

Table of Contents

Proposition 1
Water Storage Investment Program
Funding Application
August 2017



This page is intentionally left blank.

Table of Contents

An index of application contents is provided in Section 3-6 Other Application Information.

Tab 1 • Applicant Information

1-1 Applicant Information	1-1.1
1-1.1 Proposal Objective.....	1-1.1
1-2 Budget.....	1-1.2
1-3 Geographic Information	1-1.2
1-4 Legislative Information	1-1.3

Tab 2 • Projects

2-1 Project Information.....	2-1.1
2-2 Project Benefits Information	2-1.1

Tab 3• Eligibility and General Project Info

3-1 Questions 1 through 6

3-1.1 Application Instructions	3-1.1
3-1.2 Applicant Type	3-1.2
3-1.3 Project Type.....	3-1.2
3-1.4 Public Benefits.....	3-1.3
3-1.5 California or Federal Wild and Scenic Rivers Act.....	3-1.3
3-1.6 Agricultural or Urban Water Supplier	3-1.3
3-1.6.1 Agricultural Water Supplier	3-1.3
3-1.6.2 Urban Water Supplier.....	3-1.3
3-1.7 Groundwater Basins	3-1.5

3-2 Executive Summary

3-2.1 Project Facilities and Operations.....	3-2.1
3-2.1.1 Local Agency Potential Partners	3-2.3
3-2.1.2 South-of-Delta Wildlife Refuges.....	3-2.5
3-2.2 Integration with State Water Systems	3-2.5
3-2.2.1 Integration with Existing Facilities.....	3-2.6
3-2.2.2 Integration with Future Planned Facilities.....	3-2.7

3-2.3 Contribution to Sustainable Groundwater Management 3-2.7

3-2.4 Project Expansion 3-2.7

3-2.5 LVE Project Benefits..... 3-2.7

 3-2.5.1 Ecosystem Improvements..... 3-2.7

 3-2.5.2 Emergency Response..... 3-2.8

 3-2.5.3 Recreation..... 3-2.8

 3-2.5.4 Non-Public Benefits 3-2.9

3-2.6 Economic Value of LVE Project Benefits..... 3-2.11

3-2.7 Cost of LVE Project 3-2.12

3-2.8 Cost Effectiveness & Public Benefit Ratio..... 3-2.12

3-2.9 Schedule..... 3-2.15

3-3 Resolution

3-3.1 Application Instructions 3-3.1

3-3.2 Resolution..... 3-3.1

3-4 Project Description

3-4.1 Application Instructions 3-4.1

3-4.2 Los Vaqueros Reservoir Expansion Project Description 3-4.2

 3-4.2.1 Background..... 3-4.2

 3-4.2.2 Project Overview & Benefits..... 3-4.2

 3-4.2.2.1 Public Benefits..... 3-4.2

 3-4.2.2.2 Non-Public Benefits 3-4.3

 3-4.2.3 Location 3-4.4

3-4.3 Project Partners & Beneficiaries..... 3-4.6

 3-4.3.1 Alameda County Flood Control and Water Conservation
 District, Zone 7 (Zone 7) 3-4.8

