

TEHAMA COUNTY
FLOOD CONTROL AND WATER CONSERVATION DISTRICT

Groundwater Sustainability Plan

Los Molinos Subbasin

JANUARY 2022



PREPARED BY

Luhdorff & Scalmanini
Consulting Engineers

LOS MOLINOS SUBBASIN
GROUNDWATER GUSTAINABILITY PLAN

ACKNOWLEDGMENTS

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TEHAMA COUNTY GROUNDWATER SUSTAINABILITY AGENCY BOARD OF DIRECTORS

The Tehama County Flood Control and Conservation District, a local and regional authority, serves as the exclusive GSA for the Red Bluff Subbasin. The GSA Board of Directors are same members of the Tehama County Board of Supervisors.

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Candy Carlson
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John Leach
William Moule

GROUNDWATER SUSTAINABILITY PLAN GROUNDWATER COMMISSIONERS

In June 2016, the District established the Tehama County Groundwater Commission to serve as an advisory commission to the Tehama County Flood Control and Water Conservation District Board of Directors for GSA related matters. The Commission consists of 11 members. The Groundwater Commission provided input, review of draft GSP content, defined sustainable management criteria, and provided input on next steps for GSP implementation. Tehama County Groundwater Sustainability Agency appreciates the contributions of the 11 members listed below:

Kristina Miller, City of Corning
Clay Parker, City of Red Bluff
Bill Borror, City of Tehama
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MBK Engineers
Water Resource Consulting
Pacific Agroecology

Luhdorff & Scalmanini Consulting Engineers performed modeling, planning, and other technical support for the Tehama County Groundwater Sustainability Agency in addition to composing the Red Bluff Subbasin Groundwater Sustainability Plan.

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On behalf of the Tehama County Groundwater Sustainability Agency, thank you to all of the community members who participated in public meetings, information sessions, and various outreach events. Your input was vital to shaping this Plan.



FINAL REPORT

Los Molinos Subbasin

Sustainable Groundwater Management Act

Groundwater Sustainability Plan

January 2022

Prepared For:

Tehama County Flood Control and Water Conservation District

Prepared By:

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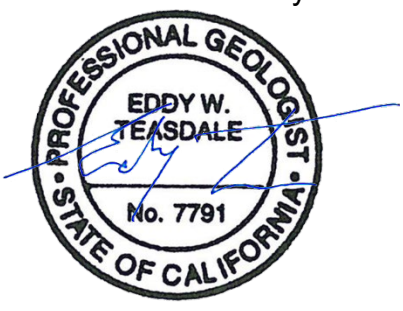




TABLE OF CONTENTS

EXECUTIVE SUMMARY

ES 1. Introduction ES-1
ES 2. Summary of Plan Area ES-2
ES 2.1. Basin Setting and Hydrogeologic Conceptual Model ES-3
ES 2.2 Water Budget ES-3
ES 3. Sustainability Management Criteria ES-5
ES 3.1. Chronic Lowering of Groundwater Elevations ES-8
ES 3.2. Reduction of Groundwater Storage ES-8
ES 3.3. Subsidence ES-8
ES 3.4. Degraded Water Quality ES-8
ES 3.5. Seawater Intrusion ES-8
ES 3.6. Depletion of Interconnected Surface Waters ES-8
ES 3.7. Monitoring Network ES-9
ES 4. Overview of Projects and Management Actions ES-11
ES 4.1. PMAs Planned for Implementation ES-11
ES 4.1.1. Multi-Benefit Groundwater Recharge Programs ES-11
ES 4.1.2. Grower Education and Outreach ES-11
ES 4.1.3. Deer Creek Instream Flow Enhancements and Conjunctive Use Management Projects ES-11
ES 4.1.4. Lower Deer Creek Improvements and Habitat Restoration Phases 1 and 3 ..... ES-11
ES 4.2. Proposed Potential PMAs ES-12
ES 4.2.1 Direct Groundwater Recharge ES-12
ES 4.2.2. Groundwater Demand Reduction ES-12
ES 4.2.3. Surface Water Supply Augmentation & In-Lieu Groundwater Recharge ES-12
ES 4.2.4. Education/Outreach, In-Lieu Groundwater Recharge ES-12
ES 4.2.5. Groundwater Demand Reduction. ES-12
ES 4.2.6. In-Lieu Groundwater Recharge ES-12
ES 4.2.7. Monitoring to Fill Data Gaps & Programs to Support Wells ES-13
ES 5. Plan Implementation ES-13
ES 6. Overview of Governance ES-16

Chapter 1. Introduction

1. INTRODUCTION 1-1

1.1. Purpose of Groundwater Sustainability Plan 1-1
1.1.1. Justification for Management Area 1-3
1.2. Sustainability Goal 1-5
1.3. Agency Information 1-6
1.3.1. Organization and Management Structure of the GSA 1-7
1.3.2. Legal Authority of the GSA 1-8
1.3.3. Estimated Cost of Implementing the GSP 1-10
1.4. GSP Organization 1-10

Chapter 2A. Plan Area

2. SUBBASIN PLAN AREA AND BASIN SETTING (REG. § 354.8) 2A-1
2.1. Description of Plan Area 2A-1
2.1.1. Summary of Jurisdictional Areas and Other Features 2A-1
2.1.2. Water Resource Monitoring Entities, Management Programs, and Data Sources 2A-13
2.1.3. Land Use Elements or Topic Categories of Applicable General Plans 2A-27
2.1.4. Notice and Communication 2A-34
2.1.5. References 2A-50

Chapter 2B. Basin Setting

2.SUBBASIN PLAN AREA AND BASIN SETTING (REG. § 354.8) 2B-1
2.1.Description of Plan Area 2B-1
2.2.Basin Setting 2B-1
2.2.1. Hydrogeologic Conceptual Model 2B-1
2.2.2. Current and Historical Groundwater Conditions 2B-45
2.2.3.Basin Setting Summary 2B-85
2.3.References 2B-87

Chapter 2C. Water Budget

2. SUBBASIN PLAN AREA AND BASIN SETTING (REG. § 354.8) 2C-1
2.1.Description of Plan Area 2C-1
2.2.Basin Setting 2C-1
2.3.Water Budget (Reg. § 354.18) 2C-1
2.3.1. Water Budget Conceptual Model 2C-2
2.3.2. Water Budget Analysis Periods 2C-6
2.3.3. Surface Water System (SWS) Water Budget Description 2C-8
2.3.4. Groundwater System Water Budget Description 2C-15

2.3.5. Historical Water Budget....2C-18
2.3.6. Current Water Budget....2C-30
2.3.7. Projected Water Budgets....2C-33
2.3.8 Projected (Future Land Use) Water Budget Summary....2C-42
2.3.9. Projected Water Budgets with Climate Change....2C-54
2.3.10. Projected Groundwater Storage Change by Aquifer....2C-56
2.3.11. Uncertainty in Water Budget Estimates....2C-58
2.3.12. Estimate of Sustainable Yield....2C-61
2.4. References....2C-62

Chapter 3. Sustainable Management Criteria

3. SUSTAINABLE MANAGEMENT CRITERIA....3-1
3.1. Sustainability Goal (Reg §354.24)....3-4
3.1.1. Goal Description....3-4
3.1.2. Description of Measures....3-5
3.1.3. Description of Measures and Explanation of How the Goal Will Be Achieved in 20 Years....3-5
3.2. Measurable Objectives and Interim Milestones (Reg. § 354.30)....3-5
3.2.1. Measurable Objectives for Chronic Lowering of Water Levels....3-6
3.2.2. Measurable Objectives for Reduction in Groundwater Storage....3-10
3.2.3. Measurable Objectives for Subsidence....3-11
3.2.4. Measurable Objectives for Degraded Water Quality....3-13
3.2.5. Measurable Objectives for Interconnected Surface Waters....3-15
3.3. Minimum Thresholds (Reg. § 354.28)....3-17
3.3.1. Minimum Thresholds for Chronic Lowering of Groundwater Elevations....3-18
3.3.2. Minimum Thresholds for Reduction in Groundwater Storage....3-21
3.3.3. Minimum Thresholds for Subsidence....3-23
3.3.4. Minimum Thresholds for Groundwater Quality....3-24
3.3.5. Minimum Thresholds for Interconnected Surface Water Depletions....3-26
3.3.6. Relationship Between the Established Minimum Threshold and Sustainability Indicator(s) 3-27
3.3.7 Minimum Thresholds Impacts to Adjacent Basins....3-28
3.3.8. Minimum Thresholds Impacts on Beneficial Users....3-28
3.4. Undesirable Results (Reg. § 354.26)....3-28
3.4.1. Groundwater Elevation....3-30
3.4.2. Groundwater Storage....3-30

3.4.3. Subsidence 3-30
3.4.4. Groundwater Quality 3-30
3.4.5. Interconnected Surface Waters 3-31
3.4.6. Potential Effects on the Beneficial Users of Groundwater 3-31
3.5. Management Areas 3-31
3.6. Monitoring Network 3-31
3.6.1. Description of Monitoring Network (Reg. § 354.34) 3-32
3.6.2. Groundwater Elevation Monitoring Network 3-34
3.6.3. Groundwater Storage Monitoring Network 3-37
3.6.4. Subsidence Monitoring Network 3-39
3.6.5. Groundwater Quality Monitoring Network 3-41
3.6.6. Interconnected Surface Water Monitoring Network 3-43
3.7. Description of Monitoring Protocols (Reg. § 354.34) 3-45
3.7.1. Protocols for Monitoring Sites 3-45
3.7.2. Groundwater Level Elevation 3-45
3.7.3. Groundwater Storage Measurements 3-47
3.7.4. Groundwater Quality Measurements 3-47
3.7.5. Subsidence Measurements 3-49
3.7.6. Interconnected Surface Water Measurements 3-49
3.7.7. Representative Monitoring (Reg. § 354.36) 3-49
3.7.8. Assessment and Improvement of Monitoring Network ((Reg. § 354.38) 3-49

