



Appendix A

Basis of Cost Estimating TM

TECHNICAL MEMORANDUM

DATE: November 21, 2025

Project No.: 798-50-24-05

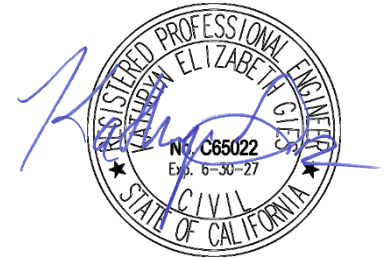
SENT VIA: EMAIL

TO: Parastou Hooshialsadat

FROM: Niloofar Shakourifar

REVIEWED BY: Kathryn Gies, PE, RCE #65022

SUBJECT: Basis for Cost Estimating for West County Water Quality and Recycled Water Supply Feasibility Study



West Yost is preparing a Water Quality and Recycled Water Supply Feasibility Study (Project) for the Russian River Community Services District (RRCSD). This technical memorandum (TM) details the basis for cost estimating used for economic evaluations of alternatives for the Project. The factors that influence the cost estimating process presented in this TM include:

- Present Worth Analysis
- Cost Estimate Basis
- Basis of Costs Over Time
- Construction Cost Estimating Assumptions
- Project-Related Capital Cost Assumptions
- Operation and Maintenance Cost Assumptions

PRESENT WORTH ANALYSIS

The economic evaluation of alternatives depends on a comparison of the present worth cost for each alternative. The present value of future annual costs, including operation and maintenance (O&M) and refurbishment costs, is calculated based on the period of operation and the value of money, which is termed as the discount rate. The U.S. Bureau of Reclamation sets the interest rate to be used by federal agencies in the formulation and evaluation of plans for water and related land resource projects. The discount rate set for Fiscal Year 2025 was 3.00 percent, which is used for life cycle cost analyses in this Project.

COST ESTIMATE BASIS

Construction and operating costs for the alternatives are based on an evaluation of each specific alternative. Estimates are prepared using the construction costs of similar unit processes and from vendor quotes for major equipment. The cost estimates presented for the Project are Association of Advancement of Cost Engineering Class 5 planning estimates, for Study or Feasibility purposes. Class 5 estimates have 0 to 2 percent of project definition with a targeted -50 percent to +100 percent accuracy.

The primary purpose of these estimates is to provide a basis for comparing alternatives. The aggregate cost of a particular course of action may also be used for long-range capital improvement planning, with appropriate consideration for the potential variability in project scope, economic factors, and the ongoing evolving construction materials and techniques. Preliminary design and detailed design efforts will be necessary to refine and confirm the estimated costs.

BASIS FOR COSTS OVER TIME

Costs can be expected to undergo long-term changes consistent with corresponding changes in the national economy. One of the best available barometers of these changes is the Engineering News Record (ENR) Construction Cost Index (CCI). The CCI is computed from the prices for structural steel, Portland cement, lumber and common labor; and is based on a value of 100 in the year 1913. The trend of the ENR 20-City average CCI since year 2000 is shown on Figure 1.

Future changes in the costs of material, labor and equipment as inflation increases capital costs will affect all alternatives. Therefore, decisions based on today's cost would be similar as costs inflate. The evaluation of alternatives is therefore based on existing costs with an ENR CCI of 13,798.3, representative of the 20-City average for April 2025.

The operating costs developed in this report are based on estimated costs over a 20-year period from 2025 to 2045. These costs were developed based on current (2025) costs and inflated at rate of 3.0 percent per year for the duration of the 20-year project lifetime.

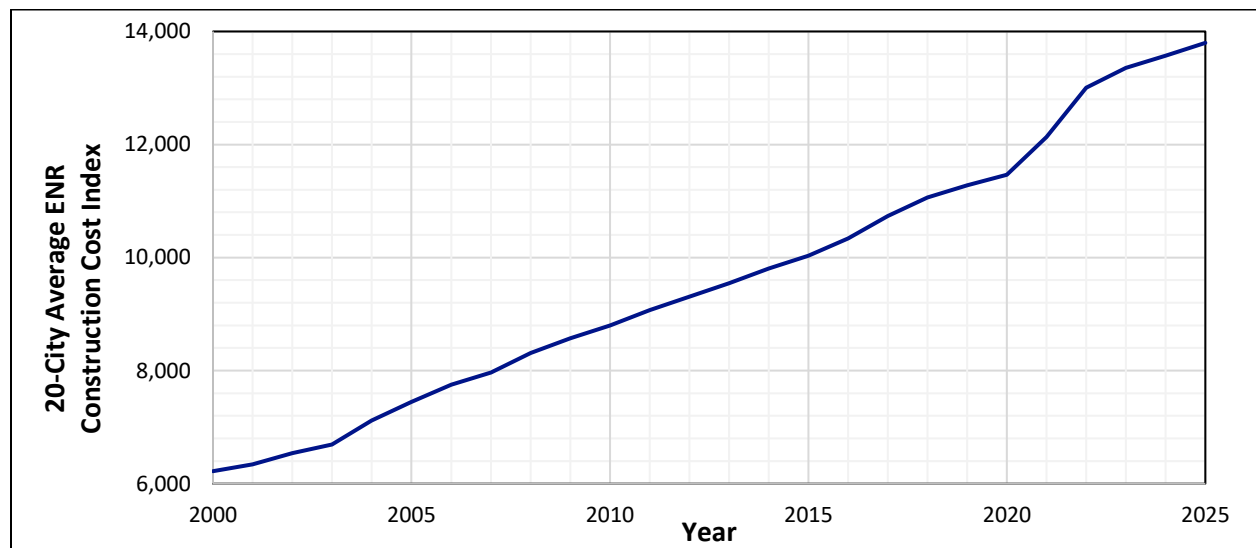


Figure 1. ENR Construction Cost Index for Year 2000 to 2025

CONSTRUCTION COST ESTIMATING ASSUMPTIONS

The construction costs presented for this Project represent an engineer’s preliminary opinion of probable construction cost (OPCC). The OPCC represents the sum of the following:

- component costs,
- distributed costs,
- estimating contingency, and
- contractor costs and profit.

The assumptions and methods used to prepare these elements of the OPCC are documented below.

Component Costs

Costs for individual facility components were estimated using a variety of sources. When possible, equipment quotes were obtained from appropriate vendors and assumptions were made regarding the cost of the equipment installation as a percentage of the equipment cost. Estimates of quantities of materials were also developed where appropriate. In some cases, lump sum costs that include the distributed and contractor costs discussed below were used, where these costs were based on total construction costs from similar projects.

Distributed Costs

Distributed costs account for costs that are not included in the component costs at this level of planning. Distributed costs include:

- plant paving, grading and yard piping
- miscellaneous mechanical and piping
- electrical
- instrumentation and controls

These distributed costs are calculated as a multiple of the total base costs. The default multipliers used are listed in Table 1. For each facility component, facility-specific multipliers were adjusted to account for the related distributed costs.

Item	Multiplier, percent
Plant Paving, Grading, and Yard Piping ^(a)	10
Mechanical and Piping	10
Electrical	25
Instrumentation and Controls	15

Estimating Contingencies

Because of the limitations of cost estimates based on planning information, cost estimates must allow for the following:

- items not identified in the conceptual development of a given alternative,
- unanticipated improvements,
- variation in final quantities,
- adverse construction conditions, and
- other unforeseeable difficulties that will increase the final construction cost.

A total contingency allowance of 30 percent is applied to project-phase level OPCCs to cover costs for these items.

Contractor Costs and Profit

Contractor costs include:

- mark-up on subcontractors
- bonds
- insurance
- mobilization and demobilization
- general overhead

These cost factors, as well as contractor profit are calculated as a multiple of the total base and distributed costs, with the exception of the markup on subcontractor costs. The markup of subcontractors work is only applied to the calculated electrical and instrumentation and controls costs. The default multipliers used are listed in Table 2. The amounts for some items, such as the portion subject to subcontractor markup, mobilization or demobilization will vary in practice depending on the nature of the work and the particular contractor selected; nevertheless, the factors provide a reasonable estimate and are useful when used in conjunction with appropriate contingencies.

Item	Multiplier, percent
Contractor's Markup of Subcontractors' Work ^(a)	10
Mobilization and Demobilization	5
Contractor's Overhead and Profit	15
Contractor's General Conditions (Bonds and Insurance, other requirements)	10

(a) Applied only to electrical and instruction and controls costs.

PROJECT-RELATED CAPITAL COST ASSUMPTIONS

The OPCC plus the construction contingency represents an estimated construction budget. The engineer's preliminary opinion of probable total capital cost (OPTCC) is calculated as the sum of the following:

- engineer's preliminary OPCC,
- construction contingency, and
- other project-related capital costs

The construction contingency is a reserved amount of money in a project's budget that accounts for unexpected costs or changes that occur during construction. It serves as a financial buffer to help manage risks and uncertainties that arise after the project starts. At this stage of planning, a construction contingency has not been applied.

The project-related costs, which are costs not included in the construction contract and construction contingency, are predicted as a percentage of the estimated construction costs. Depending on the size and type of project, non-construction costs may range from 13 to 25 percent of the contract cost when all the above services are provided. The lower percentage applies to large projects without complicated mechanical systems. The higher percentage applies to small, complicated projects and to projects that involve extensive remodeling of existing plants. For this project, which may include improvements to existing WWTPs, total engineering costs are anticipated to average 25 percent of the contract cost.

O&M COST ASSUMPTIONS

O&M costs were developed for each alternative that included the following elements:

- **Power (Electricity) Costs:** Power costs were determined according to the power demands of equipment, estimated annual operating hours, and unit power costs paid by the RRCSD.
- **Chemical Costs:** The polymer unit cost for thickening and dewatering processes were based on a similar project. Chlorine gas and sulfur dioxide unit costs were based on chemical purchase bids.
- **Maintenance Costs:** Maintenance costs were calculated for replacement parts based on information from the equipment manufacturers, unless specified otherwise.
- **Solids Hauling Costs:** The cost of hauling and disposing of biosolids and annual biosolids production was estimated based on a similar project.

All the applied O&M cost assumptions are summarized in Table 3. In addition, the current annual O&M costs were used where applicable to estimate O&M cost savings.

Table 3. Assumed Unit Costs for Developing Annual Operating Cost		
Item	Unit Cost, dollars	Unit Basis
Chemical Costs		
Polymer-Thickening	5	per neat pound
Polymer-Dewatering	5	per neat pound
Chlorine Gas	3,050	per ton
Sulfur Dioxide	0.61	per pound
Non-Chemical Costs		
Electrical Power	0.15 ^(a)	per kilowatt-hour
Solids Hauling	70	per wet ton
(a) Assumed electrical power unit cost provided by RRCSD staff.		

REFERENCES

Association of Advancement of Cost Engineering (AACE) International Recommended Practice No 17R-97. August 2020. Cost Estimate Classification System

Engineering News Record. April 2025. Construction Cost Index History. Accessed at https://www.enr.com/economics/historical_indices/construction_cost_index_history on April 2025.

Federal Register. December 12, 2024. Volume 89, No. 100533. Accessed at <https://www.govinfo.gov/content/pkg/FR-2024-12-12/pdf/2024-29263.pdf> on August 26, 2025.

Appendix B

Phase 1 Capital Costs



PROJECT: West County - Alternative 1a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
OPCC Manager: LMS & NS
Reviewer: CEH
Description of Work: Cost Estimating
Type of Estimate: Class 5
Date of This Estimate: 21-May-25

ELEMENT #	DESCRIPTION	UNIT COST	UNITS	ANTICIPATED COST
1	Fill Effluent Pond at FWD WWTP	\$3,600,000	1	\$3,600,000
2	Suspended Air Flotation at FWD WWTP	\$3,900,000	1	\$3,900,000
3	Filter influent pump station	\$2,600,000	1	\$2,600,000
4	Tertiary Disk Filtration at FWD WWTP	\$2,800,000	1	\$2,800,000
5	Chlorine Contact Basin Expansion at FWD WWTP	\$1,900,000	1	\$1,900,000
6	Headworks Improvement at GCSD WWTP	\$800,000	1	\$800,000
7	Pond Aeration System Upgrades at GCSD WWTP	\$9,400,000	1	\$9,400,000
8	Effluent Storage Pond Expansion at GCSD WWTP	\$20,400,000	1	\$20,400,000
9	Pipelines at FWD and GCSD WWTP	\$700,000	1	\$700,000
10	Conveyance Pipelines	\$5,800,000	1	\$5,800,000
11	Conveyance Pump Stations	\$7,400,000	1	\$7,400,000
12	Hydraulics Capacity Improvement at RRCSD WWTP	\$600,000	1	\$600,000
13	RRCSD CIP	\$23,000,000	1	\$23,000,000
14	Land Application (RRCSD)	\$200,000	1	\$200,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE PROJECT COST				\$83,100,000
Construction Contingency		0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin Costs		25%		\$20,800,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST				\$103,900,000



PROJECT: West County - Alternative 1a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Eff Pond Fill @FWD
Element #: 1

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Effluent Pond Fill	16,100	CY	\$120	\$1,932,000	\$0	\$1,932,000
2							
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$1,932,000
Plant Paving, Grading, and Yard Piping					10%		\$193,000
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$2,130,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					10%		\$0
Contractor's Overhead and Profit					15%		\$320,000
Mobilization and Demobilization					5%		\$107,000
Contractor's General Conditions					10%		\$213,000
SUBTOTAL							\$2,770,000
Project Phase-Level OPCC Contingency					30%		\$831,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$3,600,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$900,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$4,500,000



PROJECT: West County - Alternative 1a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: SAF @FWD
Element #: 2

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Concrete Pad	28	CY	\$550	\$15,400	\$15,400	\$31,000
2	Secondary Effluent Junction Box	0	0	\$0	\$98,000	\$0	\$98,000
3	Suspended Air Floatation System (1.5 mgd capacity - includes tank, flocculation tubes, generator)	1	LS	\$589,625	\$589,625	\$589,625	\$1,179,000
4	Canopy	820	SF	\$85	\$69,700	\$0	\$70,000
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$1,378,000
Plant Paving, Grading, and Yard Piping					10%		\$138,000
Mechanical and Piping					10%		\$138,000
Electrical					25%		\$345,000
Instrumentation and Controls					15%		\$207,000
SUBTOTAL							\$2,210,000
Tax on Materials					9.3%		\$71,000
Contractor's Markup on Sub-Contractors' Work					10%		\$55,000
Contractor's Overhead and Profit					15%		\$332,000
Mobilization and Demobilization					5%		\$111,000
Contractor's General Conditions					10%		\$221,000
SUBTOTAL							\$3,000,000
Project Phase-Level OPCC Contingency					30%		\$900,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$3,900,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$975,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$4,880,000



PROJECT: West County - Alternative 1a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: FIPS @FWD
Element #: 3

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	1.5 mgd pump station before SAF and cloth disk filters	1	LS	\$1,960,000	\$1,960,000	\$0	\$1,960,000
2							
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$1,960,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$1,960,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$1,960,000
Project Phase-Level OPCC Contingency					30%		\$588,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$2,550,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$638,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$3,190,000



PROJECT: West County - Alternative 1a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Tert.Filt. @FWD
Element #: 4

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

	DESCRIPTION	MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Concrete Pad (under two 4-Disk filter unit tanks)	21	CY	\$550	\$11,550	\$11,550	\$23,000
2	Cloth Media Filters (two (2) 4-Disk AquaDisk filters in steel tanks treating a max. flow of 1.5 MGD, with full redundancy)	1	LS	\$600,000	\$600,000	\$300,000	\$900,000
3	Canopy	671	SF	\$85	\$57,069	\$0	\$57,000
4							
5							
6							
7							
8							
9							
10							
	SUBTOTAL						\$980,000
	Plant Paving, Grading, and Yard Piping				10%		\$98,000
	Mechanical and Piping				10%		\$98,000
	Electrical				25%		\$245,000
	Instrumentation and Controls				15%		\$147,000
	SUBTOTAL						\$1,570,000
	Tax on Materials				9.3%		\$62,000
	Contractor's Markup on Sub-Contractors' Work				10%		\$39,000
	Contractor's Overhead and Profit				15%		\$236,000
	Mobilization and Demobilization				5%		\$79,000
	Contractor's General Conditions				10%		\$157,000
	SUBTOTAL						\$2,140,000
	Project Phase-Level OPCC Contingency				30%		\$642,000
	ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST						\$2,780,000
	Construction Contingency				0%		\$0
	Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin				25%		\$695,000
	ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST						\$3,480,000



PROJECT: West County - Alternative 1a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: CCB @FWD
Element #: 5

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Excavation for two new chlorine contact basins	1,174	CY	\$45	\$52,830	\$0	\$53,000
2	Concrete basins for two (2) new chlorine contactors (match existing)	395	CY	\$550	\$217,250	\$217,250	\$435,000
3	Additional chemical storage building for gas cylinders for the two new CCBs.	216	SF	\$450	\$97,200	\$0	\$97,000
4	Metal grating over chlorine contact basin inlets	86	SF	\$35	\$2,993	\$0	\$3,000
5	Surface Mounted Fiberglass Slide Gate and Frame (2 per chlorine contact basin)	4	EA	\$5,000	\$20,000	\$10,000	\$30,000
6	Chlorine Ejector (Chlorination) Assembly (1 per chlorine contact basin)	2	EA	\$10,000	\$20,000	\$10,000	\$30,000
7	Sulfur Dioxide Ejector (Dechlorination) Assembly (1 per chlorine contact basin)	2	EA	\$10,000	\$20,000	\$10,000	\$30,000
8							
9							
10							
SUBTOTAL							\$678,000
Plant Paving, Grading, and Yard Piping					10%		\$68,000
Mechanical and Piping					10%		\$68,000
Electrical					25%		\$170,000
Instrumentation and Controls					15%		\$102,000
SUBTOTAL							\$1,090,000
Tax on Materials					9.3%		\$40,000
Contractor's Markup on Sub-Contractors' Work					10%		\$27,000
Contractor's Overhead and Profit					15%		\$164,000
Mobilization and Demobilization					5%		\$55,000
Contractor's General Conditions					10%		\$109,000
SUBTOTAL							\$1,490,000
Project Phase-Level OPCC Contingency					30%		\$447,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$1,940,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$485,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$2,430,000



PROJECT: West County - Alternative 1a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: GCSO Headworks
Element #: 6

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	ROTAMAT Micro Strainer Ro9	1	LS	\$136,782	\$136,782	\$136,782	\$274,000
2	Bin	1	LS	\$50,000	\$50,000	\$0	\$50,000
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$324,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					5%		\$16,000
Electrical					25%		\$81,000
Instrumentation and Controls					15%		\$49,000
SUBTOTAL							\$470,000
Tax on Materials					9.3%		\$17,000
Contractor's Markup on Sub-Contractors' Work					10%		\$13,000
Contractor's Overhead and Profit					15%		\$71,000
Mobilization and Demobilization					5%		\$24,000
Contractor's General Conditions					10%		\$47,000
SUBTOTAL							\$640,000
Project Phase-Level OPCC Contingency					30%		\$192,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$830,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$208,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$1,040,000



PROJECT: West County - Alternative 1a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Aer.Ponds @GCSD
Element #: 7

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

	DESCRIPTION	MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Blower Building (houses three (3) 100HP blowers for pond aeration system)	1,053	SF	\$550	\$579,150	\$0	\$579,000
2	Ares Aeration® Pond Aeration System (in treatment ponds) & Floating Cover (on settling pond)	1	EA	\$1,468,680	\$1,468,680	\$1,468,680	\$2,937,000
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$3,516,000
	Plant Paving, Grading, and Yard Piping				10%		\$352,000
	Mechanical and Piping				10%		\$294,000
	Electrical				25%		\$734,000
	Instrumentation and Controls				15%		\$441,000
SUBTOTAL							\$5,340,000
	Tax on Materials				9.3%		\$136,000
	Contractor's Markup on Sub-Contractors' Work				10%		\$118,000
	Contractor's Overhead and Profit				15%		\$801,000
	Mobilization and Demobilization				5%		\$267,000
	Contractor's General Conditions				10%		\$534,000
SUBTOTAL							\$7,200,000
	Project Phase-Level OPCC Contingency				30%		\$2,160,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$9,360,000
	Construction Contingency				0%		\$0
	Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin				25%		\$2,340,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$11,700,000



PROJECT: West County - Alternative 1a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Eff.Stor.Pond @GCSD
Element #: 8

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Excavation	182,000	CY	\$45	\$8,190,000	\$0	\$8,190,000
2	Rip rap	6,000	ton	\$375	\$2,250,000	\$0	\$2,250,000
3	Gravel	2,000	ton	\$210	\$420,000	\$0	\$420,000
4	Misc Structure	2	EA	\$100,000	\$200,000	\$0	\$200,000
5	Fencing	3,966	LF	\$75	\$300,000	\$0	\$300,000
6							
7							
8							
9							
10							
SUBTOTAL							\$11,360,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					5%		\$570,000
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$11,930,000
Tax on Materials					9.3%		\$150,000
Contractor's Markup on Sub-Contractors' Work					10%		\$0
Contractor's Overhead and Profit					15%		\$1,790,000
Mobilization and Demobilization					5%		\$600,000
Contractor's General Conditions					10%		\$1,190,000
SUBTOTAL							\$15,660,000
Project Phase-Level OPCC Contingency					30%		\$4,700,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$20,360,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$5,090,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$25,450,000



PROJECT: West County - Alternative 1a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Pipeline-Treatment
Element #: 9

OPPC PROVIDED BY: NS
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	6 inch Pipeline	240	LF	\$180	\$43,200	\$0	\$43,000
2	8 inch Pipeline	1,250	LF	\$240	\$300,000	\$0	\$300,000
3	10 inch Pipeline	270	LF	\$300	\$81,000	\$0	\$81,000
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$424,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$420,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					10%		\$0
Contractor's Overhead and Profit					15%		\$63,000
Mobilization and Demobilization					5%		\$21,000
Contractor's General Conditions					10%		\$42,000
SUBTOTAL							\$550,000
Project Phase-Level OPCC Contingency					30%		\$165,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$720,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$180,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$900,000



PROJECT: West County - Alternative 1a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Pipeline-Conveyance
Element #: 10

OPPC PROVIDED BY: NS
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Rehab 8 inch Pipe	8,980	LF	\$120	\$1,077,600	\$0	\$1,078,000
2	6 inch Pipeline	13,180	LF	\$180	\$2,372,400	\$0	\$2,372,000
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$3,450,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$3,450,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					10%		\$0
Contractor's Overhead and Profit					15%		\$518,000
Mobilization and Demobilization					5%		\$173,000
Contractor's General Conditions					10%		\$345,000
SUBTOTAL							\$4,490,000
Project Phase-Level OPCC Contingency					30%		\$1,347,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$5,840,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$1,460,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$7,300,000



PROJECT: West County - Alternative 1a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Conveyance PS
Element #: 11

OPPC PROVIDED BY: NS
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

	DESCRIPTION	MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	GCSD Secondary Effluent Pump Station	1	EA	\$1,890,000	\$1,890,000	\$0	\$1,890,000
2	GCSD Tertiary Effluent Pump Station	1	EA	\$1,960,000	\$1,960,000	\$0	\$1,960,000
3	FWD Tertiary Effluent Pump Station	1	EA	\$1,840,000	\$1,840,000	\$0	\$1,840,000
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$5,690,000
	Plant Paving, Grading, and Yard Piping				0%		\$0
	Mechanical and Piping				0%		\$0
	Electrical				0%		\$0
	Instrumentation and Controls				0%		\$0
SUBTOTAL							\$5,690,000
	Tax on Materials				0%		\$0
	Contractor's Markup on Sub-Contractors' Work				0%		\$0
	Contractor's Overhead and Profit				0%		\$0
	Mobilization and Demobilization				0%		\$0
	Contractor's General Conditions				0%		\$0
SUBTOTAL							\$5,690,000
	Project Phase-Level OPCC Contingency				30%		\$1,707,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$7,400,000
	Construction Contingency				0%		\$0
	Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin				25%		\$1,850,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$9,250,000



PROJECT: West County - Alternative 1a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: RRCSD Hydraulic
Element #: 12

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

DESCRIPTION		QTY	UNIT	UNIT COST	COST	COST	TOTAL COST
1	18" UV Effluent Pipe	150	LF	\$540	\$81,000	\$0	\$81,000
2	16" Mixed Liquor Pipe	450	LF	\$480	\$216,000	\$0	\$216,000
3	14" Secondary Effluent Pipe	60	LF	\$420	\$25,200	\$0	\$25,000
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$322,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$320,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					10%		\$0
Contractor's Overhead and Profit					15%		\$48,000
Mobilization and Demobilization					5%		\$16,000
Contractor's General Conditions					10%		\$32,000
SUBTOTAL							\$420,000
Project Phase-Level OPCC Contingency					30%		\$126,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$550,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$138,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$690,000



PROJECT: West County - Alternative 1a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: RRCSD CIP
Element #: 13

OPPC PROVIDED BY: Niloofer S.
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Capital Improvement Programs	1	LS	\$8,000,000	\$8,000,000	\$0	\$8,000,000
2	Headworks Improvement	1	LS	\$1,991,434	\$1,991,434	\$0	\$2,000,000
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$10,000,000
Plant Paving, Grading, and Yard Piping					5%		\$500,000
Mechanical and Piping					5%		\$500,000
Electrical					10%		\$1,000,000
Instrumentation and Controls					10%		\$1,000,000
SUBTOTAL							\$13,000,000
Tax on Materials					9.3%		\$900,000
Contractor's Markup on Sub-Contractors' Work					10%		\$200,000
Contractor's Overhead and Profit					15%		\$2,000,000
Mobilization and Demobilization					5%		\$700,000
Contractor's General Conditions					10%		\$1,300,000
SUBTOTAL							\$18,000,000
Project Phase-Level OPCC Contingency					30%		\$5,400,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$23,000,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$5,800,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$29,000,000



PROJECT: West County - Alternative 1a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Land Application
Element #: 14

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Land Application Area	5	acres	\$25,000	\$125,000	\$0	\$125,000
2							
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$125,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$130,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$130,000
Project Phase-Level OPCC Contingency					30%		\$39,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$170,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$43,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$210,000



PROJECT: West County - Alternative 1c
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
OPCC Manager: LMS & NS
Reviewer: CEH
Description of Work: Cost Estimating
Type of Estimate: Class 5
Date of This Estimate: 21-May-25

ELEMENT #	DESCRIPTION	UNIT COST	UNITS	ANTICIPATED COST
1	Fill Effluent Pond at FWD WWTP	\$3,500,000	1	\$3,500,000
2	Influent Pump Station to MBR System at FWD WWTP	\$3,200,000	1	\$3,200,000
3	Fine Screens at FWD WWTP	\$3,200,000	1	\$3,200,000
4	MBR System at FWD WWTP	\$34,700,000	1	\$34,700,000
5	UV Disinfection System at FWD WWTP	\$4,700,000	1	\$4,700,000
6	WAS Thickening, Aerobic Digestion and Dewatering at FWD	\$16,100,000	1	\$16,100,000
7	Outfall to Russian River	\$32,500,000	1	\$32,500,000
8	Equalization Facilities at FWD WWTP	\$3,700,000	1	\$3,700,000
9	Headworks Improvement at GCSD WWTP	\$800,000	1	\$800,000
10	Equalization Facilities at GCSD WWTP	\$200,000	1	\$200,000
11	GCSD/FWD Conveyance Pipelines	\$3,300,000	1	\$3,300,000
12	Equalization Facilities at RRCSD WWTP	\$300,000	1	\$300,000
13	RRCSD Conveyance Pipelines	\$76,000,000	1	\$76,000,000
14	Conveyance Pump Stations	\$15,300,000	1	\$15,300,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE PROJECT COST				\$197,500,000
Construction Contingency		0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin Costs		25%		\$54,300,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST				\$251,800,000



PROJECT: West County - Alternative 1c
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Eff Pond Fill @FWD
Element #: 1

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Effluent Pond Fill	15,700	CY	\$120	\$1,884,000	\$0	\$1,884,000
2							
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$1,884,000
Plant Paving, Grading, and Yard Piping					10%		\$188,000
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$2,070,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					10%		\$0
Contractor's Overhead and Profit					15%		\$311,000
Mobilization and Demobilization					5%		\$104,000
Contractor's General Conditions					10%		\$207,000
SUBTOTAL							\$2,690,000
Project Phase-Level OPCC Contingency					30%		\$807,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$3,500,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$875,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$4,380,000



PROJECT: West County - Alternative 1c
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: MBR IPS
Element #: 2

OPPC PROVIDED BY: LMS
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	4.5 mgd pump station combining and conveying flow from all regional partners into MBR system	1	EA	\$2,470,000	\$2,470,000	\$0	\$2,470,000
2							
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$2,470,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$2,470,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$2,470,000
Project Phase-Level OPCC Contingency					30%		\$741,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$3,210,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$803,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$4,010,000



PROJECT: West County - Alternative 1c
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Fine Screens
Element #: 3

OPPC PROVIDED BY: LMS
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Concrete platform for elevated fine screens (dumpster below)	119	CY	\$550	\$65,450	\$65,450	\$131,000
2	Aluminum stairs up to fine screen platform	1	LS	\$5,000	\$5,000	\$0	\$5,000
3	Fine Screen (2mm) System with Washer/Compactor, 2 units (1 duty + 1 standby), each 4.5 mgd capacity	LS	1	\$666,000	\$666,000	\$333,000	\$999,000
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$1,135,000
Plant Paving, Grading, and Yard Piping					10%		\$114,000
Mechanical and Piping					10%		\$114,000
Electrical					25%		\$284,000
Instrumentation and Controls					15%		\$170,000
SUBTOTAL							\$1,820,000
Tax on Materials					9.3%		\$68,000
Contractor's Markup on Sub-Contractors' Work					10%		\$45,000
Contractor's Overhead and Profit					15%		\$273,000
Mobilization and Demobilization					5%		\$91,000
Contractor's General Conditions					10%		\$182,000
SUBTOTAL							\$2,480,000
Project Phase-Level OPCC Contingency					30%		\$744,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$3,220,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$805,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$4,030,000



PROJECT: West County - Alternative 1c
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: MBR System
Element #: 4

OPPC PROVIDED BY: LMS
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Concrete for process basins and membrane basins	1,671	CY	\$550	\$919,050	\$919,050	\$1,838,000
2	Cinderblock building for blowers next to MBR process basins.	1,350	SF	\$450	\$607,500	\$0	\$608,000
3	Cinderblock building for permeate pumps next to MBR membrane basins.	1,288	SF	\$450	\$579,375	\$0	\$579,000
4	MBR Treatment System (4.5 mgd capacity)	1	LS	\$4,571,100	\$4,571,100	\$4,571,100	\$9,142,000
5	Bridge crane system above membrane basins	1	EA	\$80,000	\$80,000	\$40,000	\$120,000
6							
7							
8							
9							
10							
SUBTOTAL							\$12,287,000
Plant Paving, Grading, and Yard Piping					10%		\$1,229,000
Mechanical and Piping					10%		\$1,229,000
Electrical					25%		\$3,072,000
Instrumentation and Controls					15%		\$1,843,000
SUBTOTAL							\$19,660,000
Tax on Materials					9.3%		\$625,000
Contractor's Markup on Sub-Contractors' Work					10%		\$492,000
Contractor's Overhead and Profit					15%		\$2,949,000
Mobilization and Demobilization					5%		\$983,000
Contractor's General Conditions					10%		\$1,966,000
SUBTOTAL							\$26,680,000
Project Phase-Level OPCC Contingency					30%		\$8,004,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$34,680,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$8,670,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$43,350,000



PROJECT: West County - Alternative 1c
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: UV
Element #: 5

OPPC PROVIDED BY: LMS
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Concrete for two UV channels	68	CY	\$550	\$37,400	\$37,400	\$75,000
2	Concrete pads for control panels (one dedicated to each channel)	11	CY	\$550	\$6,050	\$6,050	\$12,000
3	Aluminum grating over channels	178	SF	\$35	\$6,230	\$0	\$6,000
4	Canopy over channels and concrete pads	1,058	SF	\$85	\$89,930	\$0	\$90,000
5	UV Treatment System (two channels, 4.5 mgd total capacity, 80 mJ/cm2 @65%UVT)	1	LS	\$733,000	\$733,000	\$733,000	\$1,466,000
6							
7							
8							
9							
10							
SUBTOTAL							\$1,649,000
Plant Paving, Grading, and Yard Piping					10%		\$165,000
Mechanical and Piping					10%		\$165,000
Electrical					25%		\$412,000
Instrumentation and Controls					15%		\$247,000
SUBTOTAL							\$2,640,000
Tax on Materials					9.3%		\$81,000
Contractor's Markup on Sub-Contractors' Work					10%		\$66,000
Contractor's Overhead and Profit					15%		\$396,000
Mobilization and Demobilization					5%		\$132,000
Contractor's General Conditions					10%		\$264,000
SUBTOTAL							\$3,580,000
Project Phase-Level OPCC Contingency					30%		\$1,074,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$4,650,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$1,163,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$5,810,000



PROJECT: West County - Alternative 1c
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Aerobic Digestion
Element #: 6

OPPC PROVIDED BY:
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Slab, Roof, Walls - Aerobic Digesters	1,097	CY	\$550	\$603,566	\$603,566	\$1,207,000
2	Slab, Roof Walls - TWAS Storage	152	CY	\$550	\$83,801	\$83,801	\$168,000
3	Solids and Electrical Building	7,000	SF	\$400	\$2,800,000	\$0	\$2,800,000
4	WAS Pumps	2	EA	\$35,000	\$70,000	\$14,000	\$84,000
5	Rotary Drum Thickener	1	EA	\$187,462	\$187,462	\$74,985	\$262,000
6	Thickener Feed Pump	1	EA	\$19,975	\$19,975	\$7,990	\$28,000
7	TWAS Tank Mixer	1	EA	\$50,000	\$50,000	\$20,000	\$70,000
8	TWAS Tank Blower	1	EA	\$60,700	\$60,700	\$24,280	\$85,000
9	TWAS Pumps	1	EA	\$19,975	\$19,975	\$7,990	\$28,000
10	Centrifuge	1	EA	\$477,726	\$477,726	\$191,090	\$669,000
11	Conveyors	1	LS	\$54,440	\$54,440	\$21,776	\$76,000
12	Digester Blowers and Diffusers	1	EA	\$121,400	\$121,400	\$48,560	\$170,000
SUBTOTAL							\$5,647,000
Plant Paving, Grading, and Yard Piping					10%		\$565,000
Mechanical and Piping					10%		\$565,000
Electrical					25%		\$1,412,000
Instrumentation and Controls					15%		\$847,000
SUBTOTAL							\$9,040,000
Tax on Materials					9.3%		\$405,000
Contractor's Markup on Sub-Contractors' Work					10%		\$226,000
Contractor's Overhead and Profit					15%		\$1,356,000
Mobilization and Demobilization					5%		\$452,000
Contractor's General Conditions					10%		\$904,000
SUBTOTAL							\$12,380,000
Project Phase-Level OPCC Contingency					30%		\$3,714,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$16,090,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$4,023,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$20,110,000



PROJECT: West County - Alternative 1c
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Outfall
Element #: 7

OPPC PROVIDED BY:
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Outfall	1	LS	\$3,800,000	\$3,800,000	\$0	\$3,800,000
2	24" Pipeline	21,400	LF	\$720	\$15,408,000	\$0	\$15,408,000
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$19,208,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$19,210,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					10%		\$0
Contractor's Overhead and Profit					15%		\$2,882,000
Mobilization and Demobilization					5%		\$961,000
Contractor's General Conditions					10%		\$1,921,000
SUBTOTAL							\$24,970,000
Project Phase-Level OPCC Contingency					30%		\$7,491,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$32,460,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					40%		\$12,984,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$45,440,000



PROJECT: West County - Alternative 1c
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: FWD EQ Facilities
Element #: 8

OPPC PROVIDED BY: Niloofer S.
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Flow Control Structure	1	EA	\$98,000	\$98,000	\$0	\$98,000
2	4" Pipeline	210	0	\$120	\$25,200	\$0	\$25,000
3	8" Pipeline	140	0	\$240	\$33,600	\$0	\$34,000
4	16" Pipeline	560	0	\$480	\$268,800	\$0	\$269,000
5	FWD Ponds Drain Pump	1	EA	\$1,760,000	\$1,760,000	\$0	\$1,760,000
6							
7							
8							
9							
10							
SUBTOTAL							\$2,186,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$2,190,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					10%		\$0
Contractor's Overhead and Profit					15%		\$329,000
Mobilization and Demobilization					5%		\$110,000
Contractor's General Conditions					10%		\$219,000
SUBTOTAL							\$2,850,000
Project Phase-Level OPCC Contingency					30%		\$855,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$3,710,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$928,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$4,640,000



PROJECT: West County - Alternative 1c
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: GCSD Headworks
Element #: 9

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	ROTAMAT Micro Strainer Ro9	1	LS	\$136,782	\$136,782	\$136,782	\$274,000
2	Bin	1	LS	\$50,000	\$50,000	\$0	\$50,000
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$324,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					5%		\$16,000
Electrical					25%		\$81,000
Instrumentation and Controls					15%		\$49,000
SUBTOTAL							\$470,000
Tax on Materials					9.3%		\$17,000
Contractor's Markup on Sub-Contractors' Work					10%		\$13,000
Contractor's Overhead and Profit					15%		\$71,000
Mobilization and Demobilization					5%		\$24,000
Contractor's General Conditions					10%		\$47,000
SUBTOTAL							\$640,000
Project Phase-Level OPCC Contingency					30%		\$192,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$830,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$208,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$1,040,000



PROJECT: West County - Alternative 1c
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: GCSD EQ Facilities
Element #: 10

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Flow Control Structure	1	EA	\$98,000	\$98,000	\$0	\$98,000
2	8" Pipeline	30	0	\$240	\$7,200	\$0	\$7,000
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$105,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$110,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					10%		\$0
Contractor's Overhead and Profit					15%		\$17,000
Mobilization and Demobilization					5%		\$6,000
Contractor's General Conditions					10%		\$11,000
SUBTOTAL							\$140,000
Project Phase-Level OPCC Contingency					30%		\$42,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$180,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$45,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$230,000



PROJECT: West County - Alternative 1c
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Pipelines-FWD GCSD
Element #: 11

OPPC PROVIDED BY: NS
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Rehab 8" Pipe	2,760	LF	\$120	\$331,200	\$0	\$331,000
2	8" Pipeline	1,300	LF	\$240	\$312,000	\$0	\$312,000
3	16" Pipeline	2,760	LF	\$480	\$1,324,800	\$0	\$1,325,000
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$1,968,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$1,970,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					10%		\$0
Contractor's Overhead and Profit					15%		\$296,000
Mobilization and Demobilization					5%		\$99,000
Contractor's General Conditions					10%		\$197,000
SUBTOTAL							\$2,560,000
Project Phase-Level OPCC Contingency					30%		\$768,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$3,330,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$833,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$4,160,000



PROJECT: West County - Alternative 1c
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: RRCSD EQ Facilities
Element #: 12

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Flow Control Structure	1	EA	\$98,000	\$98,000	\$0	\$98,000
2	16" Pipeline	190	0	\$480	\$91,200	\$0	\$91,000
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$189,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$190,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					10%		\$0
Contractor's Overhead and Profit					15%		\$29,000
Mobilization and Demobilization					5%		\$10,000
Contractor's General Conditions					10%		\$19,000
SUBTOTAL							\$250,000
Project Phase-Level OPCC Contingency					30%		\$75,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$330,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$83,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$410,000



PROJECT: West County - Alternative 1c
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Pipelines-RRCS D
Element #: 13

OPPC PROVIDED BY: NS
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Creek Crossing	2	EA	\$3,800,000	\$7,600,000	\$0	\$7,600,000
2	Rehab 8" Pipe	6,220	LF	\$120	\$746,400	\$0	\$746,000
3	8" Pipeline	2,920	LF	\$240	\$700,800	\$0	\$701,000
4	16" Pipeline	6,220	LF	\$480	\$2,985,600	\$0	\$2,986,000
5	20" Pipeline	54,910	LF	\$600	\$32,946,000	\$0	\$32,946,000
6							
7							
8							
9							
10							
SUBTOTAL							\$44,979,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$44,980,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					10%		\$0
Contractor's Overhead and Profit					15%		\$6,747,000
Mobilization and Demobilization					5%		\$2,249,000
Contractor's General Conditions					10%		\$4,498,000
SUBTOTAL							\$58,470,000
Project Phase-Level OPCC Contingency					30%		\$17,541,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$76,010,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$19,003,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$95,010,000



PROJECT: West County - Alternative 1c
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Conveyance PS
Element #: 14

OPPC PROVIDED BY: NS
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	RRCSD Raw Water Effluent Pump Station	1	EA	\$2,700,000	\$2,700,000	\$0	\$2,700,000
2	GCSD Raw Water Effluent Pump Station	1	EA	\$1,810,000	\$1,810,000	\$0	\$1,810,000
3	GCSD Tertiary Water Pump Station	1	EA	\$1,860,000	\$1,860,000	\$0	\$1,860,000
4	FWD Tertiary Effluent Pump Station	1	EA	\$2,470,000	\$2,470,000	\$0	\$2,470,000
5	FWD Outfall Pump Station	1	EA	\$2,920,000	\$2,920,000	\$0	\$2,920,000
6							
7							
8							
9							
10							
SUBTOTAL							\$11,760,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$11,760,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$11,760,000
Project Phase-Level OPCC Contingency					30%		\$3,528,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$15,290,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$3,823,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$19,110,000



PROJECT: West County - Alternative 2a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: FWD EQ Facilities
Element #: 1

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Flow Control Structure	1	EA	\$98,000	\$98,000	\$0	\$98,000
2	4" Pipeline	210	LF	\$120	\$25,200	\$0	\$25,000
3	8" Pipeline	480	LF	\$240	\$115,200	\$0	\$115,000
4	FWD Ponds Drain Pump	1	EA	\$1,760,000	\$1,760,000	\$0	\$1,760,000
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$1,998,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$2,000,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					10%		\$0
Contractor's Overhead and Profit					15%		\$300,000
Mobilization and Demobilization					5%		\$100,000
Contractor's General Conditions					10%		\$200,000
SUBTOTAL							\$2,600,000
Project Phase-Level OPCC Contingency					30%		\$780,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$3,380,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$845,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$4,230,000



PROJECT: West County - Alternative 2a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: GCSD Headworks
Element #: 2

OPPC PROVIDED BY: Nilofar S.
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	ROTAMAT Micro Strainer Ro9	1	LS	\$136,782	\$136,782	\$136,782	\$274,000
2	Bin	1	LS	\$50,000	\$50,000	\$0	\$50,000
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$324,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					5%		\$16,000
Electrical					25%		\$81,000
Instrumentation and Controls					15%		\$49,000
SUBTOTAL							\$470,000
Tax on Materials					9.3%		\$17,000
Contractor's Markup on Sub-Contractors' Work					10%		\$13,000
Contractor's Overhead and Profit					15%		\$71,000
Mobilization and Demobilization					5%		\$24,000
Contractor's General Conditions					10%		\$47,000
SUBTOTAL							\$640,000
Project Phase-Level OPCC Contingency					30%		\$192,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$830,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$208,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$1,040,000



PROJECT: West County - Alternative 2a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: GCSD EQ Facilities
Element #: 3

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Flow Control Structure	1	EA	\$98,000	\$98,000	\$0	\$98,000
2	8" Pipeline	30	LF	\$240	\$7,200	\$0	\$7,000
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$105,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$110,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					10%		\$0
Contractor's Overhead and Profit					15%		\$17,000
Mobilization and Demobilization					5%		\$6,000
Contractor's General Conditions					10%		\$11,000
SUBTOTAL							\$140,000
Project Phase-Level OPCC Contingency					30%		\$42,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$180,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$45,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$230,000



PROJECT: West County - Alternative 2a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Pipelines-FWD GCSD
Element #: 4

OPPC PROVIDED BY: Niloofer S.
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Creek Crossing	1	EA	\$3,800,000	\$3,878,832	\$0	\$3,879,000
2	Rehab 8 inch Pipe	8,980	LF	\$120	\$1,077,600	\$0	\$1,078,000
3	8 inch Pipeline	8,450	LF	\$240	\$2,028,000	\$0	\$2,028,000
4	24 Inch Pipeline	8,623	LF	\$720	\$6,208,744	\$0	\$6,209,000
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$13,194,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$13,190,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					10%		\$0
Contractor's Overhead and Profit					15%		\$1,979,000
Mobilization and Demobilization					5%		\$660,000
Contractor's General Conditions					10%		\$1,319,000
SUBTOTAL							\$17,150,000
Project Phase-Level OPCC Contingency					30%		\$5,145,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$22,300,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$5,575,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$27,880,000



PROJECT: West County - Alternative 2a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: RRCSD EQ Facilities
Element #: 5

OPPC PROVIDED BY: Niloofer S.
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Flow Control Structure	1	EA	\$98,000	\$98,000	\$0	\$98,000
2	16" Pipeline	190	LF	\$480	\$91,200	\$0	\$91,000
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$189,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$190,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					10%		\$0
Contractor's Overhead and Profit					15%		\$29,000
Mobilization and Demobilization					5%		\$10,000
Contractor's General Conditions					10%		\$19,000
SUBTOTAL							\$250,000
Project Phase-Level OPCC Contingency					30%		\$75,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$330,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$83,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$410,000



PROJECT: West County - Alternative 2a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Pipelines-RRCS
Element #: 6

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Creek Crossing	6	EA	\$3,800,000	\$22,721,168	\$0	\$22,721,000
2	20 inch Pipeline	52,270	LF	\$600	\$31,362,000	\$0	\$31,362,000
3	24 Inch Pipeline	33,617	LF	\$720	\$24,204,056	\$0	\$24,204,000
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$78,287,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$78,290,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					10%		\$0
Contractor's Overhead and Profit					15%		\$11,744,000
Mobilization and Demobilization					5%		\$3,915,000
Contractor's General Conditions					10%		\$7,829,000
SUBTOTAL							\$101,780,000
Project Phase-Level OPCC Contingency					30%		\$30,534,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$132,310,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$33,078,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$165,390,000



PROJECT: West County - Alternative 2a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Conveyance PS
Element #: 7

OPPC PROVIDED BY: Niloofer S.
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	GCSD Raw Wastewater Pump Station	1	EA	\$1,810,000	\$1,810,000	\$0	\$1,810,000
2	FWD Raw Wastewater Pump Station	1	EA	\$2,050,000	\$2,050,000	\$0	\$2,050,000
3	RRCSD Raw Wastewater Pump Station	1	EA	\$2,700,000	\$2,700,000	\$0	\$2,700,000
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$6,560,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$6,560,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$6,560,000
Project Phase-Level OPCC Contingency					30%		\$1,968,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$8,530,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$2,133,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$10,660,000



PROJECT: West County - Alternative 2a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Connection fee
Element #: 8

OPPC PROVIDED BY: Niloofer S.
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Connection fee to Windsor	1	LS	\$69,556,000	\$69,556,000	\$0	\$69,556,000
2							
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$69,556,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$69,560,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$69,560,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$69,560,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$69,560,000



PROJECT: West County - Alternative 2b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: FWD EQ Facilities
Element #: 1

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Flow Control Structure	1	EA	\$98,000	\$98,000	\$0	\$98,000
2	4" Pipeline	210	LF	\$120	\$25,200	\$0	\$25,000
3	8" Pipeline	480	LF	\$240	\$115,200	\$0	\$115,000
4	FWD Ponds Drain Pump	1	EA	\$1,760,000	\$1,760,000	\$0	\$1,760,000
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$1,998,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$2,000,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					10%		\$0
Contractor's Overhead and Profit					15%		\$300,000
Mobilization and Demobilization					5%		\$100,000
Contractor's General Conditions					10%		\$200,000
SUBTOTAL							\$2,600,000
Project Phase-Level OPCC Contingency					30%		\$780,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$3,380,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$845,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$4,230,000



PROJECT: West County - Alternative 2b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: GCSO Headworks
Element #: 2

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	ROTAMAT Micro Strainer Ro9	1	LS	\$136,782	\$136,782	\$136,782	\$274,000
2	Bin	1	LS	\$50,000	\$50,000	\$0	\$50,000
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$324,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					5%		\$16,000
Electrical					25%		\$81,000
Instrumentation and Controls					15%		\$49,000
SUBTOTAL							\$470,000
Tax on Materials					9.3%		\$17,000
Contractor's Markup on Sub-Contractors' Work					10%		\$13,000
Contractor's Overhead and Profit					15%		\$71,000
Mobilization and Demobilization					5%		\$24,000
Contractor's General Conditions					10%		\$47,000
SUBTOTAL							\$640,000
Project Phase-Level OPCC Contingency					30%		\$192,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$830,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$208,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$1,040,000



PROJECT: West County - Alternative 2b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: GCSD EQ Facilities
Element #: 3

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Flow Control Structure	1	EA	\$98,000	\$98,000	\$0	\$98,000
2	8" Pipeline	30	LF	\$240	\$7,200	\$0	\$7,000
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$105,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$110,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					10%		\$0
Contractor's Overhead and Profit					15%		\$17,000
Mobilization and Demobilization					5%		\$6,000
Contractor's General Conditions					10%		\$11,000
SUBTOTAL							\$140,000
Project Phase-Level OPCC Contingency					30%		\$42,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$180,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$45,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$230,000



PROJECT: West County - Alternative 2b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Pipelines-FWD GCSD
Element #: 4

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Creek Crossing	0.4	EA	\$3,800,000	\$1,551,533	\$0	\$1,552,000
2	8 inch Pipe	5,810	LF	\$240	\$1,394,400	\$0	\$1,394,000
3	16 inch Pipe	607	LF	\$480	\$291,224	\$0	\$291,000
4	24 Inch Pipe	8,193	LF	\$720	\$5,898,601	\$0	\$5,899,000
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$9,136,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$9,140,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					10%		\$0
Contractor's Overhead and Profit					15%		\$1,371,000
Mobilization and Demobilization					5%		\$457,000
Contractor's General Conditions					10%		\$914,000
SUBTOTAL							\$11,880,000
Project Phase-Level OPCC Contingency					30%		\$3,564,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$15,440,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$3,860,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$19,300,000



PROJECT: West County - Alternative 2b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: RRCSD EQ Facilities
Element #: 5

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Flow Control Structure	1	EA	\$98,000	\$98,000	\$0	\$98,000
2	16" Pipeline	190	LF	\$480	\$91,200	\$0	\$91,000
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$189,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$190,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					10%		\$0
Contractor's Overhead and Profit					15%		\$29,000
Mobilization and Demobilization					5%		\$10,000
Contractor's General Conditions					10%		\$19,000
SUBTOTAL							\$250,000
Project Phase-Level OPCC Contingency					30%		\$75,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$330,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$83,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$410,000



PROJECT: West County - Alternative 2b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Pipelines-RRCS D
Element #: 6

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Creek Crossing	4	EA	\$3,800,000	\$13,648,467	\$0	\$13,648,000
2	16 inch Pipe	8,373	LF	\$480	\$4,019,176	\$0	\$4,019,000
3	20 inch Pipe	54,910	LF	\$600	\$32,946,000	\$0	\$32,946,000
4	24 Inch Pipe	31,937	LF	\$720	\$22,994,999	\$0	\$22,995,000
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$73,608,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$73,610,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					10%		\$0
Contractor's Overhead and Profit					15%		\$11,042,000
Mobilization and Demobilization					5%		\$3,681,000
Contractor's General Conditions					10%		\$7,361,000
SUBTOTAL							\$95,690,000
Project Phase-Level OPCC Contingency					30%		\$28,707,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$124,400,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$31,100,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$155,500,000



PROJECT: West County - Alternative 2b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Conveyance PS
Element #: 7

OPPC PROVIDED BY: Niloofer S.
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

	DESCRIPTION	MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	RRCSD Raw Wastewater Pump Station	1	EA	\$2,700,000	\$2,700,000	\$0	\$2,700,000
2	FWD Raw Wastewater Pump Station	1	EA	\$2,760,000	\$2,760,000	\$0	\$2,760,000
3	GCSD Raw Wastewater Pump Station	1	EA	\$1,990,000	\$1,990,000	\$0	\$1,990,000
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$7,450,000
	Plant Paving, Grading, and Yard Piping				0%		\$0
	Mechanical and Piping				0%		\$0
	Electrical				0%		\$0
	Instrumentation and Controls				0%		\$0
SUBTOTAL							\$7,450,000
	Tax on Materials				0%		\$0
	Contractor's Markup on Sub-Contractors' Work				0%		\$0
	Contractor's Overhead and Profit				0%		\$0
	Mobilization and Demobilization				0%		\$0
	Contractor's General Conditions				0%		\$0
SUBTOTAL							\$7,450,000
	Project Phase-Level OPCC Contingency				30%		\$2,235,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$9,690,000
	Construction Contingency				0%		\$0
	Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin				25%		\$2,423,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$12,110,000



PROJECT: West County - Alternative 2b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Connection fee
Element #: 8

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Connection fee to Santa Rosa	1	LS	\$68,800,000	\$68,800,000	\$0	\$68,800,000
2	Recycled Water Stoarge	1	LS	\$5,000,000	\$5,000,000	\$0	\$5,000,000
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$73,800,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$73,800,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$73,800,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$73,800,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$73,800,000



PROJECT: West County - Alternative 3b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Eff Pond Fill @FWD
Element #: 1

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

DESCRIPTION		QTY	UNIT	UNIT COST	COST	COST	TOTAL COST
1	Effluent Pond Fill	16,100	CY	\$120	\$1,932,000	\$0	\$1,932,000
2							
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$1,932,000
Plant Paving, Grading, and Yard Piping					10%		\$193,000
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$2,130,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					10%		\$0
Contractor's Overhead and Profit					15%		\$320,000
Mobilization and Demobilization					5%		\$107,000
Contractor's General Conditions					10%		\$213,000
SUBTOTAL							\$2,770,000
Project Phase-Level OPCC Contingency					30%		\$831,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$3,600,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$900,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$4,500,000



PROJECT: West County - Alternative 3b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: SAF @FWD
Element #: 2

OPPC PROVIDED BY: Nilofar S.
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

DESCRIPTION		QTY	UNIT	UNIT COST	COST	COST	TOTAL COST
1	Concrete Pad	28	CY	\$550	\$15,400	\$15,400	\$31,000
2	Secondary Effluent Junction Box	0	0	\$0	\$98,000	\$0	\$98,000
3	Suspended Air Floatation System (1.5 mgd capacity - includes tank, flocculation tubes, generato	1	LS	\$589,625	\$589,625	\$589,625	\$1,179,000
4	Canopy	820	SF	\$85	\$69,700	\$0	\$70,000
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$1,378,000
Plant Paving, Grading, and Yard Piping					10%		\$138,000
Mechanical and Piping					10%		\$138,000
Electrical					25%		\$345,000
Instrumentation and Controls					15%		\$207,000
SUBTOTAL							\$2,210,000
Tax on Materials					9.3%		\$71,000
Contractor's Markup on Sub-Contractors' Work					10%		\$55,000
Contractor's Overhead and Profit					15%		\$332,000
Mobilization and Demobilization					5%		\$111,000
Contractor's General Conditions					10%		\$221,000
SUBTOTAL							\$3,000,000
Project Phase-Level OPCC Contingency					30%		\$900,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$3,900,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$975,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$4,880,000



PROJECT: West County - Alternative 3b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: FIPS @FWD
Element #: 3

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

DESCRIPTION		QTY	UNIT	UNIT COST	COST	COST	TOTAL COST
1	1.5 mgd pump station before SAF and cloth disk filters	1	LS	\$1,960,000	\$1,960,000	\$0	\$1,960,000
2							
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$1,960,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$1,960,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$1,960,000
Project Phase-Level OPCC Contingency					30%		\$588,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$2,550,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$638,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$3,190,000



PROJECT: West County - Alternative 3b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Tert.Filt. @FWD
Element #: 4

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

DESCRIPTION		QTY	UNIT	UNIT COST	COST	COST	TOTAL COST
1	Concrete Pad (under both tanks)	21	CY	\$550	\$11,550	\$11,550	\$23,000
2	Cloth Media Filters (two (2) 4-Disk AquaDisk filters in steel tanks treating a max. flow of 1.5 MG)	1	LS	\$600,000	\$600,000	\$300,000	\$900,000
3	Canopy	671	SF	\$85	\$57,069	\$0	\$57,000
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$980,000
Plant Paving, Grading, and Yard Piping					10%		\$98,000
Mechanical and Piping					10%		\$98,000
Electrical					25%		\$245,000
Instrumentation and Controls					15%		\$147,000
SUBTOTAL							\$1,570,000
Tax on Materials					9.3%		\$62,000
Contractor's Markup on Sub-Contractors' Work					10%		\$39,000
Contractor's Overhead and Profit					15%		\$236,000
Mobilization and Demobilization					5%		\$79,000
Contractor's General Conditions					10%		\$157,000
SUBTOTAL							\$2,140,000
Project Phase-Level OPCC Contingency					30%		\$642,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$2,780,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$695,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$3,480,000