 3-4.3.2 Alameda County Water District (ACWD) 3-4.8

 3-4.3.3 Bay Area Water Supply and Conservation Agency (BAWSCA)..... 3-4.8

 3-4.3.4 Byron-Bethany Irrigation District (BBID) 3-4.9

 3-4.3.5 City of Brentwood (Brentwood)..... 3-4.9

 3-4.3.6 East Bay Municipal Utility District (EBMUD)..... 3-4.9

 3-4.3.7 East Contra Costa Irrigation District (ECCID)..... 3-4.9

 3-4.3.8 Santa Clara Valley Water District (SCVWD) 3-4.10

 3-4.3.9 San Francisco Public Utilities Commission (SFPUC) 3-4.10

 3-4.3.10 San Luis & Delta-Mendota Water Authority (SLDMWA) 3-4.10

 3-4.3.11 South-of-Delta Wildlife Refuges..... 3-4.11

3-4.4 Sources of Water Supply 3-4.11

3-4.5 Relationship to Other Water Projects 3-4.14

 3-4.5.1 Current Relationships 3-4.14

3-4.5.2 Integration with Existing Facilities..... 3-4.15

3-4.5.3 Integration with Planned Future Facilities..... 3-4.16

3-4.6 Facilities..... 3-4.16

3-4.6.1 Existing Facilities 3-4.17

 3-4.6.1.1 Los Vaqueros Reservoir & Watershed 3-4.17

 3-4.6.1.2 Contra Costa Canal and Rock Slough Intake 3-4.19

 3-4.6.1.3 Old River Intake 3-4.20

 3-4.6.1.4 Middle River Intake..... 3-4.20

 3-4.6.1.5 Old River Pipeline, Transfer Facility, Transfer Pipeline, and
 Los Vaqueros Pipeline 3-4.20

 3-4.6.1.6 EBMUD-CCWD Intertie..... 3-4.21

 3-4.6.1.7 Freeport Intake..... 3-4.21

 3-4.6.1.8 Los Vaqueros Pipeline and Energy Recovery Project..... 3-4.22

3-4.6.2 New and Modified Facilities 3-4.22

 3-4.6.2.1 Los Vaqueros Reservoir Dam Raise..... 3-4.24

 3-4.6.2.2 Transfer Station Upgrade..... 3-4.26

 3-4.6.2.3 Transfer-Bethany Pipeline..... 3-4.26

 3-4.6.2.4 Delta-Transfer Pipeline..... 3-4.26

 3-4.6.2.5 Neroly High-Lift Pump Station 3-4.26

 3-4.6.2.6 Pumping Plant #1 Replacement..... 3-4.28

 3-4.6.2.7 Los Vaqueros Watershed Recreation Facilities..... 3-4.28

 3-4.6.2.8 Walnut Creek VFD 3-4.33

 3-4.6.2.9 Mokelumne Aqueduct Relining..... 3-4.33

 3-4.6.2.10 ECCID Pipeline 3-4.34

 3-4.6.2.11 Brentwood Pipeline 3-4.34

 3-4.6.2.12 Rock Slough Fish Screen Improvements..... 3-4.34

3-5 Project Description Support

3-5.1 Application Instructions 3-5.1

3-5.2 Project Description Support..... 3-5.1

3-6 Attestation

3-6.1 Application Instructions 3-6.1

3-6.2 Attestation..... 3-6.1

3-7 Other Application Information

3-7.1 Application Instructions 3-7.1

3-7.2 List of Acronyms & Abbreviations 3-7.2

3-7.3 Application Index 3-7.4

3-7.4 Letters of Support 3-7.8

Tab 4 • Physical Public Benefits

4-1 Ecosystem Benefits

4-1.1 Application Instructions 4-1.1
 4-1.2 Ecosystem Benefit Worksheets 4-1.1
 4-1.3 Ecosystem Benefit Supporting Documentation..... 4-1.2

4-2 Water Quality Benefits

4-2.1 Application Instructions 4-2.1
 4-2.2 Water Quality Benefit Worksheets..... 4-2.1
 4-2.3 Water Quality Benefit Supporting Documentation 4-2.2

4-3 Emergency Response Benefits

4-3.1 Application Instructions 4-3.1
 4-3.2 Project Operation for Emergency Response Benefits 4-3.1
 4-3.2.1 Non-Drought Emergency Response 4-3.1
 4-3.2.2 Drought Emergency Response 4-3.2
 4-3.3 Quantification and Commitment of Emergency Response Benefits 4-3.3

4-4 Recreation Benefits

4-4.1 Application Instructions 4-4.1
 4-4.2 Project Operation for Recreation Benefits..... 4-4.2
 4-4.3 Effects on Existing Facilities 4-4.3
 4-4.4 Assessment of Recreation Physical Benefits 4-4.3
 4-4.5 Visitation Estimates and Methodology..... 4-4.6
 4-4.5.1 Maximum Surface Acreage 4-4.7
 4-4.5.2 Average Monthly (Seasonal) Storage..... 4-4.7
 4-4.5.3 Population Within 60 miles of Facility..... 4-4.7
 4-4.5.4 Maximum Substitute Acreage within 30 Miles 4-4.10
 4-4.5.5 Number of Boat Lanes..... 4-4.11
 4-4.5.6 Number of Campsites 4-4.11
 4-4.5.7 Real Annual Average Price of Gasoline..... 4-4.11
 4-4.5.8 Results 4-4.11
 4-4.6 Relevant Recreation Studies 4-4.11

