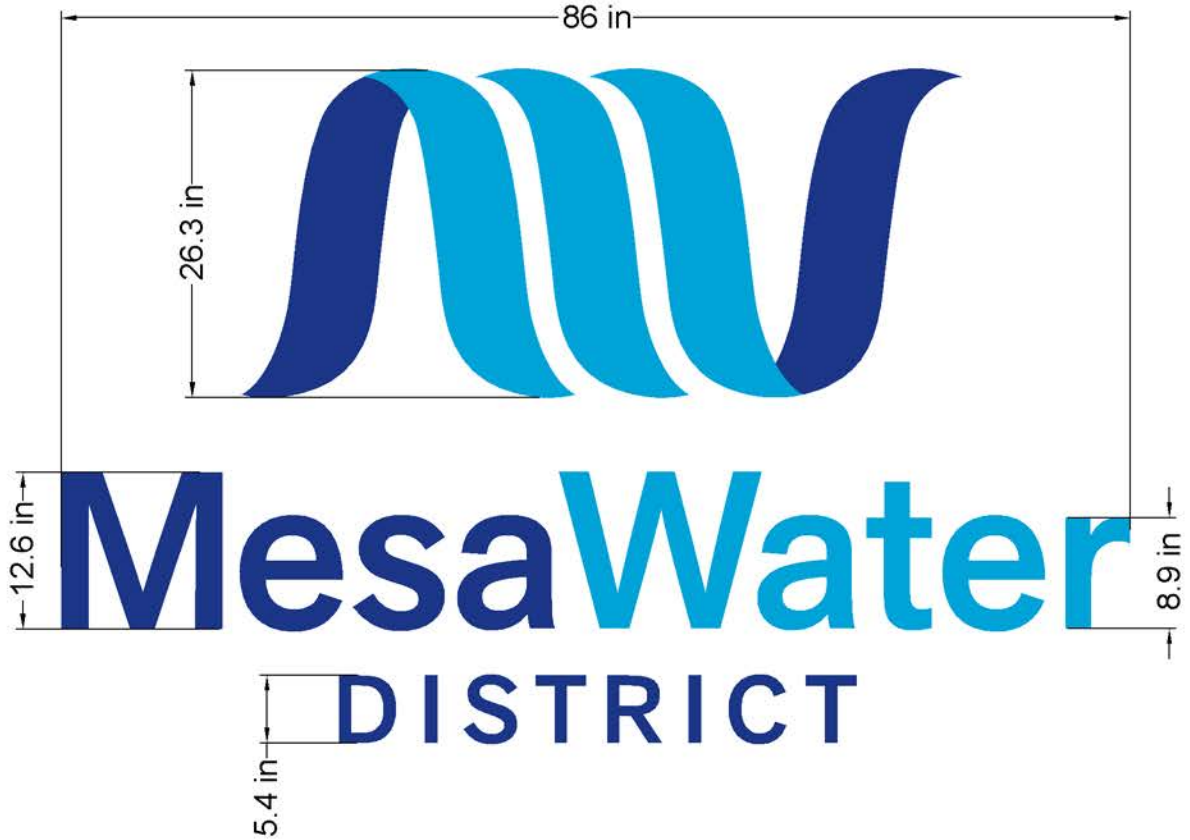
Staff recommends the Board of Directors direct staff to install a Mesa Water logo on the second floor south-facing wall of the Headquarters Administration building.

FINANCIAL IMPACT

In Fiscal Year 2026, no funds are budgeted for the Headquarters South Wall Logo; requested funds would come from Cash on Hand.