PROJECT: West County - Alternative 3b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: CCB @FWD
Element #: 5

OPPC PROVIDED BY: Nilofar S.
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

	DESCRIPTION	QTY	UNIT	UNIT COST	COST	COST	TOTAL COST
1	Excavation for two new chlorine contact basins	1,174	CY	\$45	\$52,830	\$0	\$53,000
2	Concrete basins for two (2) new chlorine contactors (match existing)	395	CY	\$550	\$217,250	\$217,250	\$435,000
3	'Additional chemical storage building for gas cylinders for the two new CCBs.	216	SF	\$450	\$97,200	\$0	\$97,000
4	Metal grating over chlorine contact basin inlets	86	SF	\$35	\$2,993	\$0	\$3,000
5	Surface Mounted Fiberglass Slide Gate and Frame (2 per chlorine contact basin)	4	EA	\$5,000	\$20,000	\$10,000	\$30,000
6	Chlorine Ejector (Chlorination) Assembly (1 per chlorine contact basin)	2	EA	\$10,000	\$20,000	\$10,000	\$30,000
7	Sulfur Dioxide Ejector (Dechlorination) Assembly (1 per chlorine contact basin)	2	EA	\$10,000	\$20,000	\$10,000	\$30,000
8							
9							
10							
	SUBTOTAL						\$678,000
	Plant Paving, Grading, and Yard Piping				10%		\$68,000
	Mechanical and Piping				10%		\$68,000
	Electrical				25%		\$170,000
	Instrumentation and Controls				15%		\$102,000
	SUBTOTAL						\$1,090,000
	Tax on Materials				9.3%		\$40,000
	Contractor's Markup on Sub-Contractors' Work				10%		\$27,000
	Contractor's Overhead and Profit				15%		\$164,000
	Mobilization and Demobilization				5%		\$55,000
	Contractor's General Conditions				10%		\$109,000
	SUBTOTAL						\$1,490,000
	Project Phase-Level OPCC Contingency				30%		\$447,000
	ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST						\$1,940,000
	Construction Contingency				0%		\$0
	Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin				25%		\$485,000
	ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST						\$2,430,000



PROJECT: West County - Alternative 3b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: GCSD Headworks
Element #: 6

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

DESCRIPTION		QTY	UNIT	UNIT COST	COST	COST	TOTAL COST
1	ROTAMAT Micro Strainer Ro9	1	LS	\$136,782	\$136,782	\$136,782	\$274,000
2	Bin	1	LS	\$50,000	\$50,000	\$0	\$50,000
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$324,000
Plant Paving, Grading, and Yard Piping					0%	\$0	
Mechanical and Piping					5%	\$16,000	
Electrical					25%	\$81,000	
Instrumentation and Controls					15%	\$49,000	
SUBTOTAL							\$470,000
Tax on Materials					9.3%	\$17,000	
Contractor's Markup on Sub-Contractors' Work					10%	\$13,000	
Contractor's Overhead and Profit					15%	\$71,000	
Mobilization and Demobilization					5%	\$24,000	
Contractor's General Conditions					10%	\$47,000	
SUBTOTAL							\$640,000
Project Phase-Level OPCC Contingency					30%	\$192,000	
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$830,000
Construction Contingency					0%	\$0	
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%	\$208,000	
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$1,040,000



PROJECT: West County - Alternative 3b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Aer.Ponds @GCSD
Element #: 7

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

DESCRIPTION		QTY	UNIT	UNIT COST	COST	COST	TOTAL COST
1	Blower Building (houses three (3) 100HP blowers for pond aeration system)	1,053	CY	\$550	\$579,150	\$0	\$579,000
2	Ares Aeration® Pond Aeration System (in treatment ponds) & Floating Cover (on settling pond)	1	EA	\$1,468,680	\$1,468,680	\$1,468,680	\$2,937,000
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$3,516,000
Plant Paving, Grading, and Yard Piping					10%		\$352,000
Mechanical and Piping					10%		\$294,000
Electrical					25%		\$734,000
Instrumentation and Controls					15%		\$441,000
SUBTOTAL							\$5,340,000
Tax on Materials					9.3%		\$136,000
Contractor's Markup on Sub-Contractors' Work					10%		\$118,000
Contractor's Overhead and Profit					15%		\$801,000
Mobilization and Demobilization					5%		\$267,000
Contractor's General Conditions					10%		\$534,000
SUBTOTAL							\$7,200,000
Project Phase-Level OPCC Contingency					30%		\$2,160,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$9,360,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$2,340,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$11,700,000



PROJECT: West County - Alternative 3b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Eff.Stor.Pond @GCSD
Element #: 8

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

DESCRIPTION		QTY	UNIT	UNIT COST	COST	COST	TOTAL COST
1	Excavation	182,000	CY	\$45	\$8,190,000	\$0	\$8,190,000
2	Rip rap	6,000	ton	\$375	\$2,250,000	\$0	\$2,250,000
3	Gravel	2,000	ton	\$210	\$420,000	\$0	\$420,000
4	Misc Structure	2	EA	\$100,000	\$200,000	\$0	\$200,000
5	Fencing	3,966	LF	\$75	\$300,000	\$0	\$300,000
6							
7							
8							
9							
10							
SUBTOTAL							\$11,360,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					5%		\$568,000
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$11,930,000
Tax on Materials					9.3%		\$147,000
Contractor's Markup on Sub-Contractors' Work					10%		\$0
Contractor's Overhead and Profit					15%		\$1,790,000
Mobilization and Demobilization					5%		\$597,000
Contractor's General Conditions					10%		\$1,193,000
SUBTOTAL							\$15,660,000
Project Phase-Level OPCC Contingency					30%		\$4,698,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$20,360,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$5,090,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$25,450,000



PROJECT: West County - Alternative 3b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Pipelines-Treatment
Element #: 9

OPPC PROVIDED BY: NS
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

DESCRIPTION		QTY	UNIT	UNIT COST	COST	COST	TOTAL COST
1	6 inch Pipeline	240	LF	\$180	\$43,200	\$0	\$43,000
2	8 inch Pipeline	1,250	LF	\$240	\$300,000	\$0	\$300,000
3	10 inch Pipeline	270	LF	\$300	\$81,000	\$0	\$81,000
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$424,000
Plant Paving, Grading, and Yard Piping					0%	\$0	
Mechanical and Piping					0%	\$0	
Electrical					0%	\$0	
Instrumentation and Controls					0%	\$0	
SUBTOTAL							\$420,000
Tax on Materials					0%	\$0	
Contractor's Markup on Sub-Contractors' Work					10%	\$0	
Contractor's Overhead and Profit					15%	\$63,000	
Mobilization and Demobilization					5%	\$21,000	
Contractor's General Conditions					10%	\$42,000	
SUBTOTAL							\$550,000
Project Phase-Level OPCC Contingency					30%	\$165,000	
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$720,000
Construction Contingency					0%	\$0	
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%	\$180,000	
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$900,000



PROJECT: West County - Alternative 3b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: FWD GCSD Pipelines
Element #: 10

OPPC PROVIDED BY: NS
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

DESCRIPTION		QTY	UNIT	UNIT COST	COST	COST	TOTAL COST
1	Rehab 8 inch Pipe	8,976	LF	\$120	\$1,077,120	\$0	\$1,077,000
2	6 inch Pipeline	13,180	LF	\$180	\$2,372,400	\$0	\$2,372,000
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$3,449,000
Plant Paving, Grading, and Yard Piping					0%	\$0	
Mechanical and Piping					0%	\$0	
Electrical					0%	\$0	
Instrumentation and Controls					0%	\$0	
SUBTOTAL							\$3,450,000
Tax on Materials					0%	\$0	
Contractor's Markup on Sub-Contractors' Work					10%	\$0	
Contractor's Overhead and Profit					15%	\$518,000	
Mobilization and Demobilization					5%	\$173,000	
Contractor's General Conditions					10%	\$345,000	
SUBTOTAL							\$4,490,000
Project Phase-Level OPCC Contingency					30%	\$1,347,000	
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$5,840,000
Construction Contingency					0%	\$0	
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%	\$1,460,000	
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$7,300,000



PROJECT: West County - Alternative 3b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: RRCSD Pipelines
Element #: 11

OPPC PROVIDED BY: NS
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

DESCRIPTION		QTY	UNIT	UNIT COST	COST	COST	TOTAL COST
1	Creek Crossing	7	EA	\$3,800,000	\$26,600,000	\$0	\$26,600,000
2	20 inch Pipe	99,790	LF	\$600	\$59,874,000	\$0	\$59,874,000
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$86,474,000
Plant Paving, Grading, and Yard Piping					0%	\$0	
Mechanical and Piping					0%	\$0	
Electrical					0%	\$0	
Instrumentation and Controls					0%	\$0	
SUBTOTAL							\$86,470,000
Tax on Materials					0%	\$0	
Contractor's Markup on Sub-Contractors' Work					10%	\$0	
Contractor's Overhead and Profit					15%	\$12,971,000	
Mobilization and Demobilization					5%	\$4,324,000	
Contractor's General Conditions					10%	\$8,647,000	
SUBTOTAL							\$112,410,000
Project Phase-Level OPCC Contingency					30%	\$33,723,000	
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$146,130,000
Construction Contingency					0%	\$0	
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%	\$36,533,000	
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$182,660,000



PROJECT: West County - Alternative 3b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: RRCSD EQ Facilities
Element #: 12

OPPC PROVIDED BY: Niloofer S.
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

DESCRIPTION		QTY	UNIT	UNIT COST	COST	COST	TOTAL COST
1	Flow Control Structure	1	EA	\$98,000	\$98,000	\$0	\$98,000
2	16" Pipeline	190	LF	\$480	\$91,200	\$0	\$91,000
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$189,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$190,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					10%		\$0
Contractor's Overhead and Profit					15%		\$29,000
Mobilization and Demobilization					5%		\$10,000
Contractor's General Conditions					10%		\$19,000
SUBTOTAL							\$250,000
Project Phase-Level OPCC Contingency					30%		\$75,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$330,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$83,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$410,000



PROJECT: West County - Alternative 3b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Conveyance PS
Element #: 13

OPPC PROVIDED BY: NS
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

	DESCRIPTION	QTY	UNIT	UNIT COST	COST	COST	TOTAL COST
1	GCSD Secondary Effluent Pump Station	1	EA	\$1,890,000	\$1,890,000	\$0	\$1,890,000
2	GCSD Tertiary Effluent Pump Station	1	EA	\$1,960,000	\$1,960,000	\$0	\$1,960,000
3	FWD Tertiary Effluent Pump Station	1	EA	\$1,840,000	\$1,840,000	\$0	\$1,840,000
4	RRCSD Raw Wastewater	1	EA	\$2,700,000	\$2,700,000	\$0	\$2,700,000
5							
6							
7							
8							
9							
10							
	SUBTOTAL						\$8,390,000
	Plant Paving, Grading, and Yard Piping				0%		\$0
	Mechanical and Piping				0%		\$0
	Electrical				0%		\$0
	Instrumentation and Controls				0%		\$0
	SUBTOTAL						\$8,390,000
	Tax on Materials				0%		\$0
	Contractor's Markup on Sub-Contractors' Work				0%		\$0
	Contractor's Overhead and Profit				0%		\$0
	Mobilization and Demobilization				0%		\$0
	Contractor's General Conditions				0%		\$0
	SUBTOTAL						\$8,390,000
	Project Phase-Level OPCC Contingency				30%		\$2,517,000
	ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST						\$10,910,000
	Construction Contingency				0%		\$0
	Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin				25%		\$2,728,000
	ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST						\$13,640,000



PROJECT: West County - Alternative 3b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Connection fee
Element #: 14

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 21-May-25
REVIEWED BY: CEH

DESCRIPTION		QTY	UNIT	UNIT COST	COST	COST	TOTAL COST
1	Connection fee to Windsor	1	LS	\$44,800,000	\$44,800,000	\$0	\$44,800,000
2							
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$44,800,000
Plant Paving, Grading, and Yard Piping					0%	\$0	
Mechanical and Piping					0%	\$0	
Electrical					0%	\$0	
Instrumentation and Controls					0%	\$0	
SUBTOTAL							\$44,800,000
Tax on Materials					0%	\$0	
Contractor's Markup on Sub-Contractors' Work					0%	\$0	
Contractor's Overhead and Profit					0%	\$0	
Mobilization and Demobilization					0%	\$0	
Contractor's General Conditions					0%	\$0	
SUBTOTAL							\$44,800,000
Project Phase-Level OPCC Contingency					0%	\$0	
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$44,800,000
Construction Contingency					0%	\$0	
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%	\$0	
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$44,800,000

Appendix C

Phase 1 Lifecycle Costs

Analysis Period (years) 20
Discount Rate (%) 3.0
Inflation Rate (%) 3.0

Lifecycle Analysis of O&M Cost for Alternative 1a

Year	Present Worth Factor	Inflation Factor	O&M Costs, 2025 Dollars											O&M Costs, Present Worth										
			Labor	Piping and Valve Maintenance and Replacement	Power	Chemical Addition	Routine Maintenance: Blower Filter/Belt/Oil Changes, Pond Cleaning	Pump Rebuild & Major Maintenance	Cloth Disk Filters	15-Year Major Equipment Replacement	15-Year Instrumentation Replacement	10-Year Equipment Replacement	Total	Labor	Piping and Valve Maintenance and Replacement	Power	Chemical Addition	Routine Maintenance: Blower Filter/Belt/Oil Changes, Pond Cleaning	Pump Rebuild & Major Maintenance	Cloth Disk Filters	15-Year Major Equipment Replacement	15-Year Instrumentation Replacement	10-Year Equipment Replacement	Total
0 2025	1.00	1.00	\$0	\$60,000	\$46,000	\$12,000	\$8,000	-	\$2,000	-	-	-	\$128,000	\$0	\$60,000	\$46,000	\$12,000	\$8,000	-	\$2,000	-	-	-	\$128,000
1 2026	1.03	1.03	\$0	\$61,800	\$47,380	\$12,360	\$8,240	-	\$2,060	-	-	-	\$131,840	\$0	\$60,000	\$46,000	\$12,000	\$8,000	-	\$2,000	-	-	-	\$128,000
2 2027	1.06	1.06	\$0	\$63,654	\$48,801	\$12,731	\$8,487	-	\$2,122	-	-	-	\$135,795	\$0	\$60,000	\$46,000	\$12,000	\$8,000	-	\$2,000	-	-	-	\$128,000
3 2028	1.09	1.09	\$0	\$65,564	\$50,265	\$13,113	\$8,742	-	\$2,185	-	-	-	\$139,869	\$0	\$60,000	\$46,000	\$12,000	\$8,000	-	\$2,000	-	-	-	\$128,000
4 2029	1.13	1.13	\$0	\$67,531	\$51,773	\$13,506	\$9,004	-	\$2,251	-	-	-	\$144,065	\$0	\$60,000	\$46,000	\$12,000	\$8,000	-	\$2,000	-	-	-	\$128,000
5 2030	1.16	1.16	\$0	\$69,556	\$53,327	\$13,911	\$9,274	-	\$2,319	-	-	-	\$148,387	\$0	\$60,000	\$46,000	\$12,000	\$8,000	-	\$2,000	-	-	-	\$128,000
6 2031	1.19	1.19	\$0	\$71,643	\$54,926	\$14,329	\$9,552	-	\$2,388	-	-	-	\$152,839	\$0	\$60,000	\$46,000	\$12,000	\$8,000	-	\$2,000	-	-	-	\$128,000
7 2032	1.23	1.23	\$0	\$73,792	\$56,574	\$14,758	\$9,839	-	\$2,460	-	-	-	\$157,424	\$0	\$60,000	\$46,000	\$12,000	\$8,000	-	\$2,000	-	-	-	\$128,000
8 2033	1.27	1.27	\$0	\$76,006	\$58,271	\$15,201	\$10,134	-	\$2,534	-	-	-	\$162,147	\$0	\$60,000	\$46,000	\$12,000	\$8,000	-	\$2,000	-	-	-	\$128,000
9 2034	1.30	1.30	\$0	\$78,286	\$60,020	\$15,657	\$10,438	-	\$2,610	-	-	-	\$167,011	\$0	\$60,000	\$46,000	\$12,000	\$8,000	-	\$2,000	-	-	-	\$128,000
10 2035	1.34	1.34	\$0	\$80,635	\$61,820	\$16,127	\$10,751	\$61,820	\$2,688	-	-	\$2,688	\$236,529	\$0	\$60,000	\$46,000	\$12,000	\$8,000	\$46,000	\$2,000	-	-	\$2,000	\$176,000
11 2036	1.38	1.38	\$0	\$83,054	\$63,675	\$16,611	\$11,074	-	\$2,768	-	-	-	\$177,182	\$0	\$60,000	\$46,000	\$12,000	\$8,000	-	\$2,000	-	-	-	\$128,000
12 2037	1.43	1.43	\$0	\$85,546	\$65,585	\$17,109	\$11,406	-	\$2,852	-	-	-	\$182,497	\$0	\$60,000	\$46,000	\$12,000	\$8,000	-	\$2,000	-	-	-	\$128,000
13 2038	1.47	1.47	\$0	\$88,112	\$67,553	\$17,622	\$11,748	-	\$2,937	-	-	-	\$187,972	\$0	\$60,000	\$46,000	\$12,000	\$8,000	-	\$2,000	-	-	-	\$128,000
14 2039	1.51	1.51	\$0	\$90,755	\$69,579	\$18,151	\$12,101	-	\$3,025	-	-	-	\$193,611	\$0	\$60,000	\$46,000	\$12,000	\$8,000	-	\$2,000	-	-	-	\$128,000
15 2040	1.56	1.56	\$0	\$93,478	\$71,667	\$18,696	\$12,464	-	\$3,116	\$66,993	\$70,109	-	\$336,521	\$0	\$60,000	\$46,000	\$12,000	\$8,000	-	\$2,000	\$43,000	\$45,000	-	\$216,000
16 2041	1.60	1.60	\$0	\$96,282	\$73,816	\$19,256	\$12,838	-	\$3,209	-	-	-	\$205,402	\$0	\$60,000	\$46,000	\$12,000	\$8,000	-	\$2,000	-	-	-	\$128,000
17 2042	1.65	1.65	\$0	\$99,171	\$76,031	\$19,834	\$13,223	-	\$3,306	-	-	-	\$211,564	\$0	\$60,000	\$46,000	\$12,000	\$8,000	-	\$2,000	-	-	-	\$128,000
18 2043	1.70	1.70	\$0	\$102,146	\$78,312	\$20,429	\$13,619	-	\$3,405	-	-	-	\$217,911	\$0	\$60,000	\$46,000	\$12,000	\$8,000	-	\$2,000	-	-	-	\$128,000
19 2044	1.75	1.75	\$0	\$105,210	\$80,661	\$21,042	\$14,028	-	\$3,507	-	-	-	\$224,449	\$0	\$60,000	\$46,000	\$12,000	\$8,000	-	\$2,000	-	-	-	\$128,000
20 2045	1.81	1.81	\$0	\$108,367	\$83,081	\$21,673	\$14,449	\$83,081	\$3,612	-	-	\$3,612	\$317,876	\$0	\$60,000	\$46,000	\$12,000	\$8,000	\$46,000	\$2,000	-	-	\$2,000	\$176,000
													\$0	\$1,260,000	\$970,000	\$250,000	\$170,000	\$90,000	\$40,000	\$40,000	\$50,000	\$4,000	\$2,870,000	

Analysis Period (years) 20
Discount Rate (%) 3.0
Inflation Rate (%) 3.0

Lifecycle Analysis of O&M Cost for Alternative 1c

Year	Present Worth Factor	Inflation Factor	O&M Costs, 2024 Dollars													O&M Costs, Present Worth												
			Labor	Piping and Valve Maintenance and Replacement	Power	Chemical Addition	Solids Hauling	Pump Rebuild & Major Maintenance	Membrane Cassettes	UV Equipment Replacement	20-Year Major Equipment Replacement	15-Year Instrumentation Replacement	15-Year MBR System Replacements	20-Year MBR System Replacements	Total	Labor	Piping and Valve Maintenance and Replacement	Power	Chemical Addition	Solids Hauling	Pump Rebuild & Major Maintenance	Membrane Cassettes	UV Equipment Replacement	20-Year Major Equipment Replacement	15-Year Instrumentation Replacement	15-Year MBR System Replacements	20-Year MBR System Replacements	Total
0	2025	1.00	1.00	-\$2,980,000	-\$592,000	-\$257,000	-\$67,000	\$126,000	-	\$46,000	\$12,000	-	-	-	-\$3,712,000	-\$2,980,000	-\$592,000	-\$257,000	-\$67,000	\$126,000	-	\$46,000	\$12,000	-	-	-	-	-\$3,712,000
1	2026	1.03	1.03	-\$3,069,400	-\$609,760	-\$264,710	-\$69,010	\$129,780	-	\$47,380	\$12,360	-	-	-	-\$3,823,360	-\$2,980,000	-\$592,000	-\$257,000	-\$67,000	\$126,000	-	\$46,000	\$12,000	-	-	-	-	-\$3,712,000
2	2027	1.06	1.06	-\$3,161,482	-\$628,053	-\$272,651	-\$71,080	\$133,673	-	\$48,801	\$12,731	-	-	-	-\$3,938,061	-\$2,980,000	-\$592,000	-\$257,000	-\$67,000	\$126,000	-	\$46,000	\$12,000	-	-	-	-	-\$3,712,000
3	2028	1.09	1.09	-\$3,256,326	-\$646,894	-\$280,831	-\$73,213	\$137,684	-	\$50,265	\$13,113	-	-	-	-\$4,056,203	-\$2,980,000	-\$592,000	-\$257,000	-\$67,000	\$126,000	-	\$46,000	\$12,000	-	-	-	-	-\$3,712,000
4	2029	1.13	1.13	-\$3,354,016	-\$666,301	-\$289,256	-\$75,409	\$141,814	-	\$51,773	\$13,506	-	-	-	-\$4,177,889	-\$2,980,000	-\$592,000	-\$257,000	-\$67,000	\$126,000	-	\$46,000	\$12,000	-	-	-	-	-\$3,712,000
5	2030	1.16	1.16	-\$3,454,637	-\$686,290	-\$297,933	-\$77,671	\$146,069	-	\$53,327	\$13,911	-	-	-	-\$4,303,225	-\$2,980,000	-\$592,000	-\$257,000	-\$67,000	\$126,000	-	\$46,000	\$12,000	-	-	-	-	-\$3,712,000
6	2031	1.19	1.19	-\$3,558,276	-\$706,879	-\$306,871	-\$80,002	\$150,451	-	\$54,926	\$14,329	-	-	-	-\$4,432,322	-\$2,980,000	-\$592,000	-\$257,000	-\$67,000	\$126,000	-	\$46,000	\$12,000	-	-	-	-	-\$3,712,000
7	2032	1.23	1.23	-\$3,665,024	-\$728,085	-\$316,078	-\$82,402	\$154,964	-	\$56,574	\$14,758	-	-	-	-\$4,565,292	-\$2,980,000	-\$592,000	-\$257,000	-\$67,000	\$126,000	-	\$46,000	\$12,000	-	-	-	-	-\$3,712,000
8	2033	1.27	1.27	-\$3,774,975	-\$749,928	-\$325,560	-\$84,874	\$159,613	-	\$58,271	\$15,201	-	-	-	-\$4,702,251	-\$2,980,000	-\$592,000	-\$257,000	-\$67,000	\$126,000	-	\$46,000	\$12,000	-	-	-	-	-\$3,712,000
9	2034	1.30	1.30	-\$3,888,224	-\$772,426	-\$335,327	-\$87,420	\$164,401	-	\$60,020	\$15,657	-	-	-	-\$4,843,318	-\$2,980,000	-\$592,000	-\$257,000	-\$67,000	\$126,000	-	\$46,000	\$12,000	-	-	-	-	-\$3,712,000
10	2035	1.34	1.34	-\$4,004,871	-\$795,598	-\$345,387	-\$90,042	\$169,333	\$286,254	\$61,820	\$16,127	-	-	-	-\$4,702,363	-\$2,980,000	-\$592,000	-\$257,000	-\$67,000	\$126,000	\$213,000	\$46,000	\$12,000	-	-	-	-	-\$3,499,000
11	2036	1.38	1.38	-\$4,125,017	-\$819,466	-\$355,748	-\$92,744	\$174,413	-	\$63,675	\$16,611	-	-	-	-\$5,138,276	-\$2,980,000	-\$592,000	-\$257,000	-\$67,000	\$126,000	-	\$46,000	\$12,000	-	-	-	-	-\$3,712,000
12	2037	1.43	1.43	-\$4,248,767	-\$844,050	-\$366,421	-\$95,526	\$179,646	-	\$65,585	\$17,109	-	-	-	-\$5,292,424	-\$2,980,000	-\$592,000	-\$257,000	-\$67,000	\$126,000	-	\$46,000	\$12,000	-	-	-	-	-\$3,712,000
13	2038	1.47	1.47	-\$4,376,230	-\$869,372	-\$377,413	-\$98,392	\$185,035	-	\$67,553	\$17,622	-	-	-	-\$5,451,197	-\$2,980,000	-\$592,000	-\$257,000	-\$67,000	\$126,000	-	\$46,000	\$12,000	-	-	-	-	-\$3,712,000
14	2039	1.51	1.51	-\$4,507,517	-\$895,453	-\$388,736	-\$101,344	\$190,586	-	\$69,579	\$18,151	-	-	-	-\$5,614,733	-\$2,980,000	-\$592,000	-\$257,000	-\$67,000	\$126,000	-	\$46,000	\$12,000	-	-	-	-	-\$3,712,000
15	2040	1.56	1.56	-\$4,642,743	-\$922,317	-\$400,398	-\$104,384	\$196,304	-	\$71,667	\$18,696	-	\$288,224	\$378,586	-\$5,116,365	-\$2,980,000	-\$592,000	-\$257,000	-\$67,000	\$126,000	-	\$46,000	\$12,000	-	\$185,000	\$243,000	-	-\$3,284,000
16	2041	1.60	1.60	-\$4,782,025	-\$949,986	-\$412,410	-\$107,515	\$202,193	-	\$73,816	\$19,256	-	-	-	-\$5,956,670	-\$2,980,000	-\$592,000	-\$257,000	-\$67,000	\$126,000	-	\$46,000	\$12,000	-	-	-	-	-\$3,712,000
17	2042	1.65	1.65	-\$4,925,486	-\$978,486	-\$424,782	-\$110,741	\$208,259	-	\$76,031	\$19,834	-	-	-	-\$6,135,370	-\$2,980,000	-\$592,000	-\$257,000	-\$67,000	\$126,000	-	\$46,000	\$12,000	-	-	-	-	-\$3,712,000
18	2043	1.70	1.70	-\$5,073,251	-\$1,007,840	-\$437,525	-\$114,063	\$214,507	-	\$78,312	\$20,429	-	-	-	-\$6,319,432	-\$2,980,000	-\$592,000	-\$257,000	-\$67,000	\$126,000	-	\$46,000	\$12,000	-	-	-	-	-\$3,712,000
19	2044	1.75	1.75	-\$5,225,448	-\$1,038,076	-\$450,651	-\$117,485	\$220,942	-	\$80,661	\$21,042	-	-	-	-\$6,509,014	-\$2,980,000	-\$592,000	-\$257,000	-\$67,000	\$126,000	-	\$46,000	\$12,000	-	-	-	-	-\$3,712,000
20	2045	1.81	1.81	-\$5,382,211	-\$1,069,218	-\$464,171	-\$121,009	\$227,570	\$384,702	\$83,081	\$21,673	\$1,202,870	-	-	\$1,085,473	-\$4,031,240	-\$2,980,000	-\$592,000	-\$257,000	-\$67,000	\$126,000	\$213,000	\$46,000	\$12,000	\$666,000	-	\$601,000	-\$2,232,000
																-\$62,580,000	-\$12,430,000	-\$5,400,000	-\$1,410,000	\$2,650,000	\$430,000	\$970,000	\$250,000	\$670,000	\$190,000	\$240,000	\$600,000	-\$75,820,000

Analysis Period (years) 20
Discount Rate (%) 3.0
Inflation Rate (%) 3.0

Lifecycle Analysis of O&M Cost for Alternative 2a

Year	Present Worth Factor	Inflation Factor	O&M Costs, 2025 Dollars						O&M Costs, Present Worth						
			Labor	Piping and Valve Maintenance and Replacement	Power	Chemical Addition	Pump Rebuild & Major Maintenance	Total	Labor	Piping and Valve Maintenance and Replacement	Power	Chemical Addition	Pump Rebuild & Major Maintenance	Total	
0	2025	1.00	1.00	-\$3,562,000	-\$699,000	-\$586,000	-\$155,000	-	-\$5,002,000	-\$3,562,000	-\$699,000	-\$586,000	-\$155,000	-	-\$5,002,000
1	2026	1.03	1.03	-\$3,668,860	-\$719,970	-\$603,580	-\$159,650	-	-\$5,152,060	-\$3,562,000	-\$699,000	-\$586,000	-\$155,000	-	-\$5,002,000
2	2027	1.06	1.06	-\$3,778,926	-\$741,569	-\$621,687	-\$164,440	-	-\$5,306,622	-\$3,562,000	-\$699,000	-\$586,000	-\$155,000	-	-\$5,002,000
3	2028	1.09	1.09	-\$3,892,294	-\$763,816	-\$640,338	-\$169,373	-	-\$5,465,820	-\$3,562,000	-\$699,000	-\$586,000	-\$155,000	-	-\$5,002,000
4	2029	1.13	1.13	-\$4,009,062	-\$786,731	-\$659,548	-\$174,454	-	-\$5,629,795	-\$3,562,000	-\$699,000	-\$586,000	-\$155,000	-	-\$5,002,000
5	2030	1.16	1.16	-\$4,129,334	-\$810,333	-\$679,335	-\$179,687	-	-\$5,798,689	-\$3,562,000	-\$699,000	-\$586,000	-\$155,000	-	-\$5,002,000
6	2031	1.19	1.19	-\$4,253,214	-\$834,643	-\$699,715	-\$185,078	-	-\$5,972,650	-\$3,562,000	-\$699,000	-\$586,000	-\$155,000	-	-\$5,002,000
7	2032	1.23	1.23	-\$4,380,811	-\$859,682	-\$720,706	-\$190,630	-	-\$6,151,829	-\$3,562,000	-\$699,000	-\$586,000	-\$155,000	-	-\$5,002,000
8	2033	1.27	1.27	-\$4,512,235	-\$885,472	-\$742,327	-\$196,349	-	-\$6,336,384	-\$3,562,000	-\$699,000	-\$586,000	-\$155,000	-	-\$5,002,000
9	2034	1.30	1.30	-\$4,647,602	-\$912,036	-\$764,597	-\$202,240	-	-\$6,526,475	-\$3,562,000	-\$699,000	-\$586,000	-\$155,000	-	-\$5,002,000
10	2035	1.34	1.34	-\$4,787,030	-\$939,398	-\$787,535	-\$208,307	\$106,169	-\$6,616,100	-\$3,562,000	-\$699,000	-\$586,000	-\$155,000	\$79,000	-\$4,923,000
11	2036	1.38	1.38	-\$4,930,641	-\$967,579	-\$811,161	-\$214,556	-	-\$6,923,938	-\$3,562,000	-\$699,000	-\$586,000	-\$155,000	-	-\$5,002,000
12	2037	1.43	1.43	-\$5,078,560	-\$996,607	-\$835,496	-\$220,993	-	-\$7,131,656	-\$3,562,000	-\$699,000	-\$586,000	-\$155,000	-	-\$5,002,000
13	2038	1.47	1.47	-\$5,230,917	-\$1,026,505	-\$860,561	-\$227,623	-	-\$7,345,606	-\$3,562,000	-\$699,000	-\$586,000	-\$155,000	-	-\$5,002,000
14	2039	1.51	1.51	-\$5,387,845	-\$1,057,300	-\$886,378	-\$234,451	-	-\$7,565,974	-\$3,562,000	-\$699,000	-\$586,000	-\$155,000	-	-\$5,002,000
15	2040	1.56	1.56	-\$5,549,480	-\$1,089,019	-\$912,969	-\$241,485	-	-\$7,792,953	-\$3,562,000	-\$699,000	-\$586,000	-\$155,000	-	-\$5,002,000
16	2041	1.60	1.60	-\$5,715,964	-\$1,121,690	-\$940,358	-\$248,729	-	-\$8,026,742	-\$3,562,000	-\$699,000	-\$586,000	-\$155,000	-	-\$5,002,000
17	2042	1.65	1.65	-\$5,887,443	-\$1,155,340	-\$968,569	-\$256,191	-	-\$8,267,544	-\$3,562,000	-\$699,000	-\$586,000	-\$155,000	-	-\$5,002,000
18	2043	1.70	1.70	-\$6,064,067	-\$1,190,001	-\$997,626	-\$263,877	-	-\$8,515,570	-\$3,562,000	-\$699,000	-\$586,000	-\$155,000	-	-\$5,002,000
19	2044	1.75	1.75	-\$6,245,989	-\$1,225,701	-\$1,027,555	-\$271,793	-	-\$8,771,037	-\$3,562,000	-\$699,000	-\$586,000	-\$155,000	-	-\$5,002,000
20	2045	1.81	1.81	-\$6,433,368	-\$1,262,472	-\$1,058,381	-\$279,947	\$142,683	-\$8,891,486	-\$3,562,000	-\$699,000	-\$586,000	-\$155,000	\$79,000	-\$4,923,000
										-\$74,800,000	-\$14,680,000	-\$12,310,000	-\$3,260,000	\$160,000	-\$104,890,000

Analysis Period (years) 20
Discount Rate (%) 3.00
Inflation Rate (%) 3.00

Lifecycle Analysis of O&M Cost for Alternative 2b

Year	Present Worth Factor	Inflation Factor	O&M Costs, 2025 Dollars						O&M Costs, Present Worth						
			Labor	Piping and Valve Maintenance and Replacement	Power	Chemical Addition	Pump Rebuild & Major Maintenance	Total	Labor	Piping and Valve Maintenance and Replacement	Power	Chemical Addition	Pump Rebuild & Major Maintenance	Total	
0	2025	1.00	1.00	-\$3,562,000	-\$688,000	-\$562,000	-\$155,000	-	-\$4,967,000	-\$3,562,000	-\$688,000	-\$562,000	-\$155,000	-	-\$4,967,000
1	2026	1.03	1.03	-\$3,668,860	-\$708,640	-\$578,860	-\$159,650	-	-\$5,116,010	-\$3,562,000	-\$688,000	-\$562,000	-\$155,000	-	-\$4,967,000
2	2027	1.06	1.06	-\$3,778,926	-\$729,899	-\$596,226	-\$164,440	-	-\$5,269,490	-\$3,562,000	-\$688,000	-\$562,000	-\$155,000	-	-\$4,967,000
3	2028	1.09	1.09	-\$3,892,294	-\$751,796	-\$614,113	-\$169,373	-	-\$5,427,575	-\$3,562,000	-\$688,000	-\$562,000	-\$155,000	-	-\$4,967,000
4	2029	1.13	1.13	-\$4,009,062	-\$774,350	-\$632,536	-\$174,454	-	-\$5,590,402	-\$3,562,000	-\$688,000	-\$562,000	-\$155,000	-	-\$4,967,000
5	2030	1.16	1.16	-\$4,129,334	-\$797,581	-\$651,512	-\$179,687	-	-\$5,758,114	-\$3,562,000	-\$688,000	-\$562,000	-\$155,000	-	-\$4,967,000
6	2031	1.19	1.19	-\$4,253,214	-\$821,508	-\$671,057	-\$185,078	-	-\$5,930,858	-\$3,562,000	-\$688,000	-\$562,000	-\$155,000	-	-\$4,967,000
7	2032	1.23	1.23	-\$4,380,811	-\$846,153	-\$691,189	-\$190,630	-	-\$6,108,783	-\$3,562,000	-\$688,000	-\$562,000	-\$155,000	-	-\$4,967,000
8	2033	1.27	1.27	-\$4,512,235	-\$871,538	-\$711,925	-\$196,349	-	-\$6,292,047	-\$3,562,000	-\$688,000	-\$562,000	-\$155,000	-	-\$4,967,000
9	2034	1.30	1.30	-\$4,647,602	-\$897,684	-\$733,283	-\$202,240	-	-\$6,480,808	-\$3,562,000	-\$688,000	-\$562,000	-\$155,000	-	-\$4,967,000
10	2035	1.34	1.34	-\$4,787,030	-\$924,614	-\$755,281	-\$208,307	\$138,423	-\$6,536,809	-\$3,562,000	-\$688,000	-\$562,000	-\$155,000	\$103,000	-\$4,864,000
11	2036	1.38	1.38	-\$4,930,641	-\$952,353	-\$777,939	-\$214,556	-	-\$6,875,490	-\$3,562,000	-\$688,000	-\$562,000	-\$155,000	-	-\$4,967,000
12	2037	1.43	1.43	-\$5,078,560	-\$980,923	-\$801,278	-\$220,993	-	-\$7,081,754	-\$3,562,000	-\$688,000	-\$562,000	-\$155,000	-	-\$4,967,000
13	2038	1.47	1.47	-\$5,230,917	-\$1,010,351	-\$825,316	-\$227,623	-	-\$7,294,207	-\$3,562,000	-\$688,000	-\$562,000	-\$155,000	-	-\$4,967,000
14	2039	1.51	1.51	-\$5,387,845	-\$1,040,662	-\$850,075	-\$234,451	-	-\$7,513,033	-\$3,562,000	-\$688,000	-\$562,000	-\$155,000	-	-\$4,967,000
15	2040	1.56	1.56	-\$5,549,480	-\$1,071,882	-\$875,578	-\$241,485	-	-\$7,738,424	-\$3,562,000	-\$688,000	-\$562,000	-\$155,000	-	-\$4,967,000
16	2041	1.60	1.60	-\$5,715,964	-\$1,104,038	-\$901,845	-\$248,729	-	-\$7,970,577	-\$3,562,000	-\$688,000	-\$562,000	-\$155,000	-	-\$4,967,000
17	2042	1.65	1.65	-\$5,887,443	-\$1,137,159	-\$928,900	-\$256,191	-	-\$8,209,694	-\$3,562,000	-\$688,000	-\$562,000	-\$155,000	-	-\$4,967,000
18	2043	1.70	1.70	-\$6,064,067	-\$1,171,274	-\$956,767	-\$263,877	-	-\$8,455,985	-\$3,562,000	-\$688,000	-\$562,000	-\$155,000	-	-\$4,967,000
19	2044	1.75	1.75	-\$6,245,989	-\$1,206,412	-\$985,470	-\$271,793	-	-\$8,709,665	-\$3,562,000	-\$688,000	-\$562,000	-\$155,000	-	-\$4,967,000
20	2045	1.81	1.81	-\$6,433,368	-\$1,242,605	-\$1,015,035	-\$279,947	\$186,029	-\$8,784,925	-\$3,562,000	-\$688,000	-\$562,000	-\$155,000	\$103,000	-\$4,864,000
										-\$74,800,000	-\$14,450,000	-\$11,800,000	-\$3,260,000	\$210,000	-\$104,100,000

Analysis Period (years) 20
Discount Rate (%) 3.00
Inflation Rate (%) 3.00

Lifecycle Analysis of O&M Cost for Alternative 3b

Year	Present Worth Factor	Inflation Factor	O&M Costs, 2025 Dollars											O&M Costs, Present Worth											
			Labor	Piping and Valve Maintenance and Replacement	Power	Chemical Addition	Blower Filter/Belt/Oil Changes	Pump Rebuild & Major Maintenance	Cloth Disk Filters	15-Year Major Equipment Replacement	15-Year Instrumentation Replacement	10-Year Equipment Replacement	Total	Labor	Piping and Valve Maintenance and Replacement	Power	Chemical Addition	Blower Filter/Belt/Oil Changes	Pump Rebuild & Major Maintenance	Cloth Disk Filters	15-Year Major Equipment Replacement	15-Year Instrumentation Replacement	10-Year Equipment Replacement	Total	
0	2025	1.00	1.00	-\$2,963,833	-\$781,600	-\$278,600	-\$23,100	\$7,800	-	\$2,200	-	-	-	-\$4,037,133	-\$2,963,833	-\$781,600	-\$278,600	-\$23,100	\$7,800	-	\$2,200	-	-	-	-\$4,037,133
1	2026	1.03	1.03	-\$3,052,748	-\$805,048	-\$286,958	-\$23,793	\$8,034	-	\$2,266	-	-	-	-\$4,158,247	-\$2,963,833	-\$781,600	-\$278,600	-\$23,100	\$7,800	-	\$2,200	-	-	-	-\$4,037,133
2	2027	1.06	1.06	-\$3,144,330	-\$829,199	-\$295,567	-\$24,507	\$8,275	-	\$2,334	-	-	-	-\$4,282,994	-\$2,963,833	-\$781,600	-\$278,600	-\$23,100	\$7,800	-	\$2,200	-	-	-	-\$4,037,133
3	2028	1.09	1.09	-\$3,238,660	-\$854,075	-\$304,434	-\$25,242	\$8,523	-	\$2,404	-	-	-	-\$4,411,484	-\$2,963,833	-\$781,600	-\$278,600	-\$23,100	\$7,800	-	\$2,200	-	-	-	-\$4,037,133
4	2029	1.13	1.13	-\$3,335,820	-\$879,698	-\$313,567	-\$25,999	\$8,779	-	\$2,476	-	-	-	-\$4,543,828	-\$2,963,833	-\$781,600	-\$278,600	-\$23,100	\$7,800	-	\$2,200	-	-	-	-\$4,037,133
5	2030	1.16	1.16	-\$3,435,894	-\$906,089	-\$322,974	-\$26,779	\$9,042	-	\$2,550	-	-	-	-\$4,680,143	-\$2,963,833	-\$781,600	-\$278,600	-\$23,100	\$7,800	-	\$2,200	-	-	-	-\$4,037,133
6	2031	1.19	1.19	-\$3,538,971	-\$933,271	-\$332,663	-\$27,583	\$9,314	-	\$2,627	-	-	-	-\$4,820,548	-\$2,963,833	-\$781,600	-\$278,600	-\$23,100	\$7,800	-	\$2,200	-	-	-	-\$4,037,133
7	2032	1.23	1.23	-\$3,645,140	-\$961,269	-\$342,643	-\$28,410	\$9,593	-	\$2,706	-	-	-	-\$4,965,164	-\$2,963,833	-\$781,600	-\$278,600	-\$23,100	\$7,800	-	\$2,200	-	-	-	-\$4,037,133
8	2033	1.27	1.27	-\$3,754,495	-\$990,107	-\$352,922	-\$29,262	\$9,881	-	\$2,787	-	-	-	-\$5,114,119	-\$2,963,833	-\$781,600	-\$278,600	-\$23,100	\$7,800	-	\$2,200	-	-	-	-\$4,037,133
9	2034	1.30	1.30	-\$3,867,129	-\$1,019,811	-\$363,510	-\$30,140	\$10,177	-	\$2,871	-	-	-	-\$5,267,543	-\$2,963,833	-\$781,600	-\$278,600	-\$23,100	\$7,800	-	\$2,200	-	-	-	-\$4,037,133
10	2035	1.34	1.34	-\$3,983,143	-\$1,050,405	-\$374,415	-\$31,044	\$10,483	\$65,852	\$2,957	-	-	\$2,822	-\$5,356,895	-\$2,963,833	-\$781,600	-\$278,600	-\$23,100	\$7,800	\$49,000	\$2,200	-	-	\$2,100	-\$3,986,033
11	2036	1.38	1.38	-\$4,102,638	-\$1,081,917	-\$385,648	-\$31,976	\$10,797	-	\$3,045	-	-	-	-\$5,588,336	-\$2,963,833	-\$781,600	-\$278,600	-\$23,100	\$7,800	-	\$2,200	-	-	-	-\$4,037,133
12	2037	1.43	1.43	-\$4,225,717	-\$1,114,375	-\$397,217	-\$32,935	\$11,121	-	\$3,137	-	-	-	-\$5,755,986	-\$2,963,833	-\$781,600	-\$278,600	-\$23,100	\$7,800	-	\$2,200	-	-	-	-\$4,037,133
13	2038	1.47	1.47	-\$4,352,488	-\$1,147,806	-\$409,133	-\$33,923	\$11,455	-	\$3,231	-	-	-	-\$5,928,666	-\$2,963,833	-\$781,600	-\$278,600	-\$23,100	\$7,800	-	\$2,200	-	-	-	-\$4,037,133
14	2039	1.51	1.51	-\$4,483,063	-\$1,182,240	-\$421,407	-\$34,941	\$11,798	-	\$3,328	-	-	-	-\$6,106,525	-\$2,963,833	-\$781,600	-\$278,600	-\$23,100	\$7,800	-	\$2,200	-	-	-	-\$4,037,133
15	2040	1.56	1.56	-\$4,617,555	-\$1,217,707	-\$434,050	-\$35,989	\$12,152	-	\$3,428	\$67,304	\$84,130	-	-\$6,138,287	-\$2,963,833	-\$781,600	-\$278,600	-\$23,100	\$7,800	-	\$2,200	\$43,200	\$54,000	-	-\$3,939,933
16	2041	1.60	1.60	-\$4,756,081	-\$1,254,239	-\$447,071	-\$37,069	\$12,517	-	\$3,530	-	-	-	-\$6,478,413	-\$2,963,833	-\$781,600	-\$278,600	-\$23,100	\$7,800	-	\$2,200	-	-	-	-\$4,037,133
17	2042	1.65	1.65	-\$4,898,764	-\$1,291,866	-\$460,483	-\$38,181	\$12,892	-	\$3,636	-	-	-	-\$6,672,765	-\$2,963,833	-\$781,600	-\$278,600	-\$23,100	\$7,800	-	\$2,200	-	-	-	-\$4,037,133
18	2043	1.70	1.70	-\$5,045,727	-\$1,330,622	-\$474,298	-\$39,326	\$13,279	-	\$3,745	-	-	-	-\$6,872,948	-\$2,963,833	-\$781,600	-\$278,600	-\$23,100	\$7,800	-	\$2,200	-	-	-	-\$4,037,133
19	2044	1.75	1.75	-\$5,197,099	-\$1,370,540	-\$488,527	-\$40,506	\$13,677	-	\$3,858	-	-	-	-\$7,079,137	-\$2,963,833	-\$781,600	-\$278,600	-\$23,100	\$7,800	-	\$2,200	-	-	-	-\$4,037,133
20	2045	1.81	1.81	-\$5,353,012	-\$1,411,657	-\$503,183	-\$41,721	\$14,088	\$88,499	\$3,973	-	-	\$3,793	-\$7,199,218	-\$2,963,833	-\$781,600	-\$278,600	-\$23,100	\$7,800	\$49,000	\$2,200	-	-	\$2,100	-\$3,986,033
															-\$62,240,000	-\$16,410,000	-\$5,850,000	-\$490,000	\$160,000	\$100,000	\$50,000	\$40,000	\$50,000	\$4,000	-\$84,590,000

Recycled Water Communication Log

Contact Name	Contact Title	Affiliation	Property Address (if applicable)	Contact Email	Communication/Research Notes	Website
Charlie (last name not captured)	Vineyard Manager for past 12 years	Chenoweth Vineyards	5550 Harrison Grade Rd, Sebastopol, CA 95472 (winery location)	<i>not determined</i>	12.5 acres of vineyards irrigated with RW; drip irrigation system. Groundwater well on-site is used for irrigation. Recycled water is not used for irrigation, only for frost protection. Frost season is after initial bloom so March and maybe April. Not interested in more recycled water. The groundwater is sufficient for their needs. For supplemental irrigation water in the peak of the summer, they do use recycled water from FWD fill station (up to 3 trips per week).	https://www.chenowethwines.com/
<i>not determined</i>	<i>not determined</i>	Earl Stephens Vineyard	<i>not determined</i>	info@tenacrewinery.com	<i>Left voicemail with receptionist, but no callback was received.</i> Available information shows 10 irrigated acres; not currently using recycled water.	https://www.tenacrewinery.com/Vineyards/Earl-Stephens-Vineyard
Lawrence Sterling	<i>not determined</i>	Iron Horse/ Sterling Vineyards	9786 Ross Station Road, Sebastopol, CA, 95472	info@ironhorsevineyards.com	<p>160 acres of irrigated vineyard but 180 acres is irrigated total (orchard, gardens, vegetable gardens for other 20 acres); 15 million gallon storage pond onsite. Receive minimum of 20 acre-feet per year and maximum 60 acre-feet per year . They do not have metered flow. Current FWD recycled water customer.</p> <p>Quantity of recycled water usage is function of weather, so demand is very unpredictable. Needs to be dry for 48 hours prior to irrigating with recycled water. They make room in the reservoir when FWD requests it and FWD provides recycled water when vineyard requests it. Main source of water is FWD recycled water. 49+ acre-feet storage capacity - no room for expansion. Actual capacity due to sediment is probably about 45 acre-feet. Currently working with DFW/NOAA on a fish screen/passage project/creek restoration project on their property. Fish screen allows vineyard to extract water from creek if needed but recycled water is first choice for irrigation. Potable water is from onsite groundwater wells. Pay an annual water bill. In some years the reservoir has gone dry, but recently they've kept the reservoir full as less frost protection has been needed - perhaps due to climate change. Cannot see property using much more recycled water, but maybe a little more.</p> <p>Have not had to use creek water for 10+ years because of sufficient recycled water. Creek is only backup supply. Do not practice dry farming; it doesn't make better grapes so only if water were not available. There's no formula for knowing how much/how little to irrigate.</p> <p>Recycled water is used for all irrigation as a priority. Biggest use of recycled water is for frost protection.</p>	https://www.ironhorsevineyards.com/
<i>not determined</i>	Recycled Water Site Supervisor (per Title 22 Report)	Jess Jackson Vineyards	<i>not determined</i>	<i>not determined</i>	<i>Left voicemail with Tate, but no callback was received.</i> Available information shows 90 acres of vineyards irrigated with recycled water; drip irrigation system. From 2022 Graton CSD Operations Report "Jackson Vineyards will be starting frost protection and irrigation and in need of recycled water to fill their storage pond. Pressure tested the line and notified Bryan of a pvc repair needed next to their storage pond. May 5th after the pvc repair was made GCSD began filling Jackson's storage pond."	https://www.jacksonfamilywines.com/
Peta Sweeney	General Manager	Sonoma-Cutrer Vineyards		psweeney@duckhorn.com	Left voicemail for Peta with receptionist, but no callback was received. 450 acre parcel with vineyard covering 270.96 acres. "in the heart of the Russian River Valley"; Chad said a FWD director (Ryan Stapleton) expressed interest in getting recycled water to vineyard.	<i>not determined</i>
Connor Murphy	Director	Shone Farm (Santa Rosa Junior College)	7450 Steve Olson Lane Forestville, CA 95436	cmurphy2@santarosa.edu	<p>Shone Farm relies heavily on recycled water from Town of Windsor. Windsor limits their recycled water to 9 inches (per acre) between March and October. That is more than enough for irrigation and post-harvest purposes, but precludes use for frost protection. They currently use roughly half of the 9 inch allocation, which equates to a crop coefficient of 0.16. They also have no cover crop (just the vines). Noted that climate change is impacting all agricultural production, so can assume an increase in irrigation requirements over the period of interest.</p> <p>Noted the wine industry is under incredible economic pressure across the state and locally. Noted many vineyards that are not pruned, planted, or otherwise productive in the County this season.</p>	https://shonefarm.santarosa.edu/

Contact Name	Contact Title	Affiliation	Property Address (if applicable)	Contact Email	Communication/Research Notes	Website
Anthony Boyle, Andrew Wojtowicz	<i>not determined</i>	BoDean Forestville Quarry/Blue Rock Quarry	7888 CA-116, Forestville, CA 95436	anthony.boyle@bodeanco.com , andrew.wojtowicz@na.crh.com	<p>BoDean is interested in hearing about the potential opportunity for recycled water but cannot make commitments at this time. They use stormwater runoff captured in their ponds as much as possible but use groundwater well water to supplement. Stormwater is not measured but estimated for reporting to Sonoma County.</p> <p>Busy season is May through October, depending on weather. Using water for washing rocks (but this water is reused at the wash facility, so total volume is not high), dust suppression, and dust abatement for quarry roads. Dust control is biggest use of water. No landscape to be irrigated on-site. Well water is used for potable water needs. Their wells do not always keep up with operational water demands in the peak season so having a supplemental water supply such as recycled water would be beneficial.</p> <p>Estimated 4 million gallons per year of stormwater capture and reused currently. Well water use the last couple years was 36,000 to 162,000 gallons per year. Usually run out of stored stormwater around September but replenished by January of the next year. Estimated could use 75,000 gallons per year of recycled water instead of well water.</p>	http://www.bodeanco.com/
Jonathon Trappe; Wendell Trappe	Operations Manager (Jonathon); owner (Wendell)	Canyon Rock Quarry	7525 CA-116, Forestville, CA 95436	jwtrappe@canyonrockinc.com	<p>Later provided data showing average potable water use of 33 acre-feet per year (10.6 million gallons per year (MG/yr)). The majority (about 80%) of potable water they receive from FWD goes into ready mix. Quarry does not use pond water for ready mix as the water quality of pond water (iron levels) are not suitable for concrete. Quarry could use recycled water for concrete if water quality were suitable. Estimated 80% of their potable water use could be replaced with recycled water (8.5 MG/yr). Spring through fall (construction season) is biggest usage time but also operate year-round. Use a lot of pond water for aggregate wash water, and this could be replaced with recycled water if it were free. They do not meter pond water, but they estimated approximately 18 MG/yr of pond water (assuming operations for 1,500 hr/yr at 200 gal/minute). Considered it a conservative estimate. Quarry could also provide storage for recycled water if needed. The buffer/landscaping/redwood trees around the quarry is irrigated with pond water, so they could also switch to recycled water for irrigation, if needed.</p> <p>Conclusion: Total estimated recycled water usage potential for quarry operations is 26.5 MG/yr (or more if counting buffer landscape irrigation). Total potable water usage that would be offset is 8.5 MG/yr.</p>	https://www.canyonrockinc.com/
Matt McDermott	Youth Park Board President (as well as FWD Board President)	Forestville Park Development Inc. "Forestville Youth Park "	7045 Mirabel Road Forestville, CA	mcd.mcdermott@gmail.com	<p>Privately funded, public access park. 8 acre site - about 4-6 acres is irrigated.</p> <p>They could probably double their recycled water use between June and October, not sure how much water they use but they use recycled water April through June for little league. Only use it for playfields (3 baseball fields and a soccer field) for 20 minutes a day. Matt estimated they could increase their use by 30% if they irrigate other fields in the park and increase the length of irrigation time per day and continue regular irrigation pattern through Oct. Youth Park is a FWD customer, so FWD has records of past water and recycled water use. Recycled water costs the Youth Park 40% less than what other recycled water users pay (since Youth Park accepted FWD monitoring wells on its property).</p>	https://forestvillyouthpark.org/



Appendix E

Risk Assessment Special Studies – Climate Adaptation Plan

Sonoma Water

Final Report

Appendix C. Risk Assessment Special Studies

October 2021

This page intentionally left blank.

Contents

1.	Risk Assessment Special Studies.....	C-1
1.1	Introduction	C-1
1.2	Climate and Sea Level Change Scenarios.....	C-1
2.	Russian River Water Supply Modeling.....	C-7
2.1	Purpose	C-7
2.2	Methodology.....	C-7
2.3	Results.....	C-8
3.	Fire Risk and Water Quality Risk Modeling.....	C-15
3.1	Purpose	C-15
3.2	Methodology.....	C-15
3.3	Results.....	C-16
4.	Santa Rosa Creek Flood Modeling.....	C-23
4.1	Purpose	C-23
4.2	Methodology.....	C-23
4.3	Results.....	C-23
5.	Russian River Flood Modeling	C-29
5.1	Purpose	C-29
5.2	Methodology.....	C-29
5.3	Results.....	C-29
6.	Sediment Loading Estimates	C-35
6.1	Purpose	C-35
6.2	Methodology.....	C-35
6.3	Results.....	C-35
7.	References.....	C-41

Tables

C-1	GCMs Downscaled by LOCA	C-2
C-2	Projected Climate Change Parameters by Likelihood of Exceedance for 2046-2075 Period Compared to the 1981-2010 Period	C-4
C-3	Projected Climate Change Parameters by Likelihood of Exceedance for 2070-2099 Period Compared to the 1981-2010 Period	C-5
C-4	Organic Carbon Models.....	C-19
C-5a	Peak Flow in Santa Rosa Creek below Bush Creek	C-25

C-5b Percent Increase in Peak Flow in Santa Rosa Creek below Bush Creek..... C-26
C-6 Tabulation of Peak Discharges for Various Flood Events along the Russian River C-31

Figures

C-1 Projected Changes in Annual Russian River Streamflow for Period of 2006-2060..... C-9
C-2 Projected Changes in 3-Year Annual Russian River Streamflow for Period of 2006-2060. C-10
C-3 Projected End-of-September Lake Sonoma Storage for Period of 2006-2060..... C-11
C-4 Projected Sonoma Water Annual Diversion Capability for Period of 2006-2060..... C-12
C- Fire Risk and Water Quality Conceptual Model Steps..... C-15
C-6 Russian River Diversion Daily TOC and DOC Concentrations under Climate and Fire Conditions C-17
C-7 Russian River Diversion WY Total TOC and DOC Loading under Climate and Fire Conditions C-18
C-8 Caisson 2 and 3 DOC Concentrations C-20
C-9 Combined Overland Flow from Santa Rosa Creek and Matanzas Creek above Triple Box Culverts..... C-25
C-10 Simulated Change in Russian River Flood Stage under Three Future Scenarios C-30
C-11 100-year Flood Hazard, Russian River near Cloverdale (Zone 4A) C-32
C-12 100-year Flood Hazard, Lower Russian River C-33
C-13 Lower Russian River Sensitivity to Sea Level Rise C-34
C-14 Cross-Section 52535 Change in Bedload Sediment Transport for a 2-year Return Interval C-38
C-15 Cross-Section 52535 Change in Bedload Sediment Transport for a 10-year Return Interval C-39

Risk Assessment Special Studies

1.1 Introduction

Following the vulnerability assessment findings and workshops with the Climate Adaptation Plan (CAP) team, several areas of uncertainty with respect to the magnitude of risk were identified. Specific modeling and technical analyses were developed to gain further insight into the climate vulnerabilities and risks for these areas. Five areas were identified as needing further information to support the quantitative assessment. These included the climate impacts for the following:

1. Russian River hydrologic impacts on water supply management and operations
2. Fire risk and water quality impacts to the water supply system
3. Russian River flooding impacts
4. Santa Rosa Creek flooding impacts
5. Sediment loading impacts on flood system operations

Detailed descriptions of these assessments are included in this section.