Chapter 4. Projects and Management Actions

4. SUSTAINABLE GROUNDWATER MANAGEMENT: PROJECTS AND MANAGEMENT ACTIONS (§ 354.44) 4-1
4.1. Introduction 4-1
4.1.1. Development Approach 4-1
4.2. Summary of Projects and Management Actions 4-5
4.2.1. Overview of All Proposed Projects and Management Actions 4-5
4.2.2. Sustainability Indicators Benefitted by Projects and Management Actions 4-16
4.2.3. Maintaining Sustainability 4-17
4.3. Overview of Concepts Explored 4-17
4.3.1. Well Permit Revision (LSCE) 4-17
4.3.2. Demand Management (LSCE/DE) 4-17

4.3.3. Multi-Benefit Recharge Project (DE) 4-18
4.3.4. Flood Managed Aquifer Recharge (Flood-MAR) 4-19
4.3.5. Rainfall Managed Aquifer Recharge (Rain-MAR) to Capture Runoff from Fields 4-19
4.3.6. Other Groundwater Management Strategies (Projects and Management Actions and Cost Feasibility) (LSCE/DE) 4-20
4.3.7. Ongoing Evaluation of Groundwater Management Efforts (LSCE) 4-20
4.4. Projects and Management Actions Developed for Implementation 4-20
4.4.1. Multi-Benefit Recharge Project 4-20
4.4.2. Grower Education Relating to On-Farm Practices for Sustainable Groundwater Management 4-27
4.4.3. Deer Creek Instream Flow Enhancements and Conjunctive Use Management Projects 4-33
4.4.4. Lower Deer Creek Improvements and Habitat Restoration Phases 1 and 3 4-33
4.5. Portfolio of Other Potential Projects and Management Actions 4-33
4.5.1. Potential Projects 4-34
4.5.2. Potential Management Actions 4-49
4.5.3. Potential Other Activities 4-60
4.6. Project Financing (LSCE?) 4-71
4.7. GSA Coordination 4-71
4.7.1. Goals, Policies, and Ordinances 4-71
4.7.2. Well Owner Outreach and Education 4-72
4.7.3. Participation in IRWMPs/GMPs/SNMPs/etc 4-72
4.8. Subbasin Water Available for Projects 4-72
4.8.1. Mill Creek 4-72
4.8.2. Deer Creek 4-74
4.8.3. Water Right Permits 4-74
4.8.4. Potential Water Available from Mill Creek for Groundwater Recharge 4-75
4.8.5. Potential Water Available from Deer Creek for Groundwater Recharge 4-78

Chapter 5. Plan Implementation

5. PLAN IMPLEMENTATION (REG. § 354.6) 5-1
5.1. Estimate of GSP Implementation Costs 5-1
5.1.1. GSA Administration, Management, Operations, and Other Costs 5-1
5.1.2. Monitoring 5-2
5.1.3. GSP Implementation and Updates 5-3

5.1.4. Project and Management Actions Development and Implementation Costs 5-4
5.1.5. Total Costs 5-4
5.1.6. Funding Sources 5-6
5.2. Schedule for Implementation 5-6
5.3. Annual Reporting 5-7
5.3.1. General Information (§356.4(a)) 5-7
5.3.2. Subbasin Conditions (§356.4(b)) 5-7
5.3.3. Plan Implementation Progress (§356.4(c)) 5-8
5.4. Periodic Evaluations and Reporting 5-8
5.4.1.Sustainability Evaluation (§356.4(a) - §356.4(b)) 5-8
5.4.2. Monitoring Network (§356.4(e)) 5-9
5.4.3. New Information (§356.4(f)) 5-9
5.4.4. GSA Actions (§356.4(g)) 5-9
5.4.5. Plan Amendments, Coordination, and Other Information (§356.4(i) - (§356.4(k)) 5-9

LIST OF TABLES

Table ES-1 Summary of Undesirable Results Applicable to the Plan Area
Table ES-2 Summary of MT, MO, and Undesirable Results
Table ES-3 Estimated GSP Implementation Costs through 2042
Table 1-1 Sustainability Goal Development and Associated GSP Sections
Table 1-2 GSA Formation Timeline
Table 1-3 Cross Reference of GSP Regulations and Associated GSP Sections
Table 2-1 Los Molinos Subbasin Land Use (Acres)
Table 2-2 Los Molinos Subbasin Agricultural Land Use (Acres)
Table 2-3 Well Density
Table 2-4 Surface Water Monitoring Stations
Table 2-5 Tehama County General Plan Relevant Goals, Policies, and Implementation Measures
Table 2-6 Beneficial Uses and Users of Groundwater
Table 2-7 Opportunities for Public Engagement
Table 2-8 Lithologic Information Including Age, Formation, Max Thickness, Water Bearing Character
Table 2-9 Sacramento Valley Water Year Types since 1980
Table 2-10. Water Budget Components by Accounting Center and Associated GSP Regulations

Table 2 11. Sacramento Valley Water Year Type Classification during the Historical Water Budget Period (1990-2018)

Table 2-12. Sacramento Valley Water Year Type Classification Over the Projected Water Budget Period (2022-2072)

Table 2 13. Land Surface System Water Budget Components

Table 2-14. Canal System Water Budget Components

Table 2-15. Rivers, Streams, and Small Watersheds System Water Budget Components

Table 2 16. Subbasin Boundary Surface Water System Water Budget Components

Table 2 17. Subbasin Boundary Groundwater System Water Budget Components

Table 2 18. Los Molinos Subbasin Land Use Areas, by Water Use Sector

Table 2 19. Los Molinos Subbasin Agricultural Land Use Areas (acres)

Table 2 20. Los Molinos Subbasin Surface Water System Historical Water Budget, 1990-2018 (acre-feet)

Table 2 21. Los Molinos Subbasin Historical Groundwater Budget Summary (acre-feet)

Table 2 22. Comparison of Recent SWS Water Budget Periods (acre-feet)

Table 2 23. Comparison of Recent GWS Water Budget Periods (acre-feet)

Table 2-24. Los Molinos Subbasin Surface Water System Projected (Current Land Use) Water Budget, 2022-2072 (acre-feet)

Table 2-25. Los Molinos Subbasin Projected (Current Land Use) Water Budget Summary (acre-feet)

Table 2-26. Los Molinos Subbasin Future Land Use Areas, by Water Use Sector (acres)

Table 2-27. Los Molinos Subbasin Projected Agricultural Land Use Areas (acres)

Table 2-28. Los Molinos Subbasin Surface Water System Projected (Future Land Use) Water Budget, 2022-2072 (acre-feet)

Table 2-29. Los Molinos Subbasin Projected (Future Land Use) Water Budget Summary (acre-feet)

Table 2-30. Comparison of Annual Projected (Current Land Use) GWS Water Budgets with Climate Change Adjustments (acre-feet)

Table 2-31. Comparison of Annual Projected (Future Land Use) GWS Water Budgets with Climate Change Adjustments (acre-feet)

Table 2-32. Comparison of Projected (Current Land Use) Aquifer-Specific GWS Water Budgets with Climate Change Adjustments

Table 2-33. Comparison of Projected (Future Land Use) Aquifer-Specific GWS Water Budgets with Climate Change Adjustments

Table 2-34. Estimated Uncertainty of Major Water Budget Components

Table 3-1. Summary of Undesirable Results Applicable to the Plan Area

Table 3-2. Measurable Objectives and Interim Milestones for the Chronic Lowering of Water Elevations – Upper Aquifer

Table 3-3. Measurable Objectives and Interim Milestones for the Chronic Lowering of Water Elevations – Lower Aquifer

Table 3-4. Measurable Objectives and Interim Milestones for Subsidence

Table 3-5. Measurable Objectives and Interim Milestone for Groundwater Quality

Table 3-6. Interim Measurable Objectives and Interim Milestones for Interconnected Surface Water

Table 3-7 Minimum Thresholds and Interim Milestones for the Chronic Lowering of Water Elevations – Upper Aquifer

Table 3-8. Minimum Thresholds and Interim Milestones for the Chronic Lowering of Water Elevations – Lower Aquifer

Table 3-9 Measurable Thresholds and Interim Milestones for Subsidence

Table 3-10. Minimum Thresholds Measurable Objectives and Interim Milestones for Groundwater Quality

Table 3-11. Interim Minimum Thresholds and Interim Milestones for Interconnected Surface Water Depletions

Table 3-12. Summary of Minimum Thresholds, Measurable Objectives, and Undesirable Results

Table 3-13. Proposed Monitoring Network

Table 3-14. Groundwater Level Monitoring Well Network – Upper Aquifer

Table 3-15. Groundwater Level Monitoring Well Network – Lower Aquifer

Table 3-16. Summary of Rationale for Selection for Wells Using Groundwater Levels

Table 3-17. Groundwater Storage Monitoring Network – Upper Aquifer

Table 3-18. Groundwater Storage Monitoring Network – Lower Aquifer

Table 3-19. Summary of Rationale for Selection for Wells Used for Storage

Table 3-20. Land Subsidence Monitoring Network

Table 3-21. Summary of Rationale for Selection of Subsidence Monitoring Sites

Table 3-22. Groundwater Quality Monitoring Network

Table 3-23. Summary of Rationale for Selection for Wells Used Groundwater Quality