ATTACHMENTS

Attach A: Headquarters South Wall Logo Mockup



SPECIFICATIONS:

- 1.5" THICK HDU LETTERS
- PAINTED W/ MATTHEWS 2 PART ACRYLIC POLYURETHANE PAINT SATIN FINISH
- COLORS PER CORPORATE LOGO
- BACK OF LOGO AND LETTERS DRILLED AND TAPPED FOR STUDS
- STUD MOUNTD TO BUILDING

SIZING MOUCKU FOR WALL SIGN

DESIGNED BY JG 10/07/25

GERARD
Signs & Graphics, Inc.
2000 Placentia Ave. Costa Mesa California 92627
Ph.949/631.3499 Fx.949/548.7059
www.gerardsigns.com

MEMORANDUM

Dedicated to Satisfying our Community's Water Needs

TO: Board of Directors
FROM: Tyler Jernigan, Water Operations Manager
DATE: October 28, 2025
SUBJECT: Landscaping and Entryway Improvements

RECOMMENDATION

Direct staff to include a Mesa Water District Headquarters landscaping upgrade in the Fiscal Year 2027 budget and defer the entryway improvement project to a future fiscal year.

STRATEGIC PLAN

Goal #2: Perpetually renew and improve our infrastructure.
Goal #6: Provide excellent customer service.

PRIOR BOARD ACTION/DISCUSSION

None.

DISCUSSION

Headquarters Landscaping

In 2011, moisture intrusion into the Mesa Water District (Mesa Water®) Boardroom led to the removal of six palm trees and plants located in the planters in front of District Headquarters. Staff used this opportunity to plant California-friendly natives, install a better irrigation system and invest in lighting for enhanced security. While the garden still exists and is being maintained by staff and landscapers, no major updates or improvements to the landscaping have been made in nearly 15 years. In the intervening years, many advances have been made regarding water-wise garden conservation, permeability and water retention.

Staff is proposing an upgrade to Mesa Water's Headquarters landscaping in Fiscal Year 2027 to extend to the District offices the high-performance landscape designed for the Mesa Water Education Center. These improvements would create continuity between the two sites and provide visitors to both facilities the chance to envision what a true California-native landscape can be. At the October 28, 2025 workshop, staff requests the Board of Directors' input on any improvements they would like to see regarding refreshed landscaping at the District's Headquarters.

Headquarters Entryway

In December 2019, a 7-year-old boy died at his elementary school in Larkspur, California after a rolling gate fell on him. Over the next few years, AB 2149 (Connolly) *Gates:standards:inspection* was written to establish a comprehensive gate safety framework. Over the legislative sessions of 2023-2024, AB 2149 was amended multiple times in both the California Assembly and Senate. Ultimately, the bill failed as there were concerns about the lack of capacity to absorb the bill's mandates.

California's Division of Occupational Safety and Health (Cal/OSHA) is now advancing a proposed regulation that could impose significant new responsibilities on local government agencies – including special districts – regarding gate safety, inspections and enforcement. Specifics include:

- New standards applied to a wide range of gates and barriers, including many commonly used by public agencies;
- Required initial and recurring inspections, with oversight responsibilities falling to the gate owner – whether a city, county, school district, special district or private entity; and
- New administrative burdens including the need to hire or train personnel, track compliance, and respond to potential enforcement actions.

As staff continues to monitor the development of this proposed regulation, it is recommended that the entryway improvements be deferred to a future fiscal year's capital budget. This approach will allow the District to incorporate any new regulatory requirements that may arise and ensure that the project aligns with forthcoming compliance standards and best practices.

FINANCIAL IMPACT

None.

ATTACHMENTS

None.

MEMORANDUM

Dedicated to Satisfying our Community's Water Needs

TO: Board of Directors
FROM: Andrew D. Wiesner, P.E., District Engineer
DATE: October 28, 2025
SUBJECT: Facility Modernization Improvements

RECOMMENDATION

Defer the Facility Modernization Improvements to a future fiscal year.

STRATEGIC PLAN

Goal #2: Perpetually renew and improve our infrastructure.
Goal #6: Provide excellent customer service.

PRIOR BOARD ACTION/DISCUSSION

None.

