



CABY INTEGRATED REGIONAL WATER MANAGEMENT PLAN
PROPOSITION 84, ROUND 2 IMPLEMENTATION GRANT



3 EL DORADO COUNTY SMALL HYDROELECTRIC DEVELOPMENT PROGRAM

GENERAL INFORMATION	
Project Title	El Dorado County Small Hydroelectric Development Project
Abstract	El Dorado Irrigation District's Tank 7 In-conduit Hydroelectric Project is one of the most promising projects prioritized in a 2007 study of hydroelectric opportunities in El Dorado County. This in-conduit project substitutes a pump acting as a turbine in place of an existing pressure reducing station. The energy that is normally released by the PRS would be used to generate hydropower that is sent to the grid through a PG&E interconnection. The water used to generate the hydropower is from an existing water right and does not result in any change in water diversions. It will increase the amount of energy available to the power grid, reduce greenhouse gas emission and decrease natural gas consumption, while still providing consistent and reliable water flows during all high demand events.
Organization	El Dorado Irrigation District (EID)
Disadvantaged Community	N/A
Grant Funds Requested	\$380,000
Non-State Match	\$1,324,560 (78%)
Total Budget	\$1,704,560
Watershed	American River
County	El Dorado
Status of Project Design	Since 2009, EID has completed 30% design document and the project is ready to move forward with final design and implementation
Existing Data or Studies	The 2009 <i>Hydroelectric Development Options Study</i> identified hydroelectric opportunities in El Dorado County. The report identified the top 10 projects recommended for detailed feasibility and implementation. EID's Tank 7 In-conduit Hydroelectric Project was listed as one of these promising projects. Attached as EN2 Resources, Inc. <i>El Dorado County Hydroelectric Development Options Study</i> . (July 24, 2009). El Dorado County Water Agency, El Dorado Irrigation District.

	<p>In response, EID, along with the El Dorado County Water Agency (EDCWA), commissioned the Hydroelectric Analysis for El Dorado Irrigation District's Pleasant Oak Main Tank 7 Report, prepared by NLine Energy et al., to re-examine the Tank 7 Hydroelectric Project. The study examined an updated and expanded dataset, overall station design, power generation estimates, value-engineered cost estimates and revenue projections for three options and arrived at numerous conclusions and recommendations for refining the Tank 7 project design for District consideration. A copy of this study is attached as NLine Energy, Inc., Domenichelli & Associates, EN2 Resources Inc. (November 9, 2012). <i>Hydroelectric Analysis for El Dorado Irrigation District's Pleasant Oak Main Tank 7</i>. El Dorado Irrigation District.</p> <p>The EDCWA <i>Water Resources Development and Management Plan</i> identifies hydroelectric development as important to the County's future water supplies and operations. A copy of the plan is attached as ECO:LOGIC Engineering Environmental Division. (December 2007). <i>El Dorado Water Resources Development and Management Plan</i>. El Dorado County Water Agency.</p>
<p>Status of CEQA, NEPA, and other environmental laws</p>	<p>The California Environmental Quality Act (CEQA) includes a "Small Hydroelectric Categorical Exemption" (CEQA Guidelines Section 15328) for projects at existing facilities that meet certain criteria (e.g., projects with capacities of 5 MW or less and that do not affect in stream flows or special-status species). The Project meets these criteria and therefore, EID filed a Notice of Exemption with the El Dorado County Clerk on January 6, 2010 (attached). In addition, EID completed the consultation process and received a Federal Energy Regulatory Commission In-conduit Exemption and had entered into an interconnection agreement with PG&E for this Project. That interconnection agreement was not extended by PG&E and a new agreement will need to be executed.</p>
<p>Work that will be completed prior to October, 2013 (assumed contract date)</p>	<p>30% design documentation and Environmental Compliance documentation.</p>
<p>Procedures for coordination with partner agencies and organizations</p>	<p>EID will be the sole recipient of the grant funds. EID will continue to coordinate with CABY and the El Dorado County Water Agency for quarterly and annual reports.</p>
<p>Description of synergies or linkages between other CABY IRWMP projects</p>	<p>This project is a critical component in increasing sustainability while addressing the amount of energy that is expended in moving water throughout the heavily plumbed CABY region. This project makes a first and critical step in illustrating ways in which existing infrastructure can be retooled to provide energy savings and generation (with associated reductions in greenhouse gases/GHG). It also demonstrates how a resource</p>