Table 3-24. Interconnected Surface Water Monitoring Network

Table 3-25. Summary of Rationale for Selection for Wells for Interconnected Surface Water

Table 3-26 Summary of Groundwater Quality Monitoring Constituents and Measurement Frequency for Representative Monitoring Test

Table 4 1. Summary of Key Groundwater System Water Budget Parameters Influencing Formulation of Projects and Management Actions in the Los Molinos Subbasin (average annual volumes in acre-feet per year, rounded)

Table 4 2. Summary of Projects and Management Actions Proposed for the Los Molinos Subbasin

Table 4 3. Benefits and Costs of Projects and Management Actions Developed for Implementation

Table 4 4. Sustainability Indicators Expected to Benefit from Projects and Management Action Types Proposed for the Los Molinos Subbasin

Table 4 5. Expected Annual Implementation Timeline for the Los Molinos Subbasin Multi-benefit Groundwater Recharge Project

Table 4 6. Estimated Average Recharge Volume and Temporary Wetland Habitat Formation for the Multi-benefit Groundwater Recharge Project

Table 4 7. Estimated capital cost and average annual operating cost per site for the multi-benefit groundwater recharge project

Table 4 8. Sustainability Indicators Benefitted by On-Farm Management Actions

Table 4 9. Grower Education Program Implementation Schedule

Table 4 10. List of Potential Projects Proposed for the Los Molinos Subbasin

Table 4 11. Direct Groundwater Recharge of Stormwater and Flood Water: Summary (23 CCR §354.44(b))

Table 4 12. Stormwater Management Improvements: Summary (23 CCR §354.44(b))

Table 4 13. Levee Setback and Stream Channel Restoration: Summary (23 CCR §354.44(b))

Table 4 14. Rain-MAR: Summary (23 CCR §354.44(b))

Table 4 15. Recycled Water Projects: Summary (23 CCR §354.44(b))

Table 4 16. Invasive Plant Removal: Summary (23 CCR §354.44(b))

Table 4 17. Inter-Basin Surface Water Transfers or Exchanges: Summary (23 CCR §354.44(b))

Table 4 18. Water Supply Reservoir Construction, Renovation, or Conversion: Summary (23 CCR §354.44(b))

Table 4 19. Enhanced Boundary Flow Measurement: Summary (23 CCR §354.44(b))

Table 4 20. Well Metering: Summary (23 CCR §354.44(b)).

Table 4 21. List of Potential Management Actions Proposed for the Los Molinos Subbasin

Table 4 22. Assistance and Incentives for On-Farm Irrigation Infrastructure Improvements: Summary (23 CCR §354.44(b)).

Table 4 23. Incentives for Residential and Municipal Water Use Efficiency Improvements: Summary (23 CCR §354.44(b)).

Table 4 24. Demand Management: Summary (23 CCR §354.44(b)).

Table 4 25. Incentives for Use of Available Surface Water and Recycled Water:

Summary (23 CCR §354.44(b)).

Table 4 26. Water Market for Surface Water and Groundwater Exchange:
Summary (23 CCR §354.44(b)).

Table 4 27. Tehama County Domestic Well Tracking and Outreach Program:
Summary (23 CCR §354.44(b)).

Table 4 28. Well Deepening or Replacement Program: Summary (23 CCR §354.44(b)).

Table 4 29. Review of County Well Permitting Ordinances: Summary (23 CCR §354.44(b)).

Table 4 30. List of Potential Other Activities Proposed for the Los Molinos Subbasin.

Table 4 31. Coordination and Development of Public Data Portals: Summary (23 CCR §354.44(b)).

Table 4 32. Additional Studies of GDEs and Groundwater - Surface Water Interactions: Summary (23 CCR §354.44(b)).

Table 4 33. Expanded Subbasin Monitoring and Aquifer Testing: Summary (23 CCR §354.44(b)).

Table 4 34. Install Additional Agroclimate Stations: Summary (23 CCR §354.44(b)).

Table 4 35. Maintain and Expand Groundwater Level Monitoring Network: Summary (23 CCR §354.44(b)).

Table 4 36. One-Time Groundwater Quality Snapshot and Evaluation: Summary (23 CCR §354.44(b)).

Table 4 37. Tehama County Well Inventory and Registration Program: Summary (23 CCR §354.44(b)).

Table 4 38. Water Year Classification Defined in Sacramento Valley Water Year Hydrologic Classification.

Table 4 39 Potential Diversion Under Streamlined Permit for all Creeks in Tehama County by Water Year Classification

Table 5-1 Estimated GSA Administration, Management, and Operations Costs

Table 5-2 Estimated Annual Monitoring Costs

Table 5-3 Estimated Plan Update Costs

Table 5-4 Estimated GSP Implementation Costs through 2042

LIST OF FIGURES

Figure ES-1 Los Molinos Subbasin Location Map
Figure ES-3 Map of all Sustainability Indicator Wells
Figure ES-3 GSP Implementation Schedule
Figure 1-1 Tehama County FCWCD GSP Subbasins
Figure 1-2 Los Molinos Subbasin Vicinity Map
Figure 2-1 Los Molinos Subbasin and Surrounding Groundwater Subbasins
Figure 2-2 Land Status in the Subbasin
Figure 2-3 2018 Land Use
Figure 2-4 Los Molinos Subbasin Land Use
Figure 2-5 Los Molinos Subbasin Agricultural Land Use
Figure 2-6 Domestic Well Density by Section
Figure 2-7 Production Well Density by Section
Figure 2-8 Public Supply Well Density by Section
Figure 2-9 Subsidence Monitoring Stations
Figure 2-10 Surface Water Monitoring Stations
Figure 2-11 Economically Distressed Areas
Figure 2-12 Water Sources
Figure 2-13 Public Water Districts
Figure 2-14 Lateral Subbasin Boundary
Figure 2-15 Contours of Equal Groundwater Elevation, Base of Freshwater
Figure 2-16 Contours of Equal Elevation, Base of Post-Eocene Deposits
Figure 2-17 Map of Topographic Slope
Figure 2-18 Map of Ground Surface Elevation
Figure 2-19 Map of Geologic Provinces
Figure 2-20 Geologic Map with Faults
Figure 2-20B Geologic Map with Faults
Figure 2-21 Map of Cross Section Locations
Figure 2-21B Map of Cross Section Locations
Figure 2-22 Cross Section D-D’
Figure 2-23 Cross Section E-E’
Figure 2-24 Cross Section F-F’
Figure 2-25 Cross Section G-G’

Figure 2-26 DWR Cross Section b-b'
Figure 2-27 DWR Cross Section c-c'
Figure 2-26B Description if Map Units for DWR Cross Section b-b' and c-c'
Figure 2-27B Description if Map Units for DWR Cross Section b-b' and c-c'
Figure 2-28 Soils – Type by Soil Series
Figure 2-28B Soils – Type by Soils Series
Figure 2-29 Soils – Texture
Figure 2-30 Soils – Saturated Hydraulic Conductivity
Figure 2-31 Soils – Drainage Class
Figure 2-32 Soils – Electrical Conductivity
Figure 2-33 Soils – pH
Figure 2-34 Map of Surface Water Features
Figure 2-35 SAGBI Groundwater Recharge Rating
Figure 2-36 Map of Discharge Areas – Wetlands, Springs, Seeps
Figure 2-37 Panel Map of Selected Groundwater Elevation Hydrographs
Figure 2-38 Annual Precipitation and Cumulative Departure at Orland
Figure 2-39 Contours of Equal Groundwater Elevation, Upper Aquifer – Seasonal High of 2019
Figure 2-40 Contours of Equal Groundwater Elevation, Upper Aquifer – Seasonal Low of 2019
Figure 2-41 Contours of Equal Groundwater Elevation, Upper Aquifer – Seasonal High of 2017
Figure 2-42 Contours of Equal Groundwater Elevation, Upper Aquifer – Seasonal Low of 2017
Figure 2-43 Contours of Equal Groundwater Elevation, Upper Aquifer – Seasonal High of 2013
Figure 2-44 Contours of Equal Groundwater Elevation, Upper Aquifer – Seasonal Low of 2013
Figure 2-45 Contours of Equal Groundwater Elevation, Upper Aquifer – Seasonal High of 2015
Figure 2-46 Contours of Equal Groundwater Elevation, Upper Aquifer – Seasonal Low of 2015
Figure 2-47 Contours of Equal Groundwater Elevation, Lower Aquifer – Seasonal High of 2019
Figure 2-48 Contours of Equal Groundwater Elevation, Lower Aquifer – Seasonal Low of 2019
Figure 2-49 Contours of Equal Groundwater Elevation, Lower Aquifer – Seasonal High of 2017
Figure 2-50 Contours of Equal Groundwater Elevation, Lower Aquifer – Seasonal Low of 2017
Figure 2-51 Contours of Equal Groundwater Elevation, Lower Aquifer – Seasonal High of 2013
Figure 2-52 Contours of Equal Groundwater Elevation, Lower Aquifer – Seasonal Low of 2013
Figure 2-53 Contours of Equal Groundwater Elevation, Lower Aquifer – Seasonal High of 2015
Figure 2-54 Contours of Equal Groundwater Elevation, Lower Aquifer – Seasonal Low of 2015
Figure 2-55 Change of Groundwater Elevation from Spring 1990 to Spring 2018