1.2 Climate and Sea Level Change Scenarios

In order to consider the range of available Coupled Model Intercomparison Project - Phase 5 (CMIP5) climate projections, a total of 20 individual daily downscaled climate projections were analyzed for the quantitative aspects of the risk analysis. These climate projections were statistically downscaled using the LOCA statistical daily downscaling method (Pierce et al., 2014) from 10 General Circulation Models (GCMs) at approximately 6 kilometers spatial resolution by the researchers at Scripps Institution of Oceanography (Pierce et al., 2014). A list of the GCMs utilized in this study is included in Table C-1. The climate projections reflect the use of these GCMs and two representative concentration pathways (RCPs) (i.e., RCP 4.5 and RCP 8.5) in the IPCC's CMIP5 model data set (Taylor et al., 2012), and are recommended for use by the California DWR Climate Change Technical Advisory Group (DWR CCTAG, 2015). LOCA downscaled climate model projections were collected from the Scripps Institution of Oceanography.

Table C-1. GCMs Downscaled by LOCA

Model Number	Model Name	Model Institution	Model Resolution
1	ACCESS-1.0	Commonwealth Scientific and Industrial Research Organization and Bureau of Meteorology	192 by 145 (165 kilometers)
2	CCSM4	National Center for Atmospheric Research	288 by 192 (110 kilometers)
3	CESM1-BGC	National Science Foundation, Department of Energy, National Center for Atmospheric Research	288 by 192 (110 kilometers)
4	CMCC-CMS	Centro Euro-Mediterraneo per I Cambiamenti Climatici	192 by 96 (165 kilometers)
5	CNRM-CM5	Centre National de Recherches Météorologiques, Centre Européen de Recherche et Formation Avancées en Calcul Scientifique	256 by 128 (123 kilometers)
6	CanESM2	Canadian Centre for Climate Modeling and Analysis	128 by 64 (247 kilometers)
7	GFDL-CM3	Geophysical Fluid Dynamics Laboratory	144 by 90 (219 kilometers)
8	HadGEM2-CC	Met Office Hadley Centre	192 by 145 (165 kilometers)
9	HadGEM2-ES	Met Office Hadley Centre; additional HadGEM2-ES realizations contributed by Instituto Nacional de Pesquisas Espaciais	192 by 145 (165 kilometers)
10	MIROC5	Atmosphere and Ocean Research Institute at the University of Tokyo, National Institute for Environmental Studies, and Japan Agency for Marine-Earth Science and Technology	256 by 128 (123 kilometers)

Note: models are listed alphabetically; and size of the model's atmospheric grid (number of longitudes by number of latitudes)

Based on these projections, specific climate change scenarios were developed to support water supply, flood management, and sanitation system assessments. When quantitative analyses permitted, all 20 climate projections were utilized. However, for many assessments, such as flood modeling, specific scenarios derived from the projections were used to represent the range of projections.

Specific scenarios were developed for flood modeling analyses, depicting increases in precipitation based on downscaled results from the set of 20 global climate model simulations. Climate model simulated 24-hour precipitation total was processed to develop a scaling factor relative to a baseline period for 19 different watersheds presented in the Russian River Basin HEC-HMS model for three future time periods over early (2016-2045), mid (2046-2075), and

late (2070-2099) century. Similar scaling factors were also developed for the watersheds presented in the Santa Rosa Creek HEC-HMS model. These factors were developed for a range of return interval events ranging from about 1-year through 100-years using the L-moments method, which is consistent with NOAA Atlas 14.

The precipitation frequency statistical analysis procedure includes the following 5 main steps as described in the following steps:

1. Compute spatial average daily precipitation for each watershed using 20 individual daily downscaled climate projections using the Localized Constructed Analogs (LOCA) statistical daily downscaling method (Pierce et al., 2014) at 1/16th degree (approximately 6 kilometers) (3.75 mile) spatial resolution over the period 1950 through 2099
2. 20 individual daily downscaled precipitation projections from 10 general circulation models (GCMs) under 2 Representative Concentration Pathways (RCPs) from the Coupled Model Intercomparison Project Phase 5 (CMIP5) recommended for use by the DWR Climate Change Technical Advisory Group (CCTAG) (DWR CCTAG, 2015)
3. Compute annual daily maximum precipitation for each water year over the period WY 1951 through WY 2099 from 20 individual daily downscaled climate projections.
4. Fit the Generalized Extreme Value (GEV) distributions to the annual maximum precipitation using the L-moments method which is consistent with NOAA Atlas 14
5. Compute precipitation frequency changes by comparing frequency curves over the reference period WY 1981 through WY 2010 and early (2016-2045), mid (2046-2075), and late (2070-2099) future periods from 20 individual daily downscaled precipitation projections.

Sea level rise scenarios were developed based on Kopp et al (2014) and are consistent with those included in the State of California's Ocean Protection Council (OPC) sea level rise guidance (OPC 2018). Polynomial regressions were developed for the RCP 8.5 and RCP 4.5 scenarios using the Kopp et al (2014) published percentile data for San Francisco centered on 2030, 2060, and 2085 future periods.

Table C-2 shows the projected changes in temperature, precipitation, and mean sea level based on likelihood for the mid-century period, while Table C-3 shows the projected changes for the late-century period.

Table C-2. Projected Climate Change Parameters by Likelihood of Exceedance for 2046-2075 Period Compared to the 1981-2010 Period

Change in Parameter	Very Likely (90% of projections exceed)	Likely (66% of projections exceed)	Moderate (50% of projections exceed)	Unlikely (33% of projections exceed)	Very Unlikely (10% of projections exceed)
Annual Average Temperature (degrees C)	1.4	2.0	2.1	2.3	3.1
Annual Average Precipitation (%)	-6.0%	-1.3%	5.7%	10.1%	30.8%
2-year 24-hour Precipitation Total (%)	-2.5%	1.7%	6.0%	11.5%	22.3%
5-year 24-hour Precipitation Total (%)	-2.4%	1.8%	6.1%	11.5%	22.4%
10-year 24-hour Precipitation Total (%)	-2.7%	1.5%	5.8%	11.2%	22.0%
25-year 24-hour Precipitation Total (%)	-3.2%	1.0%	5.2%	10.7%	21.4%
50-year 24-hour Precipitation Total (%)	-3.6%	0.5%	4.8%	10.2%	20.9%
100-year 24-hour Precipitation Total (%)	-4.1%	0.1%	4.3%	9.6%	20.3%
Mean Sea Level (centimeter) – 2060	22.2	29.3	33.2	36.7	44.8

Table C-3. Projected Climate Change Parameters by Likelihood of Exceedance for 2070-2099 Period Compared to the 1981-2010 Period

Change in Parameter	Very Likely (90% of projections exceed)	Likely (66% of projections exceed)	Moderate (50% of projections exceed)	Unlikely (33% of projections exceed)	Very Unlikely (10% of projections exceed)
Annual Average Temperature (degrees Celsius)	1.7	2.4	2.9	3.2	4.6
Annual Average Precipitation (%)	-3.0%	2.1%	7.9%	12.6%	34.2%
2-year 24-hour Precipitation Total (%)	-0.8%	4.6%	9.5%	24.9%	31.9%
5-year 24-hour Precipitation Total (%)	0.0%	5.4%	10.3%	25.9%	32.8%
10-year 24-hour Precipitation Total (%)	0.2%	5.6%	10.5%	26.1%	33.1%
25-year 24-hour Precipitation Total (%)	0.2%	5.7%	10.6%	26.2%	33.2%
50-year 24-hour Precipitation Total (%)	0.2%	5.7%	10.5%	26.2%	33.2%
100-year 24-hour Precipitation Total (%)	0.1%	5.6%	10.5%	26.1%	33.0%
Mean Sea Level (centimeter) – 2085	34.6	46.6	53.1	60.1	75.5

This page left blank intentionally.

SECTION 2

Russian River Water Supply Modeling

2.1 Purpose

The goal of this analysis was to conduct water supply modeling of the Potter Valley Project (PVP) and Russian River System to quantify impacts of climate change on this integrated water system. Hydrological information based on the 20 downscaled climate projections were selected from available (USGS) Basin Characterization Model (BCM) hydrological model results. These climate and hydrologic projections were used to adjust inflow time series and to adjust water demands in the PVP Fortran Model ER2.5 and Russian River HEC-ResSim model. The models used in this assessment are identical to those used by Sonoma Water in the Fish Habitat Flows and Water Rights Project Draft EIR (SCWA, 2016).

2.2 Methodology

Hydrological adjustments to reflect future climate change consisted of routed streamflows for 10 locations that are required as input to the Russian River Basin HEC-ResSim model and two locations in the Eel River Basin that are used for the PVP operations model. Twenty downscaled GCM projections were selected from ten different GCMs and two different Representative Concentration Pathways, RCP4.5 and RCP8.5. These ten GCMs were chosen by the DWR Climate Change Technical Advisory Group (CCTAG) based on a regional evaluation of climate model ability to reproduce a range of historical climate conditions. Two locations in the Eel River Basin were used for the PVP operations model.

Due to inherent limitations in the downscaling methods, meteorological inputs, and BCM model, the resulting streamflows were adjusted to remove historical bias before being applied for future simulations in the models.

Adjustment factors were also applied to historical consumptive use estimates to reflect future changes in potential evapotranspiration and open water surface evaporation. Existing Variable Infiltration Model (VIC) model results for potential evapotranspiration (using short grass as a reference crop) and open water surface evaporation were used to develop these demand and evaporation adjustment factors. In addition, due to the significance of frost days on water depletions on Russian River, a method was developed to translate projected changes in frost days to increases in river demand. Frost day frequency was computed for selected LOCA grid cells in areas historically affected by frost-associated water loss (Calpella, Hopland, Cloverdale, Healdsburg, Dry Creek).

PVP Fortran Model ER2.5 and Russian River HEC-ResSim model simulations were developed for a historical baseline and for future climate change conditions. PVP and Russian River HEC-ResSim model simulations were evaluated and summarized for the historical simulations and climate change conditions, and results of model simulations under historical and climate change conditions across the key locations over the Russian River were documented.

2.3 Results

Climate projection outcomes were assessed for two future periods. In order to capture variability in precipitation and streamflow a period of sufficient length was required. For this assessment, the mid-century period is defined as the period of 2006-2060 and late-century is the period of 2045-2099 and results are compared to the historical period of 1951-2005. Each of these periods includes 55-years of variability, and the historical period represents the same period for which BCM streamflow results were bias-corrected. For climate information (temperature and precipitation change), we also present changes for shorter 30-year periods in addition to the longer 55-year periods for comparison. These additional periods are 2035-2065 for mid-century and 2070-2099 for late-century compared to the historical period of 1976-2005 and are those presented in Pierce et al. (2018), a report prepared for the California Fourth Climate Change Assessment.

Figure C-1 shows the annual natural streamflow exceedance probability curves for historical and future scenarios at the Russian River downstream of the Dry Creek confluence for the period of 2006-2060. The results indicate the potential for streamflow reductions, particularly during the drier years (lower percentiles) and potential increases during wetter years (higher percentiles).

Figure C-1. Projected Changes in Russian River Annual Streamflow for Period of 2006-2060.

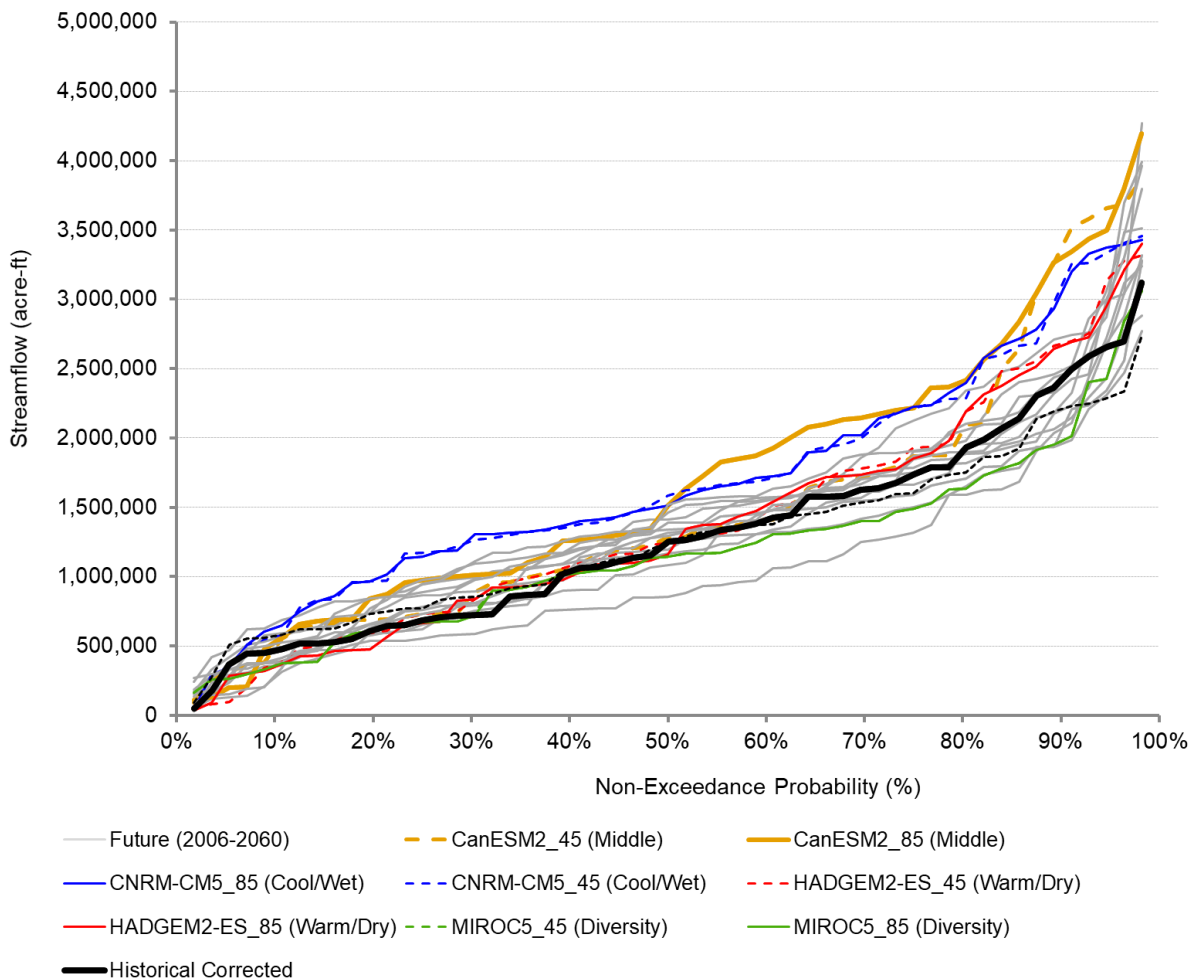


Figure C-2 shows the 3-year annual natural streamflow exceedance probability curves for historical and future scenarios at the Russian River downstream of the Dry Creek confluence for the period of 2006-2060. The results indicate an expansion in variability for the moderate to wet periods but only modest changes in variability for the driest periods. The “cool/wet” and “middle” projections show the largest increases in 3-year streamflow, while the “diversity” and “warm/dry” projections indicate the greatest reductions in 3-year streamflow. The “diversity” projection continues to exhibit the lowest 3-year annual streamflow. While not well simulated in GCMs, some projections suggest future droughts through mid-century up to 20% more severe than historical droughts.

Figure C-2. Projected Changes in Russian River 3-Year Annual Streamflow for Period of 2006-2060.

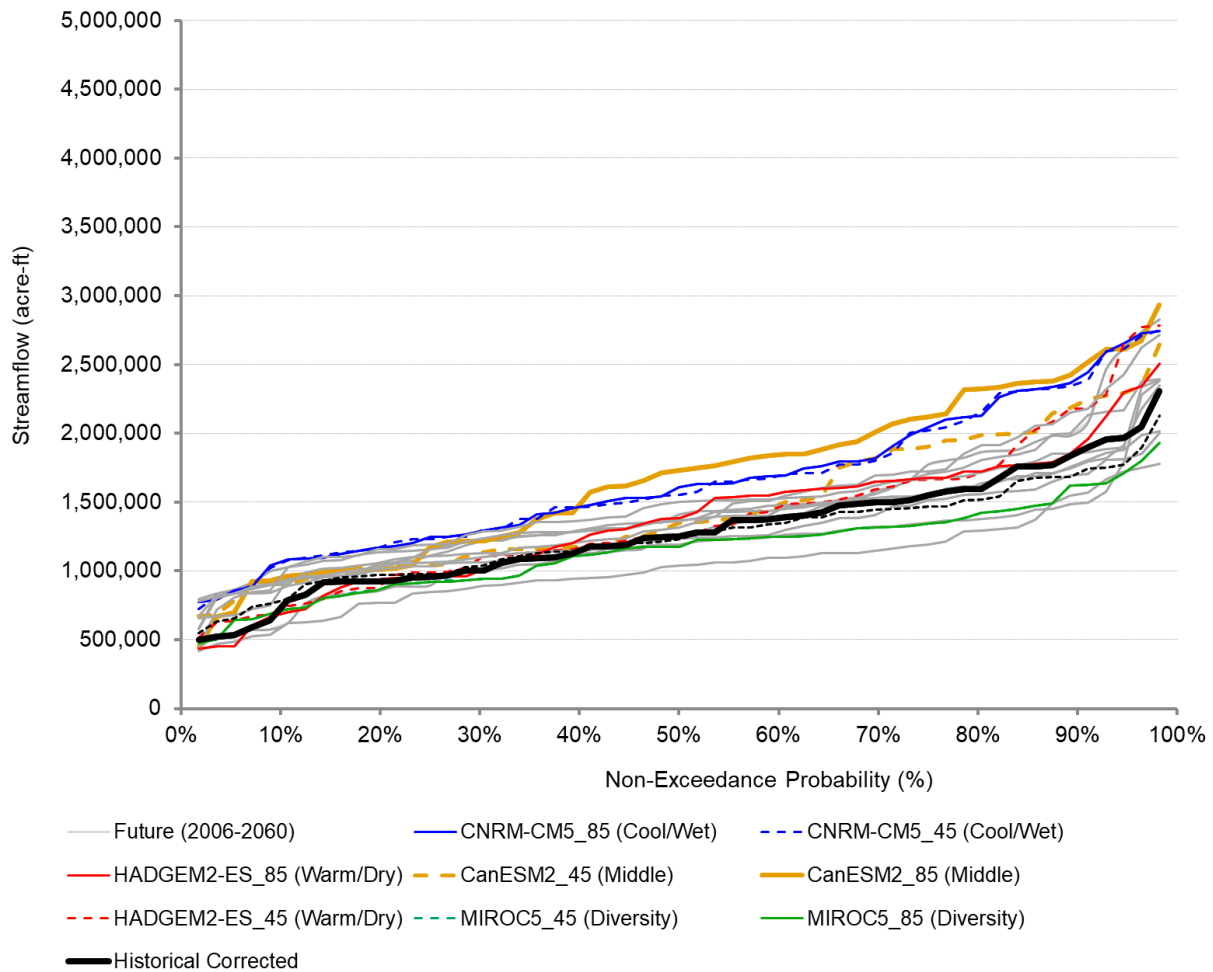


Figure C-3 shows the end-of-September storage exceedance probability curves for baseline and future scenarios at Lake Sonoma for the period of 2006-2060. Most future projections project decreases in storage across all exceedance values due to the projected increase in water demand in the basin and by Sonoma Water contractors. Note that the historical projections and “current operations” assume historical water demands. The range of outcomes for the lowest 30-40% of years is driven by the climate projections. Some projections suggest lower storage conditions than that projected under historical operations and indicate a few extreme challenging years.

Figure C-3. Projected End-of-September Lake Sonoma Storage for Period of 2006-2060.

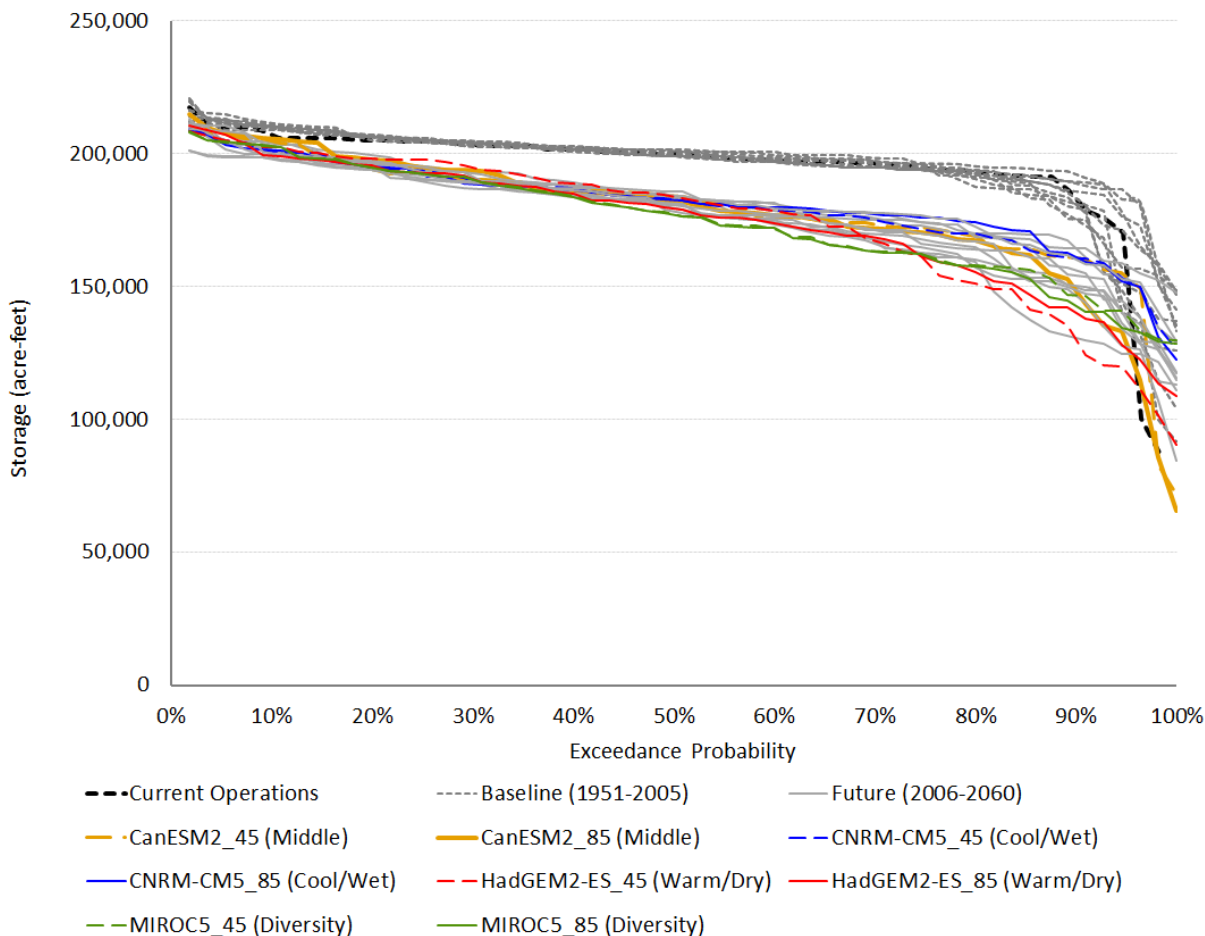
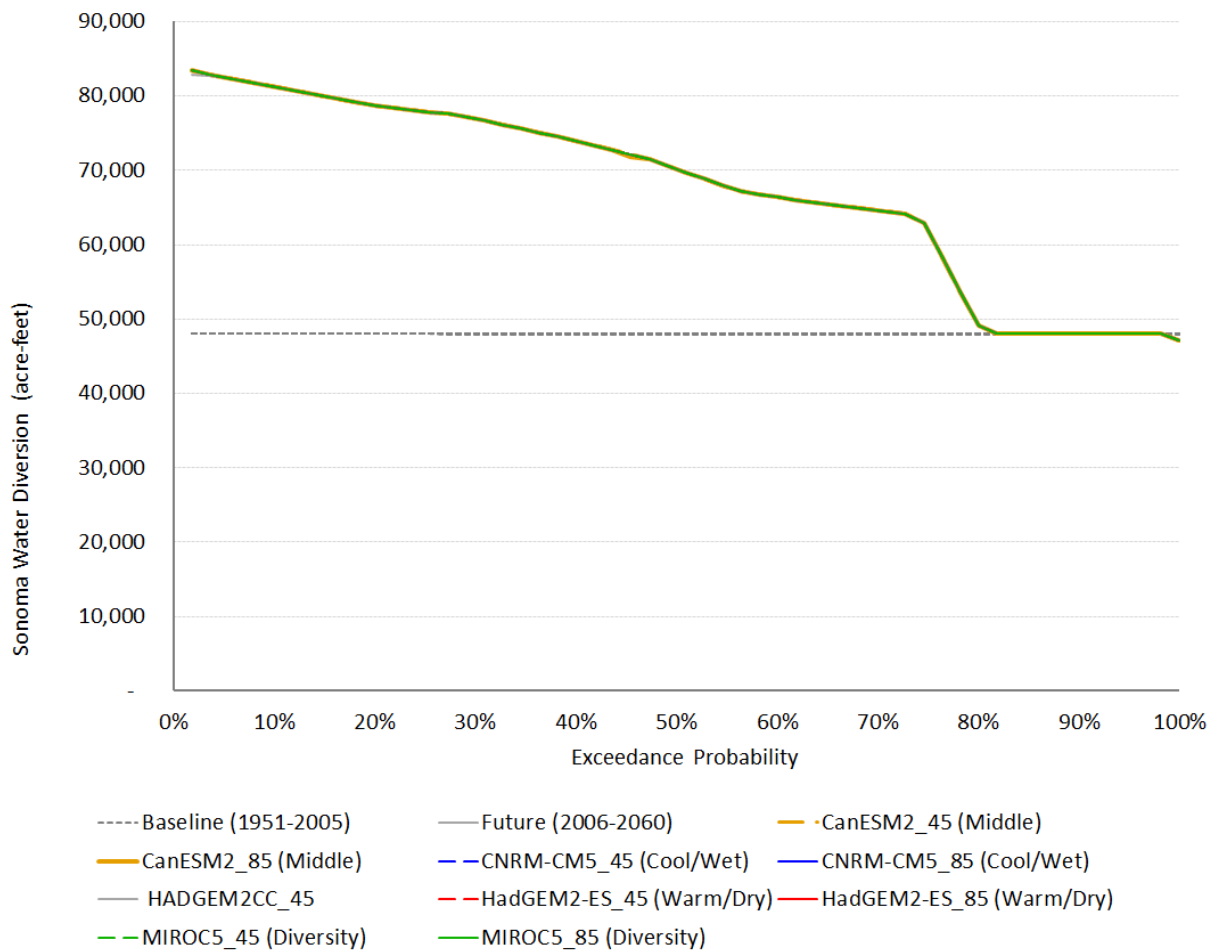


Figure C-4 shows the exceedance probability curves for annual Sonoma Water diversion (acre-feet) under both baseline and future conditions. Due to increase in water demand, the Sonoma Water diversion is increased in all simulations. In general, HEC-ResSim simulations suggest nearly identical results for all GCM model projections which indicates similar delivery capability. The Sonoma Water system appears to be able to adapt to the climate and hydrologic changes projected in the scenarios.

Figure C-4. Projected Sonoma Water Annual Diversion Capability for Period of 2006-2060.



In summary, modeling results were evaluated for changes in future streamflow, reservoir storage, and water delivery as compared to a no climate change condition. Based on these modeling results the following findings are relevant:

- Annual and 3-year streamflow on the Russian River downstream of the Dry Creek confluence is projected to become even more variable in the future with climate change. The results indicate the potential for both lower streamflows during the drier years (lower percentiles) and higher streamflows during wetter years (higher percentiles). While most projections indicate potential increases in streamflow, several projections suggest conditions drier than historical record for the lowest 10 percent of years.
- Most future projections project decreases in Lake Sonoma end-of-September storage across all exceedance values due to projected increases in water demand in the basin and by Sonoma Water contractors. However, changes in the lowest 30 to 40% of years are largely driven by climate change and some projections suggest lower storage conditions than that under historical hydrology. All projections indicate an incidence of Lake Sonoma end-of-September storage less than 150,000 acre feet and five projections indicate storage lower than 100,000 acre feet.

Sonoma Water diversion under both baseline and future conditions appears relatively robust in the face of changing climate and hydrology. Due to increases in water demand, the Sonoma Water diversion is increased in all simulations. However, simulations indicate similar delivery capability (meeting contractor demand). The Sonoma Water system appears to be able to adapt to the climate and hydrologic changes projected in the scenarios.

This page intentionally left blank.

SECTION 3

Fire Risk and Water Quality Risk Modeling

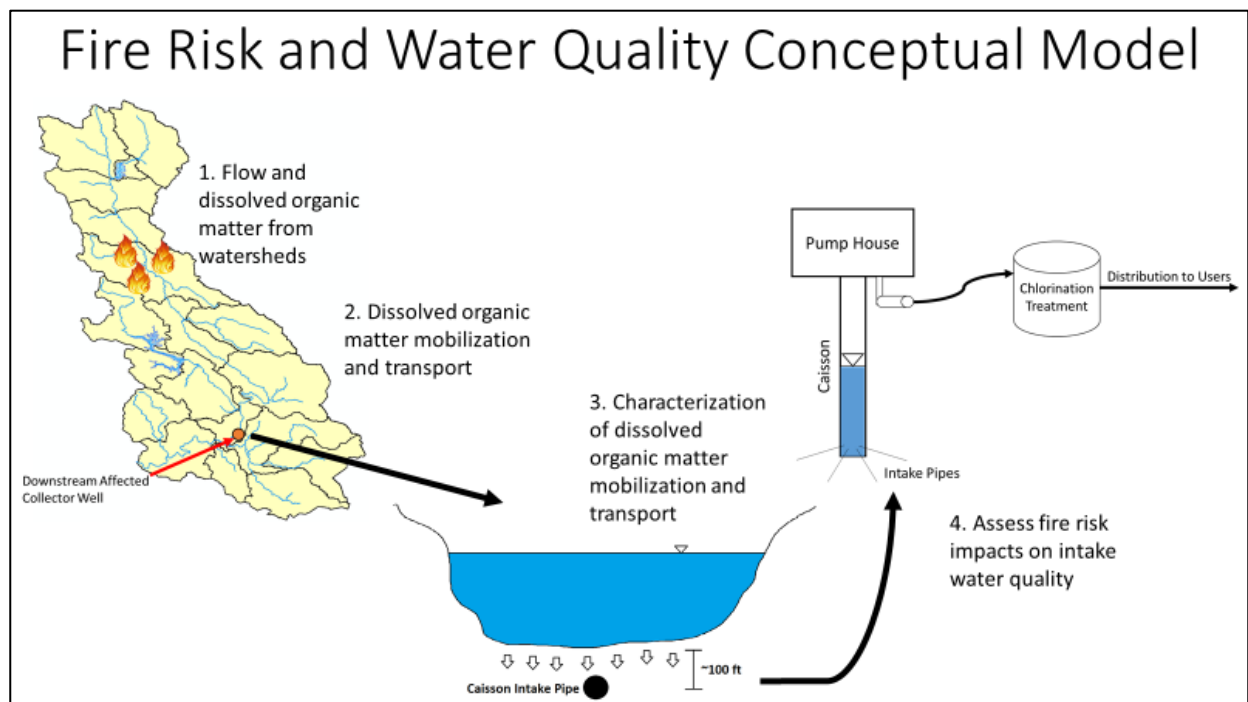
3.1 Purpose

The role of increasing fire risk and its impacts on river and intake water quality was identified as a need for the improved quantitative information. An innovative analysis was developed to better understand the probability, location, and extent of fire risk; and to assess impacts on intake water quality. This analysis integrates fire risk modeling, hydrologic modeling, and water quality estimates (primarily organic carbon) to assess impacts to water supply operations. The HEC-HMS model and landscape-scale fire modeling has been used to assess to fire risk and water quality risk.

3.2 Methodology

The workflow of the methodology is presented in four major steps shown graphically in Figure C-5 and described in the following sections.

Figure C-5 Fire Risk and Water Quality Conceptual Model Steps



Daily runoff volumes in each of the 19 study area watersheds were simulated by HEC-HMS under baseline and early, mid, and late future climate conditions. Potential future fires of low, medium, and high severity in each climate scenario were represented by the fraction of watershed area burned. Geographic specification of future fire severity by watershed was accomplished using change in area burned in wildfire scenario projections from Cal Adapt (Cal Adapt Wildfire Tool, 2018). Percent difference in area burned between historical and future periods for eight climate projections for nine HUC-10 watersheds that covered the study area were used to develop change factors to apply to baseline burn severities to include the effect of climate change. For each future time period, climate change factors were considered to be uniform for low, medium, and high burn severities. Pre-fire flows in each watershed were translated to post-fire flows using severity of the potential future fires based on the USGS Regression Methodology (Foltz, Robichaud, and Rhee, 2009).

The sediment and organic carbon (DOC and TOC) relationship with hydrology and watershed changes post-fire was characterized. The hydrologic and sediment/carbon response to climate/land disturbance conditions were also developed. The organic carbon loading at the Russian River water supply intakes was estimated under historical and future conditions. The carbon loading (TOC and DOC) in each watershed was calculated from streamflow and concentration relationships developed based on observed data, and then summed to create system-wide loading at the Russian River Diversion. Russian River organic carbon was related to caisson organic carbon with appropriate attenuation and filtration based on historical relationships. Results of potential changes in fire frequency, hydrologic conditions, and organic carbon at water supply intakes were documented, and the potential for significant water supply impacts due to water quality were estimated.

3.3 Results

Using HEC-HMS, flow in each of the 19 watersheds in Sonoma County was simulated under four climate conditions, baseline, early future, mid future, and late future. Pre-fire flows in each watershed were translated to post-fire flows using severity of the potential future fires based on the USGS Regression Methodology (Foltz, Robichaud, and Rhee, 2009).

Carbon loading (TOC and DOC) in each watershed was calculated from streamflow and concentration relationships developed based on observed data, and then summed to create system-wide loading at the Russian River Diversion. Figure C-6 shows daily simulated TOC and DOC concentrations at the Russian River Diversion for baseline and three climate scenarios under both undisturbed and disturbed conditions.

Figure C-6. Russian River Diversion Daily TOC and DOC Concentrations under Climate and Fire Conditions

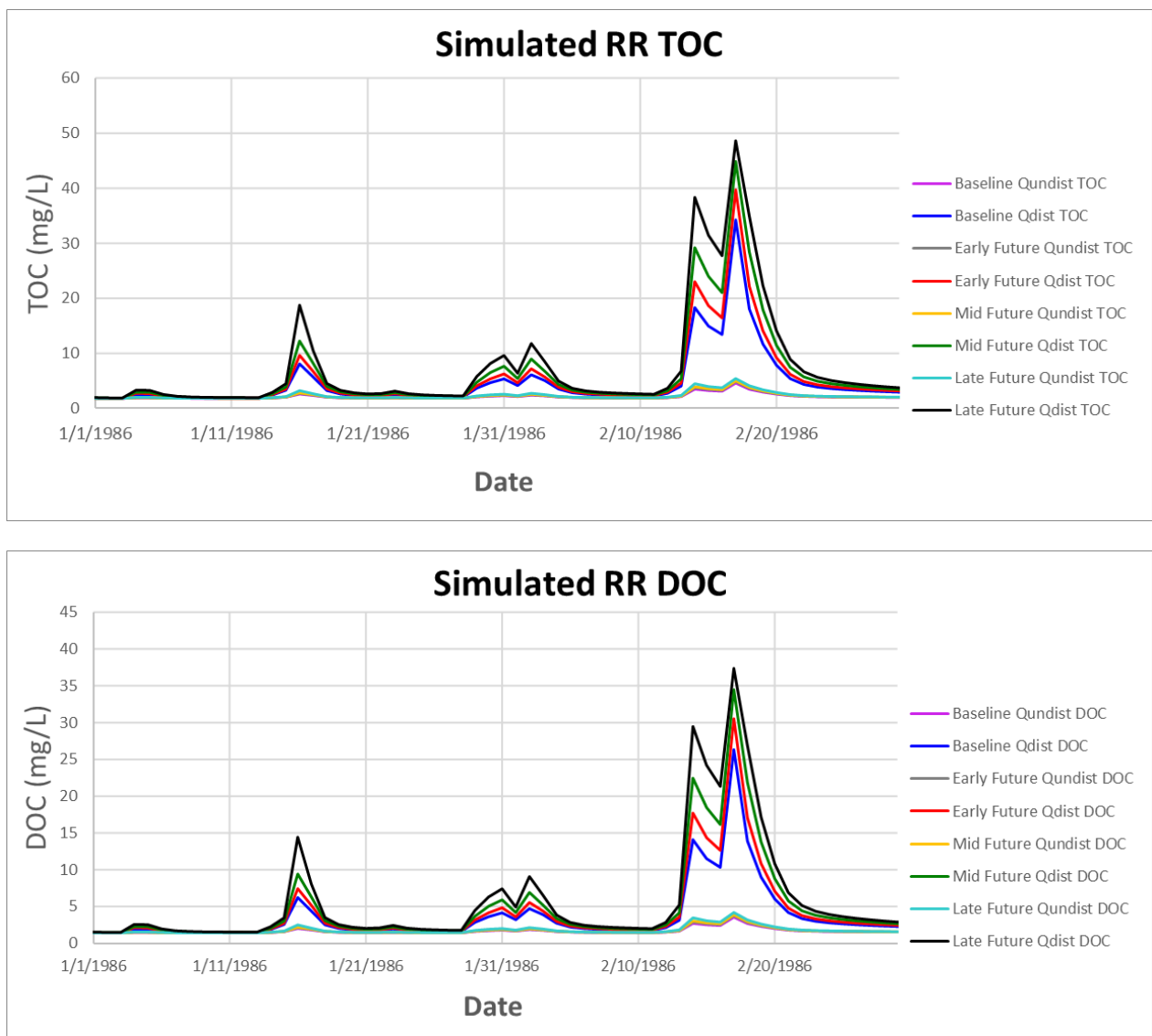
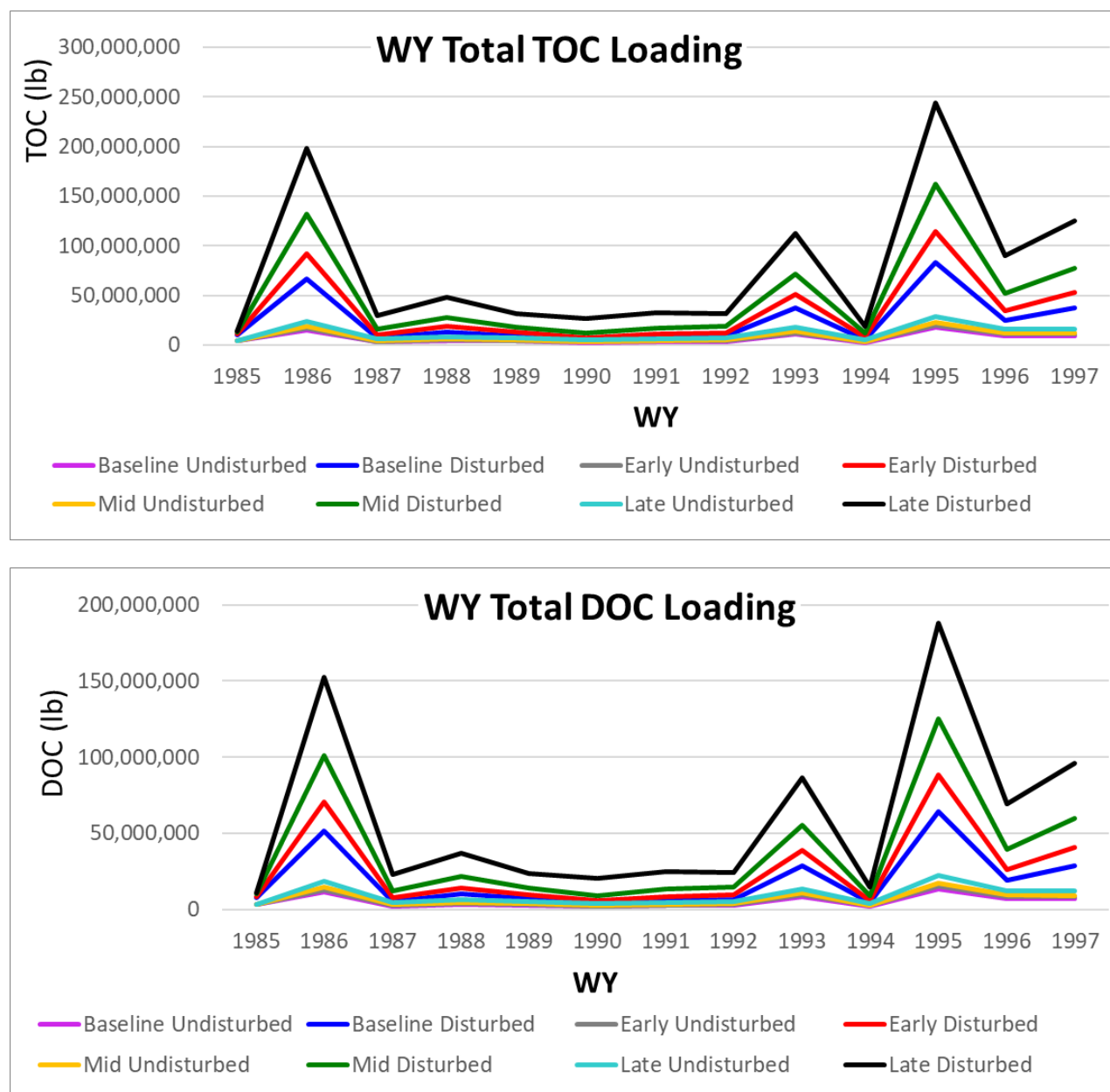


Figure C-7 in the following section shows WY total magnitude of TOC and DOC carbon loading for baseline and three climate scenarios under both undisturbed and disturbed conditions.

Figure C-7. Russian River Diversion WY Total TOC and DOC Loadings under Climate and Fire Conditions



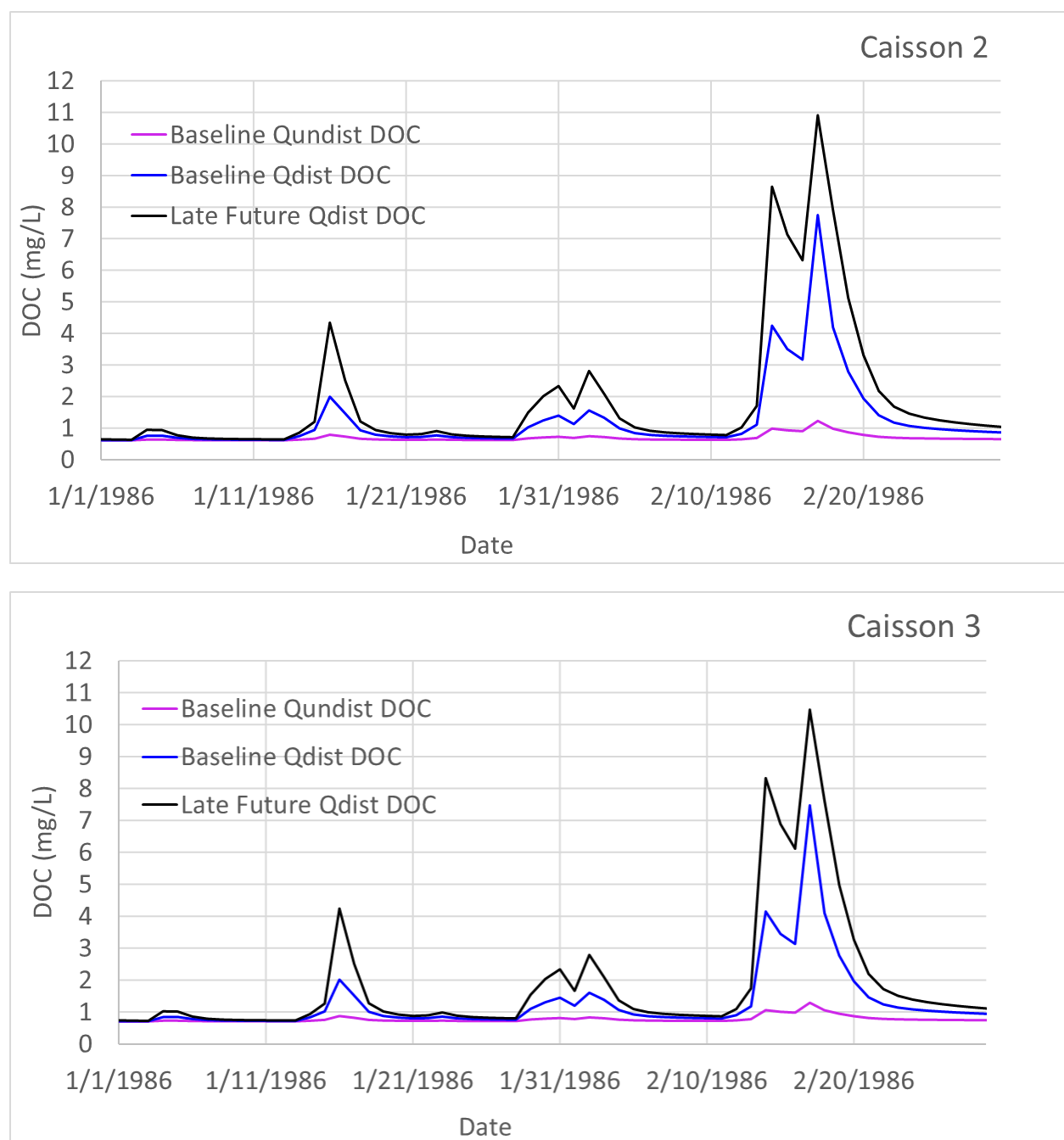
At the Russian River diversion point, river water filters through the streambed into the caisson intake pipes. The linear equations that describe relationships between river and caisson TOC and DOC can be seen in the following section in Table C-4. These linear regression models are used to capture the very complicated effect of the aquifer natural filtration and thus contain much uncertainty. The coefficient of correlation for the linear models at all caissons was less than 0.5.

Table C-4. Organic Carbon Models

Caisson No.	TOC	DOC
1	$\text{TOC}^{\text{C}} = 0.333 * \text{TOC}^{\text{RR}} + 0.118$	$\text{DOC}^{\text{C}} = 0.360 * \text{DOC}^{\text{RR}} + 0.053$
2	$\text{TOC}^{\text{C}} = 0.168 * \text{TOC}^{\text{RR}} + 0.321$	$\text{DOC}^{\text{C}} = 0.203 * \text{DOC}^{\text{RR}} + 0.283$
3	$\text{TOC}^{\text{C}} = 0.197 * \text{TOC}^{\text{RR}} + 0.399$	$\text{DOC}^{\text{C}} = 0.308 * \text{DOC}^{\text{RR}} + 0.249$
4	$\text{TOC}^{\text{C}} = 0.229 * \text{TOC}^{\text{RR}} + 0.288$	$\text{DOC}^{\text{C}} = 0.295 * \text{DOC}^{\text{RR}} + 0.218$
5	$\text{TOC}^{\text{C}} = 0.170 * \text{TOC}^{\text{RR}} + 0.277$	$\text{DOC}^{\text{C}} = 0.280 * \text{DOC}^{\text{RR}} + 0.180$
6	$\text{TOC}^{\text{C}} = 0.164 * \text{TOC}^{\text{RR}} + 0.312$	$\text{DOC}^{\text{C}} = 0.215 * \text{DOC}^{\text{RR}} + 0.267$

FigureB C-8 shows the change from undisturbed and disturbed flows under baseline and future conditions for Caisson 2 and 3. Both show significant increases in DOC concentrations in disturbed conditions.

Figure C-8. Caisson 2 and 3 DOC Concentrations



While this modeling analysis should be considered only approximate at this point in the development, it did suggest important findings that should be considered in both current and future climate risks. The following observations are drawn from this quantitative analysis:

- Wildfire risks are found to be increasing throughout the contributing watersheds to the Russian River. Both the extent and severity of wildfire burn is expected to increase under future climate change associated with earlier drying of the watershed, extended dry season length, and substantial combustible fuel in the predominantly privately-owned lands.

- Post-wildfire extreme precipitation events (flood-after-fire) have the ability to substantially increase sediment and carbon runoff from the disturbed watershed lands. Total and dissolved organic carbon in the Russian River post-fire may increase by more than 10 times the concentration under an undisturbed (non-fire) condition.
- The alluvial aquifer underlying the Russian River transmits water to the Mirabel and Wohler collectors and substantially reduces the organic carbon in the water supply. Following the Walbridge Fire of 2020, Sonoma Water conducted a robust water quality monitoring program. Some changes were noted in surface water quality, but no impacts were detected in the collector well water. However, water year 2020 was dry and no significant runoff events followed. The analysis included here suggests that under more severe hydrologic conditions water quality could be challenged. The analysis suggests that DOC at the collectors may increase by up to five times during large post-fire runoff events. Several simulated post-fire runoff events produced estimated DOC concentrations greater than the disinfection byproducts threshold (~ 2 mg/L) for chlorination. While this condition has not yet been experienced after recent wildfires, this analysis suggests that the flood-after-fire risk is high depending on the location and timing of coincident wildfire and extreme precipitation.

This page left blank intentionally.

Santa Rosa Creek Flood Modeling

4.1 Purpose

Flooding management operations on Santa Rosa Creek were assessed to be highly vulnerable to climate change. To better understand climate-flood related vulnerabilities along the Santa Rosa Creek flood management system, a modeling study was performed covering the extent of the watershed, detention facilities, hydraulic control facilities, culverts, and flood channels.

4.2 Methodology

The flood modeling analysis on Santa Rosa Creek made use of existing HEC-HMS and HEC-RAS models. Precipitation time series for 69 HEC-HMS watersheds was developed to reflect future climate change. The climate and hydrologic projections were translated into modified design storms to reflect projected changes in extreme precipitation. HEC-HMS modeling using these modified design storms was also performed to investigate detention basin operations and vulnerability. Finally, two-dimensional HEC-RAS modeling, using the existing model developed by ESA, was employed to investigate flood flows and inundation throughout Santa Rosa Creek (SCWA, 2017).

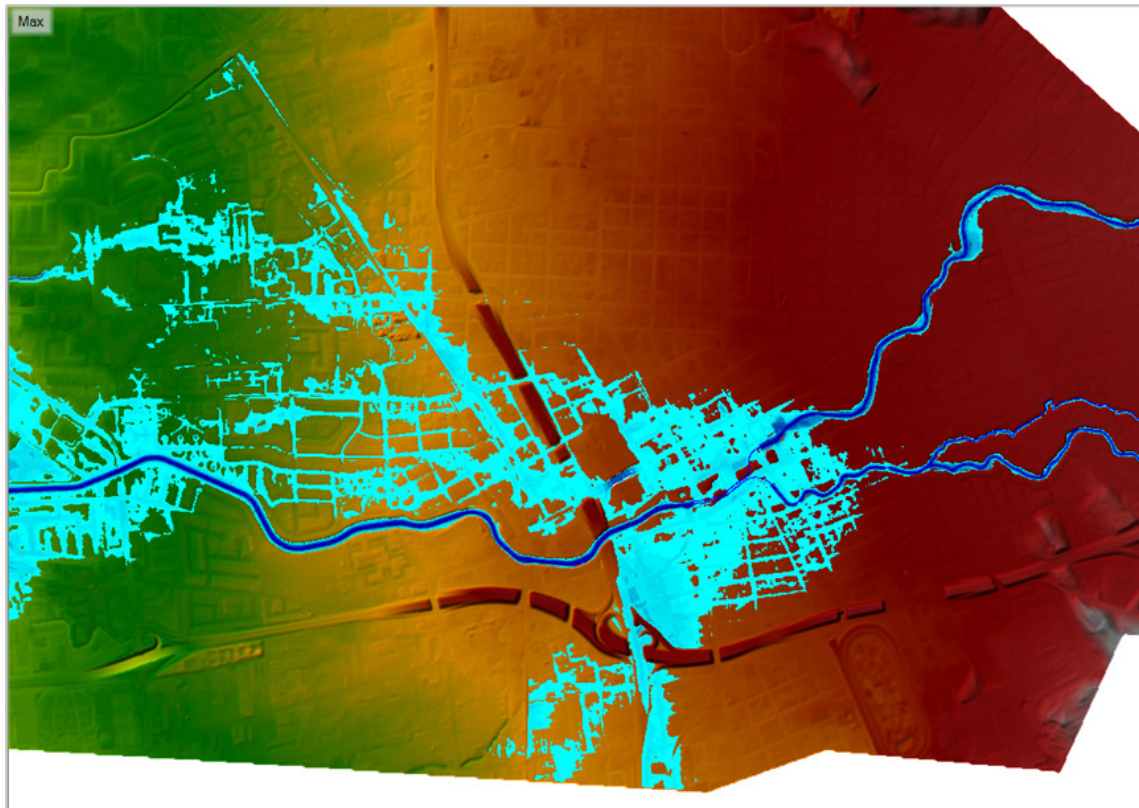
4.3 Results

Flood conveyance channels along Santa Rosa Creek and its tributaries provide flood protection for downtown Santa Rosa. The triple box culverts along Santa Rosa Creek and Matanzas Creek, which route these two creeks through downtown Santa Rosa, are of particular concern for climate induced vulnerabilities. The primary hazard for these culverts is their inability to convey flood flows much larger than a 10-year event. High resolution hydraulic modeling conducted by ESA as part of the Santa Rosa Creek Hydrology and Hydraulics Study (SCWA 2017) indicate the inability of these culverts to pass flood flows above a certain return interval event between 10 and 25 years. These results are in stark contrast to assumptions made by FEMA in the development of local Flood Insurance Rate Maps.