Tab 5 • Feasibility and Implementation Risk

5-1 Feasibility Documentation

5-1.1 Application Instructions 5-1.1
 5-1.2 Federal Feasibility Report 5-1.1

5-2 Permit List

5-2.1 Application Instructions 5-2.1
 5-2.2 Permits & Status 5-2.1

5-3 Schedule

5-3.1 Application Instructions 5-3.1
 5-3.2 Schedule..... 5-3.1

5-4 Environmental Document

5-4.1 Application Instructions 5-4.1
 5-4.2 Los Vaqueros Reservoir Expansion Project Environmental Documentation..... 5-4.1

5-5 Impacts and Consultation

5-5.1 Application Instructions 5-5.1
 5-5.2 Environmental Documentation for LVE Project 5-5.1

Tab 6 • Benefit Calculation, Monetization, and Resiliency

6-1 Model Usage

6-1.1 Application Instructions 6-1.1
 6-1.2 Modeling Requirements for Los Vaqueros Reservoir Expansion Project..... 6-1.1

6-2 Project Conditions

6-2.1 Application Instructions 6-2.1
 6-2.2 Methodology..... 6-2.1
 6-2.3 Without-Project Condition 6-2.3
 6-2.3.1 Study Area 6-2.3
 6-2.3.2 Infrastructure 6-2.4
 6-2.3.3 Demands 6-2.5
 6-2.3.4 Operations..... 6-2.6
 6-2.3.5 Incremental Level 4 Water for Wildlife Refuges 6-2.7
 6-2.4 With-Project Condition..... 6-2.8
 6-2.4.1 Study Area 6-2.9
 6-2.4.3 Infrastructure 6-2.12
 6-2.4.4 Demands 6-2.15
 6-2.4.5 Operations..... 6-2.16
 6-2.4.6 Incremental Level 4 Water for Wildlife Refuges 6-2.18