Figure 2-56 Maximum Historical TDS Concentration by Well
Figure 2-57 Maximum Historical Nitrate Concentration by Well
Figure 2-58 Maximum Historical Arsenic Concentration by Well
Figure 2-59 Map of Oil and Gas Fields and Wells
Figure 2-60 Subsidence Measurements Between 2008 and 2017
Figure 2-61 DWR InSAR Subsidence Map
Figure 2-62 UNAVCO PBO GPS Measurements
Figure 2-63 Surface Water and Shallow Groundwater Monitoring Stations
Figure 2-64 GDEs and Available Near Surface Wells with Data
Figure 2-65 Timeseries Graph of NDVI And NDMI of a GDE and Depth to Water at an Adjacent Well
Figure 2-66. The Hydrologic Cycle (Source: DWR, 2016a)
Figure 2-67. Water Budget Accounting Structure (Source: DWR, 2016a)
Figure 2-68. Subbasin Water Budget Conceptual Model
Figure 2-69. Los Molinos Subbasin Land Use Areas, by Water Use Sector
Figure 2-70. Los Molinos Subbasin Agricultural Land Use Areas
Figure 2-71. Los Molinos Subbasin Surface Water System Historical Water Budget, 1990-2018
Figure 2 72. Diagram of the Los Molinos Subbasin Historical Average Annual Water Budget (1990-2018)
Figure 2 73. Los Molinos Subbasin Historical Groundwater Budget Summary
Figure 2-74. Los Molinos Subbasin Surface Water System Projected (Current Land Use) Water Budget, 2022-2072
Figure 2-75. Diagram of the Los Molinos Subbasin Projected (Current Land Use) Average Annual Water Budget, 2022-2072
Figure 2-76 Los Molinos Subbasin Projected (Current Land Use) Water Budget Summary
Figure 2-77. Los Molinos Subbasin Future Land Use Areas, by Water Use Sector
Figure 2-78. Los Molinos Subbasin Projected Agricultural Land Use Areas
Figure 2-79. Los Molinos Subbasin Surface Water System Projected (Future Land Use) Water Budget, 2022-2072
Figure 2-80. Diagram of the Los Molinos Subbasin Projected (Future Land Use) Average Annual Water Budget, 2022-2072
Figure 2-81. Los Molinos Subbasin Projected (Future Land Use) Water Budget Summary
Figure 3-1. Representative Monitoring Sites
Figure 3-2. Groundwater Level Representative Monitoring Sites – Upper Aquifer
Figure 3-3. Groundwater Level Representative Monitoring Sites – Lower Aquifer

Figure 3-4. Subsidence Monitoring Network

Figure 3-5. Groundwater Quality Monitoring Network – Upper Aquifer

Figure 3-6. Interconnected Surface Water Monitoring

Figure 3-7. Identification of Data Gaps (GDE)

Figure 3-8. Identification of Data Gaps (Surface Water Features)

Figure 4-1. Mill Creek Monthy Flow Volume by Water Year Classification.

Figure 4-2 Deer Monthy Flow Volume by Water Year Classification

Figure 4-3. Potential Diversion for Mill Creek in Example Wet Year: Winter 1998 under Streamlined Permit

Figure 4-4. Potential Diversion for Mill Creek under Streamlined Permit by Water Year Classifcation

Figure 4-5. Potential Diversion Volume for Mill Creek for Water Years 1948-2020

Figure 4-6. Average Annual Potential Diversion for Mill Creek under Streamlined Permit with varying Recharge Capacity

Figure 4-7. Potential Diversion for Deer Creek for Example Wet Year: Winter 1998 under Streamlined Permit

Figure 4-8. Potential Diversion for Deer Creek under Streamlined Permit by Water Year Classifcation

Figure 4-9. Potential Diversion Volume for Deer Creek for Water Years 1948-2020

Figure 4-10. Average Annual Potential Diversion for Deer Creek under Streamlined Permit with varying Recharge Capacity

Figure 4-11. Average Annual Potential Diversion for Mill and Deer creeks under Streamlined Permit with varying Recharge Capacity

Figure 5-1 GSP Implementation Schedule

LIST OF APPENDICES

Appendix 1-A Tehama County Flood Control and Water Conservation District Act of Formation
Appendix 1-B GSA Formation Documents
Appendix 1-C Glossary: SGMA Definitions
Appendix 1-D Elements Guide
Appendix 2-A Domestic Well Inventory Analysis
Appendix 2-B Communication and Engagement Plan
Appendix 2-C Northern Sacramento Valley Inter-Basin Coordination Report
Appendix 2-D GSA Outreach Events and Interested Parties List
Appendix 2-E Comments on the Plan
Appendix 2-F Hydrograph Well Locations, Hydrographs, and Groundwater Level Trend Statistics
Appendix 2-G Water Quality Hydrographs
Appendix 2-H Freshwater Flora and Fauna
Appendix 2-I Surface Water Depletion and GDE Methodology and Analysis
Appendix 2-J Tehama Integrated Hydrologic Model Documentation Report
Appendix 2-K Detailed Water Budget Results
Appendix 3-A DMS Summary
Appendix 3-B Groundwater Level Hydrographs, Measurable Objectives (MO) and Minimum Thresholds (MT) of Groundwater Level Sustainability Indicator Wells
Appendix 3-C Groundwater Quality Sampling Results
Appendix 3-D InSAR Time Series Data
Appendix 4-A Projects and Management Actions Matrix

LIST OF ACRONYMS & ABBREVIATIONS

AB	Assembly Bill
af	Acre-feet
AN	Above normal Sacramento Valley water year type
AWMP	Agricultural Water Management Plan
bgs	Below Ground Surface
BMP	Best Management Practice
BN	Below normal Sacramento Valley water year type
C	Critical (dry) Sacramento Valley water year type
CalEPA	California Environmental Protection Agency

CalGEM	California Geologic Energy Management Division
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CNRA	California Natural Resources Agency
CVP	Central Valley Project
CV-SALTS	Central Valley Salinity Alternatives
CWA	Clean Water Act
CWC	California Water Code
D	Dry Sacramento Valley water year type
DCID	Deer Creek Irrigation District
DDW	Division of Drinking Water
DMS	Data Management System
DO	Dissolve Oxygen
DPR	Department of Pesticide Regulation
DQO	Data Quality Objective
DTSC	Department of Toxic Substance Control
DTW	Depth to Water
DWR	California Department of Water Resources
DWR	Department of Water Resources
EC	Electrical Conductivity
ET	Evapotranspiration
ft/yr	feet per year
FTE	Full Time Equivalent
GAMA	Groundwater Ambient Monitoring and Assessment Program
GDE	Groundwater Dependent Ecosystem
GMP	Groundwater Management Plan
GQTM	Groundwater Quality Trend Monitoring
GSA	Groundwater Sustainability Agency
GSE	Ground Surface Elevation
GSP	Groundwater Sustainability Plan
GWE	Groundwater Elevation
GWMP	Groundwater Management Plan
GWS	Groundwater System

HCM	Hydrogeological Conceptual Model
ILRP	Irrigated Lands Regulatory Program
InSAR	Interferometric Synthetic Aperture Radar
IRWMP	Integrated Regional Water Management Plan
LMMWC	Los Molinos Mutual Water Company
MAs	Management Actions
MCL	Maximum Contaminant Level
Mg/L	Mlligrams per Liter
MO	Measurable Objective
MOs	Measurable Objectives
MT	Minimum Threshold
MTs	Minimum Thresholds
NAVD88	North American Vertical Datum of 1988
NDVI	Normalized Difference Vegetation Index
ORP	Oxidation-Reduction Potential
PBO	Plate Boundary Observatory
PMAs	Projects and Management Actions
QA	Quality Assurance
QC	Quality Control
RMS	Representative Monitoring Sites
RP	Reference Point
RPE	Reference Point Elevation
RWQCB	Regional Water Quality Control Board
SB	Senate Bill
SGMA	Sustainable Groundwater Management Act
SMC	Sustainable Management Criteria
SMCL	Secondary Maximum Containment Level
SVRIC	Stanford Vina Ranch Irrigation Company
SWP	State Water Project
SWRCB	State Water Resources Control Board
SWRCB	State Water Resources Control Board
SWS	Surface Water System
TAC	Technical Advisory Committee

taf	Thousand acre-feet
TDS	Total Dissolved Solids
Tehama County FCWCD	Tehama County Flood Control and Water Conservation District
Tehama IHM	Tehama Integrated Hydrologic Model
TNC	The Nature Conservancy
UNAVACO	University NAVSTAR Consortium
USBLM	Bureau of Land Management
USBR	United States Bureau of Reclamation
USEPA	United States Environmental Protection Agency
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UWMP	Urban Water Management Plan
W	Wet Sacramento Valley water year type
WCR	Well Completion Report
WDR	Waste Discharge Requirements
WMP	Water Management Plan