Figure C-9 presents results of the recent hydraulic modeling results for a simulated 25-year flow event, showing inundation depths throughout downtown Santa Rosa. Figure C-10 presents a time series plot of the total predicted overbank flow from Santa Rosa Creek between the Triple Box Culverts and Brush Creek, and from Matanzas Creek between the triple box culvert and Spring Creek, for each return interval model simulation. Note that overbank flow exceeding 1000 cubic feet per second (cfs) is predicted for the 25-year event, and overbank flows

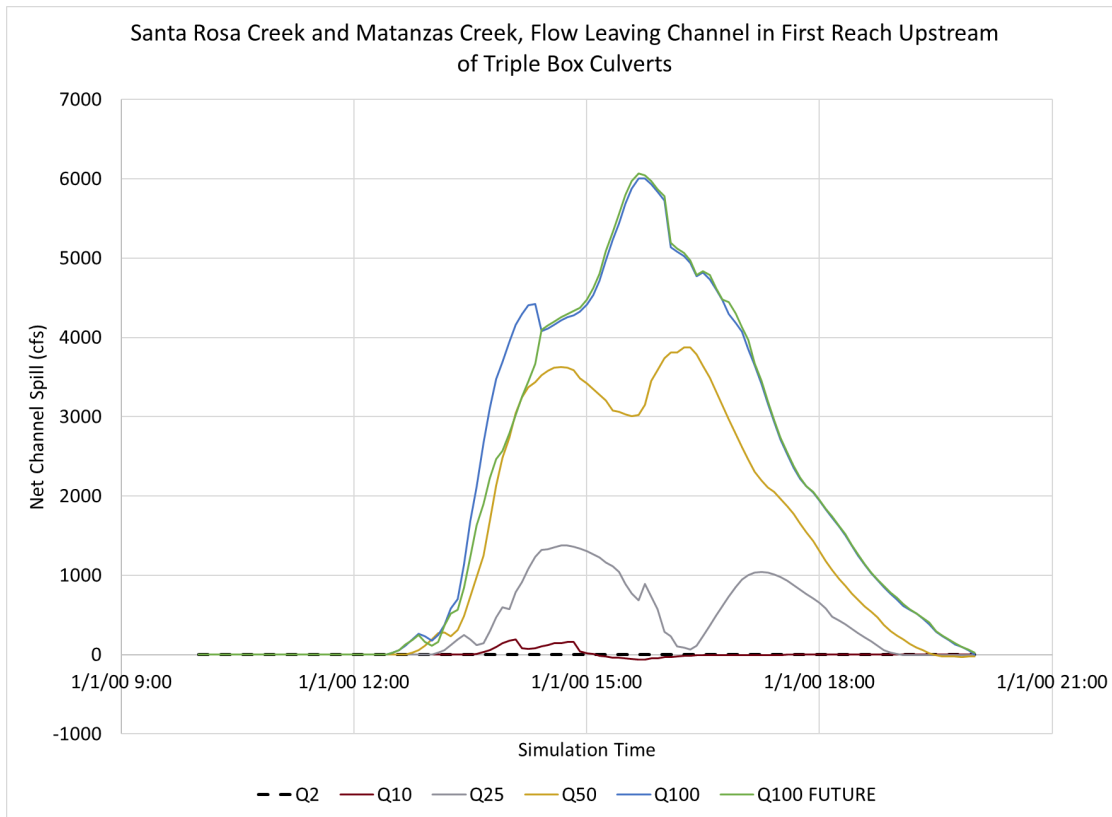
approaching 4000 cfs is shown for the 50-year event. The 100-year simulation had over 6,000 cfs leaving the creek banks upstream of the triple box culverts.

Figure C-9. Predicted Localized Flooding in Santa Rosa for a 25-year Event



Source: ESA

Figure C-10. Combined Overland Flow from Santa Rosa Creek and Matanzas Creek above Triple Box Culverts



Source: ESA

Tables C-5a and C-5b provides a quantitative overview of the frequency shift and projected changes in peak flow as well as the percent increase in peak flow for Santa Rosa Creek below Bush Creek. In the early future scenario, high frequency flows show a larger increase in peak flow than low frequency events. However, for the late future scenario, low frequency flows show larger increases in peak flow than the high frequency events.

Table C-5a. Peak Flow in Santa Rosa Creek below Bush Creek

Period	50 percent Peak Discharges (cfs)	20 percent Peak Discharges (cfs)	10 percent Peak Discharges (cfs)	4 percent Peak Discharges (cfs)	2 percent Peak Discharges (cfs)	1 percent Peak Discharges (cfs)
Baseline	3,319	4,862	6,239	8,111	9,483	10,599
Early Future	3,731	5,781	7,473	9,777	11,499	13,185
Mid Future	4,699	7,037	8,776	11,147	13,089	14,586
Late Future	6,409	8,986	10,982	13,775	15,763	17,280

Table C-5b. Percent Increase in Peak Flow in Santa Rosa Creek below Bush Creek

Period	Increase in 50 percent Peak Discharges (%)	Increase in 20 percent Peak Discharges (%)	Increase in 10 percent Peak Discharges (%)	Increase in 4 percent Peak Discharges (%)	Increase in 2 percent Peak Discharges (%)	Increase in 1 percent Peak Discharges (%)
Early Future	12	19	20	21	21	24
Mid Future	42	45	41	37	38	38
Late Future	93	85	76	70	66	63

Modeling results for simulations under historical and climate change conditions were evaluated at key locations Bin order to inform the risk assessment. The flood risk was found to be high in several areas of the watershed. The key findings are summarized in the following sections:

- Flood conveyance channels along Santa Rosa Creek and its tributaries provide flood protection for downtown Santa Rosa. The triple box culverts along Santa Rosa Creek and Matanzas Creek, which route these two creeks through downtown Santa Rosa, are of particular concern. The primary hazard for these culverts is their inability to convey flood flows much larger than a 10-year event. High resolution hydraulic modeling conducted by ESA as part of the Santa Rosa Creek Hydrology and Hydraulics Study (SCWA 2017) indicate the inability of these culverts to pass flood flows above a certain return interval event between 10 and 25 years. These results are in stark contrast to assumptions made by FEMA in the development of local Flood Insurance Rate Maps.
- Analysis of inundation depth results suggest substantial inundation throughout downtown Santa Rosa. Overbank flow is simulated from Santa Rosa Creek between the Triple Box Culverts and Brush Creek, and from Matanzas Creek between the triple box culvert and Spring Creek for each return period simulated. Overbank flow exceeding 1000 cfs is predicted for the 25-year event, nearly 4000 cfs for the 50-year event, and over 6,000 cfs for the 100-year event.
- Peak flow in Santa Rosa Creek below Brush Creek is projected to increase by about 40% under mid-century climate changes and over 60% by end of century changes. By late-century, the current 25-year event will be closer to a 5-year event, and the 100-year event will be best represented as a 10-year event.
- The nonlinear nature between flood flow and sediment transport could exacerbate future flood control channel maintenance, as expected increases in precipitation intensity drive increases in runoff and increases in sediment transport.
- Detention basins in the upper reaches of Santa Rosa Creek and tributaries will be substantially impacted by greater flow volumes associated with climate change. These reservoirs serve a vital role in reducing flood risk for the City of Santa Rosa by attenuating flows on the largest watersheds draining through Santa Rosa. The basins were designed for a 100-year event and are designed for passive operation. Increases in runoff events, sediment, and debris will reduce the effectiveness of these basins to attenuate peak flows

and could lead to overtopping of the dam. Matanzas Creek Reservoir is the most at risk due to its earthen embankment that serves as the emergency spillway.

Sedimentation is expected to increase under all future climate scenarios. The diversion structure on Santa Rosa Creek, the vortex drain structure under Montgomery Drive, and the diversion structure on Spring Creek and box culvert are all susceptible to sedimentation and/or woody debris reducing hydraulic performance.

This page intentionally left blank.

Russian River Flood Modeling

5.1 Purpose

The goal of this analysis is to provide more refined assessments of Russian River flood impacts under future climate change. The primary objectives were to assess potential changes in Russian River flood frequencies at the Wohler and Mirabel water supply facilities and within the Russian River Sanitation Zone facilities.

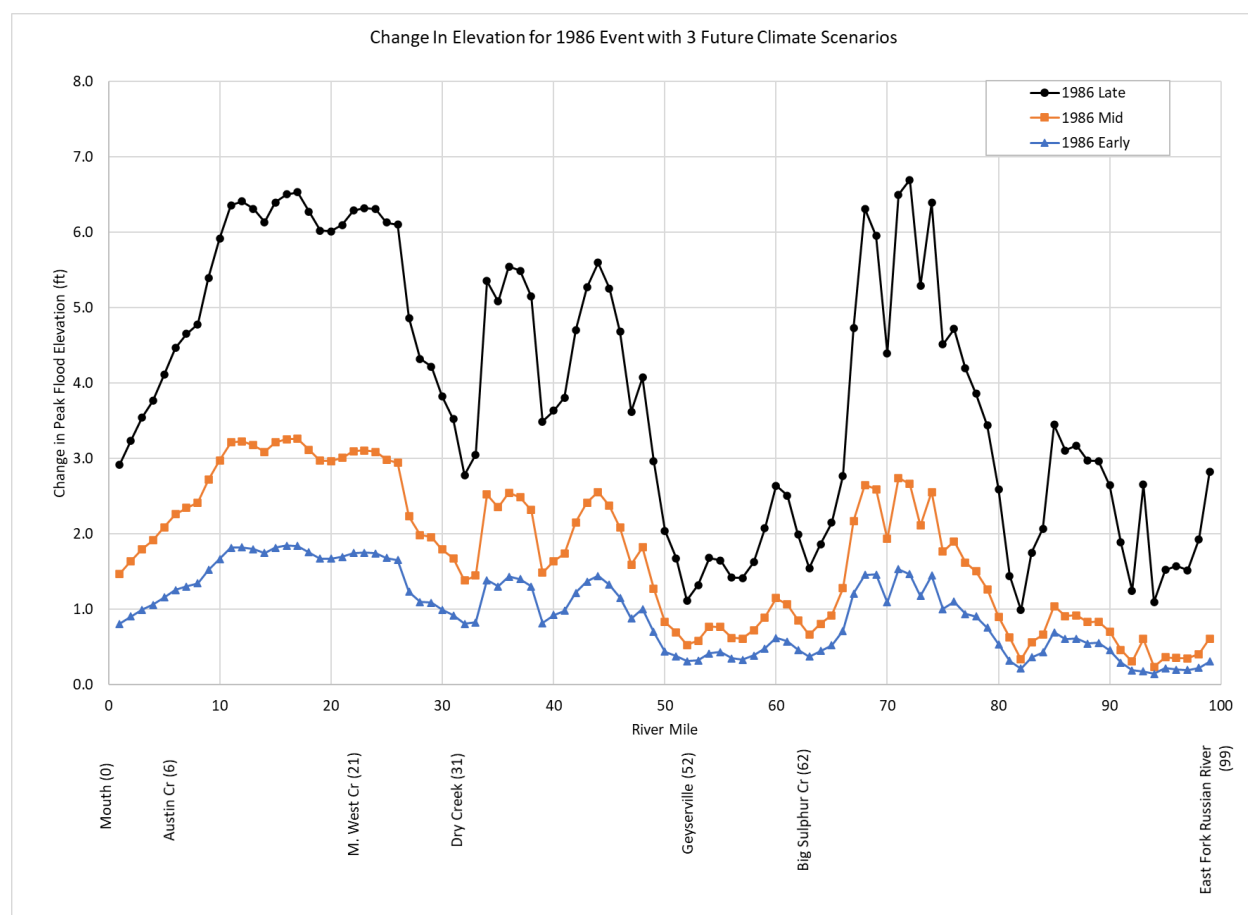
5.2 Methodology

Historical and future climate change hydrologic time series were developed for the existing Russian River HEC-RAS models for the lower Russian River. HEC-HMS and HEC-RAS models were used from the Analyzing Flood Risk for Forecast Informed Reservoir Operations in the Russian River Watershed using HEC-WAT (USACE, 2017). The downstream coastal boundary of the Russian River HEC-RAS was modified to reflect increases in mean sea level at the estuary. Changes in flood flow and stage frequencies were determined and impacts were then evaluated at the Mirabel and Wohler facilities. Additionally, changes were also evaluated for flood (flow and stage) frequencies and impacts at the Russian River Sanitation Zone.

5.3 Results

The change in elevation characterized by a future 1986-magnitude flood event under three future climate scenarios was examined along each river mile for the Russian River beginning with the mouth and ending with the East Fork of the Russian River. The simulated changes in Russian River flood stage with three future climate scenarios is shown in Figure C-11.

Figure C-11. Simulated Change in Russian River Flood Stage under Three Future Scenarios



Based on these modeling results, several observations were made and are summarized in the following sections:

- Under mid-century scenarios, changes in peak flood elevations greater than 3 feet occur in the lower Russian River, with the largest increases shown in the reach between the confluence with Mark West Creek and Austin Creek. Under the late-century scenarios, changes in peak flood elevation increase dramatically, with the largest magnitude of changes exceeding 6 feet. Across all scenarios, river miles between Geyserville and Big Sulphur Creek and between river mile 82 and the East Fork of the Russian River show the smallest magnitude of changes.
- Most infrastructure at the Wohler and Mirabel diversion facilities (e.g. collectors, access roads) will be experience substantial inundation under future climate change extreme events. All collector critical elevations will be exceeded under future extreme events and flooding may cause structural damage to facilities and will very likely flood the collectors through the access doors.
- The Russian River near Cloverdale is expected to exceed its channel capacity during the 100-year event. FEMA mapping of the 100-year and 500-year floodplains indicate that expected inundation extends over fields on the eastern bank and over light industrial areas, including the All-Coast property, and fields on the western bank. Sediment loading from Big Sulphur Creek is expected to increase and impact the riverbed significantly.

- Hazards to flood conveyance in Zone 5A include increased precipitation intensity and associated runoff, bank erosion and bank failure with higher runoff, and increased sediment transport in the Russian River and tributaries. Most populated areas in the lower Russian River are located in the 100-year floodplain, including communities of Guerneville, Monte Rio, Villa Grande, and Duncan Mills.
- Management of the freshwater lagoon in the estuary can be affected by changes in the timing and amount of runoff as well as sea level rise. Projected sea level rise and increased wave action will lead to changes in the beach profile and the effectiveness of the natural sand berm that currently closes the estuary on an annual cycle. Changes in flood stage in the lower river associated with sea level rise is most pronounced up to river mile 4 but decreases to nearly no change by river mile 10.

The 100-year Russian River floodplain will be enlarged under future climate scenarios with higher intensity rainfall events. Based on tabulated percent chance flood events shown in Table C-6, an increase of 26% in the peak flow value for the 10 percent flood event would equal the current 2 percent flood event, and an increase of 26% in the peak flow value for the current 2 percent event would equal the 1 percent event. Significant shifts in the recurrence intervals for given flood flows are expected under future climates.

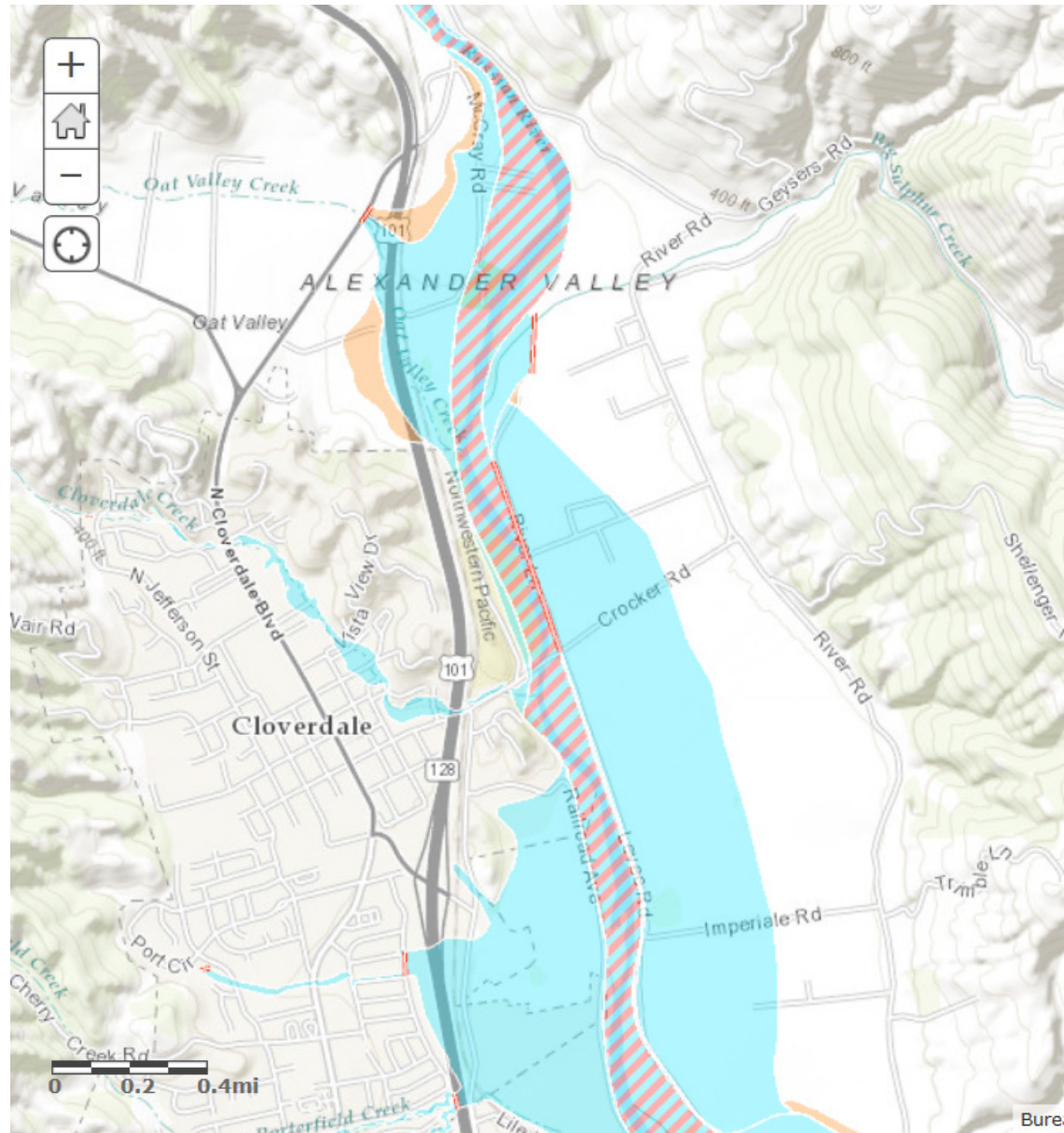
The current levees do not appear to provide 100-year flood protection based on the FEMA maps. Modifications to levees would be required to remove lands adjacent to the river from the 100-year floodplain.

Table C-6. Tabulation of Peak Discharges for Various Flood Events along the Russian River

Flooding Source and Location (Russian River)	Drainage Area (Square miles)	10 percent Peak Discharges (cfs)	2 percent Peak Discharges (cfs)	1 percent Peak Discharges (cfs)	0.2 percent Peak Discharges (cfs)
Upstream of confluence of Maacama Canal	707	51,000	73,000	82,000	115,000
Upstream of confluence of Sausal Creek	686	50,000	71,000	81,000	111,000
Upstream of confluence of Lytton Creek	678	50,000	70,000	80,000	110,000
Upstream of confluence of Miller Creek	654	48,000	68,000	79,000	106,000
Upstream of confluence of Gill Creek	642	47,000	67,000	76,000	105,000
Upstream of confluence of Big Sulphur Creek	520	46,000	58,000	73,000	100,000
Upstream of confluence of Oat Valley Creek	502	40,000	56,000	64,000	85,000

The Russian River 100-year floodplain in Cloverdale extends west to Highway 101 and the sediment contribution from Big Sulphur Creek can alter the riverbed significantly (Figure C-12).

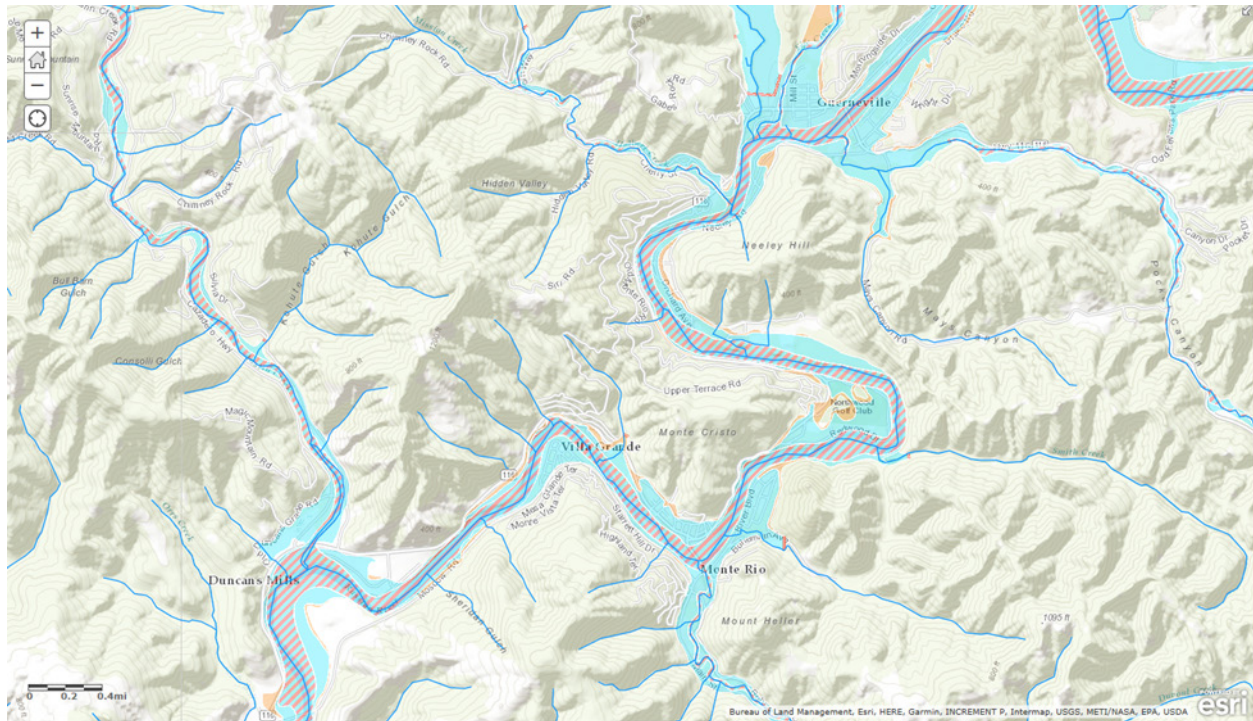
Figure C-12. 100-year Flood Hazard, Russian River near Cloverdale (Zone 4A)



Source: FEMA

Hazards to flood conveyance in Zone 5A include increased precipitation intensity and associated runoff, bank erosion and bank failure with higher runoff, and increased sediment transport in the Russian River and tributaries. Most populated areas in the lower Russian River are located in the 100-year floodplain, including communities of Guerneville, Monte Rio, Villa Grande, and Duncan Mills (Figure C-13).

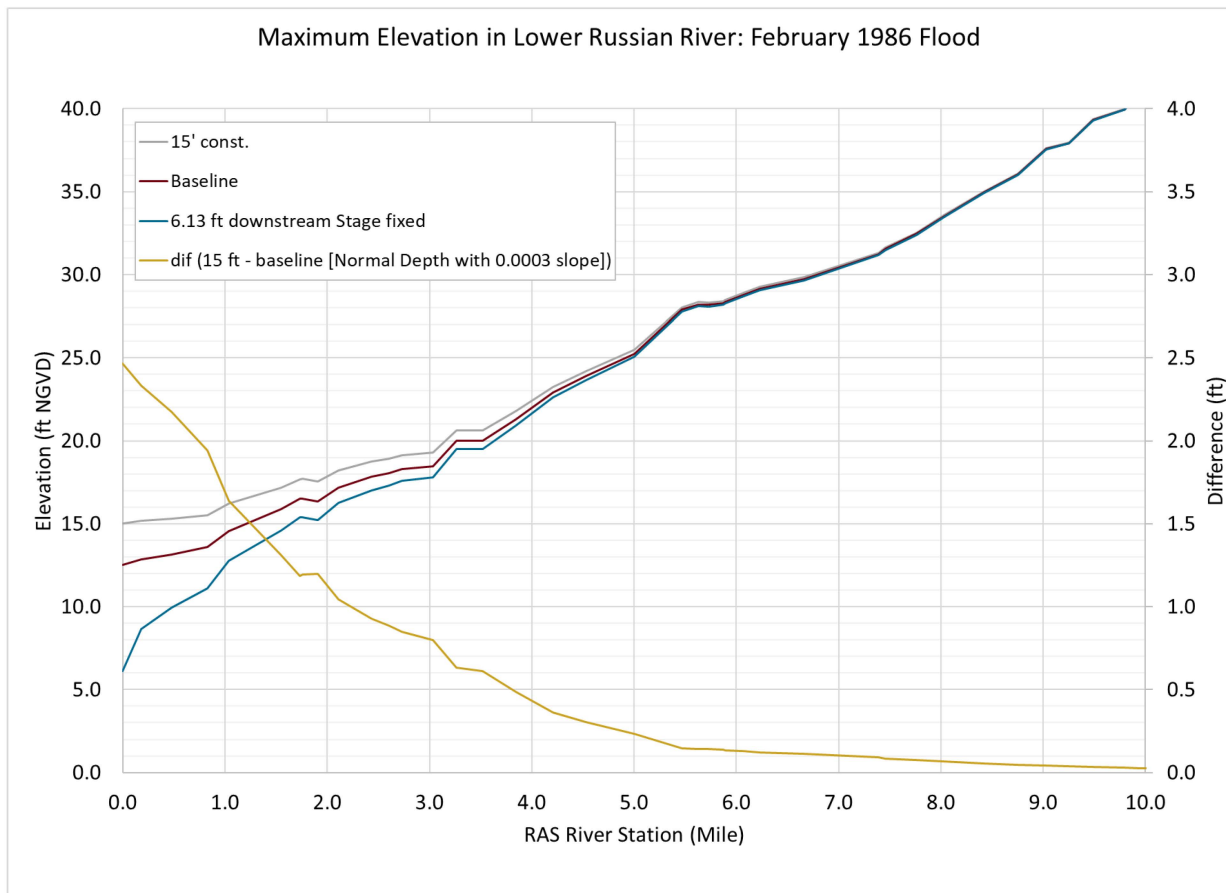
Figure C-13. 100-year Flood Hazard, Lower Russian River



Source: FEMA

Flood conveyance in Zone 5A is considered moderately sensitive to climate induced increases in river flow, as the system has current flood vulnerabilities that will occur more frequently under expected future climate scenarios. The management of the Russian River Estuary is sensitive to climate change as sea level rise will increase wave energy at the beach, requiring modifications to the management plan. Given the lack of demonstrable success of the natural berm in maintaining lagoon closure for the desired periods, future climate induced stressors acting against berm stability could further reduce the viability of this approach. Figure C-14 shows the elevation along HEC-RAS River Stations from the ocean to river mile 10 upstream. Differences are more pronounced up to river mile 4 but decrease to approximately 0 by river mile 10. Changes in flood stage in the lower river associated with sea level rise is most pronounced up to river mile 4 but decreases to nearly no change by river mile 10.

Figure C-14. Lower Russian River Sensitivity to Sea Level Rise



Sediment Loading Estimates

6.1 Purpose

One of the major responsibilities of Sonoma Water Stream Maintenance Program is associated with sediment management in Zone 1A. The goal of this analysis was to improve understanding of the distribution of sediment load, and potential changes in sediment loading in this zone.

6.2 Methodology

Historical sediment transport was correlated to historical hydrology based on maintenance records and local stream gauges. A GIS analysis was also conducted to relate gauged to ungauged streams. To estimate future sediment transport volumes for normalized and future hydrology, HEC-RAS modeling results from analyses for Santa Rosa Creek were used. Flow return periods of 2-years and 10-years as well as Early, Mid, and Late Future climate scenarios were developed for this model.

To estimate sediment loading, the Bedload Assessment in Gravel-bedded Streams (BAGS) program was used from the U.S. Forest Service and STREAM System Technology Center. BAGS employs bedload transport equations based on channel geometry, reach-average slope, and bed material grain size (Pitlick et al., 2009). The BAGS data was used to develop bedload transport estimates within the Santa Rosa Creek based on the HEC-RAS model output. The Parker (1990) and Wilcock and Crowe (2003) methods were applied within BAGS. The percent change in bedload sediment transport was estimated at 3 stations (cross-sections) within the Santa Rosa Creek for the future climate scenarios compared to the baseline historic climate scenario. Stations 11342 and 13677 are on Santa Rosa Creek downstream of Patterson Creek, and station 52535 is on Santa Rosa Creek just downstream of Brush Creek.

6.3 Results

The percent change from baseline conditions for the Early, Mid, and Late Future scenarios under each return interval is summarized in Table C-7 for the three cross-sections considered. Results vary based on the method and grain size considered. In general, the station on the Santa Rosa Creek (52535) shows the largest percent changes from baseline conditions, particularly under the late future scenario.

Figures C-15 and C-16 show the results for station 52535 in a graphical format for the 2-year and 10-year return intervals. For each of these return periods, the bedload transport increases for each of the future scenarios considered, with the largest increases being shown for the late future conditions. Compared to the 2-year return interval, the 10-year return interval shows

higher bedload transport quantities across all methods used. These results help to inform yearly sediment management maintenance activities within the Sonoma Water Stream Maintenance Program.

Several key observations derived from this analysis are summarized in the following list:

- Results vary based on the method and grain size considered. However, bedload transport increases in across all methods used.
- Station on the Santa Rosa Creek downstream of Brush Creek (52535) generally shows the largest percent changes from baseline conditions. Station 11342 and 13677 are estimated to have less than half the loading of station 52535.
- Under the mid-century scenarios, bedload transport at station 52535 is projected to increase by up to 25-55% for the 2-year event and 41-76% for the 10-year event. Bedload transport could increase by more than 150% for the late-century 10-year event.
- Planning for substantial increases in sediment removal or management is necessary for sediment management maintenance activities within the Sonoma Water Stream Maintenance Program.

Table C-7. Percent Change from Baseline Conditions at for Each Cross-Section and Return Period

Section	Time Period	Change in 50 percent sediment loading 70/30 ^[a] Parker (1990)	Change in 50 percent sediment loading 55/45 ^[a] Parker (1990)	Change in 50 percent sediment loading 70/30 ^[a] Wilcock and Crowe (2003)	Change in 50 percent sediment loading 55/45 ^[a] Wilcock and Crowe (2003)	Change in 10 percent sediment loading 70/30 ^[a] Parker (1990)	Change in 10 percent sediment loading 55/45 ^[a] Parker (1990)	Change in 10 percent sediment loading 70/30 ^[a] Wilcock and Crowe (2003)	Change in 10 percent sediment loading 55/45 ^[a] Wilcock and Crowe (2003)
11342	Early	7%	4%	9%	10%	16%	14%	19%	18%
11342	Mid	21%	14%	28%	30%	32%	28%	34%	33%
11342	Late	51%	38%	64%	69%	41%	35%	45%	44%
13677	Early	6%	3%	-22%	-19%	18%	16%	46%	-13%
13677	Mid	11%	13%	-8%	-3%	27%	10%	2%	-2%
13677	Late	40%	37%	20%	28%	42%	18%	19%	13%
52535	Early	8%	9%	6%	7%	42%	33%	14%	15%
52535	Mid	52%	54%	24%	27%	76%	59%	41%	44%
52535	Late	129%	151%	66%	73%	182%	155%	83%	89%

^[a] Gravel/Sand Distribution in Sediment

Figure C-15. Cross-Section 52535 Change in Bedload Sediment Transport for a 2-year Return Interval

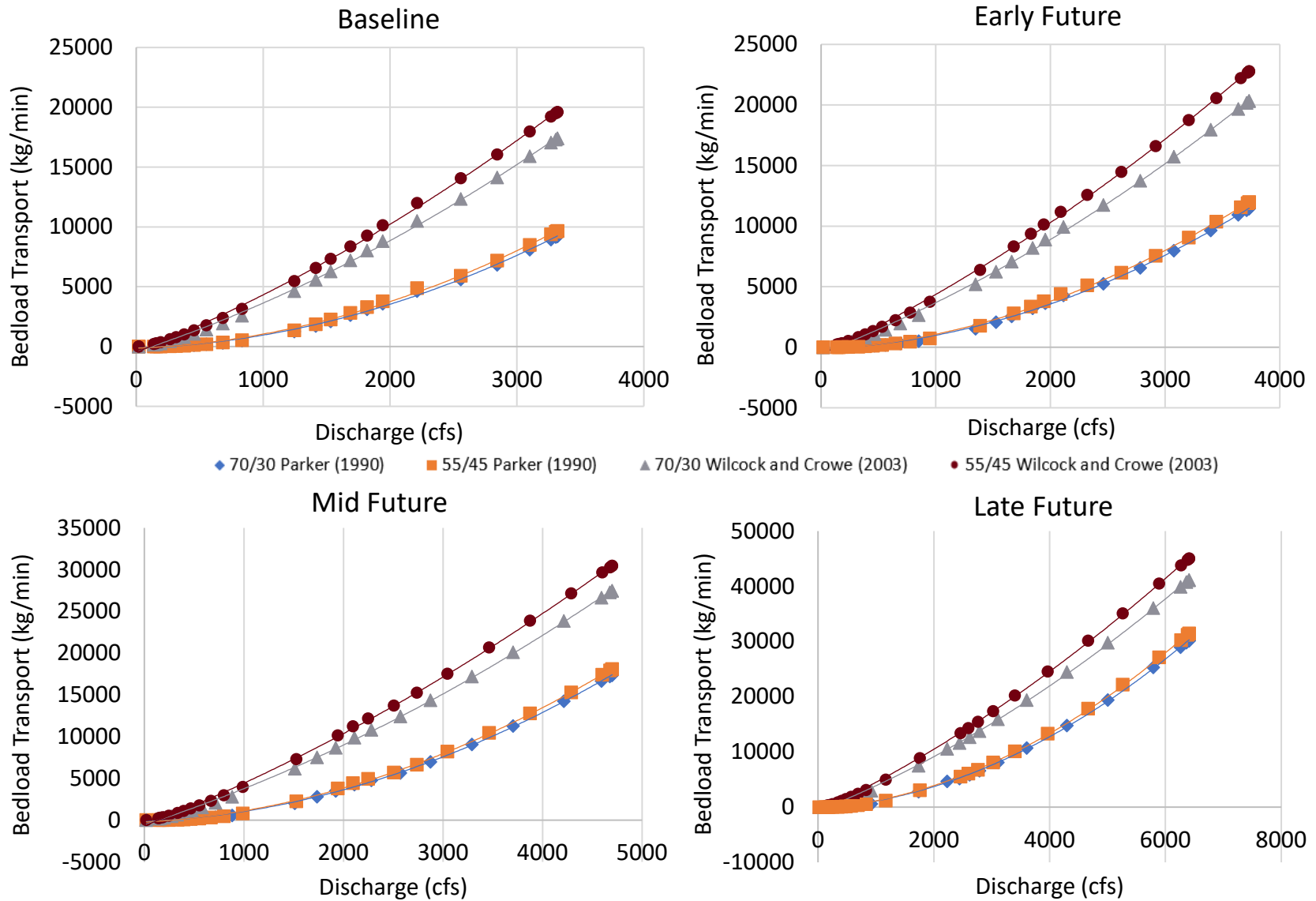
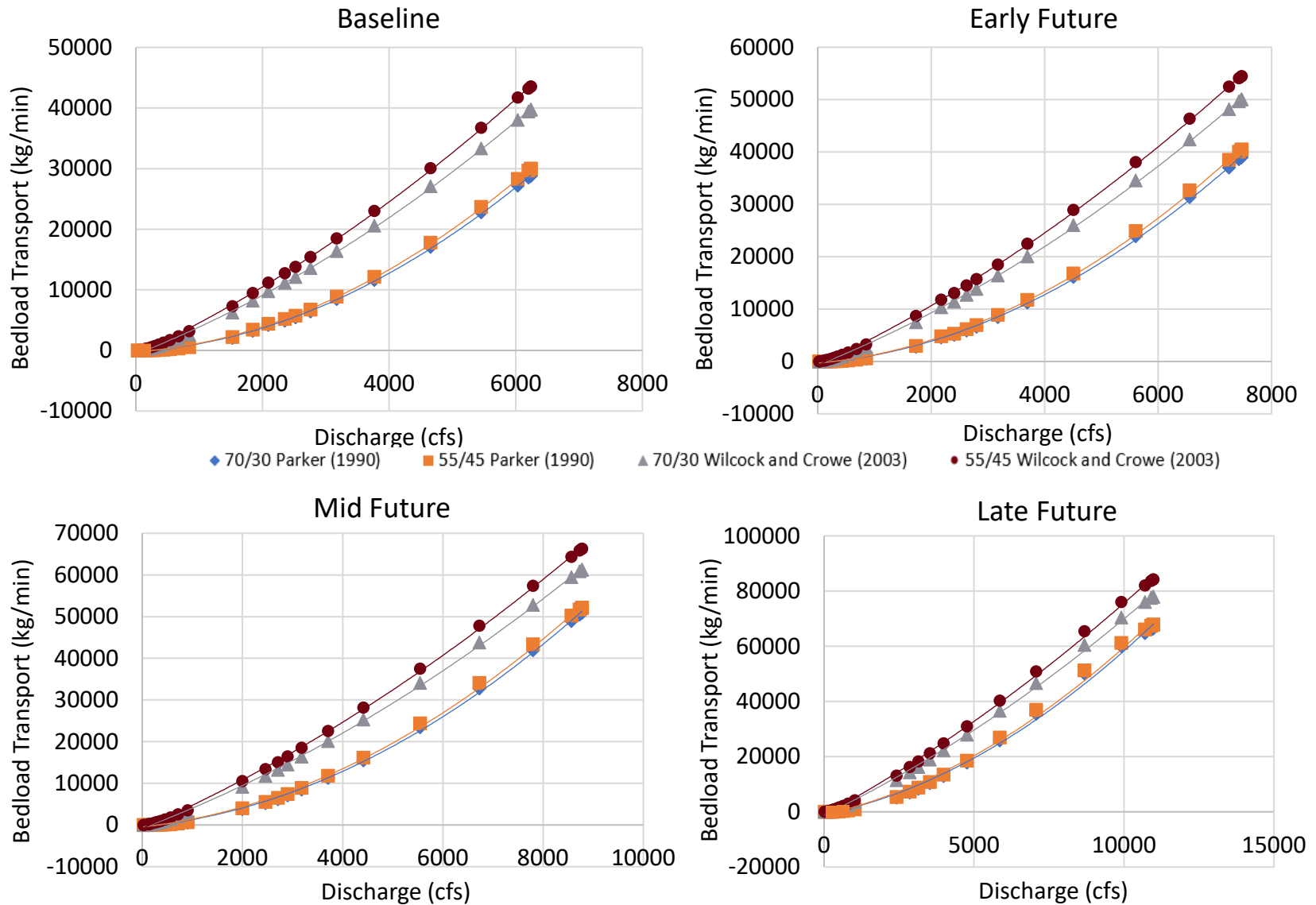


Figure C-16. Cross-Section 52535 Change in Bedload Sediment Transport for a 10-year Return Interval



This page left blank intentionally.



SECTION 7

References

- California Department of Water Resources Climate Change Technical Advisory Group (CCTAG). 2015. Perspectives and guidance for climate change analysis. California Department of Water Resources Technical Information Record. p. 142.
- Cal Adapt Wildfire Tool. 2018. <http://cal-adapt.org/tools/wildfire>
- Foltz, R.B.; Robichaud, P.R.; Rhee, H. 2009. A synthesis of post-fire road treatments for BAER teams: methods, treatment effectiveness, and decision making tools for rehabilitation. Gen. Tech. Rep. RMRS-GTR-228. Fort Collins, CO. U.S.D.A., Forest Service, Rocky Mountain Research Station. 152 p.
- Kopp, R. E., R. M. Horton, C. M. Little, J. X. Mitrovica, M. Oppenheimer, D. J. Rasmussen, B. H. Strauss, and C. Tebaldi (2014), Probabilistic 21st and 22nd century sea-level projections at a global network of tide-gauge sites, *Earth's Future*, 2, 383–406, doi:10.1002/2014EF000239
- Ocean Protection Council. 2018. State of California Sea-Level Rise Guidance 2018 Update. Retrieved from http://www.opc.ca.gov/webmaster/ftp/pdf/agenda_items/20180314/Item3_Exhibit-A OPC_SLR_Guidance-rd3.pdf.
- Parker, G. 1990. Surface-based bedload transport relation for gravel rivers. *Journal of Hydraulic Research*. 28: 417-436.
- Pierce, David W., Daniel R. Cayan, and Bridget L. Thrasher. 2014. "Statistical Downscaling Using Localized Constructed Analogs (LOCA)." *J. Hydrometeor.* 15, 2558–2585.
- Pierce, D. W., J. F. Kalansky, and D. R. Cayan, (Scripps Institution of Oceanography). 2018. Climate, Drought, and Sea Level Rise Scenarios for the Fourth California Climate Assessment. California's Fourth Climate Change Assessment, California Energy Commission. Publication Number: CNRA-CEC-2018-006.
- Pitlick, John; Cui, Yantao; Wilcock, Peter. 2009. Manual for computing bed load transport using BAGS (Bedload Assessment for Gravel-bed Streams) Software. Gen. Tech. Rep. RMRS-GTR-223. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 45 p.
- Sonoma County Water Agency (SCWA). 2016. Russian River Hydrologic Modeling for the Fish Habitat Flows and Water Rights Project. August 2016.

Sonoma County Water Agency (SCWA). 2017. Santa Rosa Creek Hydrology and Hydraulics: Hydraulic Modeling Report. Prepared by ESA. D130851.00

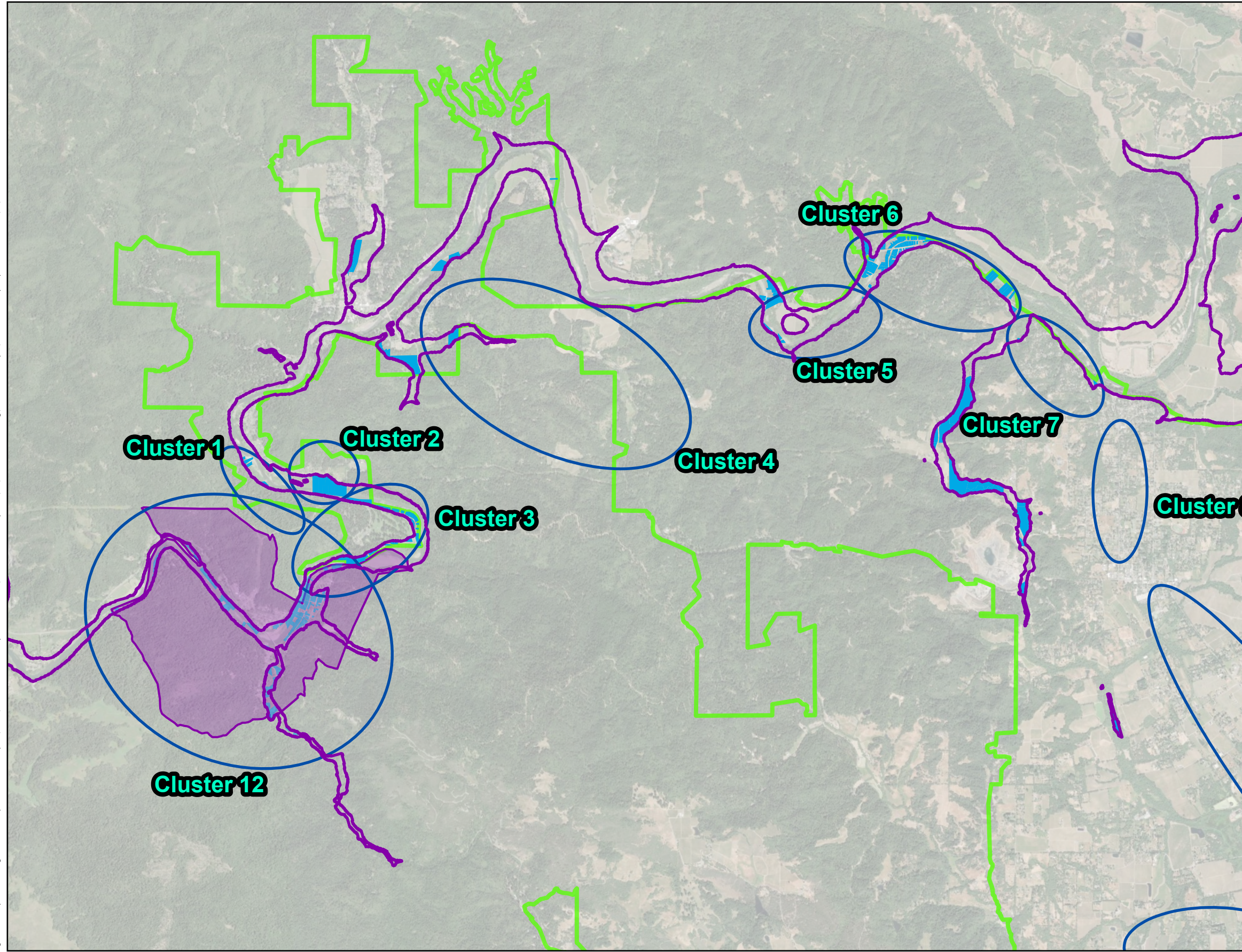
Taylor, Karl E., Ronald J. Stouffer, Gerald A. Meehl. 2012. An Overview of CMIP5 and the Experiment Design. Bull. Amer. Meteor. Soc., 93, 485–498.






U.S. Army Corps of Engineers (USACE). 2017. Analyzing Flood Risk for Forecast Informed Reservoir Operations in the Russian River Watershed using HEC-WAT. HEC Project Report PR-100. Partial Draft. June 2017.

Wilcock, P.R. Crowe, J.C. 2003. Surface-based transport model for mixed-size sediment. Journal of Hydraulic Engineering. 129: 120-128.

Climate Change Additional Figures

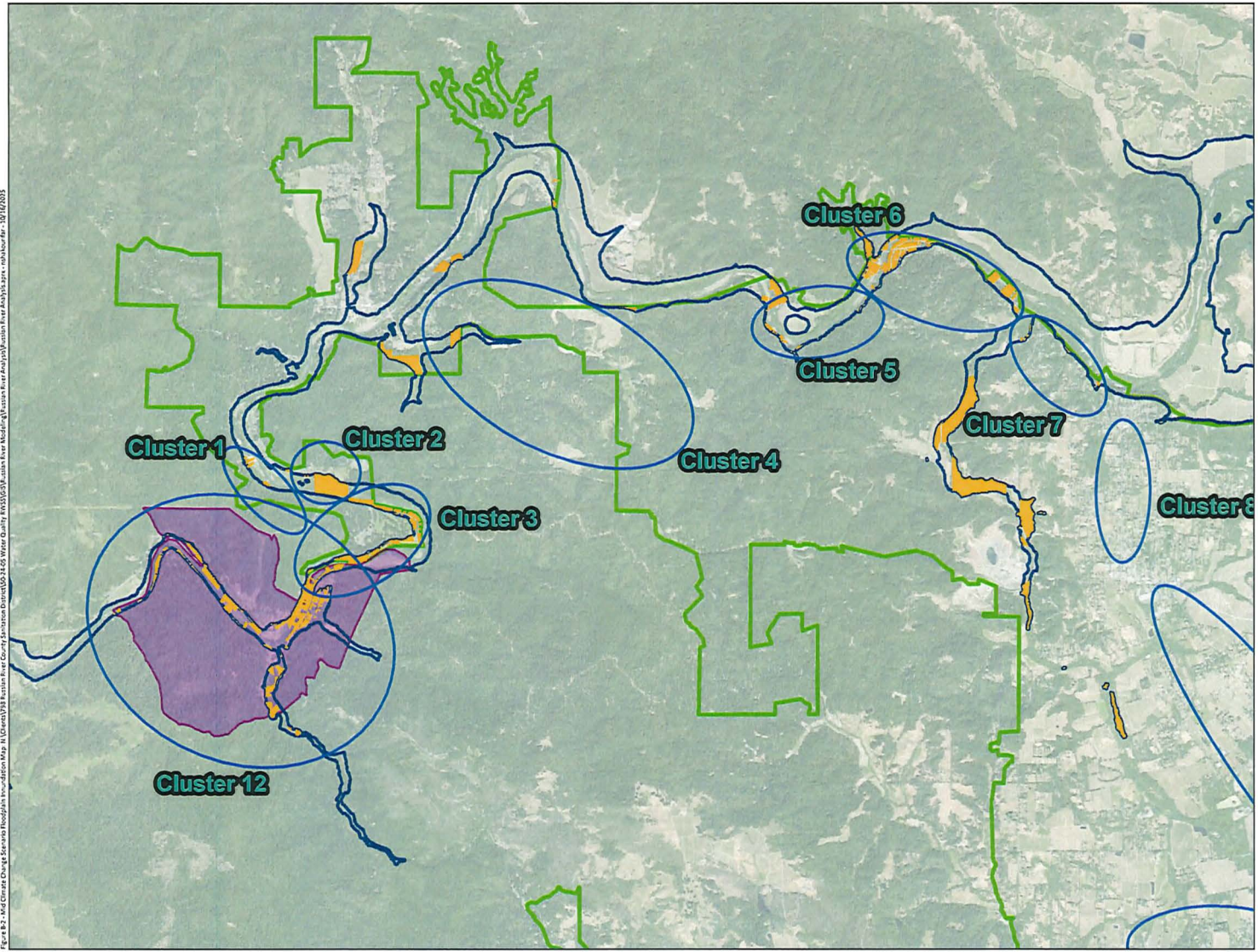
Figure B-1 - Early Climate Change Scenario Floodplain Inundation Map: N:\Clients\798 Russian River County Sanitation District\50-24-05 Water Quality RWSS\GIS\Russian River Modeling\Russian River Analysis\aprx - nshakounfar - 10/16/2025








-  Cluster Location
-  Early 1986 CC Inundation Mapping
-  Impacted Parcels Early Century CC Scenario
-  Monte Rio & Villa Grande Study Area
-  Study Area

- Notes:
1. The flood depth raster was received from the Sonoma County Water Agency (SCWA).
 2. The total number of impacted parcels under baseline conditions is 690, which is 49 more than under baseline conditions.
 3. The parcel count does not quantify the inundated area of each parcel; it includes all parcels that are impacted, regardless of whether they are only slightly inundated or completely flooded.

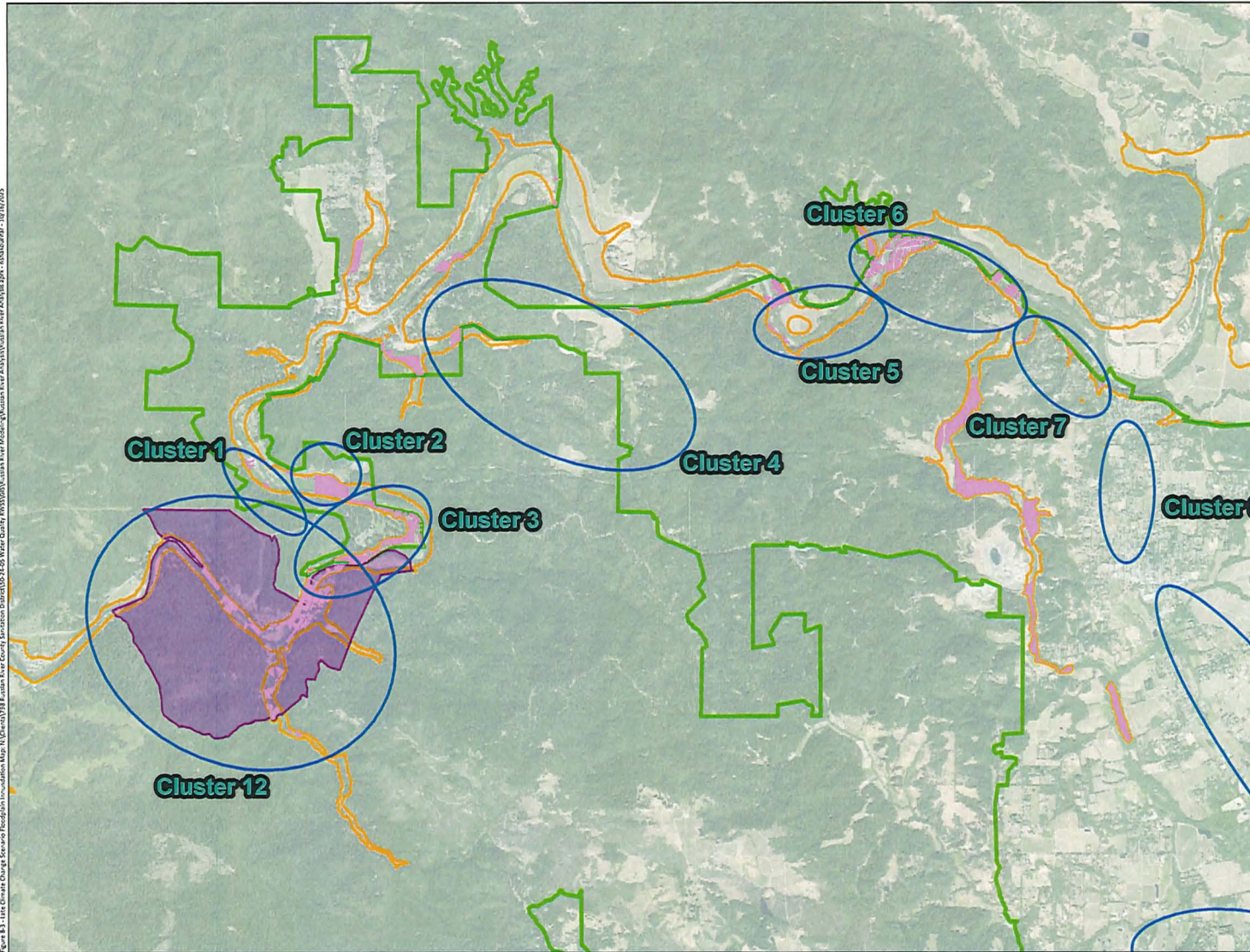
Figure F-2 - Mid Climate Change Scenario Inundation Mapping



-  Cluster Location
-  Mid 1986 CC Scenario Inundation Mapping
-  Impacted Parcels Mid Century CC Scenario
-  Monte Rio & Villa Grande Study Area
-  Study Area

- Notes:
1. The flood depth raster was received from the Sonoma County Water Agency (SCWA).
 2. The total number of impacted parcels under baseline conditions is 729, which is 88 more than under baseline conditions.
 3. The parcel count does not quantify the inundated area of each parcel; it includes all parcels that are impacted, regardless of whether they are only slightly inundated or completely flooded.

Figure F-3 - Late Climate Change Scenario Floodplain Inundation Map: N. Clearwater River County Sanitation District (DIP-24-05 Water Quality RWQIP) (Russian River Modeling) (Russian River Analysis) (Russian River Analysis) - 10/17/2023



- Cluster Location
- Late 1986 CC Scenario Inundation Mapping
- Impacted Parcels Late Century CC Scenario
- Monte Rio & Villa Grande Study Area
- Study Area

- Notes:
1. The flood depth raster was received from the Sonoma County Water Agency (SCWA).
 2. The total number of impacted parcels under baseline conditions is 832, which is 191 more than under baseline conditions.
 3. The parcel count does not quantify the inundated area of each parcel; it includes all parcels that are impacted, regardless of whether they are only slightly inundated or completely flooded.

