

A-1 Urban Water Conservation Grant Application Cover Sheet

1. Applicant (Organization or affiliation): El Dorado Irrigation District
2. Project Title: EID Main Canal Lining Project

3. Person authorized to sign and submit proposal:

Name, Title	Ane D. Deister, General Manager
Mailing address	2890 Mosquito Road; Placerville, CA 95667
Telephone	(530) 642-4041
Fax	(530) 626-5990
E-mail	adeister@eid.org

4. Contact person (if different):

Name, Title	David Powell, Director of Facilities Mgmt
Mailing address	2890 Mosquito Road, Placerville, CA 95667
Telephone	(530) 622-1195
Fax	(530) 644-1003
E-mail	dpowell@eid.org

5. Funds requested (dollar amount): \$2,882,000
6. Applicant funds pledged (local cost share) (dollar amount): None

7. Total project costs (dollar amount): \$2,882,000
8. Estimated net water savings (acre-feet/year): 1,300 af
Estimated total amount of water to be saved (acre-feet):
Over 50 years 65,000 af

Benefit/cost ratio of project for applicant: 7.26
Estimated \$/acre-feet of water to be saved: \$30.08

9. Project life (month/year to month/year): 1/1/2003-
12/1/2005

10. State Assembly District where the project is to be conducted: 4th
11. State Senate District where the project is to be conducted: 1st
12. Congressional District(s) where the project is to be conducted: 4th
13. County where the project is to be conducted: El Dorado
14. Do the actions in this application involve physical changes in land use, or potential future changes in land use?
No.

A-2 Application Signature Page

By signing below, the official declares the following:

The truthfulness of all representations in the application;

The individual signing the form is authorized to submit the application on behalf of the applicant.

The individual signing the form read and understood the conflict of interest and confidentiality section and waives any and all rights to privacy and confidentiality of the application on behalf of the applicant; and

The applicant will comply with all terms and conditions identified in this Application Package if selected for funding.

Signature: Ane D. Deister, General Manager

Date

A-3 Application Checklist

Complete this checklist to confirm all sections of this application package have been completed.

Part A: Project Description, Organizational, Financial and Legal Information

- A-1 Urban Water Conservation Grant Application Cover Sheet
- A-2 Application Signature Page
- A-3 Application Checklist
- A-4 Description of Project
- A-5 Maps
- A-6 Statement of work, schedule
- A-7 Agency authority
- A-8 Operation and maintenance (O&M)
- A-9 Innovation

Part B: Engineering and Hydrologic Feasibility (construction projects only)

- B-1 Certification statement
- B-2 Project reports and previous studies
- B-3 Preliminary project plans and specifications
- B-4 Construction inspection plan

Part C: Plan for Environmental Documentation and Permitting

- C-1 CEQA/NEPA
- C-2 Permits, easements, licenses, acquisitions, and certifications
- C-3 Local land use plans
- C-4 State and local statutes and regulations

Part D: Need for Project and Community Involvement

- D-1 Need for project
- D-2 Community involvement, support, opposition

Part E: Water Use Efficiency Improvements and Other Benefits

- E-1 Water use efficiency improvements
- E-2 Other project benefits

Part F: Economic Justification, Benefits to Costs Analysis

- F-1 Net water savings
- F-2 Project budget and budget justification
- F-3 Economic efficiency
- Benefit/Cost Analysis Tables 1; 2; 3; 4a, 4b, 4c, 4d; and 5

A-4 Description of Project

The project is located near Pollock Pines, California. The Main Canal is approximately 3 miles long and conveys 15,080 ac-ft. of raw water (40 cfs maximum) from the Forebay Reservoir (450 ac-ft. capacity) to the Reservoir 1 Water Treatment Plant (Res 1). Because the canal is earthen and unlined, a portion of the canal flow is lost to seepage and evaporation. Extensive studies of flow loss measurements have shown that the canal loses up to 1,300 ac-ft., per year, depending on flow rates and weather conditions.

The nature of the work associated with this Grant request is to line the length of the Main Canal with an impermeable material so as to prevent seepage losses. Cost to line the canal is estimated at \$2,882,000. Economic return of reduced Operations and Maintenance costs and saved water, over 50 years, is \$2,530,200.