TABLE OF CONTENTS

ES 1. Introduction ES-1
ES 2. Summary of Plan Area ES-2
ES 2.1. Basin Setting and Hydrogeologic Conceptual Model ES-3
ES 2.2 Water Budget ES-3
ES 3. Sustainability Management Criteria ES-5
ES 3.1. Chronic Lowering of Groundwater Elevations ES-8
ES 3.2. Reduction of Groundwater Storage ES-8
ES 3.3. Subsidence ES-8
ES 3.4. Degraded Water Quality ES-8
ES 3.5. Seawater Intrusion ES-8
ES 3.6. Depletion of Interconnected Surface Waters ES-8
ES 3.7. Monitoring Network ES-9
ES 4. Overview of Projects and Management Actions ES-11
ES 4.1. PMAs Planned for Implementation ES-11
ES 4.1.1. Multi-Benefit Groundwater Recharge Programs ES-11
ES 4.1.2. Grower Education and Outreach ES-11
ES 4.1.3. Deer Creek Instream Flow Enhancements and Conjunctive Use Management Projects ES-11
ES 4.1.4. Lower Deer Creek Improvements and Habitat Restoration Phases 1 and 3 ..... ES-11
ES 4.2. Proposed Potential PMAs ES-12
ES 4.2.1 Direct Groundwater Recharge ES-12
ES 4.2.2. Groundwater Demand Reduction ES-12
ES 4.2.3. Surface Water Supply Augmentation & In-Lieu Groundwater Recharge ES-12
ES 4.2.4. Education/Outreach, In-Lieu Groundwater Recharge ES-12
ES 4.2.5. Groundwater Demand Reduction. ES-12
ES 4.2.6. In-Lieu Groundwater Recharge ES-12
ES 4.2.7. Monitoring to Fill Data Gaps & Programs to Support Wells ES-13
ES 5. PLAN IMPLEMENTATION ES-13
ES 6. Overview of Governance ES-16

LIST OF TABLES

Table ES-1 Summary of Undesirable Results Applicable to the Plan Area

Table ES-2 Summary of MT, MO, and Undesirable Results

Table ES-3 Estimated GSP Implementation Costs through 2042

LIST OF FIGURES

Figure ES-1. Los Molinos Subbasin Location Map

Figure ES-3: Map of all Sustainability Indicator Wells

Figure ES-3 GSP Implementation Schedule

ES 1. INTRODUCTION

In 2014, the California legislature enacted three bills, AB 1739 (Dickinson), SB 1168 (Pavley), and SB 1319 (Pavley), collectively known as the Sustainable Groundwater Management Act (SGMA) in response to overdraft conditions of California's groundwater resources. Since 2016, the Tehama County Flood Control and Water Conservation District (Tehama County FCWCD) (District), a local and regional authority, is the exclusive GSA for the Los Molinos Subbasin. The Tehama County Groundwater Commission serves as an advisory commission to the Tehama County Flood Control and Water Conservation District Board of Directors for GSA related matters. Groundwater Commission meetings, which are open to the public, were held the 4th Wednesday of each month, except holidays.

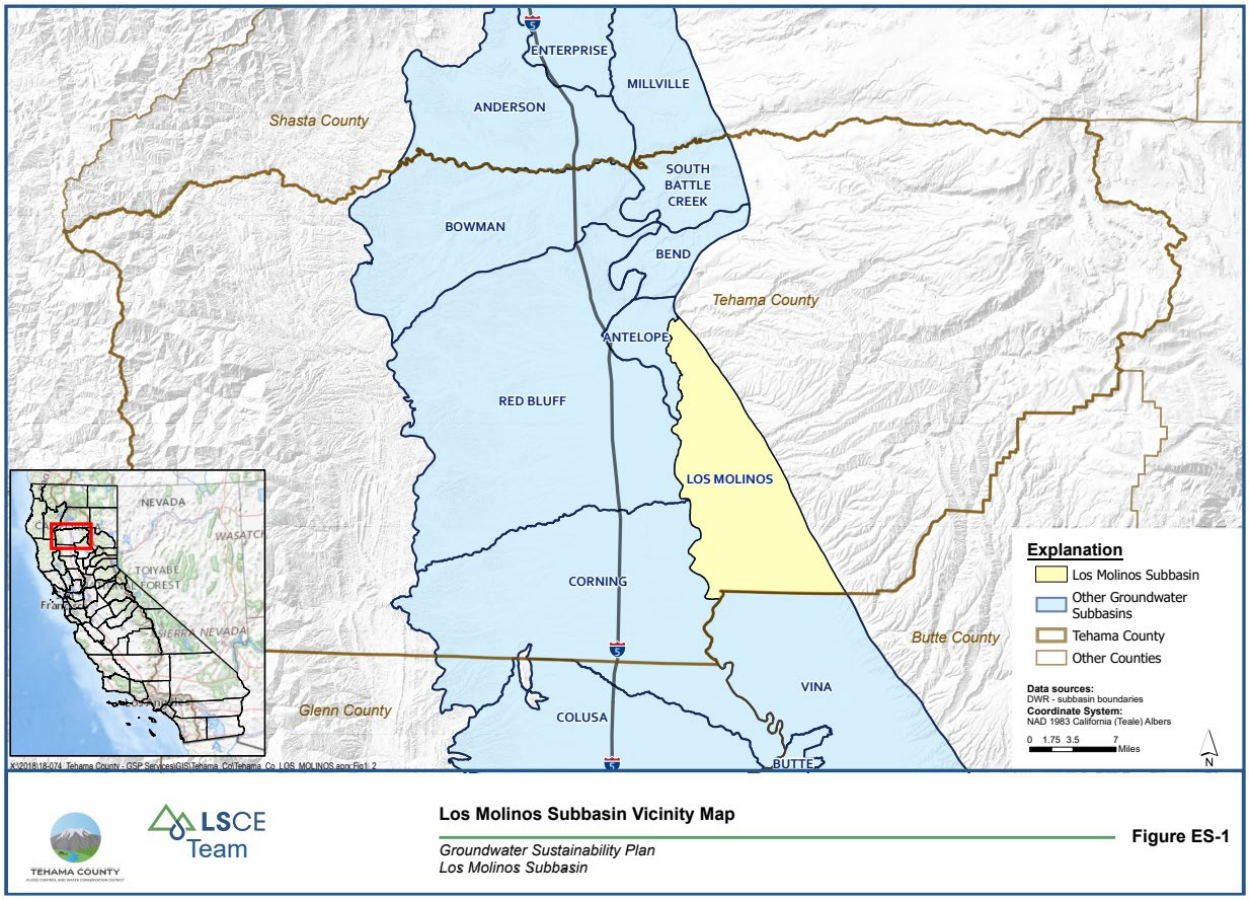
The GSP provides information demonstrating that the past and present actions of the GSA have created a sustainably managed groundwater basin. The GSP outlines planned management oversight and activities that will result in continued sustainability of the groundwater resources in the Los Molinos Subbasin.

This Executive Summary and the companion GSP are organized as follows:

- Executive Summary
- Section 1 Introduction
- Section 2 Plan Area, Basin Setting and Water Budgets
- Section 3 Sustainable Management Criteria and Monitoring Network
- Section 4 Projects and Management Actions
- Section 5 Plan Implementation
- Appendices

The following sections provide factors about the Subbasin and an overview of technical content in the GSP.

The Los Molinos Subbasin (Subbasin) (DWR Subbasin No. 5-021.54) (**Figure ES-1**) has been identified by the California Department of Water Resources (DWR) as a high priority subbasin. Under SGMA high priority subbasins are required to prepare and be managed under a GSP by January 31, 2022. This GSP, prepared by the GSA, adequately defines groundwater conditions in the managed area and establishes criteria to maintain and/or achieve sustainability within 20 years of the GSP adoption.



A Public Draft GSP was made available for public review and comment on September 24, 2021, for a period of 45 days. The GSA will receive comments, review, and prepare responses to comments, and revised the Draft GSP. The Final GSP will include those revisions. Comment letters and responses will be included as GSP appendices.

ES 2. SUMMARY OF PLAN AREA

The Los Molinos Subbasin (DWR Subbasin No. 5-021.56) covers 19,100 acres and is in the Northern Sacramento Valley Groundwater Basin (**Figure ES-1**). Los Molinos is one of seven (7) subbasins within Tehama County. The Tehama County FCWCD is the exclusive GSA for six (6) of those subbasins: Antelope, Bend, Bowman, Los Molinos, Red Bluff, and South Battle Creek. The seventh, the Corning Subbasin, extends into Glenn County, and the GSP for that subbasin is being developed in a coordinated effort between the Tehama County FCWCD and Corning Sub-basin GSA.

The lateral extent of the Subbasin is consistent with Bulletin 118 (DWR, 2018). It is bounded on the north by the Bend Subbasin and Red Bluff Subbasin, on the east and south by the Los Molinos, and on the south and west by the Red Bluff Subbasin. The Sacramento River runs along the western extent of the Subbasin, and Antelope Creek borders the majority of the eastern Subbasin. The Subbasin extends south to the point where Antelope Creek terminates into the Sacramento River. The vertical boundaries of the Subbasin are

the land surface (upper boundary) and the definable bottom of the basin (lower boundary). The definable bottom is the base of fresh water located at approximately 800-2,000 feet below ground surface (bgs).

Lands in the Los Molinos Subbasin are mostly privately owned with state and federal agencies owning a small portion. Private lands are majority farmland with nearly equal amounts riparian and other native vegetations. Over 1,500 groundwater wells exist in the Subbasin, and most are domestic wells. A few wells are operated for the public water supply and roughly ten times that number of wells are maintained for agricultural production. Numerous monitoring programs are operated in the Subbasin by federal, state, and local public agencies including the EPA, USGS and DWR. Monitoring programs collect data on groundwater levels, groundwater quality, land subsidence and surface water conditions. Data from these programs were incorporated (as applicable) into the evaluation of basin conditions within this GSP and were part of previous management plans including the Tehama County AB3030 Groundwater Management Plan (GWMP) and the Northern Sacramento Valley Integrated Regional Water Management Plan (IRWMP). Components of these management plans were incorporated into this GSP.