6-3 Preliminary Operations Plan

6-3.1 Application Instructions 6-3.1

6-3.2 Project Operations 6-3.2

 6.3.2.1 Existing Los Vaqueros Reservoir Operations 6-3.2

 6.3.2.2 Los Vaqueros Reservoir Expansion Project Operations 6-3.2

 6-3.2.2.1 Project Facilities and Water Pathways 6-3.3

 6-3.2.2.2 Local Agency Partner Needs 6-3.5

 6-3.2.2.3 Refuge Needs..... 6-3.6

 6-3.2.2.4 Operational Priorities..... 6-3.7

6-3.3 Monitoring 6-3.8

6-3.4 Preliminary Adaptive Management Strategies 6-3.9

6-4 Monetized Benefits Analysis

6-4.1 Application Instructions 6-4.1

6-4.2 Physical Benefit Calculation 6-4.1

 6-4.2.1 Public Benefits Eligible for WSIP Funding 6-4.1

 6-4.2.1.1 Ecosystem Benefits..... 6-4.1

 6-4.2.1.2 Emergency Response Benefits 6-4.3

 6-4.2.1.3 Recreation Benefits..... 6-4.5

 6-4.2.2 Other Benefits..... 6-4.5

 6-4.2.2.1 M&I Water Supply Benefits..... 6-4.5

 6-4.2.2.2 Water Quality Improvement Benefits..... 6-4.6

 6-4.2.2.3 Agriculture Benefits 6-4.8

6-4.3 Benefit Monetization 6-4.9

 6-4.3.1 Public Benefits Eligible for WSIP Funding 6-4.11

 6-4.3.1.1 Ecosystem Benefits..... 6-4.11

 6-4.3.1.2 Emergency Response Benefits 6-4.12

 6-4.3.1.3 Recreation Benefits..... 6-4.13

 6-4.3.2 Other Benefits..... 6-4.13

 6-4.3.2.1 M&I Water Supply Reliability Benefits 6-4.13

 6-4.3.2.2 Water Quality Improvement Benefits..... 6-4.14

 6-4.3.2.3 Agriculture Benefits 6-4.15

6-5 Mitigation and Compliance Obligations

6-5.1 Application Instructions 6-5.1

6-5.2 Net Public Benefits Claimed 6-5.1

 6-5.2.1 Net Ecosystem Improvements 6-5.2

 6-5.2.2 Net Emergency Supply Benefits..... 6-5.2

 6-5.2.3 Recreation Benefits..... 6-5.2

6-6 Quantification Support

6-6.1 Application Instructions 6-6.1

6-6.2 CalSim Modeling Methods and Assumptions 6-6.1

6-6.3 Cost Benefit Spreadsheet..... 6-6.1

6-6.4 Uncertainty Analysis Model..... 6-6.2

6-6.5 Other Benefit Calculation Methods & Assumptions..... 6-6.2

6-7 Monetization Table

6-7.1 Application Instructions 6-7.1

6-7.2 Annual Economic Benefit 6-7.1

6-7.3 Summary of Net Present Values of Benefits..... 6-7.1

6-7.4 Monetization Tables for Each Benefit..... 6-7.4

6-8 Non-Monetized Benefits

6-8.1 Application Instructions 6-8.1

6-8.2 Improving Regional Reliability and Coordination 6-8.1

6-9 Total Project Cost Estimate

6-9.1 Application Instructions 6-9.1

6-9.2 Capital Costs..... 6-9.1

6-10 Benefit and Cost Analysis

6-10.1 Application Instructions 6-10.1

6-10.2 Benefit & Cost Analysis 6-10.1

6-11 Cost Allocation

6-11.1 Application Instructions 6-11.1

6-11.2 Cost Allocation..... 6-11.2

6-12 Physical and Economic Summary Table

6-12.1 Application Instructions 6-12.1

6-12.2 Physical and Economic Summary Tables 6-12.1

6-12.3 Part 1. Physical and Economic Benefits..... 6-12.2

6-12.4 Part 2. Total Economic Net Benefits and Allocated Cost by Benefit Category in
2015 \$ Million..... 6-12.6

6-12.5 Part 3. Present Value of Project Costs, Cost-Effectiveness Measure, and Public
Benefit Ratio, Million 2015 \$ Present Value..... 6-12.7

6-13 Uncertainty Analysis

6-13.1 Application Instructions 6-13.1

6-13.2 Climate Change & Potential Changes to Public Benefits..... 6-13.2

6-13.3 California WaterFix and Potential Changes to Public Benefits 6-13.3

6-13.3.1 California WaterFix Modeling 6-13.3
 6-13.3.2 CCWD-DWR California WaterFix Settlement Agreement 6-13.4
 6-13.3.3 Summary of the LVE Project with California WaterFix Operations 6-13.4
 6-13.3.4 Potential Changes in Benefits of the LVE Project with California
 WaterFix 6-13.5
 6-13.4 Drought Performance 6-13.6

Tab 7 • Program Requirements

7-1 Questions 1 through 5

7-1.1 Application Instructions 7-1.1
 7-1.2 Improvement to State Water System Operation 7-1.2
 7-1.2.1 Improvement to Existing State Water System Operations 7-1.2
 7-1.2.2 Improvement to Potential Future State Water System Operations 7-1.3
 7-1.3 Improvement in Ecosystem and Water Quality Conditions 7-1.4
 7-1.4 Coordination with Water System Facility Owners and Operators 7-1.5
 7-1.5 Advancement of Long-Term Delta Objectives 7-1.7
 7-1.6 Compliance with Laws and Obligations 7-1.7

7-2 Delta or Tributary Measureable Improvement

7-2.1 Application Instructions 7-2.1
 7-2.2 Improvements to Delta Ecosystem and Tributaries to the Delta 7-2.2
 7-2.3 Contracts and Water Rights 7-2.2