A-5 Maps

See **Appendix V** – USGS Project Area Map

A-6 Statement of Work, Schedule

The construction method for the liner will use heavy equipment to grade the canal section to a uniform slope, fill areas that have been washed away, and compacted to prevent settlement.

The construction costs are affected by the liner design, site accessibility, and other factors. To prevent degradation of the proposed liner due to root intrusion, all vegetation within 10 ft. of the canal will be removed. Over the length of the canal, the vegetation removal area is approximately 17,000 square feet. In addition, minor earthwork will be required to improve channel geometry, and prevent surface water from undermining the liner. Minor earthwork will be required for about half the channel area, or for approximately 127,000 square feet. Assuming a site preparation value of \$2 per square foot for both vegetation removal and minor earthwork, the expected cost for site preparation is \$887,000.

To strengthen the liner, reinforcement material may be mixed into the liner material. To provide adequate liner strength, it is assumed that the liner thickness will be no less than 3.0 inches. Due to the non-uniformity of application, the average liner thickness is assumed to be 3.5 inches.

Based on the assumed liner width, length of canal, and liner thickness, the estimated liner material required to line the El Dorado Irrigation District (EID) Main Canal is approximately 3,850 cubic yards. Assuming a cost for applied liner material of \$150 per yard, the total cost for liner material is estimated to be \$577,500. Using a reinforcement material cost of \$1 per square foot installed, the cost for reinforcement is \$356,000. The total estimated construction cost for lining the Main Canal is \$1.82 million.

Quarterly Expenditure Projection In Dollars

Year	Quarter	Months	Tasks	Expenditure
2003	1	Jan – Mar	Initial Environmental Study	20,000
	2	Apr - Jun	Community Outreach, Meetings	10,000
	3	July – Aug	Community Outreach, Meetings	10,000
	4	Oct – Dec	Community Outreach, Meetings	10,000
	4	Oct – Dec	Environmental Assessment	70,000
2004	1	Jan – Mar	Community Outreach, Meetings	10,000
	1	Jan – Mar	Environmental Assessment	70,000
	2	Apr - Jun	Community Outreach, Meetings	10,000
	2	Apr – Jun	Environmental Assessment	60,000
	2	Apr – Jun	Right of Way Study	10,000
	2	Apr – Jun	Preliminary Design Report	40,000
	3	July - Aug	Preliminary Design Report	40,000
	3	July - Aug	Final Design, Plans & Specs	92,000
4	Aug – Nov	Final Design, Plans & Specs	90,000	
2005	1	Jan – Feb	Permits - COE	45,000
	1	Jan - Mar	Bid Process	5,000
	2	Apr - Jun	Construct Bypass	300,000
	3	July - Aug	Complete Bypass	150,000
	3	July - Aug	Construct Canal Liner	1,000,000
	4	Oct – Nov	Complete Canal Liner	820,000
	4	Dec	Final Inspection	20,000
Total				\$2,882,000

A-7 Monitoring and Evaluation

The project manager who is a California Registered Professional Engineer will monitor progress of the project throughout the process. Monthly progress reports will be generated documenting activities, opportunities, challenges, expenditures, and schedule updates. Monthly meetings will be held with the project team to coordinate activities. Milestones will be monitored and adjustments will be made as necessary. Performance will be measured by how well milestone dates are achieved. Once each month the project manager will prepare a PowerPoint presentation and update for the District’s Board of Directors documenting the progress on the project.

A key measure of the success of the project will be achieved through the environmental assessment and public outreach processes. The public, as well as the resource agencies must be satisfied that all environmental constraints are being addressed. If the resource agencies and the public are satisfied, the project will be a success. Therefore a significant effort must be dedicated to the environmental and public outreach activities.

Costs and expenses will be carefully tracked through the District Contract Administrator. All contracts will be competitively bid to assure public contracting codes and procedures are adhered to. The District financial system (HTE) will be utilized for keeping accounting information. Current expenditures on contracts, Board actions, correspondence, and all other documentation will be recorded and kept in an auditable format by the District Records Management Division.