ES 2.1. Basin Setting and Hydrogeologic Conceptual Model

The ground surface generally slopes from the east to west with steeper slopes in the east of the subbasin and water generally follows the topography flowing in a west to southwestern direction. Aquifer recharge contributions to the deeper geologic formations occurs on the eastern side of the subbasin where the formations outcrop at the surface, however recharge of the Subbasin primarily occurs from the flow of the Sacramento River and perennial streams. Water flows downward in the upper aquifer driven by natural recharge. Gaining conditions along streams represent discharge from the aquifer and occur seasonally. Larger sources of discharge from the aquifer are likely from production of wells even though a portion of the water returns to the aquifer via recharge from irrigations. Even with the noted groundwater withdraw there is little to no reported evidence of subsidence within the Subbasin.

A horizontal groundwater gradient magnitude are approximately 20 ft/mile and 10 ft/mile for the upper and lower aquifers, respectively. Seasonal historic high-water levels during wet periods were between about 10 and 90 ft bgs in the Upper Aquifer, and from less than 1 ft to about 150 ft bgs in the Lower Aquifer. Groundwater quality is generally good with few exceptions most notably undesirable concentrations of arsenic in some areas of the Subbasin.

The Subbasin is defined as a two-aquifer system with unconfined to semi-confined conditions in the Upper Aquifer and semi-confined to confined conditions in the Lower Aquifer. Fresh water occurs as groundwater to a maximum depth of over -2,000 ft msl in the west of the Subbasin. The major water bearing formations within the Subbasin are the Tuscan and Tehama Formations with some contribution from the shallower Quaternary sedimentary deposits. More recent geologic history is dominated by fluvial and alluvial deposition.

ES 2.2 Water Budget

In accordance with technical guidance documents provided by DWR, water budget scenarios were evaluated using a groundwater flow model that quantified historical, current, and projected groundwater budget conditions. The water budgets were developed through application of the Tehama Integrated Hydrologic Model (Tehama IHM), a numerical groundwater flow model that characterizes surface water and groundwater movement and storage across the entire Subbasin and extending outside of the Subbasin.

The Tehama IHM is an integrated groundwater and surface water model developed for the purpose of conducting sustainability analyses within Tehama County. The model used foundational elements of DWR's SVSim regional model for the Sacramento Valley (DWR, 2021) and was refined locally for improved application in the Subbasin area. Use of publicly available modeling platforms is a guiding principle under DWR Best Management Practices and facilitates independent assessment of modeling results.

The model was calibrated using records from 1990-2019 (29 years). This period represents long-term average hydrologic conditions and is considered the historical water budget period. The current water budget presents information on the effects of recent hydrologic and water demand conditions on the groundwater system and spans five different recent periods. The historical and current water budget periods were selected to evaluate conditions over discrete representative periods considering the following criteria: Sacramento Valley water year type; long-term mean annual water supply; inclusion of both wet and dry periods, antecedent dry conditions, adequate data availability; and inclusion of current hydrologic, cultural, and water management conditions in the Subbasin. Water budgets were calculated for a projected 50-year period. The 50-year projected water budget uses hydrologic conditions representative of the most recent 50 years of hydrology in the Subbasin, with adjustments applied in scenarios for evaluating the water budget under climate change and altered water supply and demand conditions.

Model results indicate that over the historical period the largest outflow from the groundwater system (GWS) comes from groundwater pumping (on average 16 thousand-acre feet (taf) per year). Groundwater discharge to the surface is 2 taf per year. Deep percolation is the largest net inflow to the GWS (54 taf per year). Net subsurface flows to adjacent subbasins represents 56 taf per year loss to the GWS. Groundwater root uptake represents a flux of 17 taf per year leaving the GWS. Over the 29-year historic period the average annual change in storage was around -74 af per year.

The recent three-year period from 2016 through 2018 is believed to provide a reasonable representation of the recent water budget conditions based on an evaluation of past water budgets and the hydrologic conditions over these recent periods. A comparison of several future modeled water budgets was made to define the possible effect of different climate change and management action scenarios. Overall projected storage change in the Subbasin is small and differs little between the different climate change conditions.

The sustainable yield is estimated to be 28,000 acre-feet per year, which is equal to the volume of groundwater extracted annually in the Subbasin (by pumping and by uptake) minus the simulated annual decrease in storage under the projected model scenario with future land use and 2070 climate change conditions. Under these conditions groundwater extractions range from 22,000 to 25,000 acre-feet per year. Under all of the projected scenarios, the change in storage is simulated to be very small or practically zero. Assuming potential uncertainty of 25 percent associated with the water budget estimates, an associated range of values for the estimated sustainable yield would be 21,000 to 35,000 acre-feet per year.

ES 3. SUSTAINABILITY MANAGEMENT CRITERIA

Sustainable management criteria include establishing a sustainability goal for the Subbasin, defining undesirable results, and quantifying minimum thresholds and measurable objectives.

The sustainability goal for the Los Molinos Subbasin GSP is to manage the groundwater Subbasin to:

- Protect and maintain safe and reliable sources of groundwater for all beneficial uses and users.
- Ensure current and future groundwater demands account for changing groundwater conditions due to climate change.
- Establish and protect sustainable yield for the Subbasin by achieving measurable objectives set forth in this GSP in accordance with implementation and planning periods.
- Avoid undesirable results defined in the GSP in accordance with SGMA.

Sustainable management criteria (SMC) also define the conditions that constitute sustainable groundwater management. Note that undesirable results have not occurred historically in the Los Molinos Subbasin and are not projected to occur in the future. The sustainable management criteria will commit the GSA to meeting the sustainability goal for the Subbasin.

Sustainability indicators are measurable indicators that are used to set Measurable Objectives (MO), interim milestones and Minimal Thresholds (MT) to ensure that the sustainability goals are met. Undesirable results occur when significant and unreasonable effects are caused by groundwater conditions for a given sustainability indicator. Sustainability indicators are listed in **Table ES-1** along with whether undesirable results occurred in the subbasin and if they are likely to occur in the future without GSP implementation. Sustainability indicators will be measured at representative monitoring sites (RMS) selected based on location, aquifer, and historical data. MOs, MTs and undesirable results are defined in **Table ES-2.**

Table ES-1: Summary of Undesirable Results Applicable to the Plan Area

SUSTAINABILITY INDICATOR	HISTORICAL PERIOD	EXISTING CONDITION	FUTURE CONDITIONS WITHOUT GSP IMPLEMENTATION
Chronic Lowering of Groundwater Elevations	No	No	No
Reduction of Groundwater Storage	No	No	No
Seawater Intrusion	Not Applicable	Not Applicable	Not Applicable
Degraded Water Quality	Limited	Limited	Limited
Land Subsidence	No	No	No
Depletion of Interconnected Surface Water	Data Gap	Data Gap	TBD

Table ES-2: Summary of MT, MO, and Undesirable Results

SUSTAINABILITY INDICATOR	MINIMUM THRESHOLD	MEASURABLE OBJECTIVE	UNDESIRABLE RESULT
Chronic Lowering of Groundwater Elevations	**Upper Aquifer:** Spring groundwater elevation where less than 10% or less than 20% of domestic wells could potentially be impacted. **Lower Aquifer:** Spring groundwater elevation minus 20 to 120 feet	**Upper & Lower Aquifer:** Spring 2015 groundwater elevation minus five feet (for wells with increasing or no groundwater trends) or projected Spring 2042 groundwater elevation minus five feet for wells with declining groundwater elevations	25% of groundwater elevations measured at same RMS wells exceed the associated MT for two consecutive measurements.
Reduction of Groundwater Storage	**Upper & Lower Aquifer:** Amount of groundwater in storage when groundwater elevations are at their minimum threshold	**Upper & Lower Aquifer:** Amount of groundwater storage when groundwater elevations are at their measurable objective	Same as chronic lowering of groundwater levels
Land Subsidence	Two feet over 20 years (i.e., no more than 0.5 feet of cumulative subsidence over a five-year period (beyond the measurement error), solely due to lowering of groundwater elevations	One foot over 20 years (Zero inelastic subsidence, in addition to any measurement error). If InSAR data are used, the measurement error is 0.1 feet and any measurement 0.1 feet or less would not be considered inelastic subsidence	50% of RMS exceed the minimum threshold over a 5-year period that is irreversible and is caused by lowering of groundwater elevations
Seawater Intrusion	Not Applicable	Not Applicable	Not Applicable

SUSTAINABILITY INDICATOR	MINIMUM THRESHOLD	MEASURABLE OBJECTIVE	UNDESIRABLE RESULT
Degraded Water Quality	**Upper & Lower Aquifer:** TDS concentration of 750 mg/L at all RMS wells	**Upper & Lower Aquifer:** California lower limit secondary MCL concentration for TDS of 500 mg/L measured at RMS wells	At least 25% of RMS exceed the minimum threshold for water quality for two consecutive years at each well where it can be established that GSP implementation is the cause of the exceedance
Depletion of Interconnected Surface Water	Same as chronic lowering of groundwater levels (Initial)	Same as chronic lowering of groundwater levels (Initial)	25% of groundwater elevations measured at RMS wells drop below the associated threshold during two consecutive years in the Upper Aquifer.

ES 3.1. Chronic Lowering of Groundwater Elevations

Groundwater levels declined over the historical period. This trend is expected to continue without GSP implementation. The MOs for Chronic Lowering of Groundwater Elevations indicator is defined at each of the RMS (wells) as that well's spring 2015 groundwater elevation minus five feet or projected 2042 groundwater elevation minus five ft for wells with declining groundwater elevations. MTs are defined as the groundwater level at RMS wells that are estimated to impact (potentially run dry) less than 10% or less than 20% of nearby domestic wells. It is considered an Undesirable Results for Chronic Lower of Groundwater Elevations if 25% of groundwater elevations measured at RMS wells exceed the associated MT for two consecutive measurements.