7-3 Cost Effectiveness

7-3.1 Application Instructions 7-3.1
 7-3.2 Cost Effectiveness & Public Benefit Ratio 7-3.1
 7-3.3 Least Cost Alternative 7-3.2

Tab 8 • Early Funding Request

8-1 Questions 1 and 2

8-1.1 Application Instructions 8-1.1
 8-1.2 Early Funding Request 8-1.1
 8-1.3 Requested Amount 8-1.1

8-2 Early Funding Scope, Schedule, and Budget

8-2.1 Application Instructions 8-2.1
 8-2.2 Work Completed 8-2.1

8-2.3 Early Funding Scope of Work 8-2.1

 8-2.3.1 Environmental 8-2.2

 8-2.3.2 Permitting 8-2.3

 8-2.3.3 Water Rights 8-2.4

8-2.4 Early Funding Schedule..... 8-2.5

8-2.5 Early Funding Budget..... 8-2.5

Tab 1 • Applicant Information

Table 1-1.1 Application Content of Tab 1 1-1.1
 Table 1-1.2 Applicant Information 1-1.1
 Table 1-2.1 Budget..... 1-1.2
 Table 1-3.1 Geographic Information 1-1.3
 Table 1-4.1 Legislative Information 1-1.3

Tab 2 • Projects

Table 2-1.1 Application Content of Tab 2 2-1.1
 Table 2-1.2 Project Information..... 2-1.1

Tab 3• Eligibility and General Project Info

3-1 Questions 1 through 5

Table 3-1.1 Application Content of Tab 3 Section 1 3-1.1
 Table 3-1.2 Applicant Type 3-1.2
 Table 3-1.3 Project Type..... 3-1.2
 Table 3-1.4 Summary of Agricultural and Urban Water Management Plan Compliance..... 3-1.4

3-2 Executive Summary

Table 3-2.1 Summary of Local Agency Partners..... 3-2.3
 Table 3-2.2 Magnitude of the Physical Benefits of the LVE Project 3-2.10
 Table 3-2.3 Valuation Methods and Net Present Value of LVE Project Benefits 3-2.11
 Table 3-2.4 Net Present Value of LVE Project Costs (Millions of Dollars) 3-2.12
 Table 3-2.5 Cost Benefit Analysis for the LVE Project 3-2.12

3-3 Resolution

Table 3-3.1 Application Content of Tab 3 Section 3 3-3.1

3-4 Project Description

Table 3-4.1 Application Content of Tab 3 Section 4 3-4.1
 Table 3-4.2 Water Rights for Potential Use in LVE Project..... 3-4.13
 Table 3-4.3 Characteristics of the Los Vaqueros Dam Modification 3-4.24

3-5 Project Description Support

Table 3-5.1 Application Content of Tab 3 Section 4 3-5.1

3-6 Attestation

Table 3-6.1 Application Content of Tab 3 Section 6 3-6.1

3-7 Other Application Information

Table 3-7.1 Application Content of Tab 3 Section 7 3-7.1

Tab 4 • Physical Public Benefits

4-1 Ecosystem Benefits

Table 4-1.1 Application Content of Tab 4 Section 1 4-1.1

4-2 Water Quality Benefits

Table 4-2.1 Application Content of Tab 4 Section 2 4-2.1

4-3 Emergency Response Benefits

Table 4-3.1 Application Content of Tab 4 Section 3 4-3.1

Table 4-3.2 Local Agency Partner Sources and Demands for LVE Project..... 4-3.3

Table 4-3.3 Average Emergency Response Benefit of LVE Project..... 4-3.4

4-4 Recreation Benefits

Table 4-4.1 Application Content of Tab 4 Section 4 4-4.1

Table 4-4.2 Assessment of Proposed Physical Recreation Benefits..... 4-4.4

Table 4-4.3 WSIP Visitation Model Equation Variables..... 4-4.6

Table 4-4.4 Maximum Substitute Reservoir Acres..... 4-4.10

Tab 5 • Feasibility and Implementation Risk

5-1 Feasibility Documentation

Table 5-1.1 Application Content of Tab 5 Section 1 5-1.1

5-2 Permit List

Table 5-2.1 Application Content of Tab 5 Section 2 5-2.1

Table 5-2.2 Permits and Approvals Potentially Needed for Implementation of
Los Vaqueros Reservoir Expansion Project..... 5-2.2