DISCUSSION

Mesa Water District's (Mesa Water®) Headquarters Administration Building was originally constructed in 1978. The building and Headquarters site has been expanded and remodeled over time to continue to meet the needs of the District. Significant remodels occurred in 1993 and 2019. The recent 2019 remodel included the Boardroom and the replacement of the Heating, Ventilation, and Air Conditioning (HVAC) system. A few areas of the Administration Building, including the restrooms associated with the Boardroom, were not included in the 2019 remodel and were deferred to a future phase. Recently, issues regarding the Administration Building have been brought to the attention of staff. Many of these issues have been resolved, however a few remain, such as the deterioration of caulking and other materials. While the facilities are still very functional and have remaining useful life, they could be considered out-of-date when compared to the Headquarters Building. To improve the Administration Building, Facility Modernization Improvements are being proposed.

The cost of these improvements could vary significantly depending on the scope of work. With Fiscal Year 2026 capital funds allocated to several ongoing projects including the Reservoirs 1 and 2 Pump Station Upgrades Project and Customer Information System implementation, staff recommends that the Facility Modernization Improvements be included in capital planning for a future fiscal year.

FINANCIAL IMPACT

None.

ATTACHMENTS

None.

MesaWater DISTRICT®

Dedicated to Satisfying our Community's Water Needs

MEMORANDUM

TO: Board of Directors
FROM: Paul E. Shoenberger, P.E., General Manager
DATE: October 28, 2025
SUBJECT: Fiscal Year 2025 Strategic Plan

RECOMMENDATION

Receive the status of the Fiscal Year 2025 Strategic Plan.

STRATEGIC PLAN

Goal #1: Provide an abundant, local, reliable and safe water supply.
Goal #2: Perpetually renew and improve our infrastructure.
Goal #3: Be financially responsible and transparent.
Goal #4: Increase public awareness of Mesa Water.
Goal #5: Attract, develop and retain skilled employees.
Goal #6: Provide excellent customer service.
Goal #7: Actively participate in regional and statewide water issues.
Goal #8: Practice continual business improvement.

PRIOR BOARD ACTION/DISCUSSION

At its April 24, 2024 meeting, the Board of Directors (Board) approved Mesa Water District's (Mesa Water®) Fiscal Year (FY) 2025 Strategic Plan.

DISCUSSION

Mesa Water's Board provides staff with direction annually regarding the District's strategic goals, objectives and outcomes for the upcoming fiscal year. Based on this direction, priorities are established, resources are allocated and staff work to accomplish the goals and objectives, as directed.

The intent of this agenda item is for the Board to review and discuss the status of the FY 2025 Strategic Plan (Attachment A). The status of each objective is signified using the following three-color system:

- Green - completed
- Yellow – in process
- Red - incomplete

Based on input received from the Board, staff will incorporate any comments into drafting the FY 2027 Strategic Plan, and further analyze the opportunities and constraints associated with the list of proposed initiatives. Staff will discuss the FY 2027 Strategic Plan with the Board at the spring workshop to determine the feasibility of the proposed initiatives and to develop work plans and schedules.

FINANCIAL IMPACT

None.

ATTACHMENTS

Attachment A: Fiscal Year 2025 Strategic Plan, Status

MesaWater DISTRICT©

STRATEGIC PLAN

Fiscal Year 2025

Vision

To Be a Top Performing Water Agency

Mission Statement

Mesa Water District, a local independent special district, manages its finances and water infrastructure, and advocates water policy, while reliably providing an abundance of clean, safe water to benefit the public's quality of life.

Core Values

- **Health and Safety of the Public and Our Staff**
- **Excellence**
- **Philosophy of Abundance**
- **Perpetual Agency Philosophy**

Strategic Goals

1. Provide an abundant, local, reliable and safe water supply.
2. Perpetually renew and improve our infrastructure.
3. Be financially responsible and transparent.
4. Increase favorable opinion of Mesa Water.
5. Attract, develop and retain skilled employees.
6. Provide excellent customer service.
7. Actively participate in regional and statewide water issues.

WATER SUPPLY AND RELIABILITY

Strategic Goal #1

Provide an abundant, local, reliable and safe water supply.

Objective A: Continue to meet and surpass water quality standards.