	<p>that is common to the area (i.e. sharp topographic relief with the resultant ability to generate sufficient head to generate energy) can be maximized to offset the energy consumption that the elaborate conveyance infrastructure in the region uses. This creates a clear linkage with the other projects in the suite that seek to mitigate or anticipate the effects of climate change.</p> <p>This project also supports the following CABY linkages and synergies objectives, articulated in the Introduction to the Proposal: selection of projects at multiple elevations: developing a mix of localized projects that address clear single-location needs with projects that have a regional impact; inclusion of pilot, demonstration or model projects whose benefits can then be expanded through implementation of similar projects across the region; siting of projects across all of the primary CABY watersheds; including projects that directly address the resiliency of natural and infrastructure systems; inclusion of projects which result in direct water conservation and/or use efficiencies; creation of implementation actions/projects that represent adaptive management options in response to climate change; pairing projects that create synergies of impact internally and between projects; balancing infrastructure and natural resource projects within each implementation package; and creating a balance of project sponsors across all stakeholder groups, including DAC, governmental agencies and non-profit organizations.</p>
<p>Status of acquisition of land or rights of way if applicable</p>	<p>No land purchase or easements are necessary, the project site is owned and operated by EID, and therefore there are no tasks associated with this budget category.</p>
<p>If project is part of a multi-phased project, describe how the project can operate as a stand-alone project</p>	<p>The proposed project is not part of a multi-phased project and can be fully implemented without subsequent projects.</p>

<p>SPECIFIC GOALS AND OBJECTIVES OF THE PROJECT</p>	
<p>Goal</p>	<p>Measurable Objectives for each Goal</p>
<p>Anticipate climate change needs and be prepared to respond adaptively to human and ecosystem needs</p>	<ul style="list-style-type: none"> • Decrease dependency on the electric grid • Contribute 590 Kilowatts of local energy generation • Reduction in greenhouse gases of 716 MTCO₂e tons

<p>Maintain and enhance functioning landscapes that provide sustainable services for humans: Hydropower</p>	<ul style="list-style-type: none"> • 12,600MCF natural gas savings • Reduction of 1300 lbs/yr of pollutants (CO, PM, VOC, and TOC) • 1 new small hydro project implemented
<p>Overarching Objective: Education and Outreach will be integrated into all CABY projects and programs</p>	<ul style="list-style-type: none"> • Regular reports to CABY IRWM partners • Regular updates to local community about project benefits and progress
<p>Overarching Objective: Share useable data and information across the region</p>	<ul style="list-style-type: none"> • Regular data updates to CABY website and state and all other relevant databases and agencies.
<p>Overarching Objective: All planning in region to be coordinated to ensure communication and shared solutions.</p>	<ul style="list-style-type: none"> • Regular communication with CABY partners to share project progress, lessons learned and applicability of project as a model to other partners in region.

<p>PURPOSE AND NEED OF THE PROJECT</p>
<p>EID’s contiguous service area encompasses approximately 220 square miles on the western slope of the Sierra Nevada Mountains in El Dorado County. The service area is bounded by Sacramento County to the west and the Pollock Pines/Sly Park area to the east and ranges from 500 to more than 4,000 feet in elevation. The area north of Coloma and Lotus establishes the northern-most part of the service area, while the communities of Pleasant Valley and South Shingle Springs establish the southern boundary. The City of Placerville, located in the central part of the District, receives water from the District as a wholesale customer. The District also operates two satellite water systems in the Strawberry and Outingdale communities.</p> <p>EID is primarily located in two major watersheds, the South Fork American River in the north and the North Fork of the Cosumnes River in the south, and is hydrologically split by the Placerville Ridge and Highway 50 between these two drainage watersheds. Although the rivers drain east to west, the minor streams trend northwest toward the American River and southwest toward the Cosumnes River. The ridges generally trend in a west to east direction. Two hundred pressure-regulating stations are needed for reliable operation due to the varying topographies. The potable water system contains more than 1,250 miles of pipe, 27 miles of ditches, 5 water treatment plants, 36 storage tanks/reservoirs, and 37 pumping stations.</p> <p>The El Dorado County Water Agency’s (EDCWA) Water Resources Development and Management Plan (WRD&MP</p>