At the end of the construction, flow monitoring will be conducted between Forebay and Res 1 and compared to water losses before construction to determine the amount of water saved. This final assessment will be memorialized along with a comprehensive report complete with picture documentation to assess the final success of the project.

A-8 Qualifications of the Applicant and Cooperators

El Dorado Irrigation District was formed on October 5, 1925 and has grown from primarily serving agriculture to one that predominantly serves residential, commercial and industrial sectors. EID has a large staff that can institute and complete a project of this nature in-house, from planning and design to construction and final inspection.

The project manager responsible for the system will be David Powell, Registered Civil Engineer, employed with El Dorado Irrigation District. See **Appendix IV** for the resume. The only role that external cooperators will play will be contractors that are awarded a portion of the job.

A-9 Innovation

While the project uses standard engineering and construction methods to implement the project, EID has utilized some innovative methodologies.

The Main canal is located in a sylvan setting near rural residential development. The option of lining this canal, as opposed to piping it underground, retains much of the open watercourse character in keeping with the aesthetics of the area. This option retains the path along the canal bench, which is enjoyed by local residents and wildlife.

A-10 Agency Authority

El Dorado Irrigation District was formed and operates under the California Water Code Division 11 (Irrigation district Law), 20500 et seq. The District is not required to hold an election or to obtain approval/review from any other agency upon entering into Contracts. The Board of Directors has authorized the General Manager to sign grant applications on behalf of the District (See **Appendix VII**).

The District has no knowledge of any pending litigation that would impact the

financial condition of the applicant, the operation of the water facilities, or the ability to complete the proposed project.

A-11 Operations and Maintenance

Under the current conditions the operations and maintenance costs, for this section of canal, are approximately \$18,000 annually. Once the canal is lined the operations and maintenance cost savings are expected to be at least \$6,500 annually. This equates to a savings of \$325,000 over the 50 year life.

Application Part B—Engineering and Hydrologic Feasibility

(Application Part B required for construction projects only, including meter installations.)

B-1 Certification Statement

I, David Powell, a California registered civil engineer, have reviewed the information presented in support of this application. Based on this information, and any other knowledge I have regarding the proposed project, I find that it can be designed, constructed, and operated to accomplish the purpose for which it is planned. There is a sufficient water supply for the project. The information I have reviewed to document this statement includes feasibility studies, engineering design studies, water rights permits, etc.

(Original signature and stamp with expiration date)

B-2 Project Reports and Previous Studies

Preliminary design for the proposed project has been accomplished, which is limited to proposed alignment, size, lining material and feasibility analysis.

B-3 Preliminary Project Plans and Specifications

Appendix V, Sheet 1, is a USGS map of the canal from Forebay to Res 1. This map depicts the entire length of the canal to be lined. The map also shows various locations where measurements of the existing canal have been recorded. The cross sectional profiles are shown on Sheet 2. The cross sections are shown for key locations at Forebay, at Patrick Lane, and at Res 1.

Sheet 3 shows the cross sectional view of the proposed liner. The liner material will be concrete and/or gunite, with a reinforcing mesh to keep the section from cracking. Along the edges of the canal, vegetation will be removed to a distance of 10 feet on either side of the canal to keep root intrusion to a minimum.

The canal will be graded, and compacted to provide a uniform slope and prevent settlement. Minor earthwork will be required for about half the channel area, or for approximately 127,000 square feet to improve channel geometry, and prevent surface water from undermining the liner.

To prevent degradation of the proposed liner due to root intrusion, all vegetation within 10 ft. of the canal will be removed. Over the length of the canal, the vegetation removal area is approximately 17,000 square feet.

Reinforcement material may be mixed into the liner material to provide adequate liner strength. The liner thickness will be no less than 3.0 inches with the average liner thickness to be 3.5 inches. Total volume of material needed to line the canal is estimated at 3,850 cubic yards.

Please see *Appendix II* for preliminary project plans including: dimensions, cross-sectional drawings, profile drawings and elevation. *Appendix V* contains the area map giving the project location.