Appendix G

Phase 2 Capital Costs



PROJECT: West County - Alternative 1a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
OPCC Manager: LMS & NS
Reviewer: CEH
Description of Work: Cost Estimating
Type of Estimate: Class 5
Date of This Estimate: 16-Oct-25

ELEMENT #	DESCRIPTION	UNIT COST	UNITS	ANTICIPATED COST
1	Fill Effluent Pond at FWD WWTP	\$3,600,000	1	\$3,600,000
2	Suspended Air Flotation at FWD WWTP	\$7,500,000	1	\$7,500,000
3	Filter influent pump station	\$2,800,000	1	\$2,800,000
4	Tertiary Disk Filtration at FWD WWTP	\$3,200,000	1	\$3,200,000
5	Chlorine Contact Basin Expansion at FWD WWTP	\$3,800,000	1	\$3,800,000
6	Headworks Improvement at GCSD WWTP	\$900,000	1	\$900,000
7	Pond Aeration System Upgrades at GCSD WWTP	\$9,400,000	1	\$9,400,000
8	Land Purchase for Storage Pond at GCSD WWTP	\$5,200,000	1	\$5,200,000
9	Effluent Storage Pond Expansion at GCSD WWTP	\$34,100,000	1	\$34,100,000
10	Pond Aeration System Upgrades at FWD WWTP	\$9,500,000	1	\$9,500,000
11	Pipelines at FWD and GCSD WWTP	\$1,000,000	1	\$1,000,000
12	Inter Facilities Pipelines	\$9,500,000	1	\$9,500,000
13	Conveyance Pipelines	\$16,700,000	1	\$16,700,000
14	Recycled Water Pipelines	\$51,600,000	1	\$51,600,000
15	Land Application (FWD/GCSD)	\$15,200,000	1	\$15,200,000
16	Conveyance Pump Stations	\$9,300,000	1	\$9,300,000
17	Tertiary Disk Filtration at RRCSD WWTP	\$1,700,000	1	\$1,700,000
18	Hydraulics Capacity Improvement at RRCSD WWTP	\$600,000	1	\$600,000
19	RRCSD CIP	\$23,000,000	1	\$23,000,000
20	Land Application (RRCSD)	\$1,400,000	1	\$1,400,000
21	Cluster 1 Sewer Service Connection	\$7,400,000	1	\$7,400,000
22	Cluster 2 Sewer Service Connection	\$9,200,000	1	\$9,200,000
23	Cluster 3 Sewer Service Connection	\$25,100,000	1	\$25,100,000
24	Cluster 4 Sewer Service Connection	\$14,000,000	1	\$14,000,000
25	Cluster 5 Sewer Service Connection	\$15,200,000	1	\$15,200,000
26	Cluster 6 Sewer Service Connection	\$55,100,000	1	\$55,100,000
27	Cluster 7 Sewer Service Connection	\$48,500,000	1	\$48,500,000
28	Cluster 8 Sewer Service Connection	\$19,700,000	1	\$19,700,000
29	Cluster 9 Sewer Service Connection	\$16,500,000	1	\$16,500,000
30	Cluster 10 Sewer Service Connection	\$9,200,000	1	\$9,200,000
31	Cluster 11 Sewer Service Connection	\$41,600,000	1	\$41,600,000
32	Cluster 12 Sewer Service Connection	\$101,000,000	1	\$101,000,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE PROJECT COST				\$572,500,000
Construction Contingency			0%	\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin Costs			25%	\$143,100,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST				\$715,600,000



PROJECT: West County - Alternative 1a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Eff Pond Fill @FWD
Element #: 1

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Effluent Pond Fill	16,100	CY	\$120	\$1,932,000	\$0	\$1,932,000
2							
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$1,932,000
Plant Paving, Grading, and Yard Piping					10%		\$193,000
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$2,130,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					10%		\$0
Contractor's Overhead and Profit					15%		\$320,000
Mobilization and Demobilization					5%		\$107,000
Contractor's General Conditions					10%		\$213,000
SUBTOTAL							\$2,770,000
Project Phase-Level OPCC Contingency					30%		\$831,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$3,600,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$900,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$4,500,000



PROJECT: West County - Alternative 1a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: SAF @FWD
Element #: 2

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Concrete Pad (to accommodate two 1.5 mgd SAF units)	57	CY	\$550	\$31,350	\$31,350	\$63,000
2	Secondary Effluent Junction Box	0	0	\$0	\$98,000	\$0	\$98,000
3	Suspended Air Floatation System (two units, each 1.5 mgd capacity - includes tank, flocculation	2	LS	\$589,625	\$1,179,250	\$1,179,250	\$2,359,000
4	Canopy	1,480	SF	\$85	\$125,800	\$0	\$126,000
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$2,646,000
Plant Paving, Grading, and Yard Piping					10%		\$265,000
Mechanical and Piping					10%		\$265,000
Electrical					25%		\$662,000
Instrumentation and Controls					15%		\$397,000
SUBTOTAL							\$4,240,000
Tax on Materials					9.3%		\$133,000
Contractor's Markup on Sub-Contractors' Work					10%		\$106,000
Contractor's Overhead and Profit					15%		\$636,000
Mobilization and Demobilization					5%		\$212,000
Contractor's General Conditions					10%		\$424,000
SUBTOTAL							\$5,750,000
Project Phase-Level OPCC Contingency					30%		\$1,725,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$7,480,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$1,870,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$9,350,000



PROJECT: West County - Alternative 1a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: FIPS @FWD
Element #: 3

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	2.6 mgd pump station before SAF and cloth disk filters	1	LS	\$2,170,000	\$2,170,000	\$0	\$2,170,000
2							
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$2,170,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$2,170,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$2,170,000
Project Phase-Level OPCC Contingency					30%		\$651,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$2,820,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$705,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$3,530,000



PROJECT: West County - Alternative 1a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Tert.Filt. @FWD
Element #: 4

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

	DESCRIPTION	MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Concrete Pad (under two 6-Disk filter unit tanks)	23	CY	\$550	\$12,650	\$12,650	\$25,000
2	Cloth Media Filters (two (2) 6-Disk AquaDisk filters in steel tanks treating a max. flow of 2.6 MG)	1	LS	\$680,000	\$680,000	\$340,000	\$1,020,000
3	Canopy	727	SF	\$85	\$61,786	\$0	\$62,000
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$1,107,000
	Plant Paving, Grading, and Yard Piping				10%		\$111,000
	Mechanical and Piping				10%		\$111,000
	Electrical				25%		\$277,000
	Instrumentation and Controls				15%		\$166,000
SUBTOTAL							\$1,770,000
	Tax on Materials				9.3%		\$70,000
	Contractor's Markup on Sub-Contractors' Work				10%		\$44,000
	Contractor's Overhead and Profit				15%		\$266,000
	Mobilization and Demobilization				5%		\$89,000
	Contractor's General Conditions				10%		\$177,000
SUBTOTAL							\$2,420,000
	Project Phase-Level OPCC Contingency				30%		\$726,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$3,150,000
	Construction Contingency				0%		\$0
	Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin				25%		\$788,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$3,940,000



PROJECT: West County - Alternative 1a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: CCB @FWD
Element #: 5

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

	DESCRIPTION	MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Excavation for four new chlorine contact basins	2,166	CY	\$45	\$97,470	\$0	\$97,000
2	Concrete basins for four (4) new chlorine contactors (match existing)	789	CY	\$550	\$433,950	\$433,950	\$868,000
3	Additional chemical storage building for gas cylinders for the two new CCBs.	432	SF	\$450	\$194,400	\$0	\$194,000
4	Metal grating over chlorine contact basin inlets	171	SF	\$35	\$5,985	\$0	\$6,000
5	Surface Mounted Fiberglass Slide Gate and Frame (2 per chlorine contact basin)	8	EA	\$5,000	\$40,000	\$20,000	\$60,000
6	Chlorine Ejector (Chlorination) Assembly (1 per chlorine contact basin)	4	EA	\$10,000	\$40,000	\$20,000	\$60,000
7	Sulfur Dioxide Ejector (Dechlorination) Assembly (1 per chlorine contact basin)	4	EA	\$10,000	\$40,000	\$20,000	\$60,000
8							
9							
10							
SUBTOTAL							\$1,345,000
	Plant Paving, Grading, and Yard Piping				10%		\$135,000
	Mechanical and Piping				10%		\$135,000
	Electrical				25%		\$336,000
	Instrumentation and Controls				15%		\$202,000
SUBTOTAL							\$2,150,000
	Tax on Materials				9.3%		\$79,000
	Contractor's Markup on Sub-Contractors' Work				10%		\$54,000
	Contractor's Overhead and Profit				15%		\$323,000
	Mobilization and Demobilization				5%		\$108,000
	Contractor's General Conditions				10%		\$215,000
SUBTOTAL							\$2,930,000
	Project Phase-Level OPCC Contingency				30%		\$879,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$3,810,000
	Construction Contingency				0%		\$0
	Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin				25%		\$953,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$4,760,000



PROJECT: West County - Alternative 1a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: GCSO Headworks
Element #: 6

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	ROTAMAT Micro Strainer Ro9	1	LS	\$157,000	\$157,000	\$157,000	\$314,000
2	Bin	1	LS	\$50,000	\$50,000	\$0	\$50,000
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$364,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					5%		\$18,000
Electrical					25%		\$91,000
Instrumentation and Controls					15%		\$55,000
SUBTOTAL							\$530,000
Tax on Materials					9.3%		\$19,000
Contractor's Markup on Sub-Contractors' Work					10%		\$15,000
Contractor's Overhead and Profit					15%		\$80,000
Mobilization and Demobilization					5%		\$27,000
Contractor's General Conditions					10%		\$53,000
SUBTOTAL							\$720,000
Project Phase-Level OPCC Contingency					30%		\$216,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$940,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$235,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$1,180,000



PROJECT: West County - Alternative 1a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Aer.Ponds @GCSD
Element #: 7

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Blower Building (houses three (3) 100HP blowers for pond aeration system)	1,053	SF	\$550	\$579,150	\$0	\$579,000
2	Ares Aeration® Pond Aeration System (in treatment ponds) & Floating Cover (on settling pond)	1	EA	\$1,468,680	\$1,468,680	\$1,468,680	\$2,937,000
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$3,516,000
Plant Paving, Grading, and Yard Piping					10%		\$352,000
Mechanical and Piping					10%		\$294,000
Electrical					25%		\$734,000
Instrumentation and Controls					15%		\$441,000
SUBTOTAL							\$5,340,000
Tax on Materials					9.3%		\$136,000
Contractor's Markup on Sub-Contractors' Work					10%		\$118,000
Contractor's Overhead and Profit					15%		\$801,000
Mobilization and Demobilization					5%		\$267,000
Contractor's General Conditions					10%		\$534,000
SUBTOTAL							\$7,200,000
Project Phase-Level OPCC Contingency					30%		\$2,160,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$9,360,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$2,340,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$11,700,000



PROJECT: West County - Alternative 1a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Land for Pond @GCSD
Element #: 8

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Land Purchase	52	acres	\$100,000	\$5,200,000	\$0	\$5,200,000
2							
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$5,200,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$5,200,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$5,200,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$5,200,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$1,300,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$6,500,000



PROJECT: West County - Alternative 1a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Eff.Stor.Pond @GCS D
Element #: 9

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Excavation	326,000	CY	\$45	\$14,670,000	\$0	\$14,670,000
2	Rip rap	9,000	ton	\$375	\$3,380,000	\$0	\$3,380,000
3	Gravel	2,000	ton	\$210	\$420,000	\$0	\$420,000
4	Misc Structure	2	EA	\$100,000	\$200,000	\$0	\$200,000
5	Fencing	5,024	LF	\$75	\$380,000	\$0	\$380,000
6							
7							
8							
9							
10							
SUBTOTAL							\$19,050,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					5%		\$950,000
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$20,000,000
Tax on Materials					9.3%		\$200,000
Contractor's Markup on Sub-Contractors' Work					10%		\$0
Contractor's Overhead and Profit					15%		\$3,000,000
Mobilization and Demobilization					5%		\$1,000,000
Contractor's General Conditions					10%		\$2,000,000
SUBTOTAL							\$26,200,000
Project Phase-Level OPCC Contingency					30%		\$7,860,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$34,060,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$8,520,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$42,580,000



PROJECT: West County - Alternative 1a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Aer.Ponds @FWD
Element #: 10

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

	DESCRIPTION	MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Blower Building (houses three (3) 75HP blowers for pond aeration system)	1,053	SF	\$450	\$473,850	\$0	\$474,000
2	Ares Aeration® Pond Aeration System (in treatment ponds) & Floating Cover (on settling pond)	1	EA	\$1,522,440	\$1,522,440	\$1,522,440	\$3,045,000
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$3,519,000
	Plant Paving, Grading, and Yard Piping				10%		\$352,000
	Mechanical and Piping				10%		\$305,000
	Electrical				25%		\$761,000
	Instrumentation and Controls				15%		\$457,000
SUBTOTAL							\$5,390,000
	Tax on Materials				9.3%		\$141,000
	Contractor's Markup on Sub-Contractors' Work				10%		\$122,000
	Contractor's Overhead and Profit				15%		\$809,000
	Mobilization and Demobilization				5%		\$270,000
	Contractor's General Conditions				10%		\$539,000
SUBTOTAL							\$7,270,000
	Project Phase-Level OPCC Contingency				30%		\$2,181,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$9,450,000
	Construction Contingency				0%		\$0
	Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin				25%		\$2,363,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$11,810,000



PROJECT: West County - Alternative 1a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Pipeline-Treatment
Element #: 11

OPPC PROVIDED BY: NS
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	10 inch Pipeline	1,490	LF	\$300	\$447,000	\$0	\$447,000
2	14 inch Pipeline	270	LF	\$420	\$113,400	\$0	\$113,000
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$560,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$560,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					10%		\$0
Contractor's Overhead and Profit					15%		\$84,000
Mobilization and Demobilization					5%		\$28,000
Contractor's General Conditions					10%		\$56,000
SUBTOTAL							\$730,000
Project Phase-Level OPCC Contingency					30%		\$219,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$950,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$238,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$1,190,000



PROJECT: West County - Alternative 1a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Pipeline-Inter Plants
Element #: 12

OPPC PROVIDED BY: NS
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Rehab 8 inch Pipeline	8,976	LF	\$120	\$1,077,120	\$0	\$1,077,000
2	6 inch Pipeline	4,224	LF	\$180	\$760,320	\$0	\$760,000
3	14 inch Pipeline	8,976	LF	\$420	\$3,769,920	\$0	\$3,770,000
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$5,607,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$5,610,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					10%		\$0
Contractor's Overhead and Profit					15%		\$842,000
Mobilization and Demobilization					5%		\$281,000
Contractor's General Conditions					10%		\$561,000
SUBTOTAL							\$7,290,000
Project Phase-Level OPCC Contingency					30%		\$2,187,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$9,480,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$2,370,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$11,850,000



PROJECT: West County - Alternative 1a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Pipeline-Conveyance
Element #: 13

OPPC PROVIDED BY: NS
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	4" Pipeline	21,180	LF	\$120	\$2,541,600	\$0	\$2,542,000
2	6" Pipeline	560	LF	\$180	\$100,800	\$0	\$101,000
3	8" Pipeline	30,260	LF	\$240	\$7,262,400	\$0	\$7,262,000
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$9,905,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$9,910,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					10%		\$0
Contractor's Overhead and Profit					15%		\$1,487,000
Mobilization and Demobilization					5%		\$496,000
Contractor's General Conditions					10%		\$991,000
SUBTOTAL							\$12,880,000
Project Phase-Level OPCC Contingency					30%		\$3,864,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$16,740,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$4,185,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$20,930,000



PROJECT: West County - Alternative 1a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Pipeline-ReW
Element #: 14

OPPC PROVIDED BY: NS
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	12 inch Pipelines	79,200	LF	\$360	\$28,512,000	\$0	\$28,512,000
2							
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$28,512,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$28,510,000
Tax on Materials					9.3%		\$2,637,000
Contractor's Markup on Sub-Contractors' Work					10%		\$0
Contractor's Overhead and Profit					15%		\$4,277,000
Mobilization and Demobilization					5%		\$1,426,000
Contractor's General Conditions					10%		\$2,851,000
SUBTOTAL							\$39,700,000
Project Phase-Level OPCC Contingency					30%		\$11,910,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$51,610,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$12,903,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$64,510,000



PROJECT: West County - Alternative 1a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: FWD Land Application
Element #: 15

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	FWD/GCSD Land Application Area	3,040	acres	\$5,000	\$15,200,000	\$0	\$15,200,000
2							
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$15,200,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$15,200,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$15,200,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$15,200,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$3,800,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$19,000,000



PROJECT: West County - Alternative 1a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Conveyance PS
Element #: 16

OPPC PROVIDED BY: NS
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	GCSD Secondary Effluent Pump Station	1	EA	\$1,960,000	\$1,960,000	\$0	\$1,960,000
2	GCSD Tertiary Effluent Pump Station	1	EA	\$3,050,000	\$3,050,000	\$0	\$3,050,000
3	FWD Tertiary Effluent Pump Station	1	EA	\$2,170,000	\$2,170,000	\$0	\$2,170,000
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$7,180,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$7,180,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$7,180,000
Project Phase-Level OPCC Contingency					30%		\$2,154,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$9,330,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$2,333,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$11,660,000



PROJECT: West County - Alternative 1a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: RRCSD Ter. Filter
Element #: 17

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cloth Disk Filter	1	LS	\$400,000	\$400,000	\$200,000	\$600,000
2							
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$600,000
Plant Paving, Grading, and Yard Piping					10%		\$60,000
Mechanical and Piping					10%		\$60,000
Electrical					25%		\$150,000
Instrumentation and Controls					15%		\$90,000
SUBTOTAL							\$960,000
Tax on Materials					9.3%		\$37,000
Contractor's Markup on Sub-Contractors' Work					10%		\$24,000
Contractor's Overhead and Profit					15%		\$144,000
Mobilization and Demobilization					5%		\$48,000
Contractor's General Conditions					10%		\$96,000
SUBTOTAL							\$1,310,000
Project Phase-Level OPCC Contingency					30%		\$393,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$1,700,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$425,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$2,130,000



PROJECT: West County - Alternative 1a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: RRCSD Hydraulic
Element #: 18

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	18" UV Effluent Pipe	150	LF	\$540	\$81,000	\$0	\$81,000
2	16" Mixed Liquor Pipe	450	LF	\$480	\$216,000	\$0	\$216,000
3	14" Secondary Effluent Pipe	60	LF	\$420	\$25,200	\$0	\$25,000
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$322,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$320,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					10%		\$0
Contractor's Overhead and Profit					15%		\$48,000
Mobilization and Demobilization					5%		\$16,000
Contractor's General Conditions					10%		\$32,000
SUBTOTAL							\$420,000
Project Phase-Level OPCC Contingency					30%		\$126,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$550,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$138,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$690,000



PROJECT: West County - Alternative 1a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: RRCSD CIP
Element #: 19

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Capital Improvement Programs	1	LS	\$8,000,000	\$8,000,000	\$0	\$8,000,000
2	Headworks Improvement	1	LS	\$1,991,434	\$1,991,434	\$0	\$2,000,000
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$10,000,000
Plant Paving, Grading, and Yard Piping					5%		\$500,000
Mechanical and Piping					5%		\$500,000
Electrical					10%		\$1,000,000
Instrumentation and Controls					10%		\$1,000,000
SUBTOTAL							\$13,000,000
Tax on Materials					9.3%		\$900,000
Contractor's Markup on Sub-Contractors' Work					10%		\$200,000
Contractor's Overhead and Profit					15%		\$2,000,000
Mobilization and Demobilization					5%		\$700,000
Contractor's General Conditions					10%		\$1,300,000
SUBTOTAL							\$18,000,000
Project Phase-Level OPCC Contingency					30%		\$5,400,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$23,000,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$5,800,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$29,000,000



PROJECT: West County - Alternative 1a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Land Application
Element #: 20

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	RRCSD Land Application Area	55	acres	\$25,000	\$1,375,000	\$0	\$1,375,000
2							
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$1,375,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$1,375,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$1,375,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$1,375,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$344,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$1,719,000



PROJECT: West County - Alternative 1a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 1
Element #: 21

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 1 Collection System	50	Parcel	\$112,900	\$5,645,000	\$0	\$5,600,000
2	Cluster 1 Raw Wastewater Pump Station	1	EA	\$1,840,000	\$1,840,000	\$0	\$1,800,000
3							
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$7,400,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$7,400,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$7,400,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$7,400,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$7,400,000



PROJECT: West County - Alternative 1a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 2
Element #: 22

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 2 Collection System	60	Parcel	\$125,500	\$7,530,000	\$0	\$7,500,000
2	Cluster 2 Raw Wastewater Pump Station	1	EA	\$1,710,000	\$1,710,000	\$0	\$1,700,000
3							
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$9,200,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$9,200,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$9,200,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$9,200,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$9,200,000



PROJECT: West County - Alternative 1a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 3
Element #: 23

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 3 Collection System	190	Parcel	\$122,200	\$23,218,000	\$0	\$23,200,000
2	Cluster 3 Raw Wastewater Pump Station	1	EA	\$1,860,000	\$1,860,000	\$0	\$1,900,000
3							
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$25,100,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$25,100,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$25,100,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$25,100,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$25,100,000



PROJECT: West County - Alternative 1a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 4
Element #: 24

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 4 Collection System	110	Parcel	\$110,000	\$12,100,000	\$0	\$12,100,000
2	Cluster 4 Raw Wastewater Pump Station	1	EA	\$1,850,000	\$1,850,000	\$0	\$1,900,000
3							
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$14,000,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$14,000,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$14,000,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$14,000,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$14,000,000



PROJECT: West County - Alternative 1a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 5
Element #: 25

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 5 Collection System	100	Parcel	\$133,200	\$13,320,000	\$0	\$13,300,000
2	Cluster 5 Raw Wastewater Pump Station	1	EA	\$1,850,000	\$1,850,000	\$0	\$1,900,000
3							
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$15,200,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$15,200,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$15,200,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$15,200,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$15,200,000



PROJECT: West County - Alternative 1a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 6
Element #: 26

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 6 Collection System	440	Parcel	\$121,000	\$53,240,000	\$0	\$53,200,000
2	Cluster 6 Raw Wastewater Pump Station	1	EA	\$1,900,000	\$1,900,000	\$0	\$1,900,000
3							
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$55,100,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$55,100,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$55,100,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$55,100,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$55,100,000



PROJECT: West County - Alternative 1a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 7
Element #: 27

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 7 Collection System	450	Parcel	\$103,500	\$46,575,000	\$0	\$46,600,000
2	Cluster 7 Raw Wastewater Pump Station	1	EA	\$1,900,000	\$1,900,000	\$0	\$1,900,000
3							
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$48,500,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$48,500,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$48,500,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$48,500,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$48,500,000



PROJECT: West County - Alternative 1a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 8
Element #: 28

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 8 Collection System	170	Parcel	\$106,000	\$18,020,000	\$0	\$18,000,000
2	Cluster 8 Raw Wastewater Pump Station	1	EA	\$1,720,000	\$1,720,000	\$0	\$1,700,000
3							
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$19,700,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$19,700,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$19,700,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$19,700,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$19,700,000



PROJECT: West County - Alternative 1a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 9
Element #: 29

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 9 Collection System	140	Parcel	\$105,800	\$14,812,000	\$0	\$14,800,000
2	Cluster 9 Raw Wastewater Pump Station	1	EA	\$1,720,000	\$1,720,000	\$0	\$1,700,000
3							
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$16,500,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$16,500,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$16,500,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$16,500,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$16,500,000



PROJECT: West County - Alternative 1a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 10
Element #: 30

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 10 Collection System	70	Parcel	\$105,800	\$7,406,000	\$0	\$7,400,000
2	Cluster 10 Raw Wastewater Pump Station	1	EA	\$1,840,000	\$1,840,000	\$0	\$1,800,000
3							
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$9,200,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$9,200,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$9,200,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$9,200,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$9,200,000



PROJECT: West County - Alternative 1a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 11
Element #: 31

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 11 Collection System	370	Parcel	\$102,000	\$37,740,000	\$0	\$37,700,000
2	Cluster 11 Raw Wastewater Pump Station	1	EA	\$1,930,000	\$1,930,000	\$0	\$1,900,000
3	OCSD piping/pumping upsize	1	LS	\$2,000,000	\$2,000,000	\$0	\$2,000,000
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$41,600,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$41,600,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$41,600,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$41,600,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$41,600,000



PROJECT: West County - Alternative 1a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 12
Element #: 32

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 12 Collection System	780	Parcel	\$129,487	\$101,000,000	\$0	\$101,000,000
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$101,000,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$101,000,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$101,000,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$101,000,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$101,000,000



PROJECT: West County - Alternative 1c
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
OPCC Manager: LMS & NS
Reviewer: CEH
Description of Work: Cost Estimating
Type of Estimate: Class 5
Date of This Estimate: 16-Oct-25

ELEMENT #	DESCRIPTION	UNIT COST	UNITS	ANTICIPATED COST
1	Fill Effluent Pond at FWD WWTP	\$3,500,000	1	\$3,500,000
2	Influent Pump Station to MBR System at FWD WWTP	\$3,700,000	1	\$3,700,000
3	Fine Screens at FWD WWTP	\$3,600,000	1	\$3,600,000
4	MBR System at FWD WWTP	\$54,300,000	1	\$54,300,000
5	UV Disinfection System at FWD WWTP	\$6,900,000	1	\$6,900,000
6	WAS Thickening, Aerobic Digestion and Dewatering at FWD	\$22,900,000	1	\$22,900,000
7	Outfall to Russian River	\$39,000,000	1	\$39,000,000
8	Equalization Facilities at FWD WWTP	\$3,800,000	1	\$3,800,000
9	Headworks Improvement at GCSD WWTP	\$900,000	1	\$900,000
10	Equalization Facilities at GCSD WWTP	\$200,000	1	\$200,000
11	Equalization Facilities at RRCSD WWTP	\$300,000	1	\$300,000
12	Recycled Water Pipelines to Quarries	\$1,500,000	1	\$1,500,000
13	Inter Facilities Pipelines	\$13,000,000	1	\$13,000,000
14	Conveyance Pipelines	\$92,800,000	1	\$92,800,000
15	Conveyance Pump Stations	\$16,700,000	1	\$16,700,000
16	Effluent Storage Pond Expansion at GCSD WWTP	\$14,500,000	1	\$14,500,000
17	Cluster 1 Sewer Service Connection	\$7,400,000	1	\$7,400,000
18	Cluster 2 Sewer Service Connection	\$9,200,000	1	\$9,200,000
19	Cluster 3 Sewer Service Connection	\$25,100,000	1	\$25,100,000
20	Cluster 4 Sewer Service Connection	\$14,000,000	1	\$14,000,000
21	Cluster 5 Sewer Service Connection	\$15,200,000	1	\$15,200,000
22	Cluster 6 Sewer Service Connection	\$55,100,000	1	\$55,100,000
23	Cluster 7 Sewer Service Connection	\$48,500,000	1	\$48,500,000
24	Cluster 8 Sewer Service Connection	\$19,700,000	1	\$19,700,000
25	Cluster 9 Sewer Service Connection	\$16,500,000	1	\$16,500,000
26	Cluster 10 Sewer Service Connection	\$9,200,000	1	\$9,200,000
27	Cluster 11 Sewer Service Connection	\$41,600,000	1	\$41,600,000
28	Cluster 12 Sewer Service Connection	\$101,000,000	1	\$101,000,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE PROJECT COST				\$640,100,000
Construction Contingency		0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin Costs		25%		\$165,900,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST				\$806,000,000



PROJECT: West County - Alternative 1c
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Eff Pond Fill @FWD
Element #: 1

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-2025
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Effluent Pond Fill	15,600	CY	\$120	\$1,872,000	\$0	\$1,872,000
2							
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$1,872,000
Plant Paving, Grading, and Yard Piping					10%		\$187,000
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$2,060,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					10%		\$0
Contractor's Overhead and Profit					15%		\$309,000
Mobilization and Demobilization					5%		\$103,000
Contractor's General Conditions					10%		\$206,000
SUBTOTAL							\$2,680,000
Project Phase-Level OPCC Contingency					30%		\$804,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$3,480,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$870,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$4,350,000



PROJECT: West County - Alternative 1c
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: MBR IPS
Element #: 2

OPPC PROVIDED BY: LMS
OPPC PREPARATION DATE: 16-Oct-2025
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	6.4 mgd pump station combining and conveying flow from all regional partners into MBR system	1	EA	\$2,810,000	\$2,810,000	\$0	\$2,810,000
2							
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$2,810,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$2,810,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$2,810,000
Project Phase-Level OPCC Contingency					30%		\$843,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$3,650,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$913,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$4,560,000



PROJECT: West County - Alternative 1c
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Fine Screens
Element #: 3

OPPC PROVIDED BY: LMS
OPPC PREPARATION DATE: 16-Oct-2025
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Concrete platform for elevated fine screens (dumpster below)	119	CY	\$550	\$65,450	\$65,450	\$131,000
2	Aluminum stairs up to fine screen platform	1	LS	\$5,000	\$5,000	\$0	\$5,000
3	Fine Screen (2mm) System with Washer/Compactor, 2 units (1 duty + 1 standby), each 7.5 mgd	LS	1	\$755,000	\$755,000	\$377,500	\$1,133,000
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$1,269,000
Plant Paving, Grading, and Yard Piping					10%		\$127,000
Mechanical and Piping					10%		\$127,000
Electrical					25%		\$317,000
Instrumentation and Controls					15%		\$190,000
SUBTOTAL							\$2,030,000
Tax on Materials					9.3%		\$76,000
Contractor's Markup on Sub-Contractors' Work					10%		\$51,000
Contractor's Overhead and Profit					15%		\$305,000
Mobilization and Demobilization					5%		\$102,000
Contractor's General Conditions					10%		\$203,000
SUBTOTAL							\$2,770,000
Project Phase-Level OPCC Contingency					30%		\$831,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$3,600,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$900,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$4,500,000



PROJECT: West County - Alternative 1c
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: MBR System
Element #: 4

OPPC PROVIDED BY: LMS
OPPC PREPARATION DATE: 16-Oct-2025
REVIEWED BY: CEH

	DESCRIPTION	MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Concrete for process basins and membrane basins	2,865	CY	\$550	\$1,575,750	\$1,575,750	\$3,152,000
2	Concrete building for blowers next to MBR basins.	2,863	SF	\$450	\$1,288,125	\$0	\$1,288,000
3	Concrete building for permeate pumps next to MBR basins.	2,131	SF	\$450	\$959,063	\$0	\$959,000
4	MBR Treatment System (three trians, 6.75 mgd capacity)	1	LS	\$6,856,650	\$6,856,650	\$6,856,650	\$13,713,000
5	Bridge crane system above membrane basins	1	EA	\$80,000	\$80,000	\$40,000	\$120,000
6							
7							
8							
9							
10							
SUBTOTAL							\$19,232,000
	Plant Paving, Grading, and Yard Piping				10%		\$1,923,000
	Mechanical and Piping				10%		\$1,923,000
	Electrical				25%		\$4,808,000
	Instrumentation and Controls				15%		\$2,885,000
SUBTOTAL							\$30,770,000
	Tax on Materials				9.3%		\$995,000
	Contractor's Markup on Sub-Contractors' Work				10%		\$769,000
	Contractor's Overhead and Profit				15%		\$4,616,000
	Mobilization and Demobilization				5%		\$1,539,000
	Contractor's General Conditions				10%		\$3,077,000
SUBTOTAL							\$41,770,000
	Project Phase-Level OPCC Contingency				30%		\$12,531,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$54,300,000
	Construction Contingency				0%		\$0
	Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin				25%		\$13,575,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$67,880,000



PROJECT: West County - Alternative 1c
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: UV
Element #: 5

OPPC PROVIDED BY: LMS
OPPC PREPARATION DATE: 16-Oct-2025
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Concrete for three UV channels	102	CY	\$550	\$56,100	\$56,100	\$112,000
2	Concrete pads for control panels (one dedicated to each channel)	17	CY	\$550	\$9,350	\$9,350	\$19,000
3	Aluminum grating over channels	267	SF	\$35	\$9,345	\$0	\$9,000
4	Canopy over channels and concrete pads	1,428	SF	\$85	\$121,380	\$0	\$121,000
5	UV Treatment System (three channels, 6.75 mgd total capacity, 80 mJ/cm2 @65%UVT)	1	LS	\$1,099,500	\$1,099,500	\$1,099,500	\$2,199,000
6							
7							
8							
9							
10							
SUBTOTAL							\$2,460,000
Plant Paving, Grading, and Yard Piping					10%		\$246,000
Mechanical and Piping					10%		\$246,000
Electrical					25%		\$615,000
Instrumentation and Controls					15%		\$369,000
SUBTOTAL							\$3,940,000
Tax on Materials					9.3%		\$120,000
Contractor's Markup on Sub-Contractors' Work					10%		\$98,000
Contractor's Overhead and Profit					15%		\$591,000
Mobilization and Demobilization					5%		\$197,000
Contractor's General Conditions					10%		\$394,000
SUBTOTAL							\$5,340,000
Project Phase-Level OPCC Contingency					30%		\$1,602,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$6,940,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$1,735,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$8,680,000



PROJECT: West County - Alternative 1c
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Aerobic Digestion
Element #: 6

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-2025
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Slab, Roof, Walls - Aerobic Digesters	1,646	CY	\$550	\$905,349	\$905,349	\$1,811,000
2	Slab, Roof Walls - TWAS Storage	229	CY	\$550	\$125,701	\$125,701	\$251,000
3	Solids and Electrical Building	10,500	SF	\$400	\$0	\$4,200,000	\$4,200,000
4	WAS Pumps	3	EA	\$35,000	\$105,000	\$14,000	\$119,000
5	Rotary Drum Thickener	2	EA	\$140,596	\$281,192	\$56,238	\$337,000
6	Thickener Feed Pump	2	EA	\$14,981	\$29,963	\$5,993	\$36,000
7	TWAS Tank Mixer	1	EA	\$75,000	\$75,000	\$30,000	\$105,000
8	TWAS Tank Blower	1	EA	\$91,050	\$91,050	\$36,420	\$127,000
9	TWAS Pumps	2	EA	\$14,981	\$29,963	\$5,993	\$36,000
10	Centrifuge	2	EA	\$358,295	\$716,589	\$143,318	\$860,000
11	Conveyors	1	LS	\$81,660	\$81,660	\$32,664	\$114,000
12	Digester Blowers and Diffusers	2	EA	\$91,050	\$182,100	\$36,420	\$219,000
SUBTOTAL							\$8,215,000
Plant Paving, Grading, and Yard Piping					10%		\$822,000
Mechanical and Piping					10%		\$822,000
Electrical					25%		\$2,054,000
Instrumentation and Controls					15%		\$1,232,000
SUBTOTAL							\$13,150,000
Tax on Materials					9.3%		\$218,000
Contractor's Markup on Sub-Contractors' Work					10%		\$329,000
Contractor's Overhead and Profit					15%		\$1,973,000
Mobilization and Demobilization					5%		\$658,000
Contractor's General Conditions					10%		\$1,315,000
SUBTOTAL							\$17,640,000
Project Phase-Level OPCC Contingency					30%		\$5,292,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$22,930,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$5,733,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$28,660,000





PROJECT: West County - Alternative 1c
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Outfall
Element #: 7

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-2025
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Outfall	1	LS	\$3,800,000	\$3,800,000	\$0	\$3,800,000
2	30" Pipeline	21,400	LF	\$900	\$19,260,000	\$0	\$19,260,000
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$23,060,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$23,060,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					10%		\$0
Contractor's Overhead and Profit					15%		\$3,459,000
Mobilization and Demobilization					5%		\$1,153,000
Contractor's General Conditions					10%		\$2,306,000
SUBTOTAL							\$29,980,000
Project Phase-Level OPCC Contingency					30%		\$8,994,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$38,970,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					40%		\$15,588,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$54,560,000



PROJECT: West County - Alternative 1c
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: FWD EQ Facilities
Element #: 8

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-2025
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Flow Control Structure	1	EA	\$98,000	\$98,000	\$0	\$98,000
2	8" Pipeline	140	LF	\$240	\$33,600	\$0	\$34,000
3	10" Pipeline	210	LF	\$300	\$63,000	\$0	\$63,000
4	16" Pipeline	50	LF	\$480	\$24,000	\$0	\$24,000
5	18" Pipeline	490	LF	\$540	\$264,600	\$0	\$265,000
6	20" Pipeline	20	LF	\$600	\$12,000	\$0	\$12,000
7	FWD Ponds Drain Pump	1	EA	\$1,750,000	\$1,750,000	\$0	\$1,750,000
8							
9							
10							
SUBTOTAL							\$2,246,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$2,250,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					10%		\$0
Contractor's Overhead and Profit					15%		\$338,000
Mobilization and Demobilization					5%		\$113,000
Contractor's General Conditions					10%		\$225,000
SUBTOTAL							\$2,930,000
Project Phase-Level OPCC Contingency					30%		\$879,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$3,810,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$953,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$4,760,000



PROJECT: West County - Alternative 1c
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: GCSO Headworks
Element #: 9

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-2025
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	ROTAMAT Micro Strainer Ro9	1	LS	\$157,000	\$157,000	\$157,000	\$314,000
2	Bin	1	LS	\$50,000	\$50,000	\$0	\$50,000
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$364,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					5%		\$18,000
Electrical					25%		\$91,000
Instrumentation and Controls					15%		\$55,000
SUBTOTAL							\$530,000
Tax on Materials					9.3%		\$19,000
Contractor's Markup on Sub-Contractors' Work					10%		\$15,000
Contractor's Overhead and Profit					15%		\$80,000
Mobilization and Demobilization					5%		\$27,000
Contractor's General Conditions					10%		\$53,000
SUBTOTAL							\$720,000
Project Phase-Level OPCC Contingency					30%		\$216,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$940,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$235,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$1,180,000



PROJECT: West County - Alternative 1c
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: GCSD EQ Facilities
Element #: 10

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-2025
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Flow Control Structure	1	EA	\$98,000	\$98,000	\$0	\$98,000
2	8" Pipeline	30	LF	\$240	\$7,200	\$0	\$7,000
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$105,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$110,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					10%		\$0
Contractor's Overhead and Profit					15%		\$17,000
Mobilization and Demobilization					5%		\$6,000
Contractor's General Conditions					10%		\$11,000
SUBTOTAL							\$140,000
Project Phase-Level OPCC Contingency					30%		\$42,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$180,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$45,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$230,000



PROJECT: West County - Alternative 1c
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: RRCSD EQ Facilities
Element #: 11

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-2025
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Flow Control Structure	1	EA	\$98,000	\$98,000	\$0	\$98,000
2	16" Pipeline	190	0	\$480	\$91,200	\$0	\$91,000
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$189,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$190,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					10%		\$0
Contractor's Overhead and Profit					15%		\$29,000
Mobilization and Demobilization					5%		\$10,000
Contractor's General Conditions					10%		\$19,000
SUBTOTAL							\$250,000
Project Phase-Level OPCC Contingency					30%		\$75,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$330,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$83,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$410,000



PROJECT: West County - Alternative 1c
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: ReW Pipelines
Element #: 12

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-2025
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	12" Pipelines	2,500	LF	\$360	\$900,000	\$0	\$900,000
2							
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$900,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$900,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					10%		\$0
Contractor's Overhead and Profit					15%		\$135,000
Mobilization and Demobilization					5%		\$45,000
Contractor's General Conditions					10%		\$90,000
SUBTOTAL							\$1,170,000
Project Phase-Level OPCC Contingency					30%		\$351,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$1,520,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$380,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$1,900,000



PROJECT: West County - Alternative 1c
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Pipeline-Inter Plants
Element #: 13

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-2025
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Rehab 8 inch Pipeline	8,976	LF	\$120	\$1,077,120	\$0	\$1,077,000
2	6 inch Pipeline	6,720	LF	\$180	\$1,209,600	\$0	\$1,210,000
3	20 inch Pipeline	8,976	LF	\$600	\$5,385,600	\$0	\$5,386,000
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$7,673,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$7,670,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					10%		\$0
Contractor's Overhead and Profit					15%		\$1,151,000
Mobilization and Demobilization					5%		\$384,000
Contractor's General Conditions					10%		\$767,000
SUBTOTAL							\$9,970,000
Project Phase-Level OPCC Contingency					30%		\$2,991,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$12,960,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$3,240,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$16,200,000



PROJECT: West County - Alternative 1c
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Conveyance Pipeline
Element #: 14

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-2025
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Creek Crossing	2	EA	\$3,800,000	\$7,600,000	\$0	\$7,600,000
2	4" Pipeline	6,860	LF	\$120	\$823,200	\$0	\$823,000
3	6" Pipeline	560	LF	\$180	\$100,800	\$0	\$101,000
4	8" Pipeline	3,960	LF	\$240	\$950,400	\$0	\$950,000
5	16" Pipeline	5,370	LF	\$480	\$2,577,600	\$0	\$2,578,000
6	24" Pipeline	59,550	LF	\$720	\$42,876,000	\$0	\$42,876,000
7							
8							
9							
10							
SUBTOTAL							\$54,928,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$54,930,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					10%		\$0
Contractor's Overhead and Profit					15%		\$8,240,000
Mobilization and Demobilization					5%		\$2,747,000
Contractor's General Conditions					10%		\$5,493,000
SUBTOTAL							\$71,410,000
Project Phase-Level OPCC Contingency					30%		\$21,423,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$92,830,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$23,208,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$116,040,000



PROJECT: West County - Alternative 1c
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Conveyance PS
Element #: 15

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-2025
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	RRCSD Raw Water Effluent Pump Station	1	EA	\$2,900,000	\$2,900,000	\$0	\$2,900,000
2	GCSD Raw Water Effluent Pump Station	1	EA	\$1,860,000	\$1,860,000	\$0	\$1,860,000
3	GCSD Tertiary Water Pump Station	1	EA	\$1,840,000	\$1,840,000	\$0	\$1,840,000
4	FWD Tertiary Effluent Pump Station	1	EA	\$2,810,000	\$2,810,000	\$0	\$2,810,000
5	FWD Outfall Pump Station	1	EA	\$3,410,000	\$3,410,000	\$0	\$3,410,000
6							
7							
8							
9							
10							
SUBTOTAL							\$12,820,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$12,820,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$12,820,000
Project Phase-Level OPCC Contingency					30%		\$3,846,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$16,670,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$4,168,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$20,840,000



PROJECT: West County - Alternative 1c
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Eff.Stor.Pond @GCSD
Element #: 16

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-2025
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Excavation	117,000	CY	\$45	\$5,265,000	\$0	\$5,265,000
2	Rip rap	4,000	ton	\$375	\$1,500,000	\$0	\$1,500,000
3	Gravel	2,000	ton	\$210	\$420,000	\$0	\$420,000
4	Misc Structure	2	EA	\$100,000	\$200,000	\$0	\$200,000
5	Fencing	3,340	LF	\$75	\$250,491	\$0	\$250,000
6							
7							
8							
9							
10							
SUBTOTAL							\$7,635,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					5%		\$382,000
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$8,020,000
Tax on Materials					9.3%		\$706,000
Contractor's Markup on Sub-Contractors' Work					10%		\$0
Contractor's Overhead and Profit					15%		\$1,203,000
Mobilization and Demobilization					5%		\$401,000
Contractor's General Conditions					10%		\$802,000
SUBTOTAL							\$11,130,000
Project Phase-Level OPCC Contingency					30%		\$3,339,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$14,470,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$3,618,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$18,090,000



PROJECT: West County - Alternative 1c
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 1
Element #: 17

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-2025
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 1 Collection System	50	Parcel	\$112,900	\$5,645,000	\$0	\$5,600,000
2	Cluster 1 Raw Wastewater Pump Station	1	EA	\$1,840,000	\$1,840,000	\$0	\$1,800,000
3							
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$7,400,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$7,400,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$7,400,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$7,400,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$7,400,000



PROJECT: West County - Alternative 1c
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 2
Element #: 18

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-2025
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 2 Collection System	60	Parcel	\$125,500	\$7,530,000	\$0	\$7,500,000
2	Cluster 2 Raw Wastewater Pump Station	1	EA	\$1,710,000	\$1,710,000	\$0	\$1,700,000
3							
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$9,200,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$9,200,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$9,200,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$9,200,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$9,200,000



PROJECT: West County - Alternative 1c
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 3
Element #: 19

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-2025
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 3 Collection System	190	Parcel	\$122,200	\$23,218,000	\$0	\$23,200,000
2	Cluster 3 Raw Wastewater Pump Station	1	EA	\$1,860,000	\$1,860,000	\$0	\$1,900,000
3							
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$25,100,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$25,100,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$25,100,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$25,100,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$25,100,000



PROJECT: West County - Alternative 1c
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 4
Element #: 20

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-2025
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 4 Collection System	110	Parcel	\$110,000	\$12,100,000	\$0	\$12,100,000
2	Cluster 4 Raw Wastewater Pump Station	1	EA	\$1,850,000	\$1,850,000	\$0	\$1,900,000
3							
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$14,000,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$14,000,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$14,000,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$14,000,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$14,000,000



PROJECT: West County - Alternative 1c
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 5
Element #: 21

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-2025
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 5 Collection System	100	Parcel	\$133,200	\$13,320,000	\$0	\$13,300,000
2	Cluster 5 Raw Wastewater Pump Station	1	EA	\$1,850,000	\$1,850,000	\$0	\$1,900,000
3							
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$15,200,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$15,200,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$15,200,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$15,200,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$15,200,000



PROJECT: West County - Alternative 1c
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 6
Element #: 22

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-2025
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 6 Collection System	440	Parcel	\$121,000	\$53,240,000	\$0	\$53,200,000
2	Cluster 6 Raw Wastewater Pump Station	1	EA	\$1,900,000	\$1,900,000	\$0	\$1,900,000
3							
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$55,100,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$55,100,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$55,100,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$55,100,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$55,100,000



PROJECT: West County - Alternative 1c
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 7
Element #: 23

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-2025
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 7 Collection System	450	Parcel	\$103,500	\$46,575,000	\$0	\$46,600,000
2	Cluster 7 Raw Wastewater Pump Station	1	EA	\$1,900,000	\$1,900,000	\$0	\$1,900,000
3							
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$48,500,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$48,500,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$48,500,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$48,500,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$48,500,000



PROJECT: West County - Alternative 1c
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 8
Element #: 24

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-2025
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 8 Collection System	170	Parcel	\$106,000	\$18,020,000	\$0	\$18,000,000
2	Cluster 8 Raw Wastewater Pump Station	1	EA	\$1,720,000	\$1,720,000	\$0	\$1,700,000
3							
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$19,700,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$19,700,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$19,700,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$19,700,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$19,700,000



PROJECT: West County - Alternative 1c
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 9
Element #: 25

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-2025
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 9 Collection System	140	Parcel	\$105,800	\$14,812,000	\$0	\$14,800,000
2	Cluster 9 Raw Wastewater Pump Station	1	EA	\$1,720,000	\$1,720,000	\$0	\$1,700,000
3							
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$16,500,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$16,500,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$16,500,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$16,500,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$16,500,000



PROJECT: West County - Alternative 1c
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 10
Element #: 26

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-2025
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 10 Collection System	70	Parcel	\$105,800	\$7,406,000	\$0	\$7,400,000
2	Cluster 10 Raw Wastewater Pump Station	1	EA	\$1,840,000	\$1,840,000	\$0	\$1,800,000
3							
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$9,200,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$9,200,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$9,200,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$9,200,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$9,200,000



PROJECT: West County - Alternative 1c
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 11
Element #: 27

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-2025
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 11 Collection System	370	Parcel	\$102,000	\$37,740,000	\$0	\$37,700,000
2	Cluster 11 Raw Wastewater Pump Station	1	EA	\$1,930,000	\$1,930,000	\$0	\$1,900,000
3	OCSD piping/pumping upsize	1	LS	\$2,000,000	\$2,000,000	\$0	\$2,000,000
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$41,600,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$41,600,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$41,600,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$41,600,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$41,600,000



PROJECT: West County - Alternative 1c
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 12
Element #: 28

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-2025
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 12 Collection System	780	Parcel	\$129,487	\$101,000,000	\$0	\$101,000,000
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$101,000,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$101,000,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$101,000,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$101,000,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$101,000,000



PROJECT: West County - Alternative 2a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
OPCC Manager: Niloofar S.
Reviewer: CEH
Description of Work: Cost Estimating
Type of Estimate: Class 5
Date of This Estimate: 16-Oct-25

ELEMENT #	DESCRIPTION	UNIT COST	UNITS	ANTICIPATED COST
1	Equalization Facilities at FWD WWTP	\$3,400,000	1	\$3,400,000
2	Headworks Improvement at GCSD WWTP	\$900,000	1	\$900,000
3	Equalization Facilities at GCSD WWTP	\$200,000	1	\$200,000
4	Equalization Facilities at RRCS D WWTP	\$300,000	1	\$300,000
5	Inter Facilities Pipelines	\$3,900,000	1	\$3,900,000
6	Conveyance Pipelines	\$184,800,000	1	\$184,800,000
7	Conveyance Pump Stations	\$9,000,000	1	\$9,000,000
8	Connection fee to Windsor	\$111,000,000	1	\$111,000,000
9	Cluster 1 Sewer Service Connection	\$7,400,000	1	\$7,400,000
10	Cluster 2 Sewer Service Connection	\$9,200,000	1	\$9,200,000
11	Cluster 3 Sewer Service Connection	\$25,100,000	1	\$25,100,000
12	Cluster 4 Sewer Service Connection	\$14,000,000	1	\$14,000,000
13	Cluster 5 Sewer Service Connection	\$15,200,000	1	\$15,200,000
14	Cluster 6 Sewer Service Connection	\$55,100,000	1	\$55,100,000
15	Cluster 7 Sewer Service Connection	\$48,500,000	1	\$48,500,000
16	Cluster 8 Sewer Service Connection	\$19,700,000	1	\$19,700,000
17	Cluster 9 Sewer Service Connection	\$16,500,000	1	\$16,500,000
18	Cluster 10 Sewer Service Connection	\$9,200,000	1	\$9,200,000
19	Cluster 11 Sewer Service Connection	\$41,600,000	1	\$41,600,000
20	Cluster 12 Sewer Service Connection	\$101,000,000	1	\$101,000,000
-				
-				
ENGINEER'S PRELIMINARY OPINION OF PROBABLE PROJECT COST				\$676,000,000
	Construction Contingency		0%	\$0
	Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin Costs		25%	\$169,000,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST				\$845,000,000



PROJECT: West County - Alternative 2a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: FWD EQ Facilities
Element #: 1

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Flow Control Structure	1	EA	\$98,000	\$98,000	\$0	\$98,000
2	6" Pipeline	210	LF	\$180	\$37,800	\$0	\$38,000
3	8" Pipeline	480	LF	\$240	\$115,200	\$0	\$115,000
4	FWD Ponds Drain Pump	1	EA	\$1,750,000	\$1,750,000	\$0	\$1,750,000
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$2,001,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$2,000,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					10%		\$0
Contractor's Overhead and Profit					15%		\$300,000
Mobilization and Demobilization					5%		\$100,000
Contractor's General Conditions					10%		\$200,000
SUBTOTAL							\$2,600,000
Project Phase-Level OPCC Contingency					30%		\$780,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$3,380,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$845,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$4,230,000



PROJECT: West County - Alternative 2a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: GCSD Headworks
Element #: 2

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	ROTAMAT Micro Strainer Ro9	1	LS	\$157,000	\$157,000	\$157,000	\$314,000
2	Bin	1	LS	\$50,000	\$50,000	\$0	\$50,000
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$364,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					5%		\$18,000
Electrical					25%		\$91,000
Instrumentation and Controls					15%		\$55,000
SUBTOTAL							\$530,000
Tax on Materials					9.3%		\$19,000
Contractor's Markup on Sub-Contractors' Work					10%		\$15,000
Contractor's Overhead and Profit					15%		\$80,000
Mobilization and Demobilization					5%		\$27,000
Contractor's General Conditions					10%		\$53,000
SUBTOTAL							\$720,000
Project Phase-Level OPCC Contingency					30%		\$216,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$940,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$235,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$1,180,000



PROJECT: West County - Alternative 2a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: GCSD EQ Facilities
Element #: 3

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Flow Control Structure	1	EA	\$98,000	\$98,000	\$0	\$98,000
2	8" Pipeline	30	LF	\$240	\$7,200	\$0	\$7,000
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$105,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$110,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					10%		\$0
Contractor's Overhead and Profit					15%		\$17,000
Mobilization and Demobilization					5%		\$6,000
Contractor's General Conditions					10%		\$11,000
SUBTOTAL							\$140,000
Project Phase-Level OPCC Contingency					30%		\$42,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$180,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$45,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$230,000



PROJECT: West County - Alternative 2a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: RRCSD EQ Facilities
Element #: 4

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Flow Control Structure	1	EA	\$98,000	\$98,000	\$0	\$98,000
2	16" Pipeline	190	LF	\$480	\$91,200	\$0	\$91,000
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$189,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$190,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					10%		\$0
Contractor's Overhead and Profit					15%		\$29,000
Mobilization and Demobilization					5%		\$10,000
Contractor's General Conditions					10%		\$19,000
SUBTOTAL							\$250,000
Project Phase-Level OPCC Contingency					30%		\$75,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$330,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$83,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$410,000



PROJECT: West County - Alternative 2a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Pipeline-Inter Plants
Element #: 5

OPPC PROVIDED BY: Niloofer S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Rehab 8 inch Pipeline	8,976	LF	\$120	\$1,077,120	\$0	\$1,077,000
2	6 inch Pipeline	6,720	LF	\$180	\$1,209,600	\$0	\$1,210,000
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$2,287,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$2,290,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					10%		\$0
Contractor's Overhead and Profit					15%		\$344,000
Mobilization and Demobilization					5%		\$115,000
Contractor's General Conditions					10%		\$229,000
SUBTOTAL							\$2,980,000
Project Phase-Level OPCC Contingency					30%		\$894,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$3,870,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$968,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$4,840,000



PROJECT: West County - Alternative 2a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Conveyance Pipelines
Element #: 6

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Creek Crossing	7	EA	\$3,800,000	\$26,600,000	\$0	\$26,600,000
2	4" Pipeline	8,650	LF	\$120	\$1,038,000	\$0	\$1,038,000
3	8" Pipeline	3,960	LF	\$240	\$950,400	\$0	\$950,000
4	10" Pipeline	8,310	LF	\$300	\$2,493,000	\$0	\$2,493,000
5	16" Pipeline	5,370	LF	\$480	\$2,577,600	\$0	\$2,578,000
6	24" Pipeline	52,310	LF	\$720	\$37,663,200	\$0	\$37,663,000
7	30" Pipeline	42,240	LF	\$900	\$38,016,000	\$0	\$38,016,000
8							
9							
10							
SUBTOTAL							\$109,338,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$109,340,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					10%		\$0
Contractor's Overhead and Profit					15%		\$16,401,000
Mobilization and Demobilization					5%		\$5,467,000
Contractor's General Conditions					10%		\$10,934,000
SUBTOTAL							\$142,140,000
Project Phase-Level OPCC Contingency					30%		\$42,642,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$184,780,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$46,195,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$230,980,000



PROJECT: West County - Alternative 2a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Conveyance PS
Element #: 7

OPPC PROVIDED BY: Niloofer S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

	DESCRIPTION	MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	GCSD Raw Wastewater Pump Station	1	EA	\$1,860,000	\$1,860,000	\$0	\$1,860,000
2	FWD Raw Wastewater Pump Station	1	EA	\$2,170,000	\$2,170,000	\$0	\$2,170,000
3	RRCSD Raw Wastewater Pump Station	1	EA	\$2,900,000	\$2,900,000	\$0	\$2,900,000
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$6,930,000
	Plant Paving, Grading, and Yard Piping				0%		\$0
	Mechanical and Piping				0%		\$0
	Electrical				0%		\$0
	Instrumentation and Controls				0%		\$0
SUBTOTAL							\$6,930,000
	Tax on Materials				0%		\$0
	Contractor's Markup on Sub-Contractors' Work				0%		\$0
	Contractor's Overhead and Profit				0%		\$0
	Mobilization and Demobilization				0%		\$0
	Contractor's General Conditions				0%		\$0
SUBTOTAL							\$6,930,000
	Project Phase-Level OPCC Contingency				30%		\$2,079,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$9,010,000
	Construction Contingency				0%		\$0
	Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin				25%		\$2,253,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$11,260,000



PROJECT: West County - Alternative 2a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Connection fee
Element #: 8

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Connection fee to Windsor	1	LS	\$111,043,000	\$111,043,000	\$0	\$111,043,000
2							
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$111,043,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$111,040,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$111,040,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$111,040,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$111,040,000



PROJECT: West County - Alternative 2a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 1
Element #: 9

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 1 Collection System	50	Parcel	\$112,900	\$5,645,000	\$0	\$5,600,000
2	Cluster 1 Raw Wastewater Pump Station	1	EA	\$1,840,000	\$1,840,000	\$0	\$1,800,000
3							
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$7,400,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$7,400,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$7,400,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$7,400,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$7,400,000



PROJECT: West County - Alternative 2a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 2
Element #: 10

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 2 Collection System	60	Parcel	\$125,500	\$7,530,000	\$0	\$7,500,000
2	Cluster 2 Raw Wastewater Pump Station	1	EA	\$1,710,000	\$1,710,000	\$0	\$1,700,000
3							
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$9,200,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$9,200,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$9,200,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$9,200,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$9,200,000



PROJECT: West County - Alternative 2a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 3
Element #: 11

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 3 Collection System	190	Parcel	\$122,200	\$23,218,000	\$0	\$23,200,000
2	Cluster 3 Raw Wastewater Pump Station	1	EA	\$1,860,000	\$1,860,000	\$0	\$1,900,000
3							
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$25,100,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$25,100,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$25,100,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$25,100,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$25,100,000



PROJECT: West County - Alternative 2a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 4
Element #: 12

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 4 Collection System	110	Parcel	\$110,000	\$12,100,000	\$0	\$12,100,000
2	Cluster 4 Raw Wastewater Pump Station	1	EA	\$1,850,000	\$1,850,000	\$0	\$1,900,000
3							
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$14,000,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$14,000,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$14,000,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$14,000,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$14,000,000



PROJECT: West County - Alternative 2a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 5
Element #: 13

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 5 Collection System	100	Parcel	\$133,200	\$13,320,000	\$0	\$13,300,000
2	Cluster 5 Raw Wastewater Pump Station	1	EA	\$1,850,000	\$1,850,000	\$0	\$1,900,000
3							
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$15,200,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$15,200,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$15,200,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$15,200,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$15,200,000



PROJECT: West County - Alternative 2a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 6
Element #: 14

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 6 Collection System	440	Parcel	\$121,000	\$53,240,000	\$0	\$53,200,000
2	Cluster 6 Raw Wastewater Pump Station	1	EA	\$1,900,000	\$1,900,000	\$0	\$1,900,000
3							
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$55,100,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$55,100,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$55,100,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$55,100,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$55,100,000



PROJECT: West County - Alternative 2a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 7
Element #: 15

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 7 Collection System	450	Parcel	\$103,500	\$46,575,000	\$0	\$46,600,000
2	Cluster 7 Raw Wastewater Pump Station	1	EA	\$1,900,000	\$1,900,000	\$0	\$1,900,000
3							
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$48,500,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$48,500,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$48,500,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$48,500,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$48,500,000



PROJECT: West County - Alternative 2a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 8
Element #: 16

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 8 Collection System	170	Parcel	\$106,000	\$18,020,000	\$0	\$18,000,000
2	Cluster 8 Raw Wastewater Pump Station	1	EA	\$1,720,000	\$1,720,000	\$0	\$1,700,000
3							
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$19,700,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$19,700,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$19,700,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$19,700,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$19,700,000



PROJECT: West County - Alternative 2a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 9
Element #: 17