2007) identifies hydroelectric development as important to the County's future water supplies and operations. In 2009, the EDCWA, in partnership with the El Dorado Irrigation District (EID) prepared a study to identify hydroelectric opportunities in El Dorado County to take advantage of a favorable regulatory environment and develop renewable energy resources that are both non-carbon and dependable for meeting peak energy demands. The report identified several low impact in-conduit/canal projects as feasible and recommended further development of these projects in the near term. EID's Tank 7 In-conduit Hydroelectric Project is one of the most promising projects. Advances in renewable energy generation, energy storage, energy transmission, and energy efficiency are seen by policymakers as a key to economic recovery, reducing electric utility transmission losses, air basins seeking improved air quality, and goals to reduce greenhouse gas emissions. This project falls under the El Dorado County Small Hydroelectric Development Program that is included in the CABY IRWMP. It develops sustainable renewable energy generation in an existing water system, and represents an adaptive strategy to climate change in a source water area.

DESCRIPTION OF THE PROJECT

There are tremendous demands for new non-carbon, dependable renewable energy generation, and that trend is expected to grow given the state and national policy climates. CABY's water purveyors are in a unique position to contribute to the achievement of state goals to develop renewable energy [small hydro 1.5 megawatt (MW) or less] and increasing energy efficiency and load shifting capability within existing water systems. The low impact Tank 7 In-conduit Hydroelectric Project (Project) will be located on El Dorado Irrigation District's (EID) property at an existing water storage tank (Tank 7) and pressure reducing (PRS-5) facility. The Project will tie into the existing 24-inch diameter Pleasant Oak Main (POM) immediately upstream of the existing PRS-5. The PRS-5 currently reduces high pressures in the pipeline before entering two storage tanks (Tank 7A and 7A). The new hydroelectric station will not change water system operations but will act as a pressure reducing station, producing electricity while reducing pipeline pressure with no change in water supply, capacity, or diversions. There will be no new facilities associated with the development of the Project other than the small footprint of the hydroelectric station itself.

The proposed hydroelectric facility will be constructed on the POM entirely within a parcel developed for Tank 7/7A and PRS-5 as shown in Exhibit A. The Hydroelectric station will operate year-round except for repair and maintenance a few days out of the year. Three-phase Pacific Gas & Electric (PG&E) transmission lines are located along Pleasant Valley Road less than 50 feet from the site. Power generated from the project will be transmitted to the grid at this location and sold to PG&E. In addition to this Project strengthening the regional power grid, the Project will increase revenues, which can be used to offset water system operation costs, infrastructure replacement in other parts of the water system, and provide a drought resistant energy supply.

Building the In-conduit Hydroelectric Project will:

1. Promote renewable energy in existing water systems by implementing a model example which:
 - Establishes EIDs first low impact hydroelectric facility at an existing pressure reducing station where untapped energy is readily available;
 - Maintains operation of the PRS-5 system with no added water supply, intake facilities, or other structures required and independently without significant operator attention;
 - Delivers a long-term dependable, proven source of renewable energy that correlates with time of use

energy demand, unlike intermittent renewable energy sources, such as solar and wind; and

- Demonstrates a resilient system that has minor impacts from severe climate changes, such as drought, compared to large hydroelectric projects.