- Update the District's triannual in-home Sampling Plan for compliance under the Lead and Copper Rule Revisions and the Lead and Copper Rule Improvements by December 2024
- Evaluate effectiveness of free chlorine conversion by November 2024

Objective B: Maintain and protect a high-quality water supply.

- Submit final findings to DDW for the Lead and Copper Rule Revisions by October 2024

Objective C: Continue to ensure a reliable and abundant supply of water.

- Complete the Local groundwater Supply Improvement Project (Local SIP) feasibility study by June 2025

Objective D: Ensure emergency operations.

- Construct emergency backup power at the District's Headquarters and Reservoir 1 by March 2026

Strategic Goal #2

Perpetually renew and improve our infrastructure.

Objective A: Manage water infrastructure assets to assure reliability.

- Complete construction on Reservoir 2's Reservoir Management System by March 2025
- Create and memorialize a capital valve replacement process from valve discovery to updating assets in GIS by February 2025

Objective B: Efficiently manage our water system.

- Submit a plan to implement Mesa Water's Mobile Work Order Functionality by June 2025
- Select a Program Manager and develop a Request for Proposal for a new Plan Check system by June 2025
- Complete a study to evaluate supplying local groundwater to the City of Huntington Beach by March 2025
- Implement an updated water supply and demand optimization model by October 2024

Objective C: Plan future projects based on data-driven and life-cycle cost decisions.

- Update the Water System Master Plan including an Asset Management Plan by June 2025

Objective D: Improve Mesa Water's information technology infrastructure assets to assure reliability and security.

- Implement improved meter reading software and hardware by June 2025

Strategic Goal #3

Be financially responsible and transparent.

Objective A: Maintain AAA financial goals and meet the appropriate designated fund level goals.

- Create an Investment Policy Statement by September 2024
- Review of Financial Service Processes and Implementation of Standard Operating Procedures by April 2025

Objective B: Maintain competitive rates and efficiency in per capita expenditures.

Objective C: Fund the Board's and District's priorities.

- Define a 10-15 year financial strategic plan by September 2024
- Prepare a 10-15 year financial strategic plan by June 2025
- Conduct Federal Earmarks advocacy in 2024 for Mesa Water's priority projects—"Cohort Pipe", "Mainline Valve", and "Cybersecurity by December 2024
- Implement a robust strategy to aggressively pursue grants and low-interest loan funding for Mesa Water's Capital Improvements and priority projects by June 2025

Objective D: Encompass financial responsibility and transparency.

- Implement an Electronic Content Management System by January 2025
- Standardize contracts and create a procurement matrix by November 2024
- Fully complete Resolution No. 1591 by delivering seven audits and one department assessment, and including the results in the review of the General Manager by November 2024
- Select a professional consultant to conduct a business process assessment of Engineering by March 2025
- Complete a business process assessment of Engineering, and deliver the report to the General Manager by June 2026

Strategic Goal #4

Increase favorable opinion of Mesa Water.

Objective A: Enhance Mesa Water's visibility and positive recognition.

- Implement Phase I of the "Detail the District" plan by June 2025
- Reach new audiences by hosting Yo Amo Mesa Water and an industry (e.g., building owners, health and medical professionals) briefing/event

Objective B: Increase awareness of Mesa Water and water among key audiences.

- Launch a school field trip program and community tours by September 2024
- Host 50 field trips and tours at the Mesa Water Education Center by June 2025

Objective C: Increase customer knowledge about water-use efficiency and water-wise resources

- Create Mesa Water-owned rebate programs by June 2025
- Reinstitute home water audits by June 2025

Strategic Goal #5

Attract, develop and retain skilled employees.

Objective A: Attract and retain a qualified, skilled and capable workforce.

- Complete a general salary increase survey of our benchmark agencies by June 2025
- Assess competitiveness of Retiree Health Plan and explore changes by December 2024
- Explore options for reconciling the disparity in retirement benefits between PEPRA and Classic plans by June 2025

Objective B: Develop employee skills.

- Conduct an Elite Onboarding session by June 2025
- Facilitate performance management training for managers and supervisors by September 2024

Objective C: Enhance employee engagement.