B-4 Construction Inspection Plan

EID will use standard engineering and construction methods to implement this project. To install the liner, standard-contracting procedures will be used. EID maintains a staff of highly qualified Engineers and Construction Inspectors. EID Engineers will review all plans prior to the start of the project. EID Inspectors will monitor and inspect each phase during the construction process.

Application Part C—Plan for Completion of Environmental Documentation and Permitting Requirements

C-1 California Environmental Quality Act and National Environmental Policy Act

Applicable environmental laws include CEQA, NEPA, and Fish and Game laws. The District will complete an environmental assessment and if required an EIR for the project. The estimated completion time is as follows:

Complete Draft EIR/EA: October 2003
Adopt Final EIR/EA: June 2004

Please see *Appendix VI* for the completed Environmental Impact Checklist.

C-2 Permits, Easements, Licenses, Acquisitions, and Certifications

EID will complete or obtain, studies and permits for Water Rights, Riparian Rights and COE Permit. These items are separate from, and in addition to, all required environmental assessments.

C-3 Local Land Use Plans

Not applicable.

C-4 Applicable Legal Requirements

See above. Other legal requirements are not applicable.

Application Part D- Need for Project and Community Involvement

A. Scope of Work: Relevance and Importance

D-1 Need for the Project

The project to line the Main Canal is an important and cost effective step to reduce unnecessary conveyance losses and allow the District flexibility to meet water supply needs during critical water-short years. The project allows for the District to meet its obligations during U.S. Bureau of Reclamation (USBR) cutbacks and therefore minimizes public impacts while allowing for maintenance of critical fisheries habitats downstream of Folsom Reservoir.

By way of example, in the summer of 2001 the District experienced a nearly significant problem in supplying water to the community of El Dorado Hills due to a USBR cutback in supply from Folsom Lake. The District avoided the situation by releasing a portion of the 15,080 ac-ft. back into the South Fork American River and retrieving that water at Folsom Lake to augment the El Dorado Hills supply.

Water demand estimates of present and future uses in the EID service area show that demand will exceed the current supply in 2007, so water savings measures resulting from the proposed Project are a necessity. EID customer base has risen from 1,750 in 1960 to 30,900 in 2000, with an estimated 64,722 in 2020.

This project is consistent with local and regional water management plans which emphasize water conservation and elimination of irrecoverable water losses.

The project meets the universal goal of the CALFED Program, which is to reduce irrecoverable water losses. Annually, water loss totals up to 1300 acre-feet.

D-2 Outreach, Community Involvement, Support, Opposition

Community outreach and acceptance will be a challenge for this project. The 3-mile stretch of canal traverses properties where houses abut portions of the canal. Residents have grown to view the canal as their own stream, and as an amenity that is highly prized. The project will have to mitigate concerns of the residents with respect to aesthetics and access.

The Department of Fish and Game will no doubt raise concern about the riparian habitats that have been established by the open canal and the District will need to find ways to address this issue. A potential solution would be to meter an

irrigation of grounds where habitats have been established to preserve these uses. This would have the affect of reducing, by a minor amount the conserved water, but would balance the benefits to all parties involved.

The environmental impact report will address the project impacts and is a logical vehicle and forum to address public concerns and to actively involve the public in the process. Once the environmental process is completed the EID Board of Directors will certify the EIR and the project can then move forward to the construction phase.

Outreach Efforts

El Dorado Irrigation District provides water to more than 87,000 customers through 30,900 water accounts in El Dorado County. Community meetings would be held to discuss the project benefits, gather concerns and hold workshops to collaboratively address the public concerns. Possibly a citizen advisory committee would be formed to work with staff, resource agency officials, and consulting engineers to address concerns, develop solutions, and communicate the solutions during the public outreach meetings.

EID staff regularly speak at meetings of various local service groups, providing information on current projects and other water programs. The EID staff approach is to be 'proactive and involved with the community' on all levels of service and information.

Community Involvement

This project has been met with support from community organizations such as El Dorado County Citizens For Water; The El Dorado Business Alliance, El Dorado Taxpayers Association and The El Dorado County Association of Surveyors, Architects, Geologists and Engineers (see Appendix III).