2. Advance CABY region renewable energy self-sufficiency by:

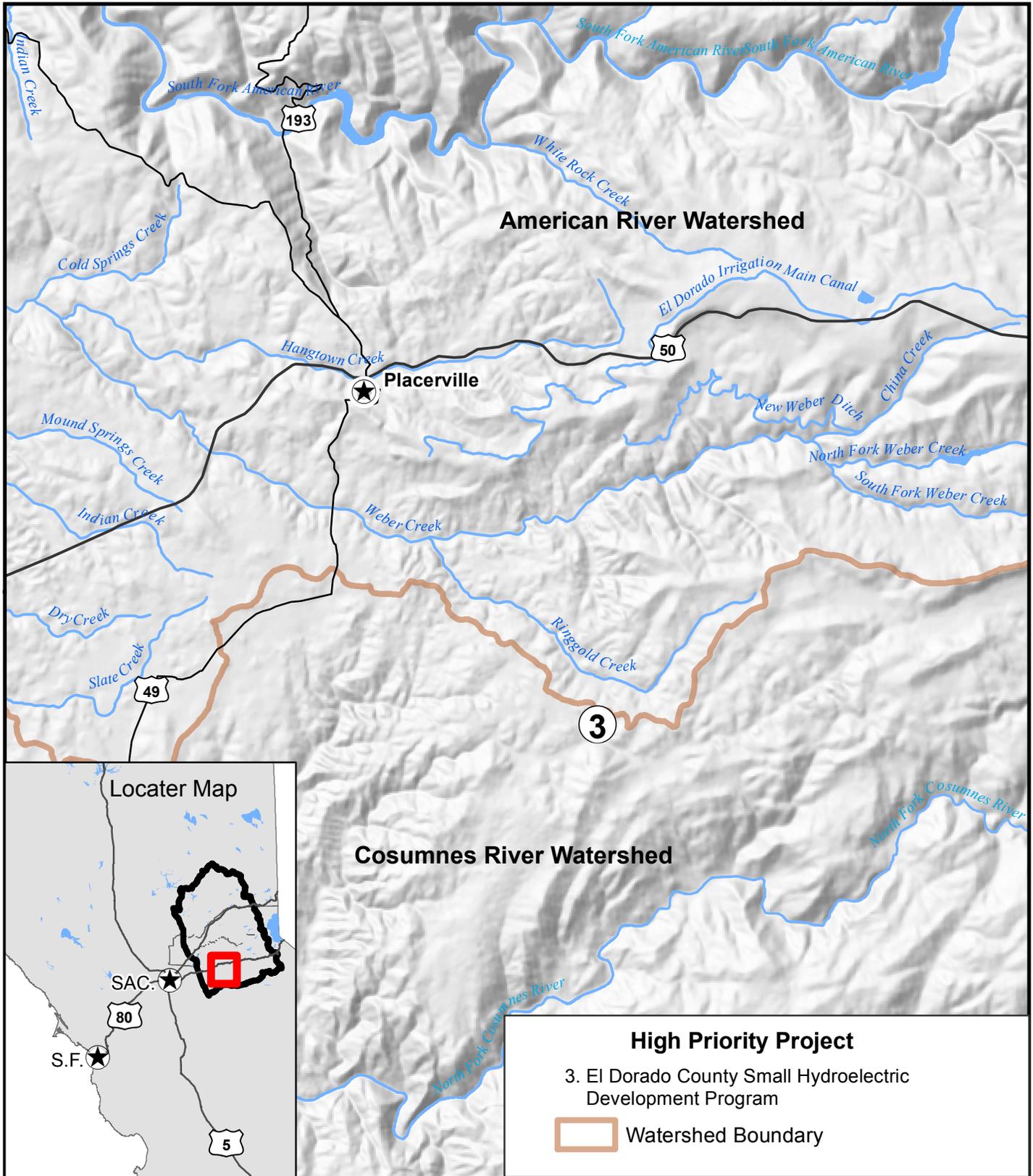
- Creating a new source of “untapped” non-carbon, renewable energy with existing water rights and infrastructure to decrease dependency on the electric grid;
- Supplying summer peak energy generation to reduce the CABY region’s dependence on fossil fuel generated electricity; and
- Balancing the CABY wide seasonal grid energy demand pattern.