- Administer an annual employee engagement pulse survey by January 2025
- Administer the annual employee survey by June 2025

Objective D: Provide a safe working environment.

- Implement an updated wellness program by June 2025

Objective E: Improve operational processes and workflow.

- Update recruitment and selection Standard Operating Procedures by September 2024
- Create an HR Calendar of Events by February 2025
- Conduct a Request for Proposal for a Human Resource Information System by November 2024

Strategic Goal #6

Provide excellent customer service.

Objective A: Provide outstanding internal and external customer service in a timely, courteous and effective manner.

Objective B: Enhance the customer experience.

- Competitively select a new customer information system by September 2024
- Implement a new customer information system by June 2025

Objective C: Measure success.

- Competitively select a consultant to examine the metrics and measurement values of office Customer Service by September 2024
- Evaluate the metrics and measurement values of the Elite Customer Service Standards by December 2024

Objective D: Continuous improvement and reinforcement.

Strategic Goal #7

Actively participate in regional and statewide water issues.

Objective A: Accomplish the Board's Policy Priorities.

- Advocate during the 2024 state legislative session to support an appropriate water bond on the November 2024 ballot by November 2024
- Support the 2024 ACWA-sponsored state assembly bill (AB 2599) to clean up enacted legislation from 2023 re. water shutoffs due to nonpayment and restitution authority by October 2024
- Re-engage the Buried Utilities Coalition (BUC) to advocate on priority air quality regulations of high impact to Mesa Water (CARB ACF, SCAQMD PR 1110.4) by December 2024

Objective B: Positively influence water policy and other priority policy issues.

- Influence 2024 legislation (SB 1110, SB 1330) regulations for CA water use efficiency to be economically viable, environmentally appropriate, and feasible by October 2024
- Advocate during the 2024 state legislative session to amend or oppose "Impact Fee" bills with concerning requirements re. connection fees and capacity charges (AB 1820, SB 937, SB 1210) by October 2024

Objective C: Optimize governmental efficiencies affecting Mesa Water.

- Apply for award(s) -- as offered (ACWA ACE) -- for Mesa Water's Business Improvement Process efforts by December 2024
- Explore ways to improve internal efficiencies for FY 2025 Water Policy processes involving all departments at Mesa Water by June 2025

Objective D: Facilitate Mesa Water's impactful participation with water, government, utility and non-governmental organizations.

- Support MET Chair Adan Ortega's re-election in 2024 for a second two-year term by December 2024

REPORTS:

10. REPORT OF THE GENERAL MANAGER

REPORTS:

11. DIRECTORS' REPORTS AND COMMENTS

CLOSED SESSION:

12. PURSUANT TO CALIFORNIA GOVERNMENT CODE SECTION 54957.6:
Public Employee Performance Evaluation
Title: General Manager

MEMORANDUM

Dedicated to Satisfying our Community's Water Needs

TO: Board of Directors
FROM: Denise Khalifa, Chief Administrative Officer
DATE: October 28, 2025
SUBJECT: Annual Performance Evaluation of the General Manager

RECOMMENDATION

Take action as the Board desires.

STRATEGIC PLAN

Goal #1: Provide an abundant, local, reliable and safe water supply.
Goal #2: Perpetually renew and improve our infrastructure.
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Goal #4: Increase public awareness of Mesa Water.
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Goal #6: Provide excellent customer service.
Goal #7: Actively participate in regional and statewide water issues.
Goal #8: Practice continual business improvement.

PRIOR BOARD ACTION/DISCUSSION

None.

DISCUSSION

At its October 28, 2025 workshop, the Board of Directors (Board) will review and discuss, in Closed Session, the General Manager's Employment Agreement and potential compensation changes. State law requires that subsequent Open Session announcement of such items be made at a regular or adjourned regular meeting of the Board; action may or may not take place at the adjourned regular Board meeting of October 28, 2025.

FINANCIAL IMPACT

There is no financial impact for the discussion of this item unless action is taken by the Board.

ATTACHMENTS

None.