Training & Employment

A contractor will be selected through competitive bid process to line the canal. Once the Project is completed, there will be no need for any new employment opportunities relating to the Project.

Information Distribution Plan

Newsletters – EID publishes a monthly newsletter that is included with every customer's bill. District activities, programs, accomplishments and water-saving tips are included. The proposed Project will also be identified, with updates as the project progresses.

Media – The local newspaper, *The Mountain Democrat*, will be a vehicle for public education and information as to the proposed Project. Additionally, the regional newspaper, *The Sacramento Bee*, may be a useful venue as well.

Web Site – EID has a web site that will keep people updated on the project. People are able to email District employees for comments and answers to questions.

Public Workshops – EID holds public workshops on various projects, to receive public input, per EID policy, and this project will be included in this type of forum.

Event Participation – EID staff participate in special events such as the Home Show, County Fair and Harvest Fair. This project could be featured in EID displays.

Water Issues/Local Management Plan.

What was once thought of as a renewable and abundant resource, shortage of water is of national, statewide and local concern. Going into 2002 many states are in drought mode with water conservation measures mandatory, and a new concern for all are security measures to keep our water safe. California is actually a “Cadillac Desert” and the people of the state are familiar with water conservation efficiency measures. The drought of 1987-1993 was a wake-up call. Current prominent issues are water quality, distribution of water and water conservation. The three main interest groups competing for water are agricultural, urban and environmental.

EID’s Policy Statement No. 21 clearly states the District’s commitment to the efficient use and conservation of water. The overall philosophy behind the policy is to conserve and preserve our water supply, to educate our citizens and maintain a consciousness of concern; to take reasonable and necessary action regarding conservation; and, at the same time, provide water for a reasonable lifestyle to be enjoyed by the customers of the District. EID has long been a leader in efficient water use and water conservation, from being the first irrigation district in the State to have a water conservation plan, establishing an annual Water Supply and Demand Report, to implementing the first Irrigation Management Service (IMS) program. The proposed project would definitely fit in with this mission.

Application Part E—Water Use Efficiency Improvements and Other Benefits

E-1 Water Use Efficiency Improvements

Reductions in water demands over time translate into the more efficient use of water and the need for less water. The beneficiary would be the South Fork of the American River system that eventually benefits the Bay/Delta. The value of water remaining in the river, as a result of the lining of the main ditch, is the California Water Bank water cost which is valued at \$150 per acre-foot. This savings translates to \$195,000 annually.

E-2 Other Project Benefits

CAL FED:

The released water is also a benefit to Folsom Lake for preservation of the cold water pool during summer months for release and the preservation of critical fish species downstream in the Bay-Delta area. Released water can also aid in supplying water to the residents of El Dorado Hills during water short years.

By lining the canal there will also be a water quality benefit due to the reduction in potential for infiltration from adjacent residential septic system leachfields.

The released water can also be used to generate additional hydroelectric power by the District's power plant.

OTHERS:

This project has benefits not only in the conservation of water for potable uses, but also allows greater flexibility for supplying water to existing customers in the District during water short years. By reducing conveyance losses in the Main Canal, water is conserved in the upper Sierra Lakes that is therefore a benefit to the environment. The water can be released during the fall months each year to preserve fishery resources in the South Fork American River.

The released water can also be used to generate additional hydroelectric power by SMUD and PG&E power plants downstream.

Application Part F – Economic Justification: Benefits to Costs

F-1 Net Water Savings

The principle economic benefits of this project are from water conservation and reduced Operations and Maintenance costs.