3. Contribute to California’s energy future by addressing the following policies:

- AB32 – Support the State’s target of GHG emission reductions to 1990 levels by 2020, PG&E’s Renewable Portfolio Standard mandate of 33 percent by 2020, and statewide electric grid transmission line efficiency improvements with this distributed generation project;
- CARB “Scoping Plan” GHG Emission Reduction Strategies (Water) – Pursue measures for (W-3) Water System Energy Efficiency and to (W-5) Increase Renewable Energy Production; and
- Governors Clean Energy Jobs Plan – Contribute to the goal of building 12,000 MW of localized electricity generation by 2020 by featuring and emphasizing the low impact, non-carbon renewable energy potential of existing water systems in the CABY region.

4. Foster “Headwater Resilience” and climate change adaptive strategies through:

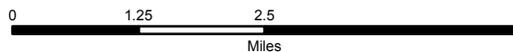
- Utilizing existing water resources for multiple benefits;
- Offset water system operating costs to provide funds for replacement of aging infrastructure;
- Flexible and responsible water system management decisions; and
- Hydroelectric development resulting in a reduction in greenhouse gas emissions.



El Dorado County Small Hydroelectric Development Program



Cosumnes, American, Bear & Yuba River Integrated Regional Water Management



PROJECT WORK TASKS

Budget Category (A) DIRECT PROJECT ADMINISTRATION

Task 1: Direct Project Administration

Subtask 1.1: Administration and Management

The objective of this task is to keep the project on time and within budget, keep all participants informed of project progress and status of deliverables, establish and maintain reliable and accurate billing and recordkeeping ensure that all requirements of the agreement with the DWR are met, and generally ensure smooth project implementation. The tasks for this budget category will comprise all non-construction project administration activities performed by the El Dorado Irrigation District (EID) and CABY staff throughout the duration of the project and will include: development and completion of contractual paperwork, maintenance and reporting of expense documentation, oversight of project scheduling and contract/agreement compliance, preparation of quarterly invoices, and completion of the final invoice.

Subtask 1.2: Labor Compliance

EID will adhere to all labor compliance requirements.

Subtask 1.3: Reporting, Performance Measures and Monitoring Plan

Description (quarterly progress reports, invoices, final reports, and post completion reports): EID will handle Project invoicing with the terms of the grant award. The tasks for this budget category will include all activities necessary to support quarterly reporting and invoicing and associated status reports, a copy of quarterly status reporting to the El Dorado County Water Agency (as project applicant) and the CABY IRWMP-RWMP, and submittal of the final report. These activities will include: tracking of the specific status of each project task, documentation of task status in an easy-to-understand and track format, creation of quarterly financial reports for the project (including percent complete of project activities), and preparation of all necessary reports (including the final report) per the format stipulated in the DWR Grant Agreement. A discussion of the monitoring system to be used to verify project performance with respect to the project benefits or objectives identified in the Proposal will be provided. A discussion of how monitoring data will be used to measure the performance in meeting the overall goals and objectives of the IRWM Plan will be included. Attachment 6 Monitoring, Assessment and Performance Measures, presents the planned project monitoring, assessment, and performance measures that will demonstrate that the Proposal will meet its intended goals, achieve measurable outcomes, and provide value to the State of California.

Subtask 1.4: Coordination with partner agencies and organizations

Description (procedures by which the applicant will coordinate with its partner agencies and organizations that may receive funding from the grant including any contracts, memorandums of understanding (MOUs), and other formal agreements): EID will prepare a Request for Proposals, possibly through Government Code Section 4217.10, et seq. This will specify the needs for a consultant team to handle the pre-construction tasks. EID will continue to utilize the consultant team as needed throughout the life of the project. In addition, EID will prepare a construction bid package for solicitation to procure a Construction Contractor using public bidding procedures.