5-3 Schedule

Table 5-3.1 Application Content of Tab 5 Section 3 5-3.1

5-4 Environmental Document

Table 5-4.1 Application Content of Tab 5 Section 4 5-4.1

5-5 Impacts and Consultation

Table 5-5.1 Application Content of Tab 5 Section 5 5-5.1

Tab 6 • Benefit Calculation, Monetization, and Resiliency

6-1 Model Usage

Table 6-1.1 Application Content of Tab 6 Section 1 6-1.1

6-2 Project Conditions

Table 6-2.1 Application Content of Tab 6 Section 2 6-2.1

Table 6-2.2 CalSim II Model Assumptions for the Existing Condition and
Future Condition with Climate Change Scenarios 6-2.2

Table 6-2.3 Infrastructure Included in the Without-Project Condition..... 6-2.6

Table 6-2.4 Los Vaqueros Reservoir Operating Constraints for
Without-Project Condition 6-2.7

Table 6-2.5 Comparison of Infrastructure for Without-Project and
With-Project Conditions 6-2.14

Table 6-2.6 Local Agency Partner Water Sources and Demands for
With-Project Condition..... 6-2.15

Table 6-2.7 Comparison of Operations for Without-Project and
With-Project Conditions 6-2.17

Table 6-2.8 Incremental Level 4 Water Demand of Wildlife Refuges
(Acre-Feet/Year) for With-Project Condition 6-2.18

6-3 Preliminary Operations Plan

Table 6-3.1 Application Content of Tab 6 Section 3 6-3.1

Table 6-3.2 Local Agency Partner Water Supply and Demands 6-3.6

Table 6-3.3 Potential Monitoring Metrics for Public Benefits 6-3.8

6-4 Monetized Benefits Analysis

Table 6-4.1 Application Content of Tab 6 Section 4 6-4.1

Table 6-4.2 Long Term Average of Phase 2 Expansion Ecosystem Improvement Benefits.... 6-4.2

Table 6-4.3 Salmonid Monitoring Data at Rock Slough1 6-4.3

Table 6-4.4 Average Emergency Response Benefit of LVE Project..... 6-4.4

Table 6-4.5 Visitation Estimates and Recreation Benefit Improvement of LVE Project 6-4.5

Table 6-4.6 Average of the LVE Project M&I Water Supply Benefits 6-4.6

Table 6-4.7 Average Water Quality Improvement Benefit for City of Brentwood..... 6-4.7

Table 6-4.8 Average Water Quality Improvement Benefit for CCWD..... 6-4.7

Table 6-4.9 Average Water Quality Improvement Benefit for ECCID 6-4.8

Table 6-4.10 Deliveries to Agricultural Partners (TAF/year)..... 6-4.9

Table 6-4.11 Potential Water Transferred to SLDMWA..... 6-4.9

Table 6-4.12 Benefit Valuation Methodology 6-4.10

Table 6-4.13 Estimated Refuge Water Supply Unit Values (\$/AF) 6-4.11

Table 6-4.14 Unit Values for Salmonids 6-4.12

Table 6-4.15 Estimated M&I Drought Emergency Water Supply Unit Values (\$/AF) 6-4.12

Table 6-4.16 Recreational Benefits of Los Vaqueros Expansion..... 6-4.13

Table 6-4.17 Estimated M&I Water Supply Unit Values (\$/AF)..... 6-4.14

Table 6-4.18 Monetization of Water Quality Improvement Benefits..... 6-4.15

Table 6-4.19 Estimated Agricultural Water Supply Unit Values (\$/AF) 6-4.16

6-5 Mitigation and Compliance Obligations

Table 6-5.1 Application Content of Tab 6 Section 5 6-5.1

6-6 Quantification Support

Table 6-6.1 Application Content of Tab 6 Section 6 6-6.1

6-7 Monetization Table

Table 6-7.1 Application Content of Tab 6 Section 7 6-7.1

Table 6-7.2 Annual Economic Benefit, \$Million/Year (2030 Conditions, 2015 dollars) 6-7.2