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 9 Collection System	140	Parcel	\$105,800	\$14,812,000	\$0	\$14,800,000
2	Cluster 9 Raw Wastewater Pump Station	1	EA	\$1,720,000	\$1,720,000	\$0	\$1,700,000
3							
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$16,500,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$16,500,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$16,500,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$16,500,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$16,500,000



PROJECT: West County - Alternative 2a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 10
Element #: 18

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 10 Collection System	70	Parcel	\$105,800	\$7,406,000	\$0	\$7,400,000
2	Cluster 10 Raw Wastewater Pump Station	1	EA	\$1,840,000	\$1,840,000	\$0	\$1,800,000
3							
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$9,200,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$9,200,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$9,200,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$9,200,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$9,200,000



PROJECT: West County - Alternative 2a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 11
Element #: 19

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 11 Collection System	370	Parcel	\$102,000	\$37,740,000	\$0	\$37,700,000
2	Cluster 11 Raw Wastewater Pump Station	1	EA	\$1,930,000	\$1,930,000	\$0	\$1,900,000
3	OCSD piping/pumping upsize	1	LS	\$2,000,000	\$2,000,000	\$0	\$2,000,000
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$41,600,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$41,600,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$41,600,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$41,600,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$41,600,000



PROJECT: West County - Alternative 2a
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 12
Element #: 20

OPPC PROVIDED BY: Niloofer S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

	DESCRIPTION	MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTAL L COST	TOTAL COST
1	Cluster 12 Collection System	780	Parcel	\$129,487	\$101,000,000	\$0	\$101,000,000
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$101,000,000
	Plant Paving, Grading, and Yard Piping				0%		\$0
	Mechanical and Piping				0%		\$0
	Electrical				0%		\$0
	Instrumentation and Controls				0%		\$0
SUBTOTAL							\$101,000,000
	Tax on Materials				0%		\$0
	Contractor's Markup on Sub-Contractors' Work				0%		\$0
	Contractor's Overhead and Profit				0%		\$0
	Mobilization and Demobilization				0%		\$0
	Contractor's General Conditions				0%		\$0
SUBTOTAL							\$101,000,000
	Project Phase-Level OPCC Contingency				0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$101,000,000
	Construction Contingency				0%		\$0
	Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and				0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$101,000,000



PROJECT: West County - Alternative 2b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: FWD EQ Facilities
Element #: 1

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Flow Control Structure	1	EA	\$98,000	\$98,000	\$0	\$98,000
2	6" Pipeline	210	LF	\$180	\$37,800	\$0	\$38,000
3	8" Pipeline	480	LF	\$240	\$115,200	\$0	\$115,000
4	FWD Ponds Drain Pump	1	EA	\$1,750,000	\$1,750,000	\$0	\$1,750,000
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$2,001,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$2,000,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					10%		\$0
Contractor's Overhead and Profit					15%		\$300,000
Mobilization and Demobilization					5%		\$100,000
Contractor's General Conditions					10%		\$200,000
SUBTOTAL							\$2,600,000
Project Phase-Level OPCC Contingency					30%		\$780,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$3,380,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$845,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$4,230,000



PROJECT: West County - Alternative 2b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: GCSO Headworks
Element #: 2

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	ROTAMAT Micro Strainer Ro9	1	LS	\$157,000	\$157,000	\$157,000	\$314,000
2	Bin	1	LS	\$50,000	\$50,000	\$0	\$50,000
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$364,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					5%		\$18,000
Electrical					25%		\$91,000
Instrumentation and Controls					15%		\$55,000
SUBTOTAL							\$530,000
Tax on Materials					9.3%		\$19,000
Contractor's Markup on Sub-Contractors' Work					10%		\$15,000
Contractor's Overhead and Profit					15%		\$80,000
Mobilization and Demobilization					5%		\$27,000
Contractor's General Conditions					10%		\$53,000
SUBTOTAL							\$720,000
Project Phase-Level OPCC Contingency					30%		\$216,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$940,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$235,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$1,180,000



PROJECT: West County - Alternative 2b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: GCSD EQ Facilities
Element #: 3

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Flow Control Structure	1	EA	\$98,000	\$98,000	\$0	\$98,000
2	8" Pipeline	30	LF	\$240	\$7,200	\$0	\$7,000
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$105,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$110,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					10%		\$0
Contractor's Overhead and Profit					15%		\$17,000
Mobilization and Demobilization					5%		\$6,000
Contractor's General Conditions					10%		\$11,000
SUBTOTAL							\$140,000
Project Phase-Level OPCC Contingency					30%		\$42,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$180,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$45,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$230,000



PROJECT: West County - Alternative 2b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: RRCSD EQ Facilities
Element #: 4

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Flow Control Structure	1	EA	\$98,000	\$98,000	\$0	\$98,000
2	16" Pipeline	190	LF	\$480	\$91,200	\$0	\$91,000
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$189,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$190,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					10%		\$0
Contractor's Overhead and Profit					15%		\$29,000
Mobilization and Demobilization					5%		\$10,000
Contractor's General Conditions					10%		\$19,000
SUBTOTAL							\$250,000
Project Phase-Level OPCC Contingency					30%		\$75,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$330,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$83,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$410,000



PROJECT: West County - Alternative 2b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Conveyance Pipelines
Element #: 5

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Creek Crossing	4	EA	\$3,800,000	\$15,200,000	\$0	\$15,200,000
2	4" Pipeline	5,940	LF	\$120	\$712,800	\$0	\$713,000
3	6" Pipeline	560	LF	\$180	\$100,800	\$0	\$101,000
4	8" Pipeline	10,590	LF	\$240	\$2,541,600	\$0	\$2,542,000
5	16" Pipeline	5,370	LF	\$480	\$2,577,600	\$0	\$2,578,000
6	24" Pipeline	70,360	LF	\$720	\$50,659,200	\$0	\$50,659,000
7	30" Pipeline	33,070	LF	\$900	\$29,763,000	\$0	\$29,763,000
8							
9							
10							
SUBTOTAL							\$101,556,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$101,560,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					10%		\$0
Contractor's Overhead and Profit					15%		\$15,234,000
Mobilization and Demobilization					5%		\$5,078,000
Contractor's General Conditions					10%		\$10,156,000
SUBTOTAL							\$132,030,000
Project Phase-Level OPCC Contingency					30%		\$39,609,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$171,640,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$42,910,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$214,550,000



PROJECT: West County - Alternative 2b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Conveyance PS
Element #: 6

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	RRCSD Raw Wastewater Pump Station	1	EA	\$2,900,000	\$2,900,000	\$0	\$2,900,000
2	FWD Raw Wastewater Pump Station	1	EA	\$3,160,000	\$3,160,000	\$0	\$3,160,000
3	GCSD Raw Wastewater Pump Station	1	EA	\$1,860,000	\$1,860,000	\$0	\$1,860,000
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$7,920,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$7,920,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$7,920,000
Project Phase-Level OPCC Contingency					30%		\$2,376,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$10,300,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$2,575,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$12,880,000



PROJECT: West County - Alternative 2b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Connection fee
Element #: 7

OPPC PROVIDED BY: Niloofer S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Connection fee to Santa Rosa	1	LS	\$117,601,400	\$117,601,400	\$0	\$117,601,000
2	Recycled Water Storage	1	LS	\$5,000,000	\$5,000,000	\$0	\$5,000,000
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$122,601,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$122,600,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$122,600,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$122,600,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$122,600,000



PROJECT: West County - Alternative 2b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 1
Element #: 8

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 1 Collection System	50	Parcel	\$112,900	\$5,645,000	\$0	\$5,600,000
2	Cluster 1 Raw Wastewater Pump Station	1	EA	\$1,840,000	\$1,840,000	\$0	\$1,800,000
3							
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$7,400,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$7,400,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$7,400,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$7,400,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$7,400,000



PROJECT: West County - Alternative 2b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 2
Element #: 9

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 2 Collection System	60	Parcel	\$125,500	\$7,530,000	\$0	\$7,500,000
2	Cluster 2 Raw Wastewater Pump Station	1	EA	\$1,710,000	\$1,710,000	\$0	\$1,700,000
3							
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$9,200,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$9,200,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$9,200,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$9,200,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$9,200,000



PROJECT: West County - Alternative 2b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 3
Element #: 10

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 3 Collection System	190	Parcel	\$122,200	\$23,218,000	\$0	\$23,200,000
2	Cluster 3 Raw Wastewater Pump Station	1	EA	\$1,860,000	\$1,860,000	\$0	\$1,900,000
3							
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$25,100,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$25,100,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$25,100,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$25,100,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$25,100,000



PROJECT: West County - Alternative 2b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 4
Element #: 11

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 4 Collection System	110	Parcel	\$110,000	\$12,100,000	\$0	\$12,100,000
2	Cluster 4 Raw Wastewater Pump Station	1	EA	\$1,850,000	\$1,850,000	\$0	\$1,900,000
3							
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$14,000,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$14,000,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$14,000,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$14,000,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$14,000,000



PROJECT: West County - Alternative 2b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 5
Element #: 12

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 5 Collection System	100	Parcel	\$133,200	\$13,320,000	\$0	\$13,300,000
2	Cluster 5 Raw Wastewater Pump Station	1	EA	\$1,850,000	\$1,850,000	\$0	\$1,900,000
3							
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$15,200,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$15,200,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$15,200,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$15,200,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$15,200,000



PROJECT: West County - Alternative 2b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 6
Element #: 13

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 6 Collection System	440	Parcel	\$121,000	\$53,240,000	\$0	\$53,200,000
2	Cluster 6 Raw Wastewater Pump Station	1	EA	\$1,900,000	\$1,900,000	\$0	\$1,900,000
3							
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$55,100,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$55,100,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$55,100,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$55,100,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$55,100,000



PROJECT: West County - Alternative 2b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 7
Element #: 14

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 7 Collection System	450	Parcel	\$103,500	\$46,575,000	\$0	\$46,600,000
2	Cluster 7 Raw Wastewater Pump Station	1	EA	\$1,900,000	\$1,900,000	\$0	\$1,900,000
3							
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$48,500,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$48,500,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$48,500,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$48,500,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$48,500,000



PROJECT: West County - Alternative 2b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 8
Element #: 15

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 8 Collection System	170	Parcel	\$106,000	\$18,020,000	\$0	\$18,000,000
2	Cluster 8 Raw Wastewater Pump Station	1	EA	\$1,720,000	\$1,720,000	\$0	\$1,700,000
3							
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$19,700,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$19,700,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$19,700,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$19,700,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$19,700,000



PROJECT: West County - Alternative 2b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 9
Element #: 16

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 9 Collection System	140	Parcel	\$105,800	\$14,812,000	\$0	\$14,800,000
2	Cluster 9 Raw Wastewater Pump Station	1	EA	\$1,720,000	\$1,720,000	\$0	\$1,700,000
3							
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$16,500,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$16,500,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$16,500,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$16,500,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$16,500,000



PROJECT: West County - Alternative 2b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 10
Element #: 17

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 10 Collection System	70	Parcel	\$105,800	\$7,406,000	\$0	\$7,400,000
2	Cluster 10 Raw Wastewater Pump Station	1	EA	\$1,840,000	\$1,840,000	\$0	\$1,800,000
3							
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$9,200,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$9,200,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$9,200,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$9,200,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$9,200,000



PROJECT: West County - Alternative 2b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 11
Element #: 18

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 11 Collection System	370	Parcel	\$102,000	\$37,740,000	\$0	\$37,700,000
2	Cluster 11 Raw Wastewater Pump Station	1	EA	\$1,930,000	\$1,930,000	\$0	\$1,900,000
3	OCSD piping/pumping upsize	1	LS	\$2,000,000	\$2,000,000	\$0	\$2,000,000
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$41,600,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$41,600,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$41,600,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$41,600,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$41,600,000



PROJECT: West County - Alternative 2b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 12
Element #: 19

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 12 Collection System	780	Parcel	\$129,487	\$101,000,000	\$0	\$101,000,000
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$101,000,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$101,000,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$101,000,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$101,000,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$101,000,000



PROJECT: West County - Alternative 3b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
OPCC Manager: LMS & NS
Reviewer: CEH
Description of Work: Cost Estimating
Type of Estimate: Class 5
Date of This Estimate: 16-Oct-25

ELEMENT #	DESCRIPTION	UNIT COST	UNITS	ANTICIPATED COST
1	Fill Effluent Pond at FWD WWTP	\$3,600,000	1	\$3,600,000
2	Suspended Air Flotation at FWD WWTP	\$7,500,000	1	\$7,500,000
3	Filter influent pump station	\$2,800,000	1	\$2,800,000
4	Tertiary Disk Filtration at FWD WWTP	\$2,800,000	1	\$2,800,000
5	Chlorine Contact Basin Expansion at FWD WWTP	\$2,900,000	1	\$2,900,000
6	Headworks Improvement at GCSD WWTP	\$900,000	1	\$900,000
7	Pond Aeration System Upgrades at GCSD WWTP	\$9,400,000	1	\$9,400,000
8	Land Purchase for Storage Pond at GCSD WWTP	\$2,000,000	1	\$2,000,000
9	Effluent Storage Pond Expansion at GCSD WWTP	\$25,400,000	1	\$25,400,000
10	Pipelines at FWD and GCSD WWTP	\$1,000,000	1	\$1,000,000
11	Inter Facilities Pipelines	\$9,500,000	1	\$9,500,000
12	Land Application (FWD/GCSD)	\$9,600,000	1	\$9,600,000
13	Conveyance Pipelines	\$168,700,000	1	\$168,700,000
14	Recycled Water Pipelines	\$16,100,000	1	\$16,100,000
15	Conveyance Pump Stations	\$12,000,000	1	\$12,000,000
16	Equalization Facilities at RRCSD	\$300,000	1	\$300,000
17	Connection Fee to Windsor	\$76,300,000	1	\$76,300,000
18	Cluster 1 Sewer Service Connection	\$7,400,000	1	\$7,400,000
19	Cluster 2 Sewer Service Connection	\$9,200,000	1	\$9,200,000
20	Cluster 3 Sewer Service Connection	\$25,100,000	1	\$25,100,000
21	Cluster 4 Sewer Service Connection	\$14,000,000	1	\$14,000,000
22	Cluster 5 Sewer Service Connection	\$15,200,000	1	\$15,200,000
23	Cluster 6 Sewer Service Connection	\$55,100,000	1	\$55,100,000
24	Cluster 7 Sewer Service Connection	\$48,500,000	1	\$48,500,000
25	Cluster 8 Sewer Service Connection	\$19,700,000	1	\$19,700,000
26	Cluster 9 Sewer Service Connection	\$16,500,000	1	\$16,500,000
27	Cluster 10 Sewer Service Connection	\$9,200,000	1	\$9,200,000
28	Cluster 11 Sewer Service Connection	\$41,600,000	1	\$41,600,000
29	Cluster 12 Sewer Service Connection	\$101,000,000	1	\$101,000,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE PROJECT COST				\$713,300,000
	Construction Contingency		0%	\$0
	Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin Costs		25%	\$178,300,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST				\$891,600,000



PROJECT: West County - Alternative 3b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Eff Pond Fill @FWD
Element #: 1

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Effluent Pond Fill	16,100	CY	\$120	\$1,932,000	\$0	\$1,932,000
2							
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$1,932,000
Plant Paving, Grading, and Yard Piping					10%		\$193,000
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$2,130,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					10%		\$0
Contractor's Overhead and Profit					15%		\$320,000
Mobilization and Demobilization					5%		\$107,000
Contractor's General Conditions					10%		\$213,000
SUBTOTAL							\$2,770,000
Project Phase-Level OPCC Contingency					30%		\$831,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$3,600,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$900,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$4,500,000



PROJECT: West County - Alternative 3b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: SAF @FWD
Element #: 2

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

	DESCRIPTION	MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Concrete Pad (to accommodate two 1.5 mgd SAF units)	57	CY	\$550	\$31,350	\$31,350	\$63,000
2	Secondary Effluent Junction Box	0	0	\$0	\$98,000	\$0	\$98,000
3	Suspended Air Floatation System (two units, each 1.5 mgd capacity - includes tank, flocculation	2	LS	\$589,625	\$1,179,250	\$1,179,250	\$2,359,000
4	Canopy	1,480	SF	\$85	\$125,800	\$0	\$126,000
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$2,646,000
	Plant Paving, Grading, and Yard Piping				10%		\$265,000
	Mechanical and Piping				10%		\$265,000
	Electrical				25%		\$662,000
	Instrumentation and Controls				15%		\$397,000
SUBTOTAL							\$4,240,000
	Tax on Materials				9.3%		\$133,000
	Contractor's Markup on Sub-Contractors' Work				10%		\$106,000
	Contractor's Overhead and Profit				15%		\$636,000
	Mobilization and Demobilization				5%		\$212,000
	Contractor's General Conditions				10%		\$424,000
SUBTOTAL							\$5,750,000
	Project Phase-Level OPCC Contingency				30%		\$1,725,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$7,480,000
	Construction Contingency				0%		\$0
	Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin				25%		\$1,870,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$9,350,000



PROJECT: West County - Alternative 3b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: FIPS @FWD
Element #: 3

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	2.6 mgd pump station before SAF and cloth disk filters	1	LS	\$2,170,000	\$2,170,000	\$0	\$2,170,000
2							
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$2,170,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$2,170,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$2,170,000
Project Phase-Level OPCC Contingency					30%		\$651,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$2,820,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$705,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$3,530,000



PROJECT: West County - Alternative 3b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Tert.Filt. @FWD
Element #: 4

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Concrete Pad (under two 6-Disk filter unit tanks)	23	CY	\$550	\$12,650	\$12,650	\$25,000
2	Cloth Media Filters (two (2) 6-Disk AquaDisk filters, each equipped with 5 cloth disks, in steel ta	1	LS	\$600,000	\$600,000	\$300,000	\$900,000
3	Canopy	727	SF	\$85	\$61,786	\$0	\$62,000
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$987,000
Plant Paving, Grading, and Yard Piping					10%		\$99,000
Mechanical and Piping					10%		\$99,000
Electrical					25%		\$247,000
Instrumentation and Controls					15%		\$148,000
SUBTOTAL							\$1,580,000
Tax on Materials					9.3%		\$62,000
Contractor's Markup on Sub-Contractors' Work					10%		\$40,000
Contractor's Overhead and Profit					15%		\$237,000
Mobilization and Demobilization					5%		\$79,000
Contractor's General Conditions					10%		\$158,000
SUBTOTAL							\$2,160,000
Project Phase-Level OPCC Contingency					30%		\$648,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$2,810,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$703,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$3,510,000



PROJECT: West County - Alternative 3b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: CCB @FWD
Element #: 5

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Excavation for three new chlorine contact basins	1,670	CY	\$45	\$75,150	\$0	\$75,000
2	Concrete basins for three (3) new chlorine contactors (match existing)	592	CY	\$550	\$325,600	\$325,600	\$651,000
3	Additional chemical storage building for gas cylinders for the three new CCBs.	324	SF	\$450	\$145,800	\$0	\$146,000
4	Metal grating over chlorine contact basin inlets	128	SF	\$35	\$4,489	\$0	\$4,000
5	Surface Mounted Fiberglass Slide Gate and Frame (2 per chlorine contact basin)	6	EA	\$5,000	\$30,000	\$15,000	\$45,000
6	Chlorine Ejector (Chlorination) Assembly (1 per chlorine contact basin)	3	EA	\$10,000	\$30,000	\$15,000	\$45,000
7	Sulfur Dioxide Ejector (Dechlorination) Assembly (1 per chlorine contact basin)	3	EA	\$10,000	\$30,000	\$15,000	\$45,000
8							
9							
10							
SUBTOTAL							\$1,011,000
Plant Paving, Grading, and Yard Piping					10%		\$101,000
Mechanical and Piping					10%		\$101,000
Electrical					25%		\$253,000
Instrumentation and Controls					15%		\$152,000
SUBTOTAL							\$1,620,000
Tax on Materials					9.3%		\$59,000
Contractor's Markup on Sub-Contractors' Work					10%		\$41,000
Contractor's Overhead and Profit					15%		\$243,000
Mobilization and Demobilization					5%		\$81,000
Contractor's General Conditions					10%		\$162,000
SUBTOTAL							\$2,210,000
Project Phase-Level OPCC Contingency					30%		\$663,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$2,870,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$718,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$3,590,000



PROJECT: West County - Alternative 3b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: GCSO Headwork
Element #: 6

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	ROTAMAT Micro Strainer Ro9	1	LS	\$157,000	\$157,000	\$157,000	\$314,000
2	Bin	1	LS	\$50,000	\$50,000	\$0	\$50,000
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$364,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					5%		\$18,000
Electrical					25%		\$91,000
Instrumentation and Controls					15%		\$55,000
SUBTOTAL							\$530,000
Tax on Materials					9.3%		\$19,000
Contractor's Markup on Sub-Contractors' Work					10%		\$15,000
Contractor's Overhead and Profit					15%		\$80,000
Mobilization and Demobilization					5%		\$27,000
Contractor's General Conditions					10%		\$53,000
SUBTOTAL							\$720,000
Project Phase-Level OPCC Contingency					30%		\$216,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$940,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$235,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$1,180,000



PROJECT: West County - Alternative 3b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Aer.Ponds @GCSD
Element #: 7

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Blower Building (houses three (3) 100HP blowers for pond aeration system)	1,053	SF	\$550	\$579,150	\$0	\$579,000
2	Ares Aeration® Pond Aeration System (in treatment ponds) & Floating Cover (on settling pond)	1	EA	\$1,468,680	\$1,468,680	\$1,468,680	\$2,937,000
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$3,516,000
Plant Paving, Grading, and Yard Piping					10%		\$352,000
Mechanical and Piping					10%		\$294,000
Electrical					25%		\$734,000
Instrumentation and Controls					15%		\$441,000
SUBTOTAL							\$5,340,000
Tax on Materials					9.3%		\$136,000
Contractor's Markup on Sub-Contractors' Work					10%		\$118,000
Contractor's Overhead and Profit					15%		\$801,000
Mobilization and Demobilization					5%		\$267,000
Contractor's General Conditions					10%		\$534,000
SUBTOTAL							\$7,200,000
Project Phase-Level OPCC Contingency					30%		\$2,160,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$9,360,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$2,340,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$11,700,000



PROJECT: West County - Alternative 3b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Land for Pond @GCSD
Element #: 8

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Land Purchase	20	acres	\$100,000	\$2,000,000	\$0	\$2,000,000
2							
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$2,000,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$2,000,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$2,000,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$2,000,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$500,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$2,500,000



PROJECT: West County - Alternative 3b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Eff.Stor.Pond @GCSD
Element #: 9

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Excavation	235,000	CY	\$45	\$10,580,000	\$0	\$10,580,000
2	Rip rap	7,000	ton	\$375	\$2,630,000	\$0	\$2,630,000
3	Gravel	2,000	ton	\$210	\$420,000	\$0	\$420,000
4	Misc Structure	2	EA	\$100,000	\$200,000	\$0	\$200,000
5	Fencing	4,397	LF	\$75	\$330,000	\$0	\$330,000
6							
7							
8							
9							
10							
SUBTOTAL							\$14,160,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					5%		\$710,000
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$14,870,000
Tax on Materials					9.3%		\$170,000
Contractor's Markup on Sub-Contractors' Work					10%		\$0
Contractor's Overhead and Profit					15%		\$2,230,000
Mobilization and Demobilization					5%		\$740,000
Contractor's General Conditions					10%		\$1,490,000
SUBTOTAL							\$19,500,000
Project Phase-Level OPCC Contingency					30%		\$5,850,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$25,350,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$6,340,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$31,690,000



PROJECT: West County - Alternative 3b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Pipelines-Treatment
Element #: 10

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	10 inch Pipeline	1,490	LF	\$300	\$447,000	\$0	\$447,000
2	14 inch Pipeline	270	LF	\$420	\$113,400	\$0	\$113,000
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$560,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$560,000
Tax on Materials					9.3%		\$52,000
Contractor's Markup on Sub-Contractors' Work					10%		\$0
Contractor's Overhead and Profit					15%		\$84,000
Mobilization and Demobilization					5%		\$28,000
Contractor's General Conditions					10%		\$56,000
SUBTOTAL							\$780,000
Project Phase-Level OPCC Contingency					30%		\$234,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$1,010,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$253,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$1,260,000



PROJECT: West County - Alternative 3b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Pipeline-Inter Plants
Element #: 11

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Rehab 8 inch Pipeline	8,976	LF	\$120	\$1,077,120	\$0	\$1,077,000
2	6 inch Pipeline	4,224	LF	\$180	\$760,320	\$0	\$760,000
3	14 inch Pipeline	8,976	LF	\$420	\$3,769,920	\$0	\$3,770,000
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$5,607,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$5,610,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					10%		\$0
Contractor's Overhead and Profit					15%		\$842,000
Mobilization and Demobilization					5%		\$281,000
Contractor's General Conditions					10%		\$561,000
SUBTOTAL							\$7,290,000
Project Phase-Level OPCC Contingency					30%		\$2,187,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$9,480,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$2,370,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$11,850,000



PROJECT: West County - Alternative 3b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: FWD Land Application
Element #: 12

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	FWD/GCSD Land Application Area	1,920	acres	\$5,000	\$9,600,000	\$0	\$9,600,000
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$9,600,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$9,600,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$9,600,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$9,600,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$2,400,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$12,000,000



PROJECT: West County - Alternative 3b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Pipelines-Conveyance
Element #: 13

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Creek crossing	7	EA	\$3,800,000	\$26,600,000	\$0	\$26,600,000
2	4" Pipeline	12,120	LF	\$120	\$1,454,400	\$0	\$1,454,400
3	8" Pipeline	5,220	LF	\$240	\$1,252,800	\$0	\$1,253,000
4	16" Pipeline	5,370	LF	\$480	\$2,577,600	\$0	\$2,578,000
5	24" Pipeline	94,310	LF	\$720	\$67,903,200	\$0	\$67,903,000
6							
7							
8							
9							
10							
SUBTOTAL							\$99,788,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$99,790,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					10%		\$0
Contractor's Overhead and Profit					15%		\$14,969,000
Mobilization and Demobilization					5%		\$4,990,000
Contractor's General Conditions					10%		\$9,979,000
SUBTOTAL							\$129,730,000
Project Phase-Level OPCC Contingency					30%		\$38,919,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$168,650,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$42,163,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$210,810,000



PROJECT: West County - Alternative 3b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Pipelines-ReW
Element #: 14

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	12 inch Pipelines	26,400	LF	\$360	\$9,504,000	\$0	\$9,504,000
2							
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$9,504,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$9,500,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					10%		\$0
Contractor's Overhead and Profit					15%		\$1,425,000
Mobilization and Demobilization					5%		\$475,000
Contractor's General Conditions					10%		\$950,000
SUBTOTAL							\$12,350,000
Project Phase-Level OPCC Contingency					30%		\$3,705,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$16,060,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$4,015,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$20,080,000



PROJECT: West County - Alternative 3b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Conveyance PS
Element #: 15

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	GCSD Secondary Effluent Pump Station	1	EA	\$1,960,000	\$1,960,000	\$0	\$1,960,000
2	GCSD Tertiary Effluent Pump Station	1	EA	\$2,290,000	\$2,290,000	\$0	\$2,290,000
3	FWD Tertiary Effluent Pump Station	1	EA	\$2,050,000	\$2,050,000	\$0	\$2,050,000
4	RRCSD Raw Wastewater Pump Station	1	EA	\$2,900,000	\$2,900,000	\$0	\$2,900,000
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$9,200,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$9,200,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$9,200,000
Project Phase-Level OPCC Contingency					30%		\$2,760,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$11,960,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$2,990,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$14,950,000



PROJECT: West County - Alternative 3b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: RRCSD EQ Facilities
Element #: 16

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Flow Control Structure	1	EA	\$98,000	\$98,000	\$0	\$98,000
2	16" Pipeline	190	LF	\$480	\$91,200	\$0	\$91,000
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$189,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$190,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					10%		\$0
Contractor's Overhead and Profit					15%		\$29,000
Mobilization and Demobilization					5%		\$10,000
Contractor's General Conditions					10%		\$19,000
SUBTOTAL							\$250,000
Project Phase-Level OPCC Contingency					30%		\$75,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$330,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					25%		\$83,000
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$410,000



PROJECT: West County - Alternative 3b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Connection fee
Element #: 17

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Connection fee to Windsor	1	LS	\$76,300,000	\$76,300,000	\$0	\$76,300,000
2							
3							
4							
5							
6							
7							
8							
9							
10							
SUBTOTAL							\$76,300,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$76,300,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$76,300,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$76,300,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$76,300,000



PROJECT: West County - Alternative 3b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 1
Element #: 18

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 1 Collection System	50	Parcel	\$112,900	\$5,645,000	\$0	\$5,600,000
2	Cluster 1 Raw Wastewater Pump Station	1	EA	\$1,840,000	\$1,840,000	\$0	\$1,800,000
3							
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$7,400,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$7,400,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$7,400,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$7,400,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$7,400,000



PROJECT: West County - Alternative 3b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 2
Element #: 19

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 2 Collection System	60	Parcel	\$125,500	\$7,530,000	\$0	\$7,500,000
2	Cluster 2 Raw Wastewater Pump Station	1	EA	\$1,710,000	\$1,710,000	\$0	\$1,700,000
3							
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$9,200,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$9,200,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$9,200,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$9,200,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$9,200,000



PROJECT: West County - Alternative 3b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 3
Element #: 20

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 3 Collection System	190	Parcel	\$122,200	\$23,218,000	\$0	\$23,200,000
2	Cluster 3 Raw Wastewater Pump Station	1	EA	\$1,860,000	\$1,860,000	\$0	\$1,900,000
3							
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$25,100,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$25,100,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$25,100,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$25,100,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$25,100,000



PROJECT: West County - Alternative 3b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 4
Element #: 21

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 4 Collection System	110	Parcel	\$110,000	\$12,100,000	\$0	\$12,100,000
2	Cluster 4 Raw Wastewater Pump Station	1	EA	\$1,850,000	\$1,850,000	\$0	\$1,900,000
3							
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$14,000,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$14,000,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$14,000,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$14,000,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$14,000,000



PROJECT: West County - Alternative 3b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 5
Element #: 22

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 5 Collection System	100	Parcel	\$133,200	\$13,320,000	\$0	\$13,300,000
2	Cluster 5 Raw Wastewater Pump Station	1	EA	\$1,850,000	\$1,850,000	\$0	\$1,900,000
3							
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$15,200,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$15,200,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$15,200,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$15,200,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$15,200,000



PROJECT: West County - Alternative 3b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 6
Element #: 23

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 6 Collection System	440	Parcel	\$121,000	\$53,240,000	\$0	\$53,200,000
2	Cluster 6 Raw Wastewater Pump Station	1	EA	\$1,900,000	\$1,900,000	\$0	\$1,900,000
3							
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$55,100,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$55,100,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$55,100,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$55,100,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$55,100,000



PROJECT: West County - Alternative 3b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 7
Element #: 24

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 7 Collection System	450	Parcel	\$103,500	\$46,575,000	\$0	\$46,600,000
2	Cluster 7 Raw Wastewater Pump Station	1	EA	\$1,900,000	\$1,900,000	\$0	\$1,900,000
3							
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$48,500,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$48,500,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$48,500,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$48,500,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$48,500,000



PROJECT: West County - Alternative 3b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 8
Element #: 25

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 8 Collection System	170	Parcel	\$106,000	\$18,020,000	\$0	\$18,000,000
2	Cluster 8 Raw Wastewater Pump Station	1	EA	\$1,720,000	\$1,720,000	\$0	\$1,700,000
3							
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$19,700,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$19,700,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$19,700,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$19,700,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$19,700,000



PROJECT: West County - Alternative 3b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 9
Element #: 26

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 9 Collection System	140	Parcel	\$105,800	\$14,812,000	\$0	\$14,800,000
2	Cluster 9 Raw Wastewater Pump Station	1	EA	\$1,720,000	\$1,720,000	\$0	\$1,700,000
3							
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$16,500,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$16,500,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$16,500,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$16,500,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$16,500,000



PROJECT: West County - Alternative 3b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 10
Element #: 27

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 10 Collection System	70	Parcel	\$105,800	\$7,406,000	\$0	\$7,400,000
2	Cluster 10 Raw Wastewater Pump Station	1	EA	\$1,840,000	\$1,840,000	\$0	\$1,800,000
3							
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$9,200,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$9,200,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$9,200,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$9,200,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$9,200,000



PROJECT: West County - Alternative 3b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 11
Element #: 28

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 11 Collection System	370	Parcel	\$102,000	\$37,740,000	\$0	\$37,700,000
2	Cluster 11 Raw Wastewater Pump Station	1	EA	\$1,930,000	\$1,930,000	\$0	\$1,900,000
3	OCSD piping/pumping upsize	1	LS	\$2,000,000	\$2,000,000	\$0	\$2,000,000
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$41,600,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$41,600,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$41,600,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$41,600,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and Admin					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$41,600,000



PROJECT: West County - Alternative 3b
OWNER: Sonoma Water
LOCATION: Sonoma County, CA
WYA Project #: 798-50-24-05
Sheet Title: Cluster 12
Element #: 29

OPPC PROVIDED BY: Niloofar S.
OPPC PREPARATION DATE: 16-Oct-25
REVIEWED BY: CEH

DESCRIPTION		MATERIAL QTY	UNIT	MATERIAL UNIT COST	MATERIAL COST	INSTALL COST	TOTAL COST
1	Cluster 12 Collection System	780	Parcel	\$129,487	\$101,000,000	\$0	\$101,000,000
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
SUBTOTAL							\$101,000,000
Plant Paving, Grading, and Yard Piping					0%		\$0
Mechanical and Piping					0%		\$0
Electrical					0%		\$0
Instrumentation and Controls					0%		\$0
SUBTOTAL							\$101,000,000
Tax on Materials					0%		\$0
Contractor's Markup on Sub-Contractors' Work					0%		\$0
Contractor's Overhead and Profit					0%		\$0
Mobilization and Demobilization					0%		\$0
Contractor's General Conditions					0%		\$0
SUBTOTAL							\$101,000,000
Project Phase-Level OPCC Contingency					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST							\$101,000,000
Construction Contingency					0%		\$0
Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, and Legal and					0%		\$0
ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST							\$101,000,000

Appendix H

Phase 2 Lifecycle Costs

Analysis Period (years) 20
Discount Rate (%) 3.00
Inflation Rate (%) 3.00

FWD/GCSD Lifecycle Analysis of O&M Cost for Alternative 1a

Year	Present Worth Factor	Inflation Factor	O&M Costs, 2025 Dollars											O&M Costs, Present Worth											
			Labor	Piping and Valve Maintenance and Replacement (Treatment)	Piping and Valve Maintenance and Replacement (Collection)	Power	Chemical Addition	Routine Maintenance: Blower Filter/Belt/Oil Changes, Pond Cleaning	Pump Rebuild & Major Maintenance	Cloth Disk Filters	15-Year Major Equipment Replacement	15-Year Instrumentation Replacement	10-Year Equipment Replacement	Total	Labor	Piping and Valve Maintenance and Replacement (Treatment)	Piping and Valve Maintenance and Replacement (Collection)	Power	Chemical Addition	Routine Maintenance: Blower Filter/Belt/Oil Changes, Pond Cleaning	Pump Rebuild & Major Maintenance	Cloth Disk Filters	15-Year Major Equipment Replacement	15-Year Instrumentation Replacement	10-Year Equipment Replacement
0 2025	1.00	1.00	\$400,000	\$198,000	\$26,800	\$244,000	\$121,000	\$15,500	\$3,000	\$244,000	\$121,000	\$15,500	\$1,008,300	\$400,000	\$198,000	\$26,800	\$244,000	\$121,000	\$15,500	-	\$3,000	-	-	-	\$1,008,300
1 2026	1.03	1.03	\$412,000	\$203,940	\$27,604	\$251,320	\$124,630	\$15,965	\$3,090	-	-	-	\$1,038,549	\$400,000	\$198,000	\$26,800	\$244,000	\$121,000	\$15,500	-	\$3,000	-	-	-	\$1,008,300
2 2027	1.06	1.06	\$424,360	\$210,058	\$28,432	\$258,860	\$128,369	\$16,444	\$3,183	-	-	-	\$1,069,705	\$400,000	\$198,000	\$26,800	\$244,000	\$121,000	\$15,500	-	\$3,000	-	-	-	\$1,008,300
3 2028	1.09	1.09	\$437,091	\$216,360	\$29,285	\$266,625	\$132,220	\$16,937	\$3,278	-	-	-	\$1,101,797	\$400,000	\$198,000	\$26,800	\$244,000	\$121,000	\$15,500	-	\$3,000	-	-	-	\$1,008,300
4 2029	1.13	1.13	\$450,204	\$222,851	\$30,164	\$274,624	\$136,187	\$17,445	\$3,377	-	-	-	\$1,134,851	\$400,000	\$198,000	\$26,800	\$244,000	\$121,000	\$15,500	-	\$3,000	-	-	-	\$1,008,300
5 2030	1.16	1.16	\$463,710	\$229,536	\$31,069	\$282,863	\$140,272	\$17,969	\$3,478	-	-	-	\$1,168,896	\$400,000	\$198,000	\$26,800	\$244,000	\$121,000	\$15,500	-	\$3,000	-	-	-	\$1,008,300
6 2031	1.19	1.19	\$477,621	\$236,422	\$32,001	\$291,349	\$144,480	\$18,508	\$3,582	-	-	-	\$1,203,963	\$400,000	\$198,000	\$26,800	\$244,000	\$121,000	\$15,500	-	\$3,000	-	-	-	\$1,008,300
7 2032	1.23	1.23	\$491,950	\$243,515	\$32,961	\$300,089	\$148,815	\$19,063	\$3,690	-	-	-	\$1,240,082	\$400,000	\$198,000	\$26,800	\$244,000	\$121,000	\$15,500	-	\$3,000	-	-	-	\$1,008,300
8 2033	1.27	1.27	\$506,708	\$250,820	\$33,949	\$309,092	\$153,279	\$19,635	\$3,800	-	-	-	\$1,277,284	\$400,000	\$198,000	\$26,800	\$244,000	\$121,000	\$15,500	-	\$3,000	-	-	-	\$1,008,300
9 2034	1.30	1.30	\$521,909	\$258,345	\$34,968	\$318,365	\$157,878	\$20,224	\$3,914	-	-	-	\$1,315,603	\$400,000	\$198,000	\$26,800	\$244,000	\$121,000	\$15,500	-	\$3,000	-	-	-	\$1,008,300
10 2035	1.34	1.34	\$537,567	\$266,095	\$36,017	\$327,916	\$162,614	\$20,831	\$4,032	\$71,228	-	\$2,688	\$1,428,986	\$400,000	\$198,000	\$26,800	\$244,000	\$121,000	\$15,500	\$53,000	\$3,000	-	-	\$2,000	\$1,063,300
11 2036	1.38	1.38	\$553,694	\$274,078	\$37,097	\$337,753	\$167,492	\$21,456	\$4,153	-	-	-	\$1,395,723	\$400,000	\$198,000	\$26,800	\$244,000	\$121,000	\$15,500	-	\$3,000	-	-	-	\$1,008,300
12 2037	1.43	1.43	\$570,304	\$282,301	\$38,210	\$347,886	\$172,517	\$22,099	\$4,277	-	-	-	\$1,437,595	\$400,000	\$198,000	\$26,800	\$244,000	\$121,000	\$15,500	-	\$3,000	-	-	-	\$1,008,300
13 2038	1.47	1.47	\$587,413	\$290,770	\$39,357	\$358,322	\$177,693	\$22,762	\$4,406	-	-	-	\$1,480,723	\$400,000	\$198,000	\$26,800	\$244,000	\$121,000	\$15,500	-	\$3,000	-	-	-	\$1,008,300
14 2039	1.51	1.51	\$605,036	\$299,493	\$40,537	\$369,072	\$183,023	\$23,445	\$4,538	-	-	-	\$1,525,144	\$400,000	\$198,000	\$26,800	\$244,000	\$121,000	\$15,500	-	\$3,000	-	-	-	\$1,008,300
15 2040	1.56	1.56	\$623,187	\$308,478	\$41,754	\$380,144	\$188,514	\$24,148	\$4,674	\$130,869	\$129,311	-	\$1,831,079	\$400,000	\$198,000	\$26,800	\$244,000	\$121,000	\$15,500	-	\$3,000	\$84,000	\$83,000	-	\$1,175,300
16 2041	1.60	1.60	\$641,883	\$317,732	\$43,006	\$391,548	\$194,169	\$24,873	\$4,814	-	-	-	\$1,618,026	\$400,000	\$198,000	\$26,800	\$244,000	\$121,000	\$15,500	-	\$3,000	-	-	-	\$1,008,300
17 2042	1.65	1.65	\$661,139	\$327,264	\$44,296	\$403,295	\$199,995	\$25,619	\$4,959	-	-	-	\$1,666,566	\$400,000	\$198,000	\$26,800	\$244,000	\$121,000	\$15,500	-	\$3,000	-	-	-	\$1,008,300
18 2043	1.70	1.70	\$680,973	\$337,082	\$45,625	\$415,394	\$205,994	\$26,388	\$5,107	-	-	-	\$1,716,563	\$400,000	\$198,000	\$26,800	\$244,000	\$121,000	\$15,500	-	\$3,000	-	-	-	\$1,008,300
19 2044	1.75	1.75	\$701,402	\$347,194	\$46,994	\$427,855	\$212,174	\$27,179	\$5,261	-	-	-	\$1,768,060	\$400,000	\$198,000	\$26,800	\$244,000	\$121,000	\$15,500	-	\$3,000	-	-	-	\$1,008,300
20 2045	1.81	1.81	\$722,444	\$357,610	\$48,404	\$440,691	\$218,539	\$27,995	\$5,418	\$95,724	\$5,418	\$3,612	\$1,920,438	\$400,000	\$198,000	\$26,800	\$244,000	\$121,000	\$15,500	\$53,000	\$3,000	-	-	\$2,000	\$1,063,300
														\$8,400,000	\$4,160,000	\$560,000	\$5,120,000	\$2,540,000	\$330,000	\$110,000	\$60,000	\$80,000	\$80,000	\$4,000	\$21,440,000

Analysis Period (years) 20
Discount Rate (%) 3.00
Inflation Rate (%) 3.00

RRCSD Lifecycle Analysis of O&M Cost for Alternative 1a

Year	Present Worth Factor	Inflation Factor	O&M Costs, 2025 Dollars										O&M Costs, Present Worth											
			Labor	Piping and Valve Maintenance and Replacement (Treatment)	Piping and Valve Maintenance and Replacement (Collection)	Power	Chemical Addition	Pump Rebuild & Major Maintenance	15-Year Major Equipment Replacement	15-Year Instrumentation Replacement	10-Year Equipment Replacement	Total	Labor	Piping and Valve Maintenance and Replacement (Treatment)	Piping and Valve Maintenance and Replacement (Collection)	Power	Chemical Addition	Pump Rebuild & Major Maintenance	15-Year Major Equipment Replacement	15-Year Instrumentation Replacement	10-Year Equipment Replacement	Total		
0	2025	1.00	1.00	\$0	\$0	\$0	\$34,000	\$12,000	-	-	-	-	\$46,000	\$0	\$0	\$0	\$34,000	\$12,000	-	-	-	-	\$46,000	
1	2026	1.03	1.03	\$0	\$0	\$0	\$35,020	\$12,360	-	-	-	-	\$47,380	\$0	\$0	\$0	\$34,000	\$12,000	-	-	-	-	\$46,000	
2	2027	1.06	1.06	\$0	\$0	\$0	\$36,071	\$12,731	-	-	-	-	\$48,801	\$0	\$0	\$0	\$34,000	\$12,000	-	-	-	-	\$46,000	
3	2028	1.09	1.09	\$0	\$0	\$0	\$37,153	\$13,113	-	-	-	-	\$50,265	\$0	\$0	\$0	\$34,000	\$12,000	-	-	-	-	\$46,000	
4	2029	1.13	1.13	\$0	\$0	\$0	\$38,267	\$13,506	-	-	-	-	\$51,773	\$0	\$0	\$0	\$34,000	\$12,000	-	-	-	-	\$46,000	
5	2030	1.16	1.16	\$0	\$0	\$0	\$39,415	\$13,911	-	-	-	-	\$53,327	\$0	\$0	\$0	\$34,000	\$12,000	-	-	-	-	\$46,000	
6	2031	1.19	1.19	\$0	\$0	\$0	\$40,598	\$14,329	-	-	-	-	\$54,926	\$0	\$0	\$0	\$34,000	\$12,000	-	-	-	-	\$46,000	
7	2032	1.23	1.23	\$0	\$0	\$0	\$41,816	\$14,758	-	-	-	-	\$56,574	\$0	\$0	\$0	\$34,000	\$12,000	-	-	-	-	\$46,000	
8	2033	1.27	1.27	\$0	\$0	\$0	\$43,070	\$15,201	-	-	-	-	\$58,271	\$0	\$0	\$0	\$34,000	\$12,000	-	-	-	-	\$46,000	
9	2034	1.30	1.30	\$0	\$0	\$0	\$44,362	\$15,657	-	-	-	-	\$60,020	\$0	\$0	\$0	\$34,000	\$12,000	-	-	-	-	\$46,000	
10	2035	1.34	1.34	\$0	\$0	\$0	\$45,693	\$16,127	\$0	-	-	\$0	\$61,820	\$0	\$0	\$0	\$34,000	\$12,000	\$0	-	-	\$0	\$46,000	
11	2036	1.38	1.38	\$0	\$0	\$0	\$47,064	\$16,611	-	-	-	-	\$63,675	\$0	\$0	\$0	\$34,000	\$12,000	-	-	-	-	\$46,000	
12	2037	1.43	1.43	\$0	\$0	\$0	\$48,476	\$17,109	-	-	-	-	\$65,585	\$0	\$0	\$0	\$34,000	\$12,000	-	-	-	-	\$46,000	
13	2038	1.47	1.47	\$0	\$0	\$0	\$49,930	\$17,622	-	-	-	-	\$67,553	\$0	\$0	\$0	\$34,000	\$12,000	-	-	-	-	\$46,000	
14	2039	1.51	1.51	\$0	\$0	\$0	\$51,428	\$18,151	-	-	-	-	\$69,579	\$0	\$0	\$0	\$34,000	\$12,000	-	-	-	-	\$46,000	
15	2040	1.56	1.56	\$0	\$0	\$0	\$52,971	\$18,696	-	\$0	\$0	-	\$71,667	\$0	\$0	\$0	\$34,000	\$12,000	-	\$0	\$0	-	\$46,000	
16	2041	1.60	1.60	\$0	\$0	\$0	\$54,560	\$19,256	-	-	-	-	\$73,816	\$0	\$0	\$0	\$34,000	\$12,000	-	-	-	-	\$46,000	
17	2042	1.65	1.65	\$0	\$0	\$0	\$56,197	\$19,834	-	-	-	-	\$76,031	\$0	\$0	\$0	\$34,000	\$12,000	-	-	-	-	\$46,000	
18	2043	1.70	1.70	\$0	\$0	\$0	\$57,883	\$20,429	-	-	-	-	\$78,312	\$0	\$0	\$0	\$34,000	\$12,000	-	-	-	-	\$46,000	
19	2044	1.75	1.75	\$0	\$0	\$0	\$59,619	\$21,042	-	-	-	-	\$80,661	\$0	\$0	\$0	\$34,000	\$12,000	-	-	-	-	\$46,000	
20	2045	1.81	1.81	\$0	\$0	\$0	\$61,408	\$21,673	\$0	-	-	\$0	\$83,081	\$0	\$0	\$0	\$34,000	\$12,000	\$0	-	-	\$0	\$46,000	
														\$0	\$0	\$0	\$710,000	\$250,000	\$0	\$0	\$0	\$0	\$0	\$960,000

Analysis Period (years) 20
 Discount Rate (%) 3.00
 Inflation Rate (%) 3.00

FWDGCSD Lifecycle Analysis of O&M Cost for Alternative 1c

Year	Present Worth Factor	Inflation Factor	O&M Costs, 2024 Dollars													O&M Costs, Present Worth												
			Labor	Piping and Valve Maintenance and Replacement	Power	Chemical Addition	Solids Hauling	Pump Rebuild & Major Maintenance	Membrane Cassettes	UV Equipment Replacement	20-Year Major Equipment Replacement	15-Year Instrumentation Replacement	15-Year MBR System Replacements	20-Year MBR System Replacements	Total	Labor	Piping and Valve Maintenance and Replacement	Power	Chemical Addition	Solids Hauling	Pump Rebuild & Major Maintenance	Membrane Cassettes	UV Equipment Replacement	20-Year Major Equipment Replacement	15-Year Instrumentation Replacement	15-Year MBR System Replacements	20-Year MBR System Replacements	Total
0	2025	1.00	1.00	-\$16,000	\$226,000	\$429,000	-\$13,000	\$188,000	-	\$69,000	\$36,000	-	-	-	\$919,000	-\$16,000	\$226,000	\$429,000	-\$13,000	\$188,000	-	\$69,000	\$36,000	-	-	-	-	\$919,000
1	2026	1.03	1.03	-\$16,480	\$232,780	\$441,870	-\$13,390	\$193,640	-	\$71,070	\$37,080	-	-	-	\$946,570	-\$16,000	\$226,000	\$429,000	-\$13,000	\$188,000	-	\$69,000	\$36,000	-	-	-	-	\$919,000
2	2027	1.06	1.06	-\$16,974	\$239,763	\$455,126	-\$13,792	\$199,449	-	\$73,202	\$38,192	-	-	-	\$974,967	-\$16,000	\$226,000	\$429,000	-\$13,000	\$188,000	-	\$69,000	\$36,000	-	-	-	-	\$919,000
3	2028	1.09	1.09	-\$17,484	\$246,956	\$468,780	-\$14,205	\$205,433	-	\$75,398	\$39,338	-	-	-	\$1,004,216	-\$16,000	\$226,000	\$429,000	-\$13,000	\$188,000	-	\$69,000	\$36,000	-	-	-	-	\$919,000
4	2029	1.13	1.13	-\$18,008	\$254,365	\$482,843	-\$14,632	\$211,596	-	\$77,660	\$40,518	-	-	-	\$1,034,343	-\$16,000	\$226,000	\$429,000	-\$13,000	\$188,000	-	\$69,000	\$36,000	-	-	-	-	\$919,000
5	2030	1.16	1.16	-\$18,548	\$261,996	\$497,329	-\$15,071	\$217,944	-	\$79,990	\$41,734	-	-	-	\$1,065,373	-\$16,000	\$226,000	\$429,000	-\$13,000	\$188,000	-	\$69,000	\$36,000	-	-	-	-	\$919,000
6	2031	1.19	1.19	-\$19,105	\$269,856	\$512,248	-\$15,523	\$224,482	-	\$82,390	\$42,986	-	-	-	\$1,097,334	-\$16,000	\$226,000	\$429,000	-\$13,000	\$188,000	-	\$69,000	\$36,000	-	-	-	-	\$919,000
7	2032	1.23	1.23	-\$19,678	\$277,951	\$527,616	-\$15,988	\$231,216	-	\$84,861	\$44,275	-	-	-	\$1,130,254	-\$16,000	\$226,000	\$429,000	-\$13,000	\$188,000	-	\$69,000	\$36,000	-	-	-	-	\$919,000
8	2033	1.27	1.27	-\$20,268	\$286,290	\$543,444	-\$16,468	\$238,153	-	\$87,407	\$45,604	-	-	-	\$1,164,162	-\$16,000	\$226,000	\$429,000	-\$13,000	\$188,000	-	\$69,000	\$36,000	-	-	-	-	\$919,000
9	2034	1.30	1.30	-\$20,876	\$294,879	\$559,748	-\$16,962	\$245,297	-	\$90,029	\$46,972	-	-	-	\$1,199,087	-\$16,000	\$226,000	\$429,000	-\$13,000	\$188,000	-	\$69,000	\$36,000	-	-	-	-	\$919,000
10	2035	1.34	1.34	-\$21,503	\$303,725	\$576,540	-\$17,471	\$252,656	\$243,249	\$92,730	\$48,381	-	-	-	\$1,478,308	-\$16,000	\$226,000	\$429,000	-\$13,000	\$188,000	\$181,000	\$69,000	\$36,000	-	-	-	-	\$1,100,000
11	2036	1.38	1.38	-\$22,148	\$312,837	\$593,836	-\$17,995	\$260,236	-	\$95,512	\$49,832	-	-	-	\$1,272,111	-\$16,000	\$226,000	\$429,000	-\$13,000	\$188,000	-	\$69,000	\$36,000	-	-	-	-	\$919,000
12	2037	1.43	1.43	-\$22,812	\$322,222	\$611,651	-\$18,535	\$268,043	-	\$98,378	\$51,327	-	-	-	\$1,310,274	-\$16,000	\$226,000	\$429,000	-\$13,000	\$188,000	-	\$69,000	\$36,000	-	-	-	-	\$919,000
13	2038	1.47	1.47	-\$23,497	\$331,889	\$630,001	-\$19,091	\$276,084	-	\$101,329	\$52,867	-	-	-	\$1,349,582	-\$16,000	\$226,000	\$429,000	-\$13,000	\$188,000	-	\$69,000	\$36,000	-	-	-	-	\$919,000
14	2039	1.51	1.51	-\$24,201	\$341,845	\$648,901	-\$19,664	\$284,367	-	\$104,369	\$54,453	-	-	-	\$1,390,070	-\$16,000	\$226,000	\$429,000	-\$13,000	\$188,000	-	\$69,000	\$36,000	-	-	-	-	\$919,000
15	2040	1.56	1.56	-\$24,927	\$352,101	\$668,368	-\$20,254	\$292,898	-	\$107,500	\$56,087	-	\$403,514	\$598,259	\$2,433,545	-\$16,000	\$226,000	\$429,000	-\$13,000	\$188,000	-	\$69,000	\$36,000	-	\$259,000	\$384,000	-	\$1,562,000
16	2041	1.60	1.60	-\$25,675	\$362,664	\$688,419	-\$20,861	\$301,685	-	\$110,725	\$57,769	-	-	-	\$1,474,725	-\$16,000	\$226,000	\$429,000	-\$13,000	\$188,000	-	\$69,000	\$36,000	-	-	-	-	\$919,000
17	2042	1.65	1.65	-\$26,446	\$373,544	\$709,072	-\$21,487	\$310,735	-	\$114,046	\$59,503	-	-	-	\$1,518,967	-\$16,000	\$226,000	\$429,000	-\$13,000	\$188,000	-	\$69,000	\$36,000	-	-	-	-	\$919,000
18	2043	1.70	1.70	-\$27,239	\$384,750	\$730,344	-\$22,132	\$320,057	-	\$117,468	\$61,288	-	-	-	\$1,564,536	-\$16,000	\$226,000	\$429,000	-\$13,000	\$188,000	-	\$69,000	\$36,000	-	-	-	-	\$919,000
19	2044	1.75	1.75	-\$28,056	\$396,292	\$752,254	-\$22,796	\$329,659	-	\$120,992	\$63,126	-	-	-	\$1,611,472	-\$16,000	\$226,000	\$429,000	-\$13,000	\$188,000	-	\$69,000	\$36,000	-	-	-	-	\$919,000
20	2045	1.81	1.81	-\$28,898	\$408,181	\$774,822	-\$23,479	\$339,549	\$326,906	\$124,622	\$65,020	\$2,291,955	-	-	\$1,137,850	-\$16,000	\$226,000	\$429,000	-\$13,000	\$188,000	\$181,000	\$69,000	\$36,000	\$1,269,000	-	-	\$630,000	\$2,999,000
																-\$340,000	\$4,750,000	\$9,010,000	-\$270,000	\$3,950,000	\$360,000	\$1,450,000	\$760,000	\$1,270,000	\$260,000	\$380,000	\$630,000	\$22,210,000