Task	Task Title	Deliverables
1	Direct Project Administration	
1.1	Administration and Management	<ul style="list-style-type: none"> • Invoices as required • Accessible and Accurate records
1.2	Labor Compliance	<ul style="list-style-type: none"> • Adherence to Labor Code Compliance through Board policies, administrative regulations and contracting procedures and documents.
1.3	Reporting, Performance Measures and Monitoring Plan	<ul style="list-style-type: none"> • Monthly Invoices and Reports • Quarterly, Annual and Final Reports to the Sierra Fund • Reports to CABY • Project Specific Performance Measures and Monitoring Plan
1.4	Coordination with partners	<ul style="list-style-type: none"> • Coordination with CABY and the Sierra Fund

Budget Category (B)
LAND PURCHASE/EASEMENT

Task 2: Land Purchase/Easement (N/A)

Task	Task Title	Deliverables
2	Land Purchase/Easement	N/A

Budget Category (C)
PLANNING/ DESIGN/ ENGINEERING/ ENVIRONMENTAL DOCUMENTATION

Task 3: Planning/Design/Engineering/Environmental Documentation

Subtask 3.1: Environmental Documentation

Environmental documentation for the Project has been completed. A CEQA Notice of Exemption was filed with the El Dorado County Clerk on January 6, 2010.

Subtask 3.2: Engineering Design

A preliminary engineering report, 10% and 30% engineering design documents have been completed. EID will continue to develop 90% and 100% engineering design documents.

Subtask 3.3: Planning

After completion of the 100% engineered drawings, applications to PG&E, the California Energy Commission, and Western Renewable Energy Generation Information System (WREGIS) to finalize registration will be prepared and submitted. On December 9, 2010 the Federal Energy Regulatory Commission issued an "Order Granting Exemption From Licensing (Conduit)" for this project under Part I of the Federal Power Act, 16 U.S.C. §§ 792-823 (2006) (see Exhibit #). A PG&E Small Generator Interconnection Agreement and a PG&E Power Purchase Agreement will be required. In addition, a California Independent System Operator Interconnection Agreement, California Energy Commission Renewable Portfolio Standard Pre and Final certification, WREGIS certification and CPUC approval of PG&E's agreement with EID will be required; applications will be prepared and submitted.

Task	Task Title	Deliverables
3.	Planning/Design/Engineering/Environmental Documentation	
3.1	Environmental Documentation	<ul style="list-style-type: none"> • Filed CEQA Documentation; Categorical Exemption
3.2	Engineering Design	<ul style="list-style-type: none"> • Final Engineering Design and Construction Specifications
3.3	Planning	<ul style="list-style-type: none"> • FERC Exemption • PG&E Interconnection and Power Purchase Agreements (Reapplication) • CA ISO Interconnection Agreement • CEC RPS Pre and Final Certification • CPUC approval of Self-Generation Incentive Program Application & PG&E Agreements • WREGIS Registration

Budget Category (D) **CONSTRUCTION/IMPLEMENTATION**

Task 4: Construction Implementation

Subtask 4.1 Pre-Construction Contracting

Description: EID has established procedures and protocols for advertising, opening, and evaluating bids for construction services, as well as for awarding and developing contracts with construction companies. Pre-construction activities include, but are not limited to: developing technical specifications to support publication of the bid materials, a pre-bid meeting to respond to contractor questions (as required), review of

submitted materials for completeness and qualifications/experience, and award of the contract in accordance with the applicable Public Contract Codes.

Subtask 4.2: Mobilization and Site Preparation

Description: Generally, mobilization and site preparation will include: mobilization of equipment to the site, establishment of a staging area for materials and equipment, removal and replacement of fencing, site grading, and implementation of water pollution control. EID and the contractor will coordinate to ensure that all requirements for pre-construction staging are met.