Table 6-7.3 Annual Economic Benefit, \$Million/Year (2070 Conditions, 2015 dollars) 6-7.3

Table 6-7.4 Net Present Value of Economic Benefits, \$millions (2015 dollars) 6-7.3

Table 6-7.5 M&I Water EBMUD..... 6-7.4

Table 6-7.6 M&I Water Bay Area -SOD..... 6-7.7

Table 6-7.7 Agriculture Water South of Delta..... 6-7.10

Table 6-7.8 Ecosystem - Refuge Water CA Aqueduct..... 6-7.13

Table 6-7.9 Ecosystem - Refuge Water Delta-Mendota Canal..... 6-7.16

Table 6-7.10 Non-Drought Emergency (WSIP TRD Calculations) 6-7.19

Table 6-7.11 Drought Emergency..... 6-7.22

Table 6-7.12 Recreation Benefit 6-7.25

Table 6-7.13 M&I Water Quality 6-7.28

Table 6-7.14 Salmon Benefit at Rock Slough Fish Screen..... 6-7.31

Table 6-7.15 Potential Transfers to SLDMWA..... 6-7.34

6-8 Non-Monetized Benefits

Table 6-8.1 Application Content of Tab 6 Section 8 6-8.1

6-9 Total Project Cost Estimate

Table 6-9.1 Application Content of Tab 6 Section 9 6-9.1

Table 6-9.2 Construction Capital Costs 6-9.2
 Table 6-9.3 Non-Construction Capital Costs..... 6-9.3
 Table 6-9.4 Schedule for Incurring Capital Costs 6-9.4
 Table 6-9.5 Present Value of Project Costs 6-9.5
 Table 6-9.6 Net Present Value Calculation for Project Costs..... 6-9.6
 Table 6-9.7 Cost of Re-Operating Existing Facilities to Provide Public Benefits..... 6-9.9

6-10 Benefit and Cost Analysis

Table 6-10.1 Application Content of Tab 6 Section 10..... 6-10.1
 Table 6-10.2 Net Present Values of Total LVE Project Benefits and Costs
 (Millions of Dollars, 2015)..... 6-10.2
 Table 6-10.3 Public Benefit Ratio for LVE Project..... 6-10.2

6-11 Cost Allocation

Table 6-11.1 Application Content of Tab 6 Section 11 6-11.1
 Table 6-11.2 Cost Allocation for Public Benefits (Millions of Dollars, 2015) 6-11.3
 Table 6-11.3 Cost Allocation for Non-Public Benefits (Millions of Dollars, 2015) 6-11.3

6-12 Physical and Economic Summary Table

Table 6-12.1 Application Content of Tab 6 Section 12 6-12.1
 Table 6-12.2 Part 1. Physical and Economic Benefits..... 6-12.2
 Table 6-12.3 Part 2. Total Economic Net Benefits and Allocated Cost by Benefit Category
 in 2015 \$ Million..... 6-12.6
 Table 6-12.4 Part 3. Present Value of Project Costs, Cost-Effectiveness Measure, and
 Public Benefit Ratio, Million 2015 \$ Present Value 6-12.7

6-13 Uncertainty Analysis

Table 6-13.1 Application Content of Tab 6 Section 13 6-13.1
 Table 6-13.2 System Performance With and Without LVE Project During
 the 1990s Drought (Water Years 1988-1992) 6-13.7

Tab 7 • Program Requirements

7-1 Questions 1 through 5

Table 7-1.1 Application Content of Tab 7 Section 1 7-1.1
 Table 7-1.2 Summary of Coordination with Other Water System Facility Owners and
 Operators 7-1.6

7-2 Delta or Tributary Measureable Improvement

Table 7-2.1 Application Content of Tab 7 Section 2 7-2.1

7-3 Cost Effectiveness

Table 7-3.1 Application Content of Tab 7 Section 3 7-3.1
 Table 7-3.2 Cost Benefit Analysis for the LVE Project 7-3.2
 Table 7-3.3 Summary of Least Cost Alternatives for the Benefits Provided by LVE Project. 7-3.3