Analysis Period (years) 20
Discount Rate (%) 3.00
Inflation Rate (%) 3.00

RRCSD Lifecycle Analysis of O&M Cost for Alternative 1c

Year	Present Worth Factor	Inflation Factor	O&M Costs, 2024 Dollars							O&M Costs, Present Worth							
			Labor	Piping and Valve Maintenance and Replacement	Power	Chemical Addition	Pump Rebuild & Major Maintenance	15-Year Instrumentation Replacement	Total	Labor	Piping and Valve Maintenance and Replacement	Power	Chemical Addition	Pump Rebuild & Major Maintenance	15-Year Instrumentation Replacement	Total	
0	2025	1.00	1.00	-\$2,964,000	-\$721,000	-\$218,000	-\$35,000	-	-	-\$3,938,000	-\$2,964,000	-\$721,000	-\$218,000	-\$35,000	-	-	-\$3,938,000
1	2026	1.03	1.03	-\$3,052,920	-\$742,630	-\$224,540	-\$36,050	-	-	-\$4,056,140	-\$2,964,000	-\$721,000	-\$218,000	-\$35,000	-	-	-\$3,938,000
2	2027	1.06	1.06	-\$3,144,508	-\$764,909	-\$231,276	-\$37,132	-	-	-\$4,177,824	-\$2,964,000	-\$721,000	-\$218,000	-\$35,000	-	-	-\$3,938,000
3	2028	1.09	1.09	-\$3,238,843	-\$787,856	-\$238,214	-\$38,245	-	-	-\$4,303,159	-\$2,964,000	-\$721,000	-\$218,000	-\$35,000	-	-	-\$3,938,000
4	2029	1.13	1.13	-\$3,336,008	-\$811,492	-\$245,361	-\$39,393	-	-	-\$4,432,254	-\$2,964,000	-\$721,000	-\$218,000	-\$35,000	-	-	-\$3,938,000
5	2030	1.16	1.16	-\$3,436,088	-\$835,837	-\$252,722	-\$40,575	-	-	-\$4,565,221	-\$2,964,000	-\$721,000	-\$218,000	-\$35,000	-	-	-\$3,938,000
6	2031	1.19	1.19	-\$3,539,171	-\$860,912	-\$260,303	-\$41,792	-	-	-\$4,702,178	-\$2,964,000	-\$721,000	-\$218,000	-\$35,000	-	-	-\$3,938,000
7	2032	1.23	1.23	-\$3,645,346	-\$886,739	-\$268,113	-\$43,046	-	-	-\$4,843,243	-\$2,964,000	-\$721,000	-\$218,000	-\$35,000	-	-	-\$3,938,000
8	2033	1.27	1.27	-\$3,754,707	-\$913,341	-\$276,156	-\$44,337	-	-	-\$4,988,541	-\$2,964,000	-\$721,000	-\$218,000	-\$35,000	-	-	-\$3,938,000
9	2034	1.30	1.30	-\$3,867,348	-\$940,741	-\$284,441	-\$45,667	-	-	-\$5,138,197	-\$2,964,000	-\$721,000	-\$218,000	-\$35,000	-	-	-\$3,938,000
10	2035	1.34	1.34	-\$3,983,368	-\$968,964	-\$292,974	-\$47,037	\$67,196	-	-\$5,225,147	-\$2,964,000	-\$721,000	-\$218,000	-\$35,000	\$50,000	-	-\$3,888,000
11	2036	1.38	1.38	-\$4,102,869	-\$998,033	-\$301,763	-\$48,448	-	-	-\$5,451,113	-\$2,964,000	-\$721,000	-\$218,000	-\$35,000	-	-	-\$3,938,000
12	2037	1.43	1.43	-\$4,225,955	-\$1,027,974	-\$310,816	-\$49,902	-	-	-\$5,614,646	-\$2,964,000	-\$721,000	-\$218,000	-\$35,000	-	-	-\$3,938,000
13	2038	1.47	1.47	-\$4,352,734	-\$1,058,813	-\$320,140	-\$51,399	-	-	-\$5,783,086	-\$2,964,000	-\$721,000	-\$218,000	-\$35,000	-	-	-\$3,938,000
14	2039	1.51	1.51	-\$4,483,316	-\$1,090,577	-\$329,745	-\$52,941	-	-	-\$5,956,578	-\$2,964,000	-\$721,000	-\$218,000	-\$35,000	-	-	-\$3,938,000
15	2040	1.56	1.56	-\$4,617,815	-\$1,123,295	-\$339,637	-\$54,529	-	\$10,906	-\$6,124,370	-\$2,964,000	-\$721,000	-\$218,000	-\$35,000	-	\$7,000	-\$3,931,000
16	2041	1.60	1.60	-\$4,756,350	-\$1,156,993	-\$349,826	-\$56,165	-	-	-\$6,319,334	-\$2,964,000	-\$721,000	-\$218,000	-\$35,000	-	-	-\$3,938,000
17	2042	1.65	1.65	-\$4,899,040	-\$1,191,703	-\$360,321	-\$57,850	-	-	-\$6,508,914	-\$2,964,000	-\$721,000	-\$218,000	-\$35,000	-	-	-\$3,938,000
18	2043	1.70	1.70	-\$5,046,012	-\$1,227,454	-\$371,130	-\$59,585	-	-	-\$6,704,181	-\$2,964,000	-\$721,000	-\$218,000	-\$35,000	-	-	-\$3,938,000
19	2044	1.75	1.75	-\$5,197,392	-\$1,264,278	-\$382,264	-\$61,373	-	-	-\$6,905,307	-\$2,964,000	-\$721,000	-\$218,000	-\$35,000	-	-	-\$3,938,000
20	2045	1.81	1.81	-\$5,353,314	-\$1,302,206	-\$393,732	-\$63,214	\$90,306	-	-\$7,022,160	-\$2,964,000	-\$721,000	-\$218,000	-\$35,000	\$50,000	-	-\$3,888,000
											-\$62,240,000	-\$15,140,000	-\$4,580,000	-\$740,000	\$100,000	\$7,000	-\$82,590,000

Analysis Period (years) 20
Discount Rate (%) 3.00
Inflation Rate (%) 3.00

FWDGCSD Lifecycle Analysis of O&M Cost for Alternative 2a

Year		Present Worth Factor	Inflation Factor	O&M Costs, 2025 Dollars						O&M Costs, Present Worth					
				Labor	Piping and Valve Maintenance and Replacement	Power	Chemical Addition	Pump Rebuild & Major Maintenance	Total	Labor	Piping and Valve Maintenance and Replacement	Power	Chemical Addition	Pump Rebuild & Major Maintenance	Total
0	2025	1.00	1.00	-\$598,000	-\$99,000	-\$171,000	-\$120,000	-	-\$988,000	-\$598,000	-\$99,000	-\$171,000	-\$120,000	-	-\$988,000
1	2026	1.03	1.03	-\$615,940	-\$101,970	-\$176,130	-\$123,600	-	-\$1,017,640	-\$598,000	-\$99,000	-\$171,000	-\$120,000	-	-\$988,000
2	2027	1.06	1.06	-\$634,418	-\$105,029	-\$181,414	-\$127,308	-	-\$1,048,169	-\$598,000	-\$99,000	-\$171,000	-\$120,000	-	-\$988,000
3	2028	1.09	1.09	-\$653,451	-\$108,180	-\$186,856	-\$131,127	-	-\$1,079,614	-\$598,000	-\$99,000	-\$171,000	-\$120,000	-	-\$988,000
4	2029	1.13	1.13	-\$673,054	-\$111,425	-\$192,462	-\$135,061	-	-\$1,112,003	-\$598,000	-\$99,000	-\$171,000	-\$120,000	-	-\$988,000
5	2030	1.16	1.16	-\$693,246	-\$114,768	-\$198,236	-\$139,113	-	-\$1,145,363	-\$598,000	-\$99,000	-\$171,000	-\$120,000	-	-\$988,000
6	2031	1.19	1.19	-\$714,043	-\$118,211	-\$204,183	-\$143,286	-	-\$1,179,724	-\$598,000	-\$99,000	-\$171,000	-\$120,000	-	-\$988,000
7	2032	1.23	1.23	-\$735,465	-\$121,758	-\$210,308	-\$147,585	-	-\$1,215,115	-\$598,000	-\$99,000	-\$171,000	-\$120,000	-	-\$988,000
8	2033	1.27	1.27	-\$757,529	-\$125,410	-\$216,618	-\$152,012	-	-\$1,251,569	-\$598,000	-\$99,000	-\$171,000	-\$120,000	-	-\$988,000
9	2034	1.30	1.30	-\$780,254	-\$129,173	-\$223,116	-\$156,573	-	-\$1,289,116	-\$598,000	-\$99,000	-\$171,000	-\$120,000	-	-\$988,000
10	2035	1.34	1.34	-\$803,662	-\$133,048	-\$229,810	-\$161,270	\$72,571	-\$1,255,218	-\$598,000	-\$99,000	-\$171,000	-\$120,000	\$54,000	-\$934,000
11	2036	1.38	1.38	-\$827,772	-\$137,039	-\$236,704	-\$166,108	-	-\$1,367,623	-\$598,000	-\$99,000	-\$171,000	-\$120,000	-	-\$988,000
12	2037	1.43	1.43	-\$852,605	-\$141,150	-\$243,805	-\$171,091	-	-\$1,408,652	-\$598,000	-\$99,000	-\$171,000	-\$120,000	-	-\$988,000
13	2038	1.47	1.47	-\$878,183	-\$145,385	-\$251,119	-\$176,224	-	-\$1,450,911	-\$598,000	-\$99,000	-\$171,000	-\$120,000	-	-\$988,000
14	2039	1.51	1.51	-\$904,529	-\$149,746	-\$258,653	-\$181,511	-	-\$1,494,439	-\$598,000	-\$99,000	-\$171,000	-\$120,000	-	-\$988,000
15	2040	1.56	1.56	-\$931,665	-\$154,239	-\$266,412	-\$186,956	-	-\$1,539,272	-\$598,000	-\$99,000	-\$171,000	-\$120,000	-	-\$988,000
16	2041	1.60	1.60	-\$959,614	-\$158,866	-\$274,405	-\$192,565	-	-\$1,585,450	-\$598,000	-\$99,000	-\$171,000	-\$120,000	-	-\$988,000
17	2042	1.65	1.65	-\$988,403	-\$163,632	-\$282,637	-\$198,342	-	-\$1,633,013	-\$598,000	-\$99,000	-\$171,000	-\$120,000	-	-\$988,000
18	2043	1.70	1.70	-\$1,018,055	-\$168,541	-\$291,116	-\$204,292	-	-\$1,682,004	-\$598,000	-\$99,000	-\$171,000	-\$120,000	-	-\$988,000
19	2044	1.75	1.75	-\$1,048,597	-\$173,597	-\$299,850	-\$210,421	-	-\$1,732,464	-\$598,000	-\$99,000	-\$171,000	-\$120,000	-	-\$988,000
20	2045	1.81	1.81	-\$1,080,055	-\$178,805	-\$308,845	-\$216,733	\$97,530	-\$1,686,908	-\$598,000	-\$99,000	-\$171,000	-\$120,000	\$54,000	-\$934,000
										-\$12,560,000	-\$2,080,000	-\$3,590,000	-\$2,520,000	\$110,000	-\$20,640,000

Analysis Period (years) 20
Discount Rate (%) 3.00
Inflation Rate (%) 3.00

RRCSD Lifecycle Analysis of O&M Cost for Alternative 2a

Year	Present Worth Factor	Inflation Factor	O&M Costs, 2025 Dollars							O&M Costs, Present Worth					
			Labor	Piping and Valve Maintenance and Replacement	Power	Chemical Addition	Pump Rebuild & Major Maintenance	Total	Labor	Piping and Valve Maintenance and Replacement	Power	Chemical Addition	Pump Rebuild & Major Maintenance	Total	
0	2025	1.00	1.00	-\$2,964,000	-\$660,000	-\$317,000	-\$35,000	-	-\$3,976,000	-\$2,964,000	-\$660,000	-\$317,000	-\$35,000	-	-\$3,976,000
1	2026	1.03	1.03	-\$3,052,920	-\$679,800	-\$326,510	-\$36,050	-	-\$4,095,280	-\$2,964,000	-\$660,000	-\$317,000	-\$35,000	-	-\$3,976,000
2	2027	1.06	1.06	-\$3,144,508	-\$700,194	-\$336,305	-\$37,132	-	-\$4,218,138	-\$2,964,000	-\$660,000	-\$317,000	-\$35,000	-	-\$3,976,000
3	2028	1.09	1.09	-\$3,238,843	-\$721,200	-\$346,394	-\$38,245	-	-\$4,344,683	-\$2,964,000	-\$660,000	-\$317,000	-\$35,000	-	-\$3,976,000
4	2029	1.13	1.13	-\$3,336,008	-\$742,836	-\$356,786	-\$39,393	-	-\$4,475,023	-\$2,964,000	-\$660,000	-\$317,000	-\$35,000	-	-\$3,976,000
5	2030	1.16	1.16	-\$3,436,088	-\$765,121	-\$367,490	-\$40,575	-	-\$4,609,274	-\$2,964,000	-\$660,000	-\$317,000	-\$35,000	-	-\$3,976,000
6	2031	1.19	1.19	-\$3,539,171	-\$788,075	-\$378,515	-\$41,792	-	-\$4,747,552	-\$2,964,000	-\$660,000	-\$317,000	-\$35,000	-	-\$3,976,000
7	2032	1.23	1.23	-\$3,645,346	-\$811,717	-\$389,870	-\$43,046	-	-\$4,889,978	-\$2,964,000	-\$660,000	-\$317,000	-\$35,000	-	-\$3,976,000
8	2033	1.27	1.27	-\$3,754,707	-\$836,068	-\$401,566	-\$44,337	-	-\$5,036,678	-\$2,964,000	-\$660,000	-\$317,000	-\$35,000	-	-\$3,976,000
9	2034	1.30	1.30	-\$3,867,348	-\$861,150	-\$413,613	-\$45,667	-	-\$5,187,778	-\$2,964,000	-\$660,000	-\$317,000	-\$35,000	-	-\$3,976,000
10	2035	1.34	1.34	-\$3,983,368	-\$886,985	-\$426,021	-\$47,037	\$67,196	-\$5,276,216	-\$2,964,000	-\$660,000	-\$317,000	-\$35,000	\$50,000	-\$3,926,000
11	2036	1.38	1.38	-\$4,102,869	-\$913,594	-\$438,802	-\$48,448	-	-\$5,503,714	-\$2,964,000	-\$660,000	-\$317,000	-\$35,000	-	-\$3,976,000
12	2037	1.43	1.43	-\$4,225,955	-\$941,002	-\$451,966	-\$49,902	-	-\$5,668,825	-\$2,964,000	-\$660,000	-\$317,000	-\$35,000	-	-\$3,976,000
13	2038	1.47	1.47	-\$4,352,734	-\$969,232	-\$465,525	-\$51,399	-	-\$5,838,890	-\$2,964,000	-\$660,000	-\$317,000	-\$35,000	-	-\$3,976,000
14	2039	1.51	1.51	-\$4,483,316	-\$998,309	-\$479,491	-\$52,941	-	-\$6,014,057	-\$2,964,000	-\$660,000	-\$317,000	-\$35,000	-	-\$3,976,000
15	2040	1.56	1.56	-\$4,617,815	-\$1,028,258	-\$493,876	-\$54,529	-	-\$6,194,478	-\$2,964,000	-\$660,000	-\$317,000	-\$35,000	-	-\$3,976,000
16	2041	1.60	1.60	-\$4,756,350	-\$1,059,106	-\$508,692	-\$56,165	-	-\$6,380,313	-\$2,964,000	-\$660,000	-\$317,000	-\$35,000	-	-\$3,976,000
17	2042	1.65	1.65	-\$4,899,040	-\$1,090,879	-\$523,953	-\$57,850	-	-\$6,571,722	-\$2,964,000	-\$660,000	-\$317,000	-\$35,000	-	-\$3,976,000
18	2043	1.70	1.70	-\$5,046,012	-\$1,123,606	-\$539,671	-\$59,585	-	-\$6,768,874	-\$2,964,000	-\$660,000	-\$317,000	-\$35,000	-	-\$3,976,000
19	2044	1.75	1.75	-\$5,197,392	-\$1,157,314	-\$555,861	-\$61,373	-	-\$6,971,940	-\$2,964,000	-\$660,000	-\$317,000	-\$35,000	-	-\$3,976,000
20	2045	1.81	1.81	-\$5,353,314	-\$1,192,033	-\$572,537	-\$63,214	\$90,306	-\$7,090,793	-\$2,964,000	-\$660,000	-\$317,000	-\$35,000	\$50,000	-\$3,926,000
										-\$62,240,000	-\$13,860,000	-\$6,660,000	-\$740,000	\$100,000	-\$83,400,000

Analysis Period (years) 20
Discount Rate (%) 3.00
Inflation Rate (%) 3.00

FWDGCSO Lifecycle Analysis of O&M Cost for Alternative 2b

Year		Present Worth Factor	Inflation Factor	O&M Costs, 2025 Dollars						O&M Costs, Present Worth					
				Labor	Piping and Valve Maintenance and Replacement	Power	Chemical Addition	Pump Rebuild & Major Maintenance	Total	Labor	Piping and Valve Maintenance and Replacement	Power	Chemical Addition	Pump Rebuild & Major Maintenance	Total
0	2025	1.00	1.00	-\$598,000	-\$110,000	-\$165,000	-\$120,000	-	-\$993,000	-\$598,000	-\$110,000	-\$165,000	-\$120,000	-	-\$993,000
1	2026	1.03	1.03	-\$615,940	-\$113,300	-\$169,950	-\$123,600	-	-\$1,022,790	-\$598,000	-\$110,000	-\$165,000	-\$120,000	-	-\$993,000
2	2027	1.06	1.06	-\$634,418	-\$116,699	-\$175,049	-\$127,308	-	-\$1,053,474	-\$598,000	-\$110,000	-\$165,000	-\$120,000	-	-\$993,000
3	2028	1.09	1.09	-\$653,451	-\$120,200	-\$180,300	-\$131,127	-	-\$1,085,078	-\$598,000	-\$110,000	-\$165,000	-\$120,000	-	-\$993,000
4	2029	1.13	1.13	-\$673,054	-\$123,806	-\$185,709	-\$135,061	-	-\$1,117,630	-\$598,000	-\$110,000	-\$165,000	-\$120,000	-	-\$993,000
5	2030	1.16	1.16	-\$693,246	-\$127,520	-\$191,280	-\$139,113	-	-\$1,151,159	-\$598,000	-\$110,000	-\$165,000	-\$120,000	-	-\$993,000
6	2031	1.19	1.19	-\$714,043	-\$131,346	-\$197,019	-\$143,286	-	-\$1,185,694	-\$598,000	-\$110,000	-\$165,000	-\$120,000	-	-\$993,000
7	2032	1.23	1.23	-\$735,465	-\$135,286	-\$202,929	-\$147,585	-	-\$1,221,265	-\$598,000	-\$110,000	-\$165,000	-\$120,000	-	-\$993,000
8	2033	1.27	1.27	-\$757,529	-\$139,345	-\$209,017	-\$152,012	-	-\$1,257,903	-\$598,000	-\$110,000	-\$165,000	-\$120,000	-	-\$993,000
9	2034	1.30	1.30	-\$780,254	-\$143,525	-\$215,288	-\$156,573	-	-\$1,295,640	-\$598,000	-\$110,000	-\$165,000	-\$120,000	-	-\$993,000
10	2035	1.34	1.34	-\$803,662	-\$147,831	-\$221,746	-\$161,270	\$114,233	-\$1,220,276	-\$598,000	-\$110,000	-\$165,000	-\$120,000	\$85,000	-\$908,000
11	2036	1.38	1.38	-\$827,772	-\$152,266	-\$228,399	-\$166,108	-	-\$1,374,544	-\$598,000	-\$110,000	-\$165,000	-\$120,000	-	-\$993,000
12	2037	1.43	1.43	-\$852,605	-\$156,834	-\$235,251	-\$171,091	-	-\$1,415,781	-\$598,000	-\$110,000	-\$165,000	-\$120,000	-	-\$993,000
13	2038	1.47	1.47	-\$878,183	-\$161,539	-\$242,308	-\$176,224	-	-\$1,458,254	-\$598,000	-\$110,000	-\$165,000	-\$120,000	-	-\$993,000
14	2039	1.51	1.51	-\$904,529	-\$166,385	-\$249,577	-\$181,511	-	-\$1,502,002	-\$598,000	-\$110,000	-\$165,000	-\$120,000	-	-\$993,000
15	2040	1.56	1.56	-\$931,665	-\$171,376	-\$257,065	-\$186,956	-	-\$1,547,062	-\$598,000	-\$110,000	-\$165,000	-\$120,000	-	-\$993,000
16	2041	1.60	1.60	-\$959,614	-\$176,518	-\$264,777	-\$192,565	-	-\$1,593,473	-\$598,000	-\$110,000	-\$165,000	-\$120,000	-	-\$993,000
17	2042	1.65	1.65	-\$988,403	-\$181,813	-\$272,720	-\$198,342	-	-\$1,641,278	-\$598,000	-\$110,000	-\$165,000	-\$120,000	-	-\$993,000
18	2043	1.70	1.70	-\$1,018,055	-\$187,268	-\$280,901	-\$204,292	-	-\$1,690,516	-\$598,000	-\$110,000	-\$165,000	-\$120,000	-	-\$993,000
19	2044	1.75	1.75	-\$1,048,597	-\$192,886	-\$289,328	-\$210,421	-	-\$1,741,232	-\$598,000	-\$110,000	-\$165,000	-\$120,000	-	-\$993,000
20	2045	1.81	1.81	-\$1,080,055	-\$198,672	-\$298,008	-\$216,733	\$153,519	-\$1,639,949	-\$598,000	-\$110,000	-\$165,000	-\$120,000	\$85,000	-\$908,000
										-\$12,560,000	-\$2,310,000	-\$3,470,000	-\$2,520,000	\$170,000	-\$20,690,000

Analysis Period (years) 20
 Discount Rate (%) 3.00
 Inflation Rate (%) 3.00

RRCSD Lifecycle Analysis of O&M Cost for Alternative 2b

Year	Present Worth Factor	Inflation Factor	O&M Costs, 2025 Dollars						O&M Costs, Present Worth						
			Labor	Piping and Valve Maintenance and Replacement	Power	Chemical Addition	Pump Rebuild & Major Maintenance	Total	Labor	Piping and Valve Maintenance and Replacement	Power	Chemical Addition	Pump Rebuild & Major Maintenance	Total	
0	2025	1.00	1.00	-\$2,964,000	-\$646,000	-\$149,000	-\$35,000	-	-\$3,794,000	-\$2,964,000	-\$646,000	-\$149,000	-\$35,000	-	-\$3,794,000
1	2026	1.03	1.03	-\$3,052,920	-\$665,380	-\$153,470	-\$36,050	-	-\$3,907,820	-\$2,964,000	-\$646,000	-\$149,000	-\$35,000	-	-\$3,794,000
2	2027	1.06	1.06	-\$3,144,508	-\$685,341	-\$158,074	-\$37,132	-	-\$4,025,055	-\$2,964,000	-\$646,000	-\$149,000	-\$35,000	-	-\$3,794,000
3	2028	1.09	1.09	-\$3,238,843	-\$705,902	-\$162,816	-\$38,245	-	-\$4,145,806	-\$2,964,000	-\$646,000	-\$149,000	-\$35,000	-	-\$3,794,000
4	2029	1.13	1.13	-\$3,336,008	-\$727,079	-\$167,701	-\$39,393	-	-\$4,270,180	-\$2,964,000	-\$646,000	-\$149,000	-\$35,000	-	-\$3,794,000
5	2030	1.16	1.16	-\$3,436,088	-\$748,891	-\$172,732	-\$40,575	-	-\$4,398,286	-\$2,964,000	-\$646,000	-\$149,000	-\$35,000	-	-\$3,794,000
6	2031	1.19	1.19	-\$3,539,171	-\$771,358	-\$177,914	-\$41,792	-	-\$4,530,234	-\$2,964,000	-\$646,000	-\$149,000	-\$35,000	-	-\$3,794,000
7	2032	1.23	1.23	-\$3,645,346	-\$794,499	-\$183,251	-\$43,046	-	-\$4,666,141	-\$2,964,000	-\$646,000	-\$149,000	-\$35,000	-	-\$3,794,000
8	2033	1.27	1.27	-\$3,754,707	-\$818,333	-\$188,749	-\$44,337	-	-\$4,806,126	-\$2,964,000	-\$646,000	-\$149,000	-\$35,000	-	-\$3,794,000
9	2034	1.30	1.30	-\$3,867,348	-\$842,883	-\$194,411	-\$45,667	-	-\$4,950,309	-\$2,964,000	-\$646,000	-\$149,000	-\$35,000	-	-\$3,794,000
10	2035	1.34	1.34	-\$3,983,368	-\$868,170	-\$200,244	-\$47,037	\$67,196	-\$5,031,623	-\$2,964,000	-\$646,000	-\$149,000	-\$35,000	\$50,000	-\$3,744,000
11	2036	1.38	1.38	-\$4,102,869	-\$894,215	-\$206,251	-\$48,448	-	-\$5,251,783	-\$2,964,000	-\$646,000	-\$149,000	-\$35,000	-	-\$3,794,000
12	2037	1.43	1.43	-\$4,225,955	-\$921,042	-\$212,438	-\$49,902	-	-\$5,409,337	-\$2,964,000	-\$646,000	-\$149,000	-\$35,000	-	-\$3,794,000
13	2038	1.47	1.47	-\$4,352,734	-\$948,673	-\$218,812	-\$51,399	-	-\$5,571,617	-\$2,964,000	-\$646,000	-\$149,000	-\$35,000	-	-\$3,794,000
14	2039	1.51	1.51	-\$4,483,316	-\$977,133	-\$225,376	-\$52,941	-	-\$5,738,765	-\$2,964,000	-\$646,000	-\$149,000	-\$35,000	-	-\$3,794,000
15	2040	1.56	1.56	-\$4,617,815	-\$1,006,447	-\$232,137	-\$54,529	-	-\$5,910,928	-\$2,964,000	-\$646,000	-\$149,000	-\$35,000	-	-\$3,794,000
16	2041	1.60	1.60	-\$4,756,350	-\$1,036,640	-\$239,101	-\$56,165	-	-\$6,088,256	-\$2,964,000	-\$646,000	-\$149,000	-\$35,000	-	-\$3,794,000
17	2042	1.65	1.65	-\$4,899,040	-\$1,067,740	-\$246,274	-\$57,850	-	-\$6,270,904	-\$2,964,000	-\$646,000	-\$149,000	-\$35,000	-	-\$3,794,000
18	2043	1.70	1.70	-\$5,046,012	-\$1,099,772	-\$253,663	-\$59,585	-	-\$6,459,031	-\$2,964,000	-\$646,000	-\$149,000	-\$35,000	-	-\$3,794,000
19	2044	1.75	1.75	-\$5,197,392	-\$1,132,765	-\$261,272	-\$61,373	-	-\$6,652,802	-\$2,964,000	-\$646,000	-\$149,000	-\$35,000	-	-\$3,794,000
20	2045	1.81	1.81	-\$5,353,314	-\$1,166,748	-\$269,111	-\$63,214	\$90,306	-\$6,762,080	-\$2,964,000	-\$646,000	-\$149,000	-\$35,000	\$50,000	-\$3,744,000
										-\$62,240,000	-\$13,570,000	-\$3,130,000	-\$740,000	\$100,000	-\$79,580,000

Analysis Period (years) 20
 Discount Rate (%) 3.00
 Inflation Rate (%) 3.00

FWD/GCSD Lifecycle Analysis of O&M Cost for Alternative 3b

Year	Present Worth Factor	Inflation Factor	O&M Costs, 2025 Dollars											O&M Costs, Present Worth											
			Labor	Piping and Valve Maintenance and Replacement	Power	Chemical Addition	Blower Filter/Belt/Oil Changes	Pump Rebuild & Major Maintenance	Cloth Disk Filters	15-Year Major Equipment Replacement	15-Year Instrumentation Replacement	10-Year Equipment Replacement	Total	Labor	Piping and Valve Maintenance and Replacement	Power	Chemical Addition	Blower Filter/Belt/Oil Changes	Pump Rebuild & Major Maintenance	Cloth Disk Filters	15-Year Major Equipment Replacement	15-Year Instrumentation Replacement	10-Year Cloth Disk Filtration System Replacements	Total	
0	2025	1.00	1.00	\$400,000	\$93,000	\$75,200	\$51,900	\$9,400	-	\$2,700	-	-	-	\$632,200	\$400,000	\$93,000	\$75,200	\$51,900	\$9,400	-	\$2,700	-	-	-	\$632,200
1	2026	1.03	1.03	\$412,000	\$95,790	\$77,456	\$53,457	\$9,682	-	\$2,781	-	-	-	\$651,166	\$400,000	\$93,000	\$75,200	\$51,900	\$9,400	-	\$2,700	-	-	-	\$632,200
2	2027	1.06	1.06	\$424,360	\$98,664	\$79,780	\$55,061	\$9,972	-	\$2,864	-	-	-	\$670,701	\$400,000	\$93,000	\$75,200	\$51,900	\$9,400	-	\$2,700	-	-	-	\$632,200
3	2028	1.09	1.09	\$437,091	\$101,624	\$82,173	\$56,713	\$10,272	-	\$2,950	-	-	-	\$690,822	\$400,000	\$93,000	\$75,200	\$51,900	\$9,400	-	\$2,700	-	-	-	\$632,200
4	2029	1.13	1.13	\$450,204	\$104,672	\$84,638	\$58,414	\$10,580	-	\$3,039	-	-	-	\$711,547	\$400,000	\$93,000	\$75,200	\$51,900	\$9,400	-	\$2,700	-	-	-	\$632,200
5	2030	1.16	1.16	\$463,710	\$107,812	\$87,177	\$60,166	\$10,897	-	\$3,130	-	-	-	\$732,893	\$400,000	\$93,000	\$75,200	\$51,900	\$9,400	-	\$2,700	-	-	-	\$632,200
6	2031	1.19	1.19	\$477,621	\$111,047	\$89,793	\$61,971	\$11,224	-	\$3,224	-	-	-	\$754,880	\$400,000	\$93,000	\$75,200	\$51,900	\$9,400	-	\$2,700	-	-	-	\$632,200
7	2032	1.23	1.23	\$491,950	\$114,378	\$92,487	\$63,830	\$11,561	-	\$3,321	-	-	-	\$777,526	\$400,000	\$93,000	\$75,200	\$51,900	\$9,400	-	\$2,700	-	-	-	\$632,200
8	2033	1.27	1.27	\$506,708	\$117,810	\$95,261	\$65,745	\$11,908	-	\$3,420	-	-	-	\$800,852	\$400,000	\$93,000	\$75,200	\$51,900	\$9,400	-	\$2,700	-	-	-	\$632,200
9	2034	1.30	1.30	\$521,909	\$121,344	\$98,119	\$67,718	\$12,265	-	\$3,523	-	-	-	\$824,878	\$400,000	\$93,000	\$75,200	\$51,900	\$9,400	-	\$2,700	-	-	-	\$632,200
10	2035	1.34	1.34	\$537,567	\$124,984	\$101,063	\$69,749	\$12,633	\$47,037	\$3,629	-	-	\$2,822	\$899,483	\$400,000	\$93,000	\$75,200	\$51,900	\$9,400	\$35,000	\$2,700	-	-	\$2,100	\$669,300
11	2036	1.38	1.38	\$553,694	\$128,734	\$104,094	\$71,842	\$13,012	-	\$3,737	-	-	-	\$875,113	\$400,000	\$93,000	\$75,200	\$51,900	\$9,400	-	\$2,700	-	-	-	\$632,200
12	2037	1.43	1.43	\$570,304	\$132,596	\$107,217	\$73,997	\$13,402	-	\$3,850	-	-	-	\$901,366	\$400,000	\$93,000	\$75,200	\$51,900	\$9,400	-	\$2,700	-	-	-	\$632,200
13	2038	1.47	1.47	\$587,413	\$136,574	\$110,434	\$76,217	\$13,804	-	\$3,965	-	-	-	\$928,407	\$400,000	\$93,000	\$75,200	\$51,900	\$9,400	-	\$2,700	-	-	-	\$632,200
14	2039	1.51	1.51	\$605,036	\$140,671	\$113,747	\$78,503	\$14,218	-	\$4,084	-	-	-	\$956,259	\$400,000	\$93,000	\$75,200	\$51,900	\$9,400	-	\$2,700	-	-	-	\$632,200
15	2040	1.56	1.56	\$623,187	\$144,891	\$117,159	\$80,859	\$14,645	-	\$4,207	\$67,304	\$124,637	-	\$1,176,889	\$400,000	\$93,000	\$75,200	\$51,900	\$9,400	-	\$2,700	\$43,200	\$80,000	-	\$755,400
16	2041	1.60	1.60	\$641,883	\$149,238	\$120,674	\$83,284	\$15,084	-	\$4,333	-	-	-	\$1,014,495	\$400,000	\$93,000	\$75,200	\$51,900	\$9,400	-	\$2,700	-	-	-	\$632,200
17	2042	1.65	1.65	\$661,139	\$153,715	\$124,294	\$85,783	\$15,537	-	\$4,463	-	-	-	\$1,044,930	\$400,000	\$93,000	\$75,200	\$51,900	\$9,400	-	\$2,700	-	-	-	\$632,200
18	2043	1.70	1.70	\$680,973	\$158,326	\$128,023	\$88,356	\$16,003	-	\$4,597	-	-	-	\$1,076,278	\$400,000	\$93,000	\$75,200	\$51,900	\$9,400	-	\$2,700	-	-	-	\$632,200
19	2044	1.75	1.75	\$701,402	\$163,076	\$131,864	\$91,007	\$16,483	-	\$4,734	-	-	-	\$1,108,567	\$400,000	\$93,000	\$75,200	\$51,900	\$9,400	-	\$2,700	-	-	-	\$632,200
20	2045	1.81	1.81	\$722,444	\$167,968	\$135,820	\$93,737	\$16,977	\$63,214	\$4,877	-	-	\$3,793	\$1,208,830	\$400,000	\$93,000	\$75,200	\$51,900	\$9,400	\$35,000	\$2,700	-	-	\$2,100	\$669,300
															\$8,400,000	\$1,950,000	\$1,580,000	\$1,090,000	\$200,000	\$70,000	\$60,000	\$40,000	\$80,000	\$4,000	\$13,470,000

Analysis Period (years) 20
Discount Rate (%) 3.00
Inflation Rate (%) 3.00

RRCSO Lifecycle Analysis of O&M Cost for Alternative 3b

Year	Present Worth Factor	Inflation Factor	O&M Costs, 2025 Dollars											O&M Costs, Present Worth												
			Labor	Piping and Valve Maintenance and Replacement	Power	Chemical Addition	Blower Filter/Belt/Oil Changes	Pump Rebuild & Major Maintenance	Cloth Disk Filters	15-Year Major Equipment Replacement	15-Year Instrumentation Replacement	10-Year Equipment Replacement	Total	Labor	Piping and Valve Maintenance and Replacement	Power	Chemical Addition	Blower Filter/Belt/Oil Changes	Pump Rebuild & Major Maintenance	Cloth Disk Filters	15-Year Major Equipment Replacement	15-Year Instrumentation Replacement	10-Year Cloth Disk Filtration System Replacements	Total		
0	2025	1.00	1.00	-\$2,963,833	-\$666,491	-\$316,800	-\$35,000	\$0	-	\$0	-	-	-	-\$3,982,124	-\$2,963,833	-\$666,491	-\$316,800	-\$35,000	\$0	-	\$0	-	-	-	-\$3,982,124	
1	2026	1.03	1.03	-\$3,052,748	-\$686,486	-\$326,304	-\$36,050	\$0	-	\$0	-	-	-	-\$4,101,587	-\$2,963,833	-\$666,491	-\$316,800	-\$35,000	\$0	-	\$0	-	-	-	-\$3,982,124	
2	2027	1.06	1.06	-\$3,144,330	-\$707,080	-\$336,093	-\$37,132	\$0	-	\$0	-	-	-	-\$4,224,635	-\$2,963,833	-\$666,491	-\$316,800	-\$35,000	\$0	-	\$0	-	-	-	-\$3,982,124	
3	2028	1.09	1.09	-\$3,238,660	-\$728,293	-\$346,176	-\$38,245	\$0	-	\$0	-	-	-	-\$4,351,374	-\$2,963,833	-\$666,491	-\$316,800	-\$35,000	\$0	-	\$0	-	-	-	-\$3,982,124	
4	2029	1.13	1.13	-\$3,335,820	-\$750,141	-\$356,561	-\$39,393	\$0	-	\$0	-	-	-	-\$4,481,915	-\$2,963,833	-\$666,491	-\$316,800	-\$35,000	\$0	-	\$0	-	-	-	-\$3,982,124	
5	2030	1.16	1.16	-\$3,435,894	-\$772,646	-\$367,258	-\$40,575	\$0	-	\$0	-	-	-	-\$4,616,373	-\$2,963,833	-\$666,491	-\$316,800	-\$35,000	\$0	-	\$0	-	-	-	-\$3,982,124	
6	2031	1.19	1.19	-\$3,538,971	-\$795,825	-\$378,276	-\$41,792	\$0	-	\$0	-	-	-	-\$4,754,864	-\$2,963,833	-\$666,491	-\$316,800	-\$35,000	\$0	-	\$0	-	-	-	-\$3,982,124	
7	2032	1.23	1.23	-\$3,645,140	-\$819,700	-\$389,624	-\$43,046	\$0	-	\$0	-	-	-	-\$4,897,510	-\$2,963,833	-\$666,491	-\$316,800	-\$35,000	\$0	-	\$0	-	-	-	-\$3,982,124	
8	2033	1.27	1.27	-\$3,754,495	-\$844,291	-\$401,313	-\$44,337	\$0	-	\$0	-	-	-	-\$5,044,435	-\$2,963,833	-\$666,491	-\$316,800	-\$35,000	\$0	-	\$0	-	-	-	-\$3,982,124	
9	2034	1.30	1.30	-\$3,867,129	-\$869,619	-\$413,352	-\$45,667	\$0	-	\$0	-	-	-	-\$5,195,768	-\$2,963,833	-\$666,491	-\$316,800	-\$35,000	\$0	-	\$0	-	-	-	-\$3,982,124	
10	2035	1.34	1.34	-\$3,983,143	-\$895,708	-\$425,753	-\$47,037	\$0	\$22,847	\$0	-	-	\$0	-\$5,328,795	-\$2,963,833	-\$666,491	-\$316,800	-\$35,000	\$0	\$17,000	\$0	-	-	\$0	-\$3,965,124	
11	2036	1.38	1.38	-\$4,102,638	-\$922,579	-\$438,525	-\$48,448	\$0	-	\$0	-	-	-	-\$5,512,190	-\$2,963,833	-\$666,491	-\$316,800	-\$35,000	\$0	-	\$0	-	-	-	-\$3,982,124	
12	2037	1.43	1.43	-\$4,225,717	-\$950,257	-\$451,681	-\$49,902	\$0	-	\$0	-	-	-	-\$5,677,556	-\$2,963,833	-\$666,491	-\$316,800	-\$35,000	\$0	-	\$0	-	-	-	-\$3,982,124	
13	2038	1.47	1.47	-\$4,352,488	-\$978,764	-\$465,231	-\$51,399	\$0	-	\$0	-	-	-	-\$5,847,883	-\$2,963,833	-\$666,491	-\$316,800	-\$35,000	\$0	-	\$0	-	-	-	-\$3,982,124	
14	2039	1.51	1.51	-\$4,483,063	-\$1,008,127	-\$479,188	-\$52,941	\$0	-	\$0	-	-	-	-\$6,023,319	-\$2,963,833	-\$666,491	-\$316,800	-\$35,000	\$0	-	\$0	-	-	-	-\$3,982,124	
15	2040	1.56	1.56	-\$4,617,555	-\$1,038,371	-\$493,564	-\$54,529	\$0	-	\$0	\$0	\$0	-	-\$6,204,019	-\$2,963,833	-\$666,491	-\$316,800	-\$35,000	\$0	-	\$0	\$0	\$0	-	-\$3,982,124	
16	2041	1.60	1.60	-\$4,756,081	-\$1,069,522	-\$508,371	-\$56,165	\$0	-	\$0	-	-	-	-\$6,390,139	-\$2,963,833	-\$666,491	-\$316,800	-\$35,000	\$0	-	\$0	-	-	-	-\$3,982,124	
17	2042	1.65	1.65	-\$4,898,764	-\$1,101,608	-\$523,622	-\$57,850	\$0	-	\$0	-	-	-	-\$6,581,844	-\$2,963,833	-\$666,491	-\$316,800	-\$35,000	\$0	-	\$0	-	-	-	-\$3,982,124	
18	2043	1.70	1.70	-\$5,045,727	-\$1,134,656	-\$539,331	-\$59,585	\$0	-	\$0	-	-	-	-\$6,779,299	-\$2,963,833	-\$666,491	-\$316,800	-\$35,000	\$0	-	\$0	-	-	-	-\$3,982,124	
19	2044	1.75	1.75	-\$5,197,099	-\$1,168,696	-\$555,511	-\$61,373	\$0	-	\$0	-	-	-	-\$6,982,678	-\$2,963,833	-\$666,491	-\$316,800	-\$35,000	\$0	-	\$0	-	-	-	-\$3,982,124	
20	2045	1.81	1.81	-\$5,353,012	-\$1,203,757	-\$572,176	-\$63,214	\$0	\$30,704	\$0	-	-	\$0	-\$7,161,454	-\$2,963,833	-\$666,491	-\$316,800	-\$35,000	\$0	\$17,000	\$0	-	-	\$0	-\$3,965,124	
															-\$62,240,000	-\$14,000,000	-\$6,650,000	-\$740,000	\$0	\$30,000	\$0	\$0	\$0	\$0	\$0	-\$83,600,000

Stakeholder Comments and Responses for the November 2025 Draft Feasibility Study Report

This appendix includes copies of the stakeholder comments received based on review of the November 2025 version of the Draft Feasibility Study Report. Also included is a summary table indicating a response to the comment and/or change made to the report as a result of the comment. Bold text in the response column indicates where report changes have been made.

RESPONSES TO STAKEHOLDER COMMENTS ON NOVEMBER 2025 DRAFT REPORT

Client: Russian River County Sanitation District

Project: Water Quality and Recycled Water Supply Feasibility Study

ID	REVIEWER	REPORT SECTION/ PAGE	STAKEHOLDER COMMENT	RESPONSE TO COMMENT
Rich Holmer Comments (undated)				
1	RH	not specified	As such the recommendation of “preferred alternatives” is shallow and misleading because these other issues may become obstacles to decisions regarding selection of projects and consideration of project alternatives.	The initial stated goal of the study was to define "preferred alternatives" related to regionalization and there were three approaches that were identified as the most feasible in terms of cost and qualitative ranking (Alternative 1a, Alternative 1c and a modified Alternative 1a). The report indicates that all three of these feasible alternatives should be carried forward for further assessment. It is also noted that the use of the language "preferred alternative" was not intended to imply these are the preferred alternatives related to addressing unsewered communities in the entire West County Area. These are only the most feasible options with respect to regionalization. The report has been updated to use more qualified language to demonstrate that these are the most feasible/lowest cost regionalization approaches and that identifying a preferred approach will need to include additional engineering analysis and well as an assessment of governance and financing feasibility.
2	RH	not specified	The report also glossed over significant deficiencies in the RRCSD collection system which have led to repeated discharges of untreated and partially treated wastewater to the Russian River.	As noted on page 3-1 (footnote 2), the alternatives evaluation was limited to consolidation of treatment and recycled water facilities only. Collection system infrastructure improvements were specifically excluded from the scope of this technical feasibility study and would be an issue whether the RRCSD plant continued to exist or RRCSD connected to another regional facility. I&I reductions are known issues, and RRCSD is addressing I&I reduction and collection system planning through a separate, Master Planning effort. This separate effort also identified what facilities are needed at the RRCSD plant to address elevated flows. Information from this separate effort was used to inform the regionalization analysis. The Report has been updated to note that costs and analysis related to improvements needed at the RRCSD to accommodate additional flows and loads are based on the separate Master Planning work and may need to be revisited based on information gained from the recent spill. The Report also has been updated to clarify that an investment in I&I improvements will need to occur before an acceptance of flows from outside of the service area.
3	RH	not specified	Sonoma Water estimated the recent illegal discharge at 5,507,000 gallons of untreated wastewater. This raises the question of why RRCSD is considered to be a preferred alternative when these serious violations have occurred and can be expected to occur in the future?	<i>Response to Comment 2 addresses the evaluation of I&I.</i>
4	RH	not specified	There are several alternatives reviewed which would cause increased treated wastewater discharges to the Russian River during the allowed discharge periods...There are no limits set for phosphorous and nitrogen even though the river has experienced repeated incidents of toxic algae blooms...These lax discharge requirements should be considered when determining preferred alternatives.	Discharge requirements are established by the Regional Water Quality Control Board and are put in place to address water quality issues. All of the discharge alternatives include the facilities required to meet the standards established, which include requirements to remove nitrogen. If more stringent requirements for phosphorus removal were adopted in the future, the plants would also have to meet these limits without exception. No change to the report is proposed.
5	RH	not specified	Consideration [for effluent limits] should also be given to the Monte Rio water wells being less than a mile downstream of the RRCSD discharge point.	See response to Comment 4. This is a topic that must be addressed by the RWQCB and not the subject of this report.
6	RH	2.2.4	“The RRCSD Treatment Plant Master Plan included an assessment of the WWTP capacity-related improvements needed to process the anticipated 2035 flows and loads. However, that analysis also acknowledged the need to collect additional information to confirm the recommendations.” Therefore, this issue [of RRCSD capacity-related improvements] has not been thoroughly studied and could result in significant costs. Again why is RRCSD the preferred alternative?	The Master Plan is a separate study being completed by RRCSD to understand and define the capacity and condition related improvements needed at the RRCSD WWTP. It is not uncommon for routine monitoring data to not provide a complete picture of varying influent organic and solids loads to a WWTP. The Master Plan identifies that data collected during peak flows events shows very elevated loads entering the WWTP, which is not typical for inflow and infiltration events. Therefore, the Master Plan acknowledges that additional influent data collected during peak flow events will be helpful to confirm the findings of the Master Plan. This additional work and study will also inform continued evaluation of the potential West County regionalization strategies. Specifically, because there is not space at the RRCSD WWTP site for a major facility expansion, the facility can only accommodate flows and loads from outside of the RRCSD service area to the extent these flows and loads don't require a footprint expansion. Chapters 2, 3, 8 and 9 of the Final Report have been updated to clarify this point.
7	RH	3.3.1.1.2	Section 3.1.1.2 [apparently referring to 3.3.1.1.2] states that existing storage and disposal capacities are adequate at RRCSD. Really? Then why the 5.5 million gallon overflow?	The feasibility study relied on the best available information at the time from the concurrent Master Plan study, but additional study may be needed in light of the recent spill event. Clarification has been added to the Report to indicate that additional study of facility improvements needed to process peak flows may be necessary in light of the recent spill event.
8	RH	Chapter 4	Chapter 4 talks about “preferred alternatives”. These should not be called preferred alternatives when the issues of governance and financing have not been addressed. Perhaps use “most feasible based on limited engineering analysis”.	<i>See response to Comment 1.</i>

RESPONSES TO STAKEHOLDER COMMENTS ON NOVEMBER 2025 DRAFT REPORT

Client: Russian River County Sanitation District

Project: Water Quality and Recycled Water Supply Feasibility Study

ID	REVIEWER	REPORT SECTION/ PAGE	STAKEHOLDER COMMENT	RESPONSE TO COMMENT
Rich Holmer Comments (undated) [continued]				
9	RH	9.2	Again, this [reference to RRCSD WWTP having surplus capacity] is inaccurate given the deteriorated collection system which causes inundation of the treatment plant as demonstrated by the recent overflow and past overflows.	These statements are based on findings from the separate Master Planning effort. See response to Comment 2.
10	RH	9.2	It only takes a modest investment to correct the deficiencies in this system? Why hasn't it already been done? How many sewage overflows does it take to get the improvements done?	
11	RH	9.2	The ability to use the 400 acres [near RRCSD WWTP for irrigation] is limited by a conservation easement and steep slopes. The above statement is misleading because it does not address how much, if any, of the 400 acres is usable for wastewater irrigation.	The referenced bullet acknowledges that "an additional <i>modest</i> expansion of the existing reuse system [on the 400 acres] could <i>potentially</i> occur." (emphasis added). The referenced bullet already qualifies the statement on using the 400 acres. In addition, Section 9.2 provides a brief summary of findings detailed elsewhere in the study report. The first discussion of the forested property in Section 2.2.5 acknowledges "potential challenges for installing new irrigation infrastructure." Similarly, Section 2.2.6 states "this site has restrictions for onsite uses and challenging topography that could preclude the ability to contract [sic, should be "construct"] new infrastructure within this area." Clarification is provided stating that additional assessment of use of this area is a critical next step to confirming whether RRCSD could accept additional flows from unsewered communities. It is also noted that the estimated 55 acre expansion area is based on agronomic application rates (no percolation). If percolation rates similar to historical levels on the upper Burch property were achieved, the acreage would be much less (closer to 17 acres). This potential for there to be a much smaller expansion of the land application required has been noted throughout the report (wherever the 55-acre expansion is discussed).
Brenda Adelman Comments (Letter dated January 19, 2026)				
12	BA	<i>not specified</i>	We don't think this analysis will rectify or even address the recent Guerneville illegal discharge of 50.5 MG on January 6 through 9, 2026, since few details are known at this time. Therefore, circumstances may have made this study obsolete before one hearing has been held and long before any final decision has been made as to a preferred project. This should be acknowledged and addressed	<i>Responses to Comments 2 and 7 address further evaluation of the RRCSD WWTP.</i>
13	BA	<i>not specified</i>	...the costs of 1a, though the lowest of all five, will certainly exceed the \$55 to \$84 million estimate mentioned and would end up much higher because the addition of septic system properties are not included in analysis along with the need for additional storage.	It is correct that this cost does not include the addition of unsewered communities. Evaluation of costs associated with adding in unsewered communities is presented in later chapters of the report. Chapters 5 and 8 specifically discuss costs and infrastructure needed to connect the unsewered communities evaluated, including Monte Rio and Villa Grande.
14	BA	<i>not specified</i>	I don't recall if Regional Study mentions need for more storage [for RRCSD], but it does enumerate the other major needs. Regionalization Study mentions some needs, and this one should certainly be on the list. The need for more storage should be a priority, if new flow levels are adopted.	<i>Responses to Comments 2 and 7 addresses further evaluation of the RRCSD WWTP.</i>
15	BA	Pages 2-4 and 2-40 (Table 2-17)	On page 2-4 claims 3213 ESD's (sic) and 2503 connections for RRCSD and 3621 ESD's (sic) on Table 2-17 (Page 2-40) Please explain discrepancy on ESD's (sic).	The discussion on page 2-4 is describing the existing RRCSD service area with mention of currently serving 3,213 ESDs. The next couple sentences explain that projected growth is estimated to add 408 new ESDs. Table 2-17 (titled "Projected West County ESDs") is presenting estimated projected ESDs and thus shows the combined total of 3,621 ESDs (3,213 + 408). No changes are needed to the report.
16	BA	Pages 2-4 and 2-40 (Table 2-17)	Your website should include a very clear definitions of what is covered by each [ESD] within individual Districts. For instance: how many ESDs for restaurants in District, how many ESDs for hotels, motels, guest houses, apartments, etc.	Each District has a different strategy for defining an ESD. This is not unusual. Providing this detail in the Report would not impact the findings or analysis and is therefore not necessary. Sonoma Water will consider providing information related to assignment of ESDs on its website.
17	BA	Pages 2-4 and 2-40 (Table 2-17)	Also how many properties entitled to ESDs that are not being used currently exist? This would also apply to as yet unbuilt motels, etc. In other words, we would like assessment of urbanization potential.	Each District provided information about the likely number of additional ESDs over the next 10 year period. This information was incorporated into the report. For instance, the fourth paragraph on Page 2-4 discusses a potential 408 new ESDs within the RRCSD service area. Section 2.3.1 and Table 2-6 discuss potential new ESDs for the Graton CSD, Section 2.4.1 and Table 2-11 provide similar for the Forestville Water District. No growth is assumed for the Occidental CSD.
18	BA	<i>not specified</i>	One of the goals of the project is to assess potential for the addition of unsewered areas in relative proximity to the treatment plant being studied. Yet the costs and challenges of hooking up specific septic areas are not considered in feasibility analysis. For instance, Monte Rio and Villa Grande potential loadings and costs are not considered in their likely hook up to RRCSD. ...the situation seems to invalidate fiscal estimates since a critical element is being left out. How much should be added to the estimates in order to address these concerns?	<i>See Response to Comment 13.</i>

RESPONSES TO STAKEHOLDER COMMENTS ON NOVEMBER 2025 DRAFT REPORT

Client: Russian River County Sanitation District

Project: Water Quality and Recycled Water Supply Feasibility Study

ID	REVIEWER	REPORT SECTION/ PAGE	STAKEHOLDER COMMENT	RESPONSE TO COMMENT
Brenda Adelman Comments (Letter dated January 19, 2026) [continued]				
19	BA	not specified	Capacity appears to be reserved for growth projections (another issue of concern). Then the reliability of the growth projections also come into question because of this limitation, or will the two issues [serving unsewered or growth within the RRCS D] be competing for capacity?	See response to Comment 17. The capacity assessments included both projected District expansion and unsewered communities.
20	BA	not specified	The number of ESD's (sic) does not correspond to the number of properties, and the breakdown is not explained. How many District ESDs are not hooked up to sewer in which they reside for which capacity if reserved?	See responses to Comments 16 and 17.
21	BA	not specified	Related to that, people keep asking how a 108 room proposed hotel for Guerneville can have capacity when a little ways downstream, the pipeline and Main Pump Station are often failing? What will hooking up this hotel do to the collection system if inadequate funding is available? By the way, this hotel will be open 24/7. Will their ESD's (sic) be determined at the same rate as a facility with much shorter hours?	The study relied on information from RRCS D regarding anticipated new connections and flows. Additional questions related to this topic are outside the scope of this effort.
22	BA	not specified	What type of benefit in terms of lowered costs (as promised) can current ratepayers expect when new hookups are realized. In fairness to current ratepayers, and since they are being told their rates will go down if more people hook up, shouldn't there be some kind of estimate under various scenarios that inform them of how much savings can be expected?	An assessment of reduced costs as they relate to ongoing operations is provided in Chapter 8 (see Table 8-10, for instance). However, rates also include debt service payments that account for loans taken to pay for capital projects (see Footnote 12 on page 8-29). Financing and rate assessment is beyond the scope of this technical feasibility study. This study provides high-level regionalization costs for a fair comparison across alternatives. Detailed rate assessments would be needed for alternatives that move forward. Additional clarification is provided in Chapter 8 related to when (and how) future rates may be determined.
23	BA	not specified	...does this study address the problem of unanticipated change orders for any system selected? RRCS D had about 30 change orders and the supposed \$13 million dollar system turned out to be \$30 million. Thankfully, most of the funding was provided by the State and Federal governments. What would the governing entity do if that happens?	An assessment of financing and funding strategies are beyond the scope of this technical feasibility effort. Capital costs for this study were not prepared at a level of detail that would specifically account for change orders. Additional cost refinement would be needed for alternatives that move forward.
24	BA	not specified	Addressing environmental impacts and the costs of addressing them with EIRs and other environmental studies (especially on the fishery) appear to play no part in the analysis, and impacts of system failures affecting recreation and/or other uses, were not addressed. (we may have missed it.)	The project cost estimates do include environmental studies as a percentage of the construction costs. Alternatives that may have a higher level of effort for environmental studies (i.e. a new surface discharge outfall) have a higher factor applied for defining these environmental costs.
25	BA	not specified	Also, prior stakeholders paid large amounts to maintain and improve system. If another community reaps the benefits, what do they contribute to the facility that was partly paid for by original ratepayers?	Buying into existing systems is often managed through connection or capacity fees, similar to what has been discussed with Santa Rosa and Windsor. Each West County agency has current connection fees that new users within the existing service area would be subject to that are intended to cover the cost of their use of existing infrastructures. Connection fees that unsewered communities would pay are also estimated in Chapter 8 with relevant project costs. It is also recommended in Chapter 9 that each District review and better define what costs would be incurred by unsewered communities if they were to connect.
26	BA	not specified	Is [elevating all electrical components above the 100-year floodplain] included in Regionalization Study?	The feasibility study does not address collection system improvements. As noted in the response to Comment 2, the Report has been updated to clarify that an investment in I&I improvements will need to occur before acceptance of flows from outside of the service area.
27	BA	Chapter 2 (Page 2-4)	How is it that you are confident that [up to 5 million gallons of storage] will serve all flows especially during flood periods? Both ponds hold 4.5 million gallons. How is this adequate to allow for 5.0 capacity? How does the recent spill fit into this assumption?	Responses to Comments 2 and 7 address further evaluation of the RRCS D WWTP.
28	BA	Page 2-7	Assuming [equalizing peak day flows to 4.2 mgd] will address growth factor, what will address growth to system if area septic systems are also hooked up to system.	Response to Comment 17 addresses questions about growth and who could be served.
29	BA	not specified	For all these reasons [stated above the sentence], we would question the growth rate projections.	Response to Comment 17 addresses questions about growth and who could be served.
30	BA	Page 2-8	Yet somewhere we also saw that downplayed by a statement that claimed most of the spill was diluted with rainwater. Was this true? How can it be measured?	This comment is not specific to the report. Information related to the recent spill can be found in the Sonoma Water press release: https://www.sonomawater.org/rrcsd-spill .
31	BA	not specified	Yet, what does it tell us if elevated BOD/TSS is in the influent and the [January 2026] spill appears to be from the Treatment facility even when there is no flood? Can massive I&I occur when the river is below flood stage?	This comment is not specific to the report. Information related to the recent spill can be found in the Sonoma Water press release: https://www.sonomawater.org/rrcsd-spill .