Subtask 4.3: Project Construction

Description: The Project consists of installing an in-conduit hydroelectric station at an existing District potable water storage facility. All activities associated with Project construction and operation will occur entirely within an existing facility. This facility is completely fenced and contains a pressure reducing station, storage tanks, maintenance buildings, and other potable water system infrastructure. Project construction elements include appropriate pipes, valves, and fittings, installation of turbines, generator and switch gears, electrical equipment, transformer, and tie-in to the grid including electrical controls and SCADA, building and miscellaneous structural including masonry building, foundation structure (concrete), HVAC, roofing, doors and miscellaneous supports. EID will inspect and confirm all project activities.

Task	Task Title	Deliverables
4.	Construction Implementation	
4.1	Pre-Construction Contracting	<ul style="list-style-type: none"> • Bid Set Plans and Specifications • Executed Construction Contract
4.2	Mobilization and Site Preparation	<ul style="list-style-type: none"> • Initial site preparation and equipment/contractor mobilization activities complete
4.3	Project Construction	<ul style="list-style-type: none"> • Installation, sanitization and testing of all requires infrastructure • Operational in-conduit hydroelectric station with grid tie-in • Final performance testing • Record Drawings

Budget Category (E)

ENVIRONMENTAL COMPLIANCE/ MITIGATION/ ENHANCEMENT

Task 5: Environmental Compliance

Before construction implementation, the NPDES permit program requirements will be met. A Water Pollution Control Plan will be completed.

Task	Task Title	Deliverables
5	Environmental Compliance	
5.1	Environmental Compliance	<ul style="list-style-type: none"> Water Pollution Control Plan

Budget Category (F)
CONSTRUCTION ADMINISTRATION

Task 6: Construction Administration

Description: EID will provide construction management of the project, as they have for similar projects successfully completed by EID. Supervision activities will include: ensuring implementation of construction plans including coordination with appropriate agencies, on-site observations and inspections, inspection of materials prior to installation, conducting construction progress meetings as required, review of project status schedules, inspection of work through all phases of construction, preparation and processing of change orders, review of requests for information, and submittals, review and approval of progress payments and recommendations for payment, in-field problem solving, water pollution control measures inspection, and other related activities.

Task	Task Title	Deliverables
6	Construction Administration	
6.1	Construction Administration	<ul style="list-style-type: none"> Inspection Reports Meeting Minutes

Budget Category (G)
OTHER COSTS

Task 7: Develop and Maintain CABY Project-Specific Webpage

Description: The goal of this task is to ensure that all CABY members and members of the public have access to updated and thorough information about the implementation and characteristics of the project. EID intends to provide this information through the maintenance of a webpage on the EID website that can be linked to the CABY website. Project progress reports, status updates, and other similar materials will be posted or linked to this webpage. The webpage will be designed and brought online (activated within the first month after contract agreement). The page will be updated periodically.

Task	Task Title	Deliverables
7	Develop and Maintain CABY Project-Specific Webpage	
7.1	Develop and Maintain CABY Project-Specific Webpage	<ul style="list-style-type: none"> Complete and updated Webpage

Task 8: Data Management

The goal of this task is to ensure that all data gathered and developed as a result of the project is made available to state databases as well as CABY members and the interested public using data management and monitoring deliverables that are consistent with the IRWM Plan Standards and Guidance (as stipulated in the August 2010 IRWM Guidelines, page 20). In this case, the appropriate approach is identified in the CABY Planning Grant submittal which will direct the IRWMP data collection efforts. Data will be made available to all CABY members and the general public through the existing CABY SWIM Database. Material will be uploaded as it becomes available, however most of the data will be posted upon completion of the primary project activities. The CABY technical committee will evaluate project-related data to determine its appropriateness for upload to relevant state databases.

Task	Task Title	Deliverables
8	Data Management	
8.1	Data Management	<ul style="list-style-type: none"> • Complete and updated data sets developed in response to the IRWM Program Data Management Guidelines • Submittal of project-specific data to all relevant databases

Budget Category (H)
CONSTRUCTION/IMPLEMENTATION CONTINGENCY

Task 9: Construction Contingency

EID uses a 10% contingency factor for all construction projects. This formula will be applied to this contract and it will be the responsibility of the construction manager to identify situations in which the contingency funds may be accessed.