Tab 8 • Early Funding Request

8-1 Questions 1 and 2

Table 8-1.1 Application Content of Tab 8 Section 1 8-1.1
 Table 8-1.2 Early Funding Request Amount 8-1.1

8-2 Early Funding Scope, Schedule, and Budget

Table 8-2.1 Application Content of Tab 8 Section 2 8-2.1
 Table 8-2.2 List of Permits Required for LVE Project..... 8-2.1
 Table 8-2.3 Water Rights for Potential Use in LVE Project..... 8-2.4
 Table 8-2.4 Early Funding Budget for LVE Project..... 8-2.7

Tab 1 • Applicant Information

None.

Tab 2 • Projects

None.

Tab 3 • Eligibility and General Project Info

3-2 Executive Summary

Figure 3-2.1 Key Features of the LVE Project 3-2.2
Figure 3-2.2 Map of Potential Partners and Areas Potentially Served by LVE Project 3-2.4
Figure 3-2.3 Schematic of LVE Project Facilities and Operations..... 3-2.6
Figure 3-2.4 Net Present Value of Public and Non-Public Benefits (Millions of Dollars) 3-2.11
Figure 3-2.5 LVE Project Major Milestone Schedule 3-2.15

3-4 Project Description

Figure 3-4.1 LVE Project Location, Facilities, and Beneficiaries 3-4.5
Figure 3-4.2 Map of Potential LVE Project Partners..... 3-4.7
Figure 3-4.3 Volume of Delta Surplus Water Available (CalSim II Modeling) 3-4.12
Figure 3-4.4 Photo of Los Vaqueros Reservoir and Watershed 3-4.18
Figure 3-4.5 Seasonal Pattern of Evaporation in Los Vaqueros Watershed..... 3-4.19
Figure 3-4.6 Los Vaqueros Reservoir Expansion Project New Facilities 3-4.23
Figure 3-4.7 Stage-Storage Curve for the Expanded Los Vaqueros Reservoir 3-4.25
Figure 3-4.8 Surface Area-Storage Curve for the Expanded Los Vaqueros Reservoir 3-4.25
Figure 3-4.9 Existing Los Vaqueros Marina Complex..... 3-4.29
Figure 3-4.10 Proposed New Marina Facility at Los Vaqueros Reservoir..... 3-4.30
Figure 3-4.11 Proposed Upgrades to Watershed Office Barn Area..... 3-4.32
Figure 3-4.12 Rock Slough Fish Screen Facility 3-4.35

Tab 4 • Physical Public Benefits

4-4 Recreation Benefits

Figure 4-4.1 Primary Service Area Population for Use in the Visitation Model..... 4-4.9

Tab 5 • Feasibility and Implementation Risk

5-3 Schedule

Figure 5-3.1 LVE Project Major Milestone Schedule 5-3.3

Tab 6 • Benefit Calculation, Monetization, and Resiliency

6-2 Project Conditions

Figure 6-2.1 Map of Contra Costa Water District's Existing Facilities and Service Area for the Without-Project Condition 6-2.4

Figure 6-2.2 Facilities in Without-Project Condition 6-2.5

Figure 6-2.3 Local Agency Partners for Potential Service by LVE Project 6-2.10

Figure 6-2.4 Wildlife Refuges Areas for Potential Service by LVE Project 6-2.11

Figure 6-2.5 New Facilities and Operational Priorities for the With-Project Condition 6-2.13

6-3 Preliminary Operations Plan

Figure 6-3.1 LVE Project Facilities and Water Pathways 6-3.4

6-11 Cost Allocation

Figure 6-11.1 Net Present Value of LVE Project Benefit 6-11.2

6-13 Uncertainty Analysis

Figure 6-13.1 Comparison of LVE Project Benefits in 2070 Under Three Climate Scenarios 6-13.3

Figure 6-13.2 Comparison of LVE Project Benefits in 2030, With and Without California WaterFix 6-13.6

Tab 7 • Program Requirements

None.

Tab 8 • Early Funding Request

8-2 Early Funding Scope, Schedule, and Budget

Figure 8-2.1 Schedule for LVE Project 8-2.6