RESPONSES TO STAKEHOLDER COMMENTS ON NOVEMBER 2025 DRAFT REPORT

Client: Russian River County Sanitation District
 Project: Water Quality and Recycled Water Supply Feasibility Study

ID	REVIEWER	REPORT SECTION/ PAGE	STAKEHOLDER COMMENT	RESPONSE TO COMMENT
Brenda Adelman Comments (Letter dated January 19, 2026) [continued]				
32	BA	Page 2-11	And this storage [at RRCSDD WWTP] remains constant and the flows don't go higher? Then there is the third unused aeration basin provides 0.4 of emergency storage. IS THIS REALLY ADEQUATE DURING HIGH FLOODS?	Responses to Comments 2 and 7 address further evaluation of the RRCSDD WWTP.
33	BA	Page 2-13	There needs to be a lot more study of this situation [for the 400-acre RRCSDD site] before relying on the "Burch" property for future irrigation expansion.	Response to Comment 11 addresses further evaluation of the 400-acre site.
34	BA	Page 2-13	Also there had been (and still are) concerns about allowing irrigation water to seep into the groundwater, especially at lower irrigation site, and somewhat at all irrigation areas. This limits the amount they can irrigate in any one area and with additional hookups, overirrigation could occur. This needs to be carefully analyzed and a range of options provided. It may be helpful to provide a map of the irrigation areas that shows elevations of the various hillsides on the property.	The Study relied on best available information regarding disposal capacity. Additional assessment would need to be performed if needed under a separate effort.
35	BA	Page 2-15	[Referring to use of EQ storage at RRCSDD...] So unless more accurate predictions of global warming storms could occur, how reliable would this management policy be? This spill two weeks ago was a total surprise. Was the system being run at the peak of its capacity when the spill occurred? Is it wise to run a system at its peak during unpredictable weather periods?	RRCSDD will need to assess what factors led to the recent spill and develop a mitigation plan. Both operational and physical improvements may be required. This effort is beyond the scope of this study. Responses to Comments 2 and 7 address further evaluation of the RRCSDD WWTP.
36	BA	Page 2-15	This constraint [apparently referring to available RRCSDD WWTP hydraulic capacity and growth] is mentioned on this page and claims some MINOR hydraulic conveyance improvements are needed, but do not mention details of what this would include or cost figures of doing it. We don't know what this would entail or for what populations it would serve. It goes on to mention other changes that would be needed, but our same concerns apply. Why are they not part of the project?	Details of the needed hydraulic improvements are listed on the top of Page 2-13 and Table 2-4. Costs for the hydraulic capacity improvements are first listed as \$0.7 million on page 3-4 (Section 3.3.1.1.1). This information was based on studies being completed under the RRCSDD WWTP Master Plan.
37	BA	not specified	This section [on the RRCSDD opportunities and constraints] admits to limited storage and [also] states opportunities for possible expansion of current storage are limited. We believe that this should have been analyzed.	The study incorporated these findings by confining all alternatives to what could be accommodated by existing storage. As noted previously, the study relied on findings from the Master Plan to make this determination with respect to equalization of wet weather flows. This section of the Report has been updated per the comments and responses discussed above, including a statement that the analysis in the report is based on the assumption that the footprint of the RRCSDD WWTP (treatment and storage) cannot be expanded.
38	BA	not specified	We support [joining Graton and Forestville operations] provisionally because we have had the experience of late, going through old newspapers, of reading about strenuous opposition from local citizens opposing various plans by local officials to make changes to these systems. On the surface, we think it would be reasonable to join these systems together, BUT ONLY if local citizen concerns are fully addressed.	Noted
39	BA	Table 2-9 (Page 2-23), footnote	We thought "peak daily flow" was the same as "peak influent flow". What is the difference between the types of flow?	Peak influent refers to a peak hour condition. Peak daily flow is a maximum daily average flow.
40	BA	Table 2-9 (Page 2-23), footnote	Also, how do you calculate rain water amounts on the ponds, if you do? If you don't, how do you calculate amount of discharge during a rainy period? (What consideration is there for rainwater intrusion? When rainwater joins wastewater, isn't it all considered waste? I there a dilution factor given. If so, what is it? If the rainwater has already been contaminated, and/or becomes contaminated by the spill water, what difference does it make how many contaminants are in it?	The water balances account for precipitation on the ponds. The equalization analysis was completed under the Master Planning effort and may need to be revisited as previously noted. The commenter is correct that once blended with wastewater, the stormwater is regulated with the wastewater.
41	BA	not specified	How is the number of gallons per ESD calculated as summer flows are still relatively low? (RRCSDD averages 120 gpd) What are 'average' numbers based on?	The study report is referencing existing information published for each West County agency.
42	BA	Table 2-17 (Page 2-40)	Table 2-17...states that RRCSDD has 3,621 ESD's (sic). But the number of properties is about 2600. Are there 1,000 ESD's (sic) that are part of multi-unit facilities or commercial establishments needing several ESD's such as restaurants?	An ESD is a unit that reflects the typical flows and loads provided by an individual home. So any connection that provides more flow and load than an individual home is assigned multiple ESDs.
43	BA	Page 4-12	What's the difference between effluent storage ponds and equalization basins?	Effluent storage is used to hold treated flows that cannot be immediately discharged. Effluent equalization is used to hold untreated flows that cannot immediately be processed for treatment.

RESPONSES TO STAKEHOLDER COMMENTS ON NOVEMBER 2025 DRAFT REPORT

Client: Russian River County Sanitation District

Project: Water Quality and Recycled Water Supply Feasibility Study

ID	REVIEWER	REPORT SECTION/ PAGE	STAKEHOLDER COMMENT	RESPONSE TO COMMENT
Brenda Adelman Comments (Letter dated January 19, 2026) [continued]				
44	BA	Page 6-11	To determine discharge: the Basin Plan does not allow flows over various years to be averaged in order to determine amount of discharge allowed. It's my understanding that any discharge is based on the flow that day.	The commenter is correct about actual discharge being limited to flow that day. For the study water balances, reasonably conservative assumptions were made about possible flow regimes in the Russian River. In addition, with storage the allowable discharge can be reviewed on a monthly basis, as flows held on one day can be discharged in the next. So overall storage needs are averaged out.
45	BA	Page 6-11	Discharges are not allowed at all between May 15th and October 1st which is the time of greatest amount of irrigation. The whole point of irrigation is to avoid discharge in the summer months. The irrigation capacity discussions are unclear.	The discussion on page 6-11 (Section 6.6) has been revised to add additional clarity. We have reiterated from Chapter 2 that no discharges are allowed between May 15 and September 30, and modified a reference to "discharge prohibitions" to "prohibitions on discharge flow rates above one percent of the receiving water flow rates." No change to the seasonal prohibition is assumed.
46	BA	Page 6-11	This [assumed to be referring to previous bullet about managing irrigation systems to avoid all discharge] is especially important in very dry years when irrigation is very limited. It is also a time when water allocations are strictly enforced and not as much wastewater is produced.	The purpose of the water balance analyses, including use of reasonably conservative assumptions around discharge flows, is to estimate recycled water storage and irrigation facility needs under (most reasonable) worst-case conditions (in a wet year when demands for recycled water are limited and discharge flows are the highest). The analysis is not intended to assess irrigation operations under all conditions. Nevertheless, because the concern from a recycled water producer/agency concern perspective is fulfilling contracts to water users, it is helpful to assess potential related to water availability in a dry year.
47	BA	Page 6-11	If what is being determined is the irrigation demand during various wet and dry years, and the extent to which it will use up stored water, I'm having trouble seeing the problem. During summers coming after dry years, the demand can be huge and less water may be available. But that is not a problem for treatment plants when you don't have the water to give away. During summers coming after wet years, there may be less demand, especially with grapes, but I'm not sure how you quantify the problem in so far as the wastewater ponds are concerned.	
48	BA	Chapter 9	It would be helpful to briefly name those amounts [investments for condition-related improvements compared to export costs] here.	Additional cost information can be repeated from Chapter 8 in the related bullets for clarity. Also, see response to Comment 10.
49	BA	Chapter 9	[Referencing resiliency under projected climate change conditions]...what about landslides and other geographical hazards, and groundwater intrusion (which was a problem for some discharges in the past) and seismicity of the parcel and river?	Potential impacts to hazards beyond those associated with climate change impacts were not evaluated as part of this high-level feasibility study. However, the report has been modified to incorporate available information regarding hazards associated with each of the treatment plant sites. It is also noted that the RRCSD has higher hazard risks than the FWD site. This has been further highlighted in the report for clarity.
50	BA	Chapter 9	...there has been no mention that approximately the last mile on Neeley Road before reaching the Treatment Plant, has houses that are still on septic systems and probably would not be able to hook up to the sewer system for reasons of which I am unaware. There may be an engineering justification for this that should be mentioned.	These homes are outside the current service area but were included as one of the clusters (Cluster 2) and would have the opportunity to connect in the future like any other cluster. A dedicated pump station and conveyance pipeline have been assumed for this cluster (similar to other clusters) for connecting to the RRCSD WWTP.
Dave Coleman Comment in Brelje & Race Email from January 2, 2026				
51	DC	Page 8-3	<p>The first paragraph of page 3 of Chapter 8 of the Draft Feasibility Report states "Very little detail is provided regarding the development of the cost estimates that are included in the Monte Rio Study Report, and it is unclear whether the costs are representative of the construction cost or the total project costs¹." With the footnote stating "The Monte Rio Study Report initially labels the costs a construction costs, which implies they do not include non-construction project elements such as engineering design and permitting. However, in other areas of the report, the costs are presented as project costs, which implies these elements are included."</p> <p>We are not aware of any contact [to Brelje & Race] from the report author to confirm the nature of the cost estimates included in the draft Monte Rio Study Report, and we believe Sonoma Water was aware that costs presented in the report were construction costs, rather than project costs. On December 19, 2025, a draft of the Monte Rio Feasibility and Preliminary Design Report was submitted to Sonoma Water for review. This draft report presented project costs as requested by the agency.</p>	<p>The latest report prepared by Brelje&Race has recently been provided to the team, and the Feasibility Study has been updated to accommodate the costs reflected in the revised report. Reference in Chapter 1 has been updated. It is also noted that the collection system cost estimates included in the previous draft of the Monte Rio study were updated and increased. Therefore, because these costs were used to provide a basis for this study, the construction cost of the community collection system has also been updated in Chapter 8.</p>

RESPONSES TO STAKEHOLDER COMMENTS ON NOVEMBER 2025 DRAFT REPORT

Client: Russian River County Sanitation District

Project: Water Quality and Recycled Water Supply Feasibility Study

ID	REVIEWER	REPORT SECTION/ PAGE	STAKEHOLDER COMMENT	RESPONSE TO COMMENT
Dave Coleman Comments in Personal Email (as Forestville Resident) from January 2, 2026				
52	DC	<i>not specified</i>	<p>My understanding is that one major objective of the report is the exploration of regionalization concepts to “improve water quality, water supply reliability, Pathogen TMDL compliance, and climate change resiliency in the Russian River watershed, and address ratepayer costs for West County wastewater systems [emphasis added by commenter].”</p> <p>Economy of scale is possible by combining small systems – and this is being pursued currently on the Occidental/Graton and the Graton/Forestville fronts. This will most likely result in lowering operating cost pressures on a per-user basis for each of these three small districts.</p> <p>This [economy of scale] is reflected in the estimates presented in Table 8-60, Summary of Annual Rates per ESD, of the report – which demonstrates that user rates could be less for the combined users of Occidental/Graton/Forestville compared to their respective existing rates, if these systems are combined (Alternative 1a). Further economy of scale is predicted if the flows of Guerneville are added – resulting in a 50% reduction in estimated rates (Alternative 1c). However, a larger economy of scale of the [Town of Windsor] and [Santa Rosa Laguna Treatment Plant] regionalization alternatives (Alternatives 2a and 2b) is NOT predicted for these alternatives. In fact, the user rates for each of the West County districts are estimated to be higher with these alternatives. Evidently, this is due to different O&M cost estimating methods employed for these alternatives – where treatment costs were cited by officials of those treatment plant agencies as compared to operating cost estimates for West County districts calculated more empirically by the study authors.</p>	<p>The analysis was based on the best information available. It is noted that the regional agencies have major upgrades/projects that must be completed at their facilities that are not incorporated into their current rates and both agencies indicated that rates could be even higher and suggested appropriate contingencies. The costs they suggested for use may not account for economies of scale that could be realized at their agencies (less likely an issue for Santa Rosa). Moreover, the rates addressed in this table include operation of the collection and large conveyance system, which must be borne only by the West County agencies. Therefore, it is not also reasonable to assume that connecting to these systems will have a lower overall operating cost.</p>
53	DC	<i>not specified</i>	<p>There are 5 preferred approaches that are identified out of the original 8.</p> <p>Due to the rating system employed, Alternatives 1b (all West County flows to the Guerneville plant) was eliminated whereas Alternative 1c (all West County flows to the Forestville plant site) was brought forward. However, it would seem that expanding the Guerneville plant to accommodate Occidental/Graton/Forestville would be more practical than expanding the much smaller Forestville plant to accommodate the larger flows from Guerneville. Also, Alternative 1c would involve a new treated effluent outfall to the Russian River from the Forestville plant; whereas Alternative 1b would not have required a new discharge point. Conveying the wastewater flows from Guerneville to Forestville and discharging the combined volume (more than double) of treated effluent just downstream of the Steelhead Beach Park would not be a popular proposal. It is not lost on the undersigned that currently treated effluent from the Forestville plant is ultimately discharged to the same point of the Russian River (via Jone Creek and Green Valley Creek), but the additional discharge and the physical construction of the discharge facilities would still be unpopular in the local area.</p>	<p>There are significant limitations of the RRCSD site to be expanded beyond its footprint, which limits its ability to serve as a central regional facility. Other environmental limitations and location limitations further point to RRCSD not being a good site for a large, regional facility. These details (including more information about environmental hazards/seismic risk) have been added in the description of the constraints in Chapter 2. In addition, it has been noted throughout the report that additional analysis of sizing and routing for the new outfall should be included in next steps.</p>
54	DC	<i>not specified</i>	<p>Hybrid Alternative 3b (Guerneville to Windsor and Occidental/Graton/Forestville combined at Forestville) is a preferred alternative. This does not make practical sense as the pipeline from Guerneville would pass through Forestville (less than 2 miles from the Forestville plant) on its way to Windsor. Why wouldn't that regionalization facility (the pipeline) be used to its fullest extent?</p>	<p>This alternative was identified by the Stakeholders as an approach they would like to see carried forward. So it was included.</p>

RESPONSES TO STAKEHOLDER COMMENTS ON NOVEMBER 2025 DRAFT REPORT

Client: Russian River County Sanitation District

Project: Water Quality and Recycled Water Supply Feasibility Study

ID	REVIEWER	REPORT SECTION/ PAGE	STAKEHOLDER COMMENT	RESPONSE TO COMMENT
Dave Coleman Comments in Personal Email (as Forestville Resident) from January 2, 2026 [continued]				
55	DC	<i>not specified</i>	<p>It appears that subjective scoring criteria seems to be biased against continued use of the Guerneville plant and contradictory to conclusions reached in chapter 9.</p> <p>For example, Alternative 1b has the lowest Resiliency score due to “reliance on a treatment facility that is near the Russian River and thus particularly vulnerable to seismic and flooding impacts”. However, it is not demonstrated that the Guerneville plant has a flooding issue or is more prone to seismic activity.</p> <p>Also, Alternative 1b has the lowest Long Term Regulatory Compliance score due to “the ongoing compliance issues at this site related to management of peak flows.” However, the compliance issues related to peak flows at Guerneville are largely due to the condition of the collection system – which will remain in use under any alternative. Regional loads to the plant can be connected directly to the treatment plant or to an improved and robust end of the collection/conveyance system. It seems that bringing the peak flows from Guerneville to Forestville would bring more environmental risk due to the location of the facility in relation to a small tributary to Green Valley Creek.</p>	<p>See response to Comment 53. The FWD site is well outside of the floodplain of the Green Valley Creek and is not in a seismic risk zone. This has been further clarified in Chapter 2 of the report.</p> <p>Because the RRCS plant can accommodate local flows and loads without expansion, the findings in Chapter 9 stand.</p>
56	DC	<i>not specified</i>	<p>In summary, everything else remaining equal, creating larger systems will allow a better economy of scale for both capital and operating costs. Arriving at an alternative that results in the continued use of small systems should not be undertaken lightly and regionalization alternatives should be considered as much as possible.</p>	Noted

COMMENTS ON WEST COUNTY FESIBILITY STUDY DRAFT

Comment 1

This study was focused on looking at preferred alternatives for West County sewerage and the infrastructure needs associated with those alternatives. Unfortunately, it was strictly an engineering study that did not look at issues of governance and financing. As such the recommendation of “preferred alternatives” is shallow and misleading because these other issues may become obstacles to decisions regarding selection of projects and consideration of project alternatives. At the stakeholders meeting Jan. 12, it was repeatedly stated that this was strictly an engineering study and did not include review of how a selected project might actually proceed. The study area includes disadvantaged communities which may be severely impacted by decisions made regarding any future project. The study does not provide clear guidance for decision makers and the public due to its limited scope.

Comment 2

The report also glossed over significant deficiencies in the RRCSD collection system which have led to repeated discharges of untreated and partially treated wastewater to the Russian River. These discharges have occurred for decades without resolution. Without addressing the needed improvements to the collection system, the report ignores considerable infrastructure needs and associated costs. If the collection system is not repaired, the treatment plant can be expected to continue to overflow as occurred in the recent storms.

In the past, the illegal discharges were stated to be related to surcharging of the collection system when floodwaters entered buildings and drained to the collection system from submerged fixtures. In the recent storms, flooding did not occur and the RRCSD representatives are now saying that the overflow was due to excessive inflow and infiltration into the collection system from groundwater and surface runoff (note: if groundwater can enter into the system during high groundwater levels, then sewage can leak into the groundwater during lower groundwater levels). Sonoma Water has stated that the volume of the recent illegal discharge was 5,507,00 gallons. This is a substantial amount of discharge of untreated wastewater into the Russian River.

The RRCSD collection system is clearly deficient and causes the treatment plant to fail due to surcharging of the collection system resulting in excessive influent flows to the plant. **Unless this is corrected, the RRCSD cannot be considered to be a viable solution to sewerage of unsewered communities or for use by other public treatment plants or Districts. Therefore, the “preferred alternatives” are not factual.**

The report should have addressed the causes of the excessive infiltration and inflow as well as what is needed to prevent inundation of the collection system during flood events. I feel that this is an ivory tower study without boots on the ground to pop open manholes and determine where excessive flows are originating and what is needed to correct them. It suggests a paper exercise to satisfy the requirements of the North Coast Regional Water Quality Control Board and, in its current state, will probably just be put on a shelf in an office with no follow through.

OTHER ISSUES:

Governance:

There needs to be an analysis of what type of governmental entity is needed to facilitate construction of the suggested alternatives as well as to operate the constructed facilities. At present the primary agency responsible for public sewers in the West County area is Sonoma Water. They have clearly indicated a desire to divest themselves of the current sewer systems that they operate. Is there any mandate or desire for Sonoma Water to take on a project of this broad of a scope? What agency will take a lead for preparation of engineering designs, grant applications, financing, construction oversight and operation of whatever is constructed?

Local districts most likely do not have the expertise or infrastructure to operate a sewer project of this magnitude. Is there a need for a comprehensive district to take in all of the study area?

Consultation from Sonoma Water, Sonoma LAFCO and special districts is urgently needed.

Financing:

Any project proposed as a result of this study simply will not proceed with out adequate grant financing. The study area has many low income residents living in single family housing, rentals and multi-family housing that will be significantly affected by costs associated with any project selected. It is meaningless to suggest “preferred alternatives” without consideration of how they will be paid for. Any project could disproportionately affect low income residents and minorities.

An analysis of ultimate out of pocket expenses to property owners and renters is needed. This should include in depth review of potential funding sources and how those funding sources will be accessed.

Other comments:

Section 2.2.1, RRCSD overview

Proposed infrastructure improvements do not address inflow and infiltration during rainstorms or inundation of structures during flood events.

Here is a quote from this section:

“Pending funding availability, preferably grant funding, RRCSD plans to replace three force mains and upgrade the lift stations to improve seismic and flood resiliency and address aging-related deficiencies. However, high peak influent flows to the WWTP are

expected to continue, as these collection system improvements are not specifically focused on reducing inflow and infiltration (I&I).”

Comment 3

If, as stated in the quote above, infiltration and inflow are not being addressed, then the treatment plant will continue to experience flows that it cannot accommodate. Sonoma Water estimated the recent illegal discharge at 5,507,000 gallons of untreated wastewater. This raises the question of why RRCSD is considered to be a preferred alternative when these serious violations have occurred and can be expected to occur in the future?

This section further states “During periods of high rainfall and flooding, the lift stations often become inundated. RRCSD has reported 12 SSOs since January 2019”.

Again, there is no plan for correcting problems from inflow and infiltration and inundation during a flood event. At the Jan. 12 stakeholders meeting, the Sonoma Water representative stated that backflow valves will prevent floodwater from entering the collection system during flood events. This is preposterous. Back water valves do exactly what their name implies. They prevent wastewater from flowing back into the building if the collection system becomes surcharged. They do not prevent floodwater from flowing into the collection system when the plumbing fixtures are submerged. If there is a magic valve that can differentiate between normal sewage flows from a dwelling vs flood water flows from fixtures, I would like to see that technology. The Guerneville collection system needs to be either equipped with valving that will completely shut off the sewer connection during a flood or the collection system should be reconstructed as a sealed, pressure sewer system.

Table 2.1 and section 2.2.2, Discharge limits

Comment 4

There are several alternatives reviewed which would cause increased treated wastewater discharges to the Russian River during the allowed discharge periods. The testing required for these discharges is rudimentary. There are no limits set for phosphorous and nitrogen even though the river has experienced repeated incidents of toxic algae blooms. Although the discharges are during the winter when algae growth is minimal, biostimulatory substances can become entrained in river sediments and released during periods of low flow. In addition, there are no standards for emerging contaminants such as pharmaceuticals, hormone disruptors and PFAS. Increasing the discharge to the Russian River is not appropriate.

Comment 5

These lax discharge requirements should be considered when determining preferred alternatives. Consideration should also be given to the Monte Rio water wells being less than a mile downstream of the RRCSD discharge point.

Comment 6

Section 2.2.4 states:

“The RRCSD Treatment Plant Master Plan included an assessment of the WWTP capacity-related improvements needed to process the anticipated 2035 flows and loads. However, that analysis also acknowledged the need to collect additional information to confirm the recommendations.”

Therefore, this issue has not been thoroughly studied and could result in significant costs. Again why is RRCSD the preferred alternative?

Section 2.2.6 states:

“Portions of the collection system become inundated under river flood conditions resulting from significant storm events, which would require extensive collection system upgrades to address. Costs of these improvements have not been defined”.

Again, significant costs which have not been evaluated.

Section 3.3.1.1.1 says that \$30 million dollars is needed for headwork and force main improvements to RRCSD and \$.7 million dollars is needed for hydraulic capacity improvements to the treatment plant. None of these costs address the issues of infiltration and inflow or inundation of the system. What are the actual costs to make this a functioning system? No estimate is given.

Comment 7

Section 3.1.1.2 states that existing storage and disposal capacities are adequate at RRCSD. Really? Then why the 5.5 million gallon overflow?

Chapter 3

There are numerous references in this chapter for needed infrastructure improvements and costs associated with the various alternatives. None of these sections includes costs for addressing the deteriorated collection system in RRCSD. Again, these cost estimates are erroneous without evaluating the necessary improvements to RRCSD.

Comment 8

Chapter 4 talks about “preferred alternatives”. These should not be called preferred alternatives when the issues of governance and financing have not been addressed. Perhaps use “most feasible based on limited engineering analysis”.

Tables 4.3 and 4.10 are completely inadequate due to the concerns that I have raised above about costs not being properly documented.

Section 9.2, Findings for RRCSD states:

“The RRCSD WWTP has surplus capacity to accommodate flows from local unsewered community clusters. These findings are supported by the Master Planning effort being concurrently completed.”

Comment 9

Again, this is inaccurate given the deteriorated collection system which causes inundation of the treatment plant as demonstrated by the recent overflow and past overflows.

“Some condition-related improvements have been identified for the facility, requiring a relatively modest investment in the next 20 years compared to the cost of wastewater export.”

Comment 10 Wow. It only takes a modest investment to correct the deficiencies in this system? Why hasn't it already been done? How many sewage overflows does it take to get the improvements done?

“RRCSD has existing land application area that could be expanded. RRCSD has also recently acquired nearly 400 acres of nearby forested area on which an additional modest expansion of the existing reuse system could potentially occur.”

Comment 11 The ability to use the 400 acres is limited by a conservation easement and steep slopes. The above statement is misleading because it does not address how much, if any, of the 400 acres is usable for wastewater irrigation.



RRWPC

Russian River Watershed Protection Committee

P.O. Box 501
Guerneville, CA 95446
<http://www.rrwpc.org>
rrwpc@comcast.net

January 19, 2026

Emailed to:

Andrea Rodriguez: Sonoma County Water Agency

Andrea.Rodriguez@scwa.ca.gov

CC: Valerie Quinto (NCRWQCB)

Lynda Hopkins: West County Supervisor

Samuel P. Magill: Facilitator

Parastou Hooshialsadat: SCWA

Kathryn Gies: West Yost

Ann Dubay: SCWA

RRWPC Comments on:

Draft Report: Water Quality and Recycled Water Supply Feasibility Study

West Yost: water engineers

Comments By Brenda Adelman for RRWPC

Introduction:

As a long time resident concerned about water quality, having lived in Rio Nido for the last 47 years, and customer of RRCSD for the last 30, I have tracked much of the history of the Russian River County Sanitation District (RRCSD) from 1980 to the present. On behalf of Russian River Watershed Protection Committee (RRWPC), I have written extensively about District projects and their impacts, including those from wastewater spills. I have advocated for collection system repairs before allowing new hookups. I have written about the health (or lack of it) of the Russian River and problems needing to be addressed such as endocrine disruption chemicals, toxic algae, and other issues, and have tracked local and State governmental actions to address, but sometimes make worse, identified problems. I have also requested that penalty funds for major District spills such as those in 2019, be put toward fixing our broken system, but instead the funds are being used

to fund this document calling for a possible great expansion of the District. I read somewhere that future penalties may also be applied to ‘studies’, rather than repairs.

I am in possession of a large newspaper record (10 boxes) of citizen involvement in these issues during that time, especially as they affect the West County and the lower river. I selected one article about Graton to provide a sense of how West County people feel about large agencies and their large agendas which are, on the surface, intended to address our wastewater ‘problems’, but often create new ones that make the problem worse while keeping lawyers and consultants well employed. West County residents feel strongly about preserving their rural life. Where there are battles between urban and rural values, it often ends in concessions by both, but so far has managed to retain basic rural simplicity, limited size facilities, hopefully limited environmental impacts, and cost effective construction, especially where money & space are concerned. With all the spills that have occurred with this system however, it is not known if environmental values have been upheld.

The article quoted below is from **Sonoma West Times and News** on August 2, 1995, page A4, and gives a sense of the community’s determination to be heard.

“Residents of Forestville and Graton, unhappy with the county’s plans to build a regional sewage plant for both communities, will hold a town meeting next week to discuss plans for water conservation as a means of forestalling the need for the plant and a temporary pipeline.”

“Activists who are opposing the county’s plans are also seeking a court injunction to stop the county from building a temporary pipeline between Forestville and Graton to transfer treated and untreated sewage.”

“The opponents recently filed a lawsuit challenging the new regional plant idea, claiming that the new project was not described in the environmental impact report approved in 1993.”

Supervisors later voted for the regional plant without gathering further public input. This action was met with more public outrage. It didn’t get built back then but it’s here again now.

This situation is a small sample of what has become a big problem for West County and was followed by years of protests over plans of Occidental’s sewer issues, Forestville growth issues, Monte Rio sewer issues, Camp Meeker sewer issues, Jenner water issues, and Guerneville’s sewer issues. Spills and high costs and health issues are usually the items receiving the greatest ire from the public. (Our news article collection cover most of this history.) What it boils down to is that people in West County love our natural environment, and the more simple, peaceful, and self-sufficient lifestyle. Citizens here will work hard to protect these values. We don’t see that this Regionalization Study appreciates those values with it huge infrastructure proposals and over-the-top cost estimates that don’t even cover all the infrastructure needs to be ultimately included.

Document analysis:

The Water Quality and Recycled Water Supply Feasibility Study (Regionalization Study) includes five alternatives that have been selected for further study out of eight originally put forward.

- 3 Local Scenarios: Alternatives 1a, 1b, and 1c. 1b has been eliminated, leaving 1a which includes local facilities at both Forestville (including Graton and Occidental) and Guerneville (remaining solo). The document acknowledges improvements would need to be made to both. We don't think this analysis will rectify or even address the recent Guerneville illegal discharge of 50.5 MG on January 6 through 9, 2026, since few details are known at this time. Therefore, circumstances may have made this study obsolete before one hearing has been held and long before any final decision has been made as to a preferred project. This should be acknowledged and addressed. (see PD article of 1-18-26 attached)

Comment 12

We had originally believed that 1a was the only option we could have supported. After the January 6th weather event however, we take our preliminary support back. It could change again later. (In addition, the costs of 1a, though the lowest of all five, will certainly exceed the \$55 to \$84 million estimate mentioned and would end up much higher because the addition of septic system properties are not included in analysis along with the need for additional storage. 1a is also the top choice of the consultant. It is also questionable whether it is possible to site a new storage pond at the Treatment Plant area. (If 1c were chosen where Guerneville's waste goes to Forestville, the total cost could go as high as \$185 million, definitely out of the ballpark.) If new improvements are identified for 1a, it might go much higher yet.

Comment 13

- Note: Press Democrat Article on January 18, 2026 states: *“But many of the big projects—including upgrades to the system needed after the 2014 mainline rupture—have yet to occur and are reliant on spotty federal or state grant funding. Other needed improvements include an additional holding pond at the sewer plant with an estimated cost in the tens of million dollars, Royall said.”* I don't recall if Regional Study mentions need for more storage, but it does enumerate the other major needs. Regionalization Study mentions some needs, and this one should certainly be on the list. The need for more storage should be a priority, if new flow levels are adopted.
- 1c sends Guerneville waste to Forestville. That is totally disruptive to the people of our District and a waste of money. We have so much invested over the last 40+ years, people would be outraged. As we have stated before the cost figures for all alternatives are through the roof. There is no way I can see people going along with this \$185 million figure, even if it were 100% grant funded, and we all suspect that would not be approved in today's economy.
- We view other options as outrageous proposals that are not in keeping with the values of most West County citizens. For instance, lengthy pipelines to Santa Rosa and/or Windsor would expose communities to more wear and tear that can include ruptured pipelines and spills into sensitive habitats and waterways and at much greater expense.

Comment 14

Regionalization Study Issues:

- Ratepayer cost savings supposedly will result from regionalization but may also lead to urbanization. Things like major hotel facilities open 24/7 with many rooms will encourage a great deal of night activity which may lead to many other

supporting facilities that are undesirable in a rural area. This can lead to more money for the business people but also more light (bad for wildlife), more noise and possibly more crime.

- For this reason and others, RRWPC does not support the other alternatives but for possibly 1a, and perhaps not that either after big 50.5 MG sewage spill this month when river at 29' & not flooding. It was revealed in a Sunday Press Democrat article (Front page on 1-18-26) that the system does need new storage which might cost "...tens of millions of dollars." (David Royall)
- All alternatives are far too expensive to construct; communities will likely rebel.
- On page 2-4 claims 3213 ESD's and 2503 connections for RRCSD and 3621 ESD's on Table 2-17 (Page 2-40) Please explain discrepancy on ESD's. We have found this topic constantly changing and very confusing. Your website should include a very clear definitions of what is covered by each within individual Districts. For instance: how many ESDs for restaurants in District, how many ESDs for hotels, motels, guest houses, apartments, etc. Also how many properties entitled to ESDs that are not being used currently exist? This would also apply to as yet unbuilt motels, etc. In other words, we would like assessment of urbanization potential.

Comment 15

Comment 16

Comment 17

Comment 18

(1) One of the goals of the project is to assess potential for the addition of unsewered areas in relative proximity to the treatment plant being studied. Yet the costs and challenges of hooking up specific septic areas are not considered in feasibility analysis. For instance, Monte Rio and Villa Grande potential loadings and costs are not considered in their likely hook up to RRCSD. Capacity appears to be reserved for growth projections (another issue of concern). Then the reliability of the growth projections also come into question because of this limitation, or will the two issues be competing for capacity? In either case, the situation seems to invalidate fiscal estimates since a critical element is being left out. How much should be added to the estimates in order to address these concerns?

Comment 19

(2) Costs projected in this document include costs of running TP and collection system based on current and future hookups, but not on possible septic system owners who may need a future hookup and for which the system has not currently been addressed. It also doesn't address (that we can see) the District ESD's that are not currently connected to the sewers. The number of ESD's does not correspond to the number of properties, and the breakdown is not explained. How many District ESDs are not hooked up to sewer in which they reside for which capacity is reserved?

Comment 20

Comment 21

(3) Related to that, people keep asking how a 108 room proposed hotel for Guerneville can have capacity when a little ways downstream, the pipeline and Main Pump Station are often failing? What will hooking up this hotel do to the collection system if inadequate funding is available? By the way, this hotel will be open 24/7. Will their ESD's be determined at the same rate as a facility with much shorter hours?

Comment 22

(4) What type of benefit in terms of lowered costs (as promised) can current ratepayers expect when new hookups are realized. In fairness to current ratepayers, and since they are being told their rates will go down if more people hook up, shouldn't there be some kind of estimate under various scenarios that inform them of how much savings can be expected?

(5) Will new tenants/buyers moving in be billed for a portion of the infrastructure already existing? Do owners of vacant structures pay sewer fees? Also, does this study address the problem of unanticipated change orders for any system selected? RRCSD had about 30 change orders and the supposed \$13 million dollar system turned out to be \$30 million. Thankfully, most of the funding was provided by the State and Federal governments. What would the governing entity do if that happens?

Comment 23

(6) Addressing environmental impacts and the costs of addressing them with EIRs and other environmental studies (especially on the fishery) appear to play no part in the analysis, and impacts of system failures affecting recreation and/or other uses, were not addressed. (we may have missed it.) Who pays for costs of system expansion? To what extent must current ratepayers chip in? How is it determined?

Comment 24

(7) Also, prior stakeholders paid large amounts to maintain and improve system. If another community reaps the benefits, what do they contribute to the facility that was partly paid for by original ratepayers?

Comment 25

(Following notes taken from Chapter 2 of the HMP Study. (Service area and Wastewater Characterization)

Page 44 **Hazard Mitigation Plan***pump stations and equipment including pumps and controls, can potentially be damaged in the event of a flood. It is important to ensure that all electrical components are elevated above the 100-year flood plain.*” Is this included in Regionalization Study?

2. *“Climate change may cause more extensive flood problems due to possible sea level rise and more severe weather patterns. Consequently the 500-year floodplain inundation area may become a higher probability risk, and the WWTP subject to floods.”* January 6-8, 2026 was a “King Tide” and therefore far more dangerous even though the river didn’t flood. What were river levels at Jenner when spill occurred? How will such problems be addressed? Also, if significant amounts of sewage invade the Estuary, is the District legally responsible? Can property owners downstream sue the District?

Comment 26

Back to Chapter 2: Regionalization (page 2-4)

12 SSOs since 2019: please describe/also penalties?

RRCSD plans to replace 3 force mains & upgrade lift stations to improve resiliency and repair deficiencies. This will also address flooding although high peak influent flows to plant are expected to continue. Question: Plant was upgraded to 4.5 MG capacity during high flows and may possibly go up to 5.0 million gallons. How is it that you are confident that this will serve all flows especially during flood periods? Both ponds hold 4.5 million gallons. How is this adequate to allow for 5.0 capacity? How does the recent spill fit into this assumption?

Comment 27

RRCSD ratepayers barely qualify for DAC (Disadvantaged Community) which helps provide funding for all the improvements needed by the system. Not everyone answers the questionnaire and with all the new hookups possible, it would not be difficult to lose funding from that program

to do necessary repairs to the system. What would happen to grant funding if hooking up is required for all area septic system properties after conducting a new income survey? We realize this probably has not been calculated for this Study, but does that skew the information when it gets included later?

Middle of page 2-7 it states that “...*Peak Day flows through the WWTP can be equalized to 5.0 mgd with use of existing Emergency Storage Pond. If a 0.4 EQ basin is also available, flows can be equalized to 4.2 mgd.*” Assuming this will address growth factor, what will address growth to system if area septic systems are also hooked up to system. And here is a big problem. You are utilizing any minimal existing growth capacity for future growth, but apparently none for transitioning septic systems to central sewer.

Comment 28

Another thing: Guerneville is a very difficult place to determine growth factors. I have lived here about 47 years and have not experienced extensive growth impacts although there has been a lot of rehab done on existing structures. It takes me the same time to drive to Santa Rosa along River Road as it did 47 years ago (about 18 miles). There are relatively few traffic backups when travelling that stretch. Our area is very much a summer community still. All winter there is almost no traffic between Guerneville and Rio Nido (2 miles) and in the summer, it can take 20 minutes to get into Guerneville from Rio Nido. Granted, not all of that is local traffic.

Other factors:

- Still a lot of second homes here with owners coming mostly in summer time
- A lot of vacation rentals that are sometimes occupied and sometimes not. Often they aren't occupied much in winter
- None of the various districts in our area have the same boundaries as RRCSD so you can't easily compare population changes
- There has been a lot of upgrading in our area but not much new building.
- We have floods, landslides, fog, penetrating cold in the redwoods, sewage spills, little sunshine in our redwood canyons most winters, and it's not much fun here in wintertime, minimizing population numbers but not raw sewage spills.
- Dry weather flows have stayed fairly even in the 43 years the system has been on line.

Comment 29

For all these reasons, we would question the growth rate projections.

In terms of the influents loads, for a long time after system was on line, there were numerous properties not hooked up to sewer. EPA put pressure on the District to hook everyone up and loads went up as well. There was lots of upgrading of resorts and visit serving businesses and that would make summer loads also go up. If units are sitting empty during low winter flows, the rate could stay low as well (compare inflow to drought years and with rainfall levels: much of the flow may be I&I.)

I don't think there was a very well documented growth rate analysis in this document as a result of ignoring so many population and influent factors. Also, strangely, summer flows never increased much over the years. Supposedly they average about 300,000 gpd, which is less than half of capacity and not much higher than the 250,000 that used to be common many years ago.

It seems like the analysis of BOD/TSS at the top of page 2-8 is oversimplified in terms of loading during high flows. More details and comparisons are appropriately being called for by the author of this section.

Statement on page 2-8: *“The RRCSD WWTP experiences significant I&I, which should cause a decrease in BOD/TSS concentrations due to this diluting effects of this flow contribution to the sewer system. However, samples with elevated BOD/TSS concentrations have been collected during wet weather events.”* Regarding the spill of January 6th of this year, they tell us that 5.5 million gallons of sewage spilled into the river. Yet somewhere we also saw that downplayed by a statement that claimed most of the spill was diluted with rainwater. Was this true? How can it be measured?

Comment 30

Yet, what does it tell us if elevated BOD/TSS is in the influent and the spill appears to be from the Treatment facility even when there is no flood? Can massive I&I occur when the river is below flood stage? What was the BOD/TSS of the sewage that got into the river downstream on that date? Was there any dilution factor at all? We are confused by this and look forward to an explanation, since 5.5 million gallons is many times the number of gallons of total spills into the system which has seen many (at least 19 just since 2019)

Comment 31

Top of Page 2-11 mentions storage, which I was wondering about and explains how they manage it. I still don't understand how they handle high flows if they have a constant 4.5 inflow. There is a 3.5 mg storage pond which takes care of part of the inflow. The 1.0 mg is for equalization during high influent flow and inadequately treated wastewater that has to be retreated. And this storage remains constant and the flows don't go higher? Then there is the third unused aeration basin provides 0.4 of emergency storage. IS THIS REALLY ADEQUATE DURING HIGH FLOODS? I don't have the expertise to address this, but I really believe that high winter flows are unpredictable and operators should not rely on what sounds like a tight squeeze.

Comment 32

On page 2-13 there is a note saying the following in regards to limits to future reliance on the 400 acre parcel recently purchased by the County on which sits RRCSD: *“This site does include a conservation easement limiting uses of the site, and the topography of the site also presents challenges for installing new irrigation infrastructure.”* There needs to be a lot more study of this situation before relying on the “Burch” property for future irrigation expansion.

Comment 33

Another issue in this section regarding the site serving the RRCSD Treatment Plant: we have always been told that the site is OUT of the flood plain. We know in the past there has been overirrigation of the Clar tree, any discussion about expanding irrigation in the lower field needs to address this issue. Also there had been (and still are) concerns about allowing irrigation water to seep into the groundwater, especially at lower irrigation site, and somewhat at all irrigation areas. This limits the amount they can irrigate in any one area and with additional hookups, overirrigation could occur. This needs to be carefully analyzed and a range of options provided. It may be helpful to provide a map of the irrigation areas that shows elevations of the various hillsides on the property.

Comment 34

RRCSD Regionalization Opportunities and Constraints

It seems as though treatment plant staff are pushing the limit with this system and it's impossible to know if they are using good judgment in light of the historically high number of SSOs during the life of this project. The limited certitude of staff's judgment is evident in the following statement at the start of this section on page 2-15.

“The WWTP could likely manage increased influent loads. The RRCSD Treatment Plant Master Plan indicates maximum month influent BOD loads could increase to approximately 3,650 lb/day (2) and equalized peak day flows could increase to 5.0 mgd with use of existing Emergency Storage Pond. If 0.4 MG EQ basin is also available, peak day flows can be equalized to 4.2 mgd.”

Comment 35

So unless more accurate predictions of global warming storms could occur, how reliable would this management policy be? This spill two weeks ago was a total surprise. Was the system being run at the peak of its capacity when the spill occurred? Is it wise to run a system at its peak during unpredictable weather periods? (It seems that the amount of spill went way beyond what weather predictions would have expected.)

The Sonoma County Water Agency is very proud of their weather forecasting system that predicts when its best for Army Corps of Engineers to make winter releases from the dams. Why aren't those skills applied in this situation? And if our problems were strictly caused by local conditions, why can we not get better knowledge about the details of the situation? We also want to throw out a question from left field: Are there enormous rainfall and other weather conditions (wind, temperature, etc.) differences because of the vast geological contrast between Graton/Forestville and RRCSD?

We have mentioned before and the circumstance appears here (p.2-15) where there are many septic systems within two miles of RRCSD that may need to be hooked up to the system. Again we mention the possible conflict between flow additions from new growth and those from septic system additions which appear to be in conflict with one another in terms of treatment plant capacity allocations. If this is so it appears to make this study deficient, since cost figures and plant design are critical aspects of the project. The consultant is attempting to fulfill the contract as written as indicated in the bottom half of page 2-15.

Comment 36

This constraint is mentioned on this page and claims some MINOR hydraulic conveyance improvements are needed, but do not mention details of what this would include or cost figures of doing it. We don't know what this would entail or for what populations it would serve. It goes on to mention other changes that would be needed, but our same concerns apply. Why are they not part of the project? How many other problems are inadequately addressed for which no other remedies have been sought but perhaps should have been.

Comment 37

This section admits to limited storage and states opportunities for possible expansion of current storage are limited. We believe that this should have been analyzed. There are also limited possibilities for expanding wastewater reuse near the facility. Costs for such projects and funding availability are also unknown. And as we already pointed out, there is limited ability to expand system on the 400+ acres recently purchased because of many constraints on the use of the property by the existing conservation easement.

GCSD Service Area and Facilities:

RRWPC has limited knowledge about the Graton and Forestville facilities as we have not spent much time over the years becoming familiar with them. Because of this, we tend to support joining those two facilities, along with Occidental, as long as they can do so with community support and buy in. We support this provisionally because we have had the experience of late, going through old newspapers, of reading about strenuous opposition from local citizens opposing various plans by local officials to make changes to these systems. On the surface, we think it would be reasonable to join these systems together, BUT ONLY if local citizen concerns are fully addressed. (See page 2 of these comments.)

We don't think RRCSD should be involved however, nor our local community, since our system is far from the others in distance, it exists in a harsher environment, it's much larger and complex, and would probably be much more expensive to implement 1b or 1c options. In fact, initially we supported ONLY option 1a and now we are not even sure of that, because of the recent RRCSD 5.5 MG spill a few weeks ago. Due to limited time and knowledge, I will continue to comment only on those sections dealing with RRCSD.

We do have one question however, from a footnote on page 2-23 in Table 2-9: Note (a) on the bottom states: *Value shown in peak daily flow. Peak influent flow could be 2 to 3 times this value (or higher).* We thought "peak daily flow" was the same as "peak influent flow". What is the difference between the types of flow? Also, how do you calculate rain water amounts on the ponds, if you do? If you don't, how do you calculate amount of discharge during a rainy period? (What consideration is there for rainwater intrusion? When rainwater joins wastewater, isn't it all considered waste? I there a dilution factor given. If so, what is it? If the rainwater has already been contaminated, and/or becomes contaminated by the spill water, what difference does it make how many contaminants are in it? It's been polluted and it all should be counted as the same toxic fluid. This comes up a lot in the spill documents and often the penalty gets lowered using this situation as an excuse.

I have question about water use and generation of sewage. How is the number of gallons per ESD calculated as summer flows are still relatively low? (RRCSD averages 120 gpd) What are 'average' numbers based on?

Also, Table 2-17 on page 2-40 states that RRCSD has 3,621 ESD's. But the number of properties is about 2600. Are there 1,000 ESD's that are part of multi-unit facilities or commercial establishments needing several ESD's such as restaurants?

Comments regarding RRCSD in Chapter 4: Preferred Alternatives

RRWPC will only address cost issues for RRCSD and even then in a very limited way. We believe that too much is left out of the analysis (as described earlier) to make cost figures meaningful. RRCSD is an old system that needs so many repairs and improvements and only part of it estimated in engineering studies, the numbers would probably be worthless and misleading. We do credit the authors however, on being open about limitations of the analysis.

Page 4-12: What's the difference between effluent storage ponds and equalization basins?

Page 6-11: Allowable Discharge Flows in Dry Years

I have the following issues on this page:

Comment 44

- To determine discharge: the Basin Plan does not allow flows over various years to be averaged in order to determine amount of discharge allowed. It's my understanding that any discharge is based on the flow that day.

Comment 45

- Discharges are not allowed at all between May 15th and October 1st which is the time of greatest amount of irrigation. The whole point of irrigation is to avoid discharge in the summer months. The irrigation capacity discussions are unclear.
- During the time of most irrigation demand, no discharge is allowed.
- Irrigation systems are to be managed so as to avoid all discharge.

Comment 46

- This is especially important in very dry years when irrigation is very limited. It is also a time when water allocations are strictly enforced and not as much wastewater is produced.
- In most dry summers and for Santa Rosa in many summers, irrigation in the Laguna is not utilized in order to meet contractual demands by the Geysers Project.

Comment 47

- If what is being determined is the irrigation demand during various wet and dry years, and the extent to which it will use up stored water, I'm having trouble seeing the problem. During summers coming after dry years, the demand can be huge and less water may be available. But that is not a problem for treatment plants when you don't have the water to give away. During summers coming after wet years, there may be less demand, especially with grapes, but I'm not sure how you quantify the problem in so far as the wastewater ponds are concerned. It seems like a cold cloudy summer after a very wet winter, and with no discharge allowed, may be the biggest problem of an irrigation season from the view of the discharger. But I can't be sure that is what is being discussed here. It seems they were more concerned about having too little irrigation water available. I'm in no way an expert here and would appreciate a better explanation. I know I did track Santa Rosa's and Rohnert Park's irrigation practices for a while and learned about some of their problems. Nevertheless, I don't see why the wastewater treatment systems should be overly concerned about too little wastewater available dry summers.

Chapter 9: Findings and Recommendations

This chapter includes the following conclusions regarding RRCSD:

"The RRCSD WWTP is an advanced treatment facility that provides a high-level of treatment allowing for surface water discharge to the Russian River. Continued local treatment and reuse at RRCSD is recommended for the following reasons:

- *The RRCSD WWTP has surplus capacity to accommodate flows from local unsewered community clusters. These findings are supported by the Master Planning effort being concurrently completed.*

RRWPC agrees with this only on the condition that all upgrades identified in the collection system, the pipelines, and the Treatment Plant are fully repaired before plans are made to make other hookups. Also, the treatment and collection systems need to be able to accommodate all flows at all levels experienced so far.

- *"Some condition-related improvements have been identified for the facility, requiring a relatively modest investment in the next 20 years compared to the cost of wastewater export."* It would be helpful to briefly name those amounts here.

Comment 48

Comment 49

- “The majority of the RRCSD WWTP would maintain resiliency in a 100-year event even under projected climate change conditions.” This is true according to flood plain measurements. But what about landslides and other geographical hazards, and groundwater intrusion (which was a problem for some discharges in the past) and seismicity of the parcel and river? I don’t recall these hazards being addressed. In fact, any future document should incorporate concerns in the Hazard Assessment
- “The RRCSD WWTP and identified nearby unsewered community clusters are relatively isolated within West County, whereas the FWD WWTP is about 10 miles away and both the Windsor WWTP and Laguna WWTP are about 20 miles away.” We agree with this entirely. It is a good reason to keep things where they are.
- “RRCSD has existing land application area that could be expanded. RRCSD has also recently acquired nearly 400 acres of nearby forested area on which an additional modest expansion of the existing reuse system could potentially occur.” There needs to be a study looking at this more closely. It’s not clear what is available geologically or legally in the Conservation Agreement.

Comment 50

- Finally, there has been no mention that approximately the last mile on Neeley Road before reaching the Treatment Plant, has houses that are still on septic systems and probably would not be able to hook up to the sewer system for reasons of which I am unaware. There may be an engineering justification for this that should be mentioned.

Brenda Adelman for RRWPC

“

Charles Hardy

From: Andrea Rodriguez <Andrea.Rodriguez@scwa.ca.gov>
Sent: Monday, January 5, 2026 9:59 AM
To: David Coleman
Cc: Sophia Grubb; Parastou Hooshialsadat; Steve Koldis
Subject: RE: Comment on Draft Feasibility Study Report

Dear Mr. Coleman-

Thank you for your comment on the Draft Water Quality and Recycled Water Supply Feasibility Study. It has been received and will be shared with the study team.

Please let me know if I can help with any additional information,
Andrea

From: David Coleman
Sent: Friday, January 2, 2026 4:58 PM
To: Andrea Rodriguez
Cc: Sophia Grubb ; Parastou Hooshialsadat ; Steve Koldis
Subject: Comment on Draft Feasibility Study Report

To whom it may concern,

As the Principal of Brelje & Race responsible for the *Monte Rio and Villa Grande Wastewater Solutions Project Alternatives Development and Analysis* referred to as the Monte Rio Study Report and referenced in Chapter 8 of the Draft Feasibility Study Report, the following comment is offered:

Comment 51

The first paragraph of page 3 of Chapter 8 of the Draft Feasibility Report states “Very little detail is provided regarding the development of the cost estimates that are included in the Monte Rio Study Report, and it is unclear whether the costs are representative of the construction cost or the total project costs¹.” With the footnote stating “The Monte Rio Study Report initially labels the costs a construction costs, which implies they do not include non-construction project elements such as engineering design and permitting. However, in other areas of the report, the costs are presented as project costs, which implies these elements are included.”

We are not aware of any contact from the report author to confirm the nature of the cost estimates included in the draft Monte Rio Study Report, and we believe Sonoma Water was aware that costs presented in the report were construction costs, rather than project costs. On December 19, 2025, a draft of the Monte Rio Feasibility and Preliminary Design Report was submitted to Sonoma Water for review. This draft report presented project costs as requested by the agency.

Thank you,
Dave

Dave Coleman, P.E.
Senior Principal

Brelje & Race CONSULTING ENGINEERS
Water | Wastewater | Site Development | Land Surveying | Planning

Charles Hardy

From: Andrea Rodriguez <Andrea.Rodriguez@scwa.ca.gov>
Sent: Monday, January 5, 2026 9:56 AM
To: dyatesc@aol.com
Cc: Parastou Hooshialsadat
Subject: RE: Comment on Draft Feasibility Study Report

Hi Mr. Coleman-

Thank you for your comment on the Draft Water Quality and Recycled Water Supply Feasibility Study. It has been received and will be shared with the study team.

Please let me know if I can help with any additional information,
Andrea

From: dyatesc@aol.com
Sent: Friday, January 2, 2026 4:59 PM
To: Andrea Rodriguez
Cc: Parastou Hooshialsadat
Subject: Comment on Draft Feasibility Study Report

Hello,

I am a resident and property owner in Forestville and also a property owner that is connected to the sewer in Guerneville. I happen to be the District Engineer for the Forestville Water District; however, these comments are my own and do not necessarily reflect the position of the Forestville Water District.

The report appears to be thorough and intricate with much information considered and analyzed. I have not been able to thoroughly review the report in a technical sense or to review capital cost or operating costs estimates other than on a relative basis.

However, some conclusions of the report don't seem to make sense with the realities that are inherent in operating small wastewater districts.

Most stakeholders are aware of the financial challenges that these small wastewater districts such as Occidental, Forestville, Graton and even Guerneville have faced since fixed costs have to be covered by a smaller user base. The regulatory burden associated with seasonal storage and discharge are a large reason for the high operating costs for these small systems.

Comment 52

My understanding is that one major objective of the report is the exploration of regionalization concepts to "improve water quality, water supply reliability, Pathogen TMDL compliance, and climate change resiliency in the Russian River watershed, **and address ratepayer costs for West County wastewater systems** [emphasis added]."

Economy of scale is possible by combining small systems – and this is being pursued currently on the Occidental/Graton and the Graton/Forestville fronts. This will most likely result in lowering operating cost pressures on a per-user basis for each of these three small districts.

This is reflected in the estimates presented in Table 8-60, Summary of Annual Rates per ESD, of the report – which demonstrates that user rates could be less for the combined users of Occidental/Graton/Forestville compared to their respective existing rates, if these systems are combined (Alternative 1a). Further economy of scale is predicted if the flows of Guerneville are added – resulting in a 50% reduction in estimated rates (Alternative 1c). However, a larger economy of scale of the TOW and LTP regionalization alternatives (Alternatives 2a and 2b) is NOT predicted for these alternatives. In fact, the user rates for each of the West County districts are estimated to be higher with these alternatives. Evidently, this is due to different O&M cost estimating methods employed for these alternatives – where treatment costs were cited by officials of those treatment plant agencies as compared to operating cost estimates for West County districts calculated more empirically by the study authors.

Comment 53

There are 5 preferred approaches that are identified out of the original 8.

Due to the rating system employed, Alternatives 1b (all West County flows to the Guerneville plant) was eliminated whereas Alternative 1c (all West County flows to the Forestville plant site) was brought forward. However, it would seem that expanding the Guerneville plant to accommodate Occidental/Graton/Forestville would be more practical than expanding the much smaller Forestville plant to accommodate the larger flows from Guerneville. Also, Alternative 1c would involve a new treated effluent outfall to the Russian River from the Forestville plant; whereas Alternative 1b would not have required a new discharge point. Conveying the wastewater flows from Guerneville to Forestville and discharging the combined volume (more than double) of treated effluent just downstream of the Steelhead Beach Park would not be a popular proposal. It is not lost on the undersigned that currently treated effluent from the Forestville plant is ultimately discharged to the same point of the Russian River (via Jone Creek and Green Valley Creek), but the additional discharge and the physical construction of the discharge facilities would still be unpopular in the local area.

Comment 54

Hybrid Alternative 3b (Guerneville to Windsor and Occidental/Graton/Forestville combined at Forestville) is a preferred alternative. This does not make practical sense as the pipeline from Guerneville would pass through Forestville (less than 2 miles from the Forestville plant) on its way to Windsor. Why wouldn't that regionalization facility (the pipeline) be used to its fullest extent?

It appears that subjective scoring criteria seems to be biased against continued use of the Guerneville plant and contradictory to conclusions reached in chapter 9.

For example, Alternative 1b has the lowest Resiliency score due to “reliance on a treatment facility that is near the Russian River and thus particularly vulnerable to seismic and flooding impacts”. However, it is not demonstrated that the Guerneville plant has a flooding issue or is more prone to seismic activity.

Also, Alternative 1b has the lowest Long Term Regulatory Compliance score due to “the ongoing compliance issues at this site related to management of peak flows.” However, the compliance issues

related to peak flows at Guerneville are largely due to the condition of the collection system – which will remain in use under any alternative. Regional loads to the plant can be connected directly to the treatment plant or to an improved and robust end of the collection/conveyance system. It seems that bringing the peak flows from Guerneville to Forestville would bring more environmental risk due to the location of the facility in relation to a small tributary to Green Valley Creek.

In summary, everything else remaining equal, creating larger systems will allow a better economy of scale for both capital and operating costs. Arriving at an alternative that results in the continued use of small systems should not be undertaken lightly and regionalization alternatives should be considered as much as possible.

Thank you,

Dave Coleman, Forestville