ES 3.2. Reduction of Groundwater Storage

The groundwater storage reduction sustainability indicator will be evaluated using groundwater levels as a proxy in conjunction with annual evaluations of monitored groundwater level changes. Based on considerations applied in developing the groundwater level minimum thresholds, reduction in groundwater storage minimum thresholds do not exceed any identified significant and unreasonable level of depleted groundwater storage volume.

ES 3.3. Subsidence

Land subsidence is not known to have occurred in the subbasin, is not occurring presently, and is not expected to occur without GSP implementation. MOs have been defined as a decline of one foot over 20 years. Subsidence is based on InSAR data. InSAR measurement error is 0.1 feet and any measurement 0.1 feet or less would not be considered inelastic subsidence. MTs are defined by a decline of two feet over 20 years. Undesirable Results are defined as 50% of RMS exceeding the minimum threshold over a 5-year period that is irreversible and is caused by lowering of groundwater elevations. RMS for subsidence are the InSAR pixels collocated or near the water level RMS wells.

ES 3.4. Degraded Water Quality

Groundwater quality in the Subbasin is generally good with a few exceptions. Present conditions are unchanged from conditions within the historical period however conditions could worsen without GSP implementation. MOs are defined by the California MCL for TDS of 500 mg/L measured at RMS wells. MTs are set at 750 mg/L measured at RMS wells. Undesirable Results occur if 25% of RMS exceed the minimum threshold for water quality for two consecutive years at an individual well where it can be established that GSP implementation is the cause of the exceedance.

ES 3.5. Seawater Intrusion

Due to the location of the Subbasin relative to any potential source of seawater this sustainability criterium is not applicable to this subbasin.

ES 3.6. Depletion of Interconnected Surface Waters

The interconnected surface water sustainability indicator could not be properly defined due to gaps in historical surface and groundwater monitoring programs. It is not known if conditions will worsen without GSP implementation without a reliable way to correlate the groundwater and surface water elevations. Due to the lack of data associated with this sustainability indicator the MOs and MTs are considered interim and will use the Chronic Lowering of Groundwater Elevations sustainability indicator as a proxy.

An Undesirable Result is defined as 25% of groundwater elevations measured at upper aquifer RMS wells dropping below the associated threshold during two consecutive years.

ES 3.7. Monitoring Network

Monitoring networks are developed to quantify current and future groundwater conditions in the Los Molinos Subbasin, as well as within individual GSA jurisdictions. The monitoring network for sustainability indicators is summarized in **Figure ES-2.** There are a total of seven RMS wells in the Los Molinos Subbasin, five in the Upper Aquifer and two in the Lower Aquifer. A proposed TSS well would bring the total RMS to eight. The five Upper Aquifer RMS wells serves as the monitoring locations for the Chronic Lowering of Groundwater Elevations, Reduction of Groundwater Storage, Depletion of Interconnected Surface Water, and Water Quality indicators. The Lower Aquifer RMS wells are associated with the first three indicators, but not the Interconnected Surface Water Depletion indicator. The proposed TSS well would be double completion and would monitor both upper and lower aquifers. The InSAR RMS are pixels collocated or near the water level RMS wells. Measured water level elevations will inform MO and MTs for Chronic Lowering of Groundwater Elevations, Reduction of Groundwater Storage, Depletion of Interconnected Surface Water indicators. Water quality samples taken from RMS wells will inform the MOs and MTs for the Degraded Water Quality indicator. Land Subsidence will be informed at RMS (select pixels) using satellite InSAR data. The monitoring network will be periodically reviewed and modified as needed; for instance, additional RMS wells may be added to better understand interconnected surface waters.

A Data Management System (DMS) was developed to store and analyze data collected as part of this GSP. With submittal and implementation of the Los Molinos Subbasin GSP, there will be a publicly accessible weblink to view reports, maps, graphs, and current data under the Subbasin monitoring plan.

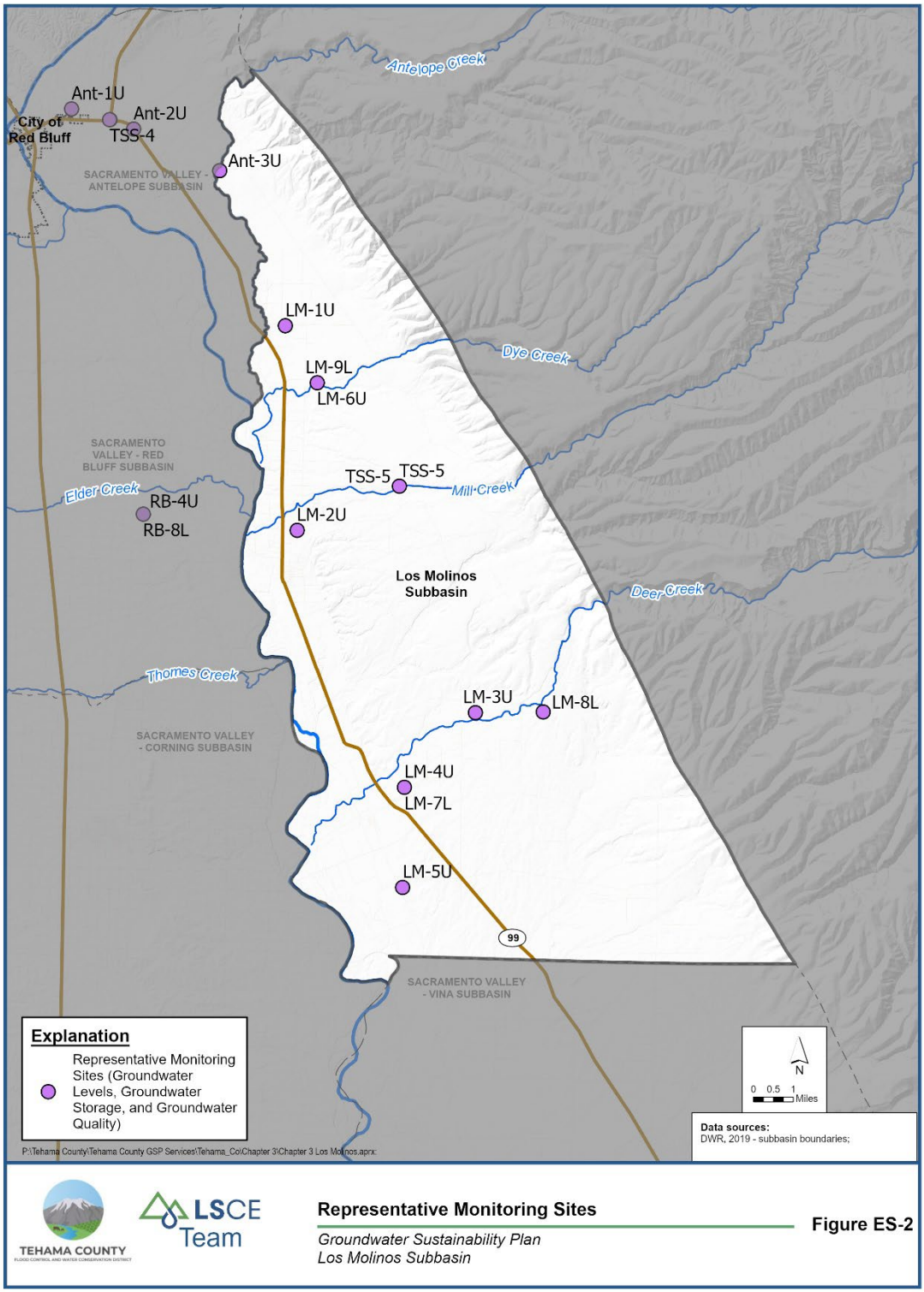


Figure ES-2. Map of all Sustainability Indicator Wells

ES 4. OVERVIEW OF PROJECTS AND MANAGEMENT ACTIONS

In accordance with 23 CCR §354.44, Projects and Management Actions (PMAs) were developed to achieve and maintain the Subbasin sustainability goal by 2042 and avoid undesirable results over the GSP planning and implementation horizon. Projects generally refer to structural features whereas management actions are typically non-structural programs or policies designed to support sustainable groundwater management. Because the Los Molinos Subbasin is currently and projected to be sustainable (i.e., no onset of undesirable results), PMAs are not expected to be essential for sustainability. However, future conditions are uncertain and PMAs will be employed through the principle of adaptive management on an as-needed basis.

Even so, the GSA plans to continue monitoring sustainability indicators throughout GSP implementation and will initiate and scale PMAs as needed to ensure that the measurable objectives are met. The following describes PMAs identified for the Los Molinos Subbasin.

ES 4.1. PMAs Planned for Implementation

The GSA has identified PMAs that are planned to be completed prior to 2042. These projects and management actions are expected to support the GSA in achieving the GSP sustainability goal and responding to changing conditions in the Subbasin.

ES 4.1.1. Multi-Benefit Groundwater Recharge Programs

A multi-benefit recharge program will provide groundwater recharge through normal farming operations while also providing critical wetland habitat for shorebirds migrating along the Pacific Flyway. The Nature Conservancy (TNC) has prepared guidance to assist GSAs in planning on-farm multi-benefit groundwater recharge programs.

ES 4.1.2. Grower Education and Outreach

This program will provide growers with educational resources that help them to plan and implement on-farm practices that simultaneously support groundwater sustainability and maintain or improve agricultural productivity.

ES 4.1.3. Deer Creek Instream Flow Enhancements and Conjunctive Use Management Projects

Trout Unlimited has received funding from Proposition 1 through the Wildlife Conservation Board for the Deer Creek Instream Flow Planning and Design Project and the Deer Creek Irrigation District (DCID) Diversion Automation Project which proposes to increase in-stream flows at critical fish passage times by reducing Deer Creek diversions through increased conjunctive use of groundwater, improved on-farm water use efficiency, and modernization of water district infrastructure.

ES 4.1.4. Lower Deer Creek Improvements and Habitat Restoration Phases 1 and 3

This is a multi-benefit project developed by the Deer Creek Watershed Conservancy and the California Department of Fish and Wildlife that will setback the levees on Lower Deer Creek to increase floodplain habitat by approximately 40 acres while also providing off-channel recharge during high flow periods.

ES 4.2. Proposed Potential PMAs

Projects and Management Actions in this category are proposed as potential options that GSAs may wish to implement, as needed, to support ongoing sustainability, to adapt to changing conditions in the Subbasin, and to achieve other water management objectives.

ES 4.2.1 Direct Groundwater Recharge

Potential projects would support efforts to recharge groundwater with excess surface water in wet years for use in dry years. Recharge may be done in conveyances such as unlined canal and laterals, natural drainages such as creek beds, recharge basins, agricultural fields, and aquifer storage and recovery (ASR) wells. Projects could also be directed at making improvements to stormwater management facilities to enhance groundwater recharge of stormwater, capture rainfall through modification of on-field conditions and facilitate use of recycled water for groundwater recharge.

ES 4.2.2. Groundwater Demand Reduction

Groundwater demand reduction can be achieved by conveyance improvements such as removal of invasive plants from creeks and irrigation canals. Plant removal would reduce conveyance issues, reduce evapotranspiration (ET), and allow for more water in the shallow groundwater areas, restoring conditions for GDEs and native riparian species.

ES 4.2.3. Surface Water Supply Augmentation & In-Lieu Groundwater Recharge

Programs directed at promoting inter-basin surface water transfers or exchanges can potentially subsidize surface water costs so that it is less expensive than groundwater. Construction, renovation, or conversion of flood control facilities to water supply reservoirs can increase available supply of surface water.

ES 4.2.4. Education/Outreach, In-Lieu Groundwater Recharge

This management action assist growers with conversion to efficient and dual-source irrigation systems, improve surface water conveyance and irrigation infrastructure to allow growers to utilize both surface water and groundwater for drip irrigation of orchards, assist growers with capital improvements to irrigation infrastructure, from use of groundwater to use of surface water or dual-source systems.

ES 4.2.5. Groundwater Demand Reduction.

Management actions aimed at reduction of groundwater demand may offer incentives for urban, residential, and commercial projects that improve water use efficiency, such as high efficiency appliance rebates and incentives for lawn removal, low-water landscape installation, rain barrels, graywater reuse, etc. Action may promote the conversion of agricultural lands to less water intensive crops to reduce water use while continuing to promote agriculture land use.

ES 4.2.6. In-Lieu Groundwater Recharge

Management actions aimed at increasing In-Lieu recharge may incentivize use of surface water for irrigation when available to allow groundwater levels to recover in between drought years when surface water is not available. Effective management actions may also increase use of surface water by creating a water market for exchanging surface water and groundwater.

ES 4.2.7. Monitoring to Fill Data Gaps & Programs to Support Wells

Several data gaps have been identified in this GSP. Additional studies of GDEs and groundwater surface water interactions, expanded subbasin monitoring and aquifer testing, install additional agroclimate stations, maintain and expand groundwater level monitoring network, and a one-time groundwater quality snapshot are all actions that can be taken to improve data gaps.

To support well owners and reduce impacts of potential undesirable results a county-wide system to tracking dry domestic wells will better inform and lead to better management of assistance to domestic well owners when water levels drop, and wells go dry.

ES 5. PLAN IMPLEMENTATION

This GSP will be implemented to achieve the Subbasin sustainability goal by 2042 and avoid undesirable results through 2070 as required by SGMA and GSP regulations. Implementation of this GSP includes PMAs in addition to on-going activities that will be completed by the GSA related to monitoring, management, administration, updates, reporting, and public outreach.

GSP implementation costs include both costs specific to projects and management actions and costs for the GSA to administer and operate all other tasks associated with the GSP over the 20-year implementation period. The total cost is estimated to be approximately $19,757,000.

These costs may be subject to change, as they are projections based on the time of development of this report. GSP implementation and GSA support costs are estimated on an annual basis and are described in further detail below.

Table ES-3: Estimated GSP Implementation Costs through 2042

FISCAL YEAR	GSA ADMINISTRATION	MONITORING	5-YEAR UPDATES	10% CONTINGENCY	TOTAL
2022	$470,000	$104,000	$0	$57,000	$631,000
2023	$484,000	$107,000	$0	$59,000	$650,000
2024	$499,000	$110,000	$0	$61,000	$670,000
2025	$514,000	$114,000	$0	$63,000	$690,000
2026	$529,000	$117,000	$150,000	$80,000	$876,000
2027	$545,000	$121,000	$150,000	$82,000	$897,000
2028	$561,000	$124,000	$0	$69,000	$754,000
2029	$578,000	$128,000	$0	$71,000	$777,000
2030	$595,000	$132,000	$0	$73,000	$800,000
2031	$613,000	$136,000	$169,000	$92,000	$1,010,000
2032	$632,000	$140,000	$174,000	$95,000	$1,040,000
2033	$651,000	$144,000	$0	$79,000	$874,000
2034	$670,000	$148,000	$0	$82,000	$900,000
2035	$690,000	$153,000	$0	$84,000	$927,000
2036	$711,000	$157,000	$196,000	$106,000	$1,170,000
2037	$732,000	$162,000	$202,000	$110,000	$1,205,000
2038	$754,000	$167,000	$0	$92,000	$1,013,000
2039	$777,000	$172,000	$0	$95,000	$1,044,000
2040	$800,000	$177,000	$0	$98,000	$1,075,000
2041	$824,000	$182,000	$227,000	$123,000	$1,357,000
2042	$849,000	$188,000	$234,000	$127,000	$1,397,000
Total	$13,478,000	$2,983,000	$1,502,000	$1,798,000	$19,757,000

Development of this GSP was funded through Proposition 1 and Proposition 68 Grants. Ongoing implementation, monitoring, and reporting are expected to be funded through fees and outside grants and funding. The GSA is currently developing a financing plan that will include one or more of the following financing approaches

- Grants and low-interest loans: GSA will continue to pursue grants and low interest loans to help fund planning studies and other GSA activities. However, grants and low-interest loans are not expected to cover all of the GSA operating costs for GSP implementation
- GSP Implementation Costs: Initial implementation costs not covered by grant funding will be assessed through either land-based charge or groundwater usage charge. In the future the GSA may adopt a volumetric charge on groundwater extracted from the Subbasin.
- Taxes: This could include general property related taxes that are not directly related to the benefit or cost of a service (ad valorem and parcel tax), or special taxes imposed for a specific purpose related to GSA activities.

The GSA is pursuing a combined approach, targeting available grants and low interest loans, and considering a combination fee and assessment to cover operating and program-specific costs. The GSA will comply with statutory and California constitutional requirements to adopt any rate, fee, charge, or assessment to fund implementation of the GSP.

This GSP will be adopted and submitted to DWR by January 31, 2022. The implementation timeline will begin thereafter and will allow the GSA to develop and implement projects and management actions to meet sustainability objectives by 2042. GSP implementation also includes annual and periodic evaluations and submittals to DWR. The full schedule for implementation is subject to change and will be evaluated and updated as necessary based on implementation progress, sustainability goals, monitoring, and other factors that could affect implementation. The implementation timeline as presently described is outlined below in **Figure ES-3**.

The GSP uses best available information and the best available science to provide a road map for the Los Molinos Subbasin to meet its sustainability goal by 2042 and comply with SGMA regulations. During each five-year update, progress will be assessed, and the GSP revised as necessary, to achieve the sustainability goal by 2042 and comply with SGMA regulations.

Annual reports will be completed and submitted to DWR by April 1 of each year pursuant to GSP Regulation §356.2. Annual reports will include sections on general information, basin conditions, and plan implementation progress for the reporting period. The annual report submitted to DWR will comply with the requirements of §356.2. The GSA will evaluate the GSP every five years and whenever the plan is amended. The evaluation will be submitted to DWR and include the elements of the Annual Report, a summary of the GSP, project, and management action implementation progress, and progress toward meeting the sustainability goal of the Subbasin.

Figure ES-3: GSP Implementation Schedule

TASK NAME	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Plan Implementation																					
GSP Submittal to DWR	x																				
Outreach and Communication																					
Monitoring and DMS																					
GSP Reporting																					
Annual Reports	x	x	x	x	x		x	x	x	x		x	x	x	x		x	x	x	x	
5-year GSP Evaluation Reports						x					x					x					x

x Indicates a submittal.
Indicates ongoing event.

ES 6. OVERVIEW OF GOVERNANCE

In adopting the Sustainable Groundwater Management Act ("SGMA"), the Legislature made clear that nothing in SGMA "determined or alters surface water of groundwater rights under common law or any provision of the law that determines or grants surface water rights. In other words, the Legislature intended that actions undertaken in accordance with SGMA to respect common law water rights.

This GSP established the objectives of maximizing the beneficial use of water with the Los Molinos Subbasin, without causing undesirable results. The powers of the GSA are set forth in SGMA. This GSP meets the requirements of SGMA and vests the management authority in the GSA. Authorities include Powers of the Board, Rules and Regulations, Committees, Specific Powers, Variances and Complaints.