F-2 Project Budget and Budget Justification

Project Budget in Dollars

	Amount
Environmental Assessment	200,000
Outreach – Community Meetings	50,000
Right-of-Ways – Research and Obtain	10,000
Project Design – Plans and Specs	262,000
Permits	50,000
Temporary Bypass Pipeline	450,000
Concrete Lining	1,820,000
Total	\$2,882,000

F-3 Economic Efficiency in Dollars

Avoided Costs		
USBR Water Purchase	39,104	
Operations and Maintenance	11,500	
Total Avoided Costs		50,604
TOTAL ANTICIPATED ANNUAL BENEFIT		50,604
TOTAL ANTICIPATED BENEFIT 50 YEAR LIFE SPAN OF PROJECT		\$2,530,200

Appendix I

Benefit/Cost Analysis Tables

- Table 1: Capital Costs
- Table 2: Annual Operations and Maintenance Costs
- Table 3: Total Annual Costs
- Table 4a: Water Supply Benefits: Avoided Cost of Current Supply Sources
- Table 4b: Water Supply Benefits: Alternative Cost of Future Supply Sources
- Table 4c: Water Supply Benefits: Water Supplier Revenue (Vendibility)
- Table 4d: Total Water Supply Benefits
- Table 5: Benefit/Cost Ratio

Table 1: Capital Costs

	Capital Cost Category (a)	Cost (b)	Contingency Percent (c)	Contingency \$ (d)	Subtotal (e)
				(bxc)	(b+d)
(a)	Environmental Assessment	200,000			220,000
(b)	Outreach – Community Meetings	50,000			50,000
(c)	Right-of-Ways – Research and Obtain	10,000			10,000
(d)	Project Design – Plans and Specs	262,000			262,000
(e)	Permits	50,000			50,000
(f)	Temporary Bypass Pipeline	450,000			450,000
(g)	Concrete Lining	1,820,000			1,820,000
(h)					
(i)					
(j)	Total (1) (a + ... + i)				\$2,882,000
(k)	Capital Recovery Factor: use Table 6				.0634
(l)	Annual Capital Costs (j x k)				\$182,719

(1) Costs must match Project Budget prepared in Section F-2.

Table 2: Annual Operations and Maintenance Costs

Administration (a)	Operations (b)	Maintenance (c)	Other (d)	Total (e)
600	2,000	3,900		\$6,500

Table 3: Total Annual Costs

Annual Capital Costs (1) (a)	Annual O&M Costs (2) (b)	Total Annual Costs (c) (a+b)
182,719	6,500	\$189,219

(1) From Table 1 line (l)

(2) From Table 2 Total, column (e)

Table 4: Water Supply Benefits

Net water savings (acre-feet/year) 1300 acre-feet

4a. Avoided Costs of Current Supply Sources In Dollars

Sources of Supply <i>(a)</i>	Cost of Water (\$/AF) <i>(b)</i>	Annual Displaced Supply (AF) <i>(c)</i>	Annual Savings (\$) <i>(d)</i>
USBR - Folsom Lake	30.08	1300	
Total			

4b. Alternative Costs of Future Supply Sources

Future Supply Sources <i>(a)</i>	Total Capital Costs (\$) <i>(b)</i>	Capital Recovery Factor (1) <i>(c)</i>	Annual Capital Costs (\$) <i>(d)</i> <i>(b x c)</i>	Annual O&M Costs (\$) <i>(e)</i>	Total Annual Costs (\$) <i>(d + e)</i>
Total					

(1) 6% discount rate; Use Table 6- Capital Recovery Factor

4c. Water Supplier Revenue (Vendibility)

Parties Purchasing Project Supplies <i>(a)</i>	Amount of Water to be Sold <i>(b)</i>	Selling Price (\$/AF) <i>(c)</i>	Expected Frequency of Sales (%) <small>(1)</small> <i>(d)</i>	Expected Selling Price (\$/AF) <i>(e)</i> <i>(c x d)</i>	"Option" Fee (\$/AF) <small>(2)</small> <i>(f)</i>		
EID Urban Customers	1,300		40.00%	1,027			
Total							

4d: Total Water Supply Benefits In Dollars

(a) Annual Avoided Cost of Current Supply Sources (\$) from 4a, column (d)	
(b) Annual Avoided Cost of Alternative Future Supply Sources (\$) from 4b, column (f)	
(c) Annual Expected Water Sale Revenue (\$) from 4c, column (h)	
(d) Total Net Annual Water Supply Benefits (\$) (a + b + c)	\$

Table 5: Benefit/Cost Ratio

Project Benefits (\$) (1)	1,374,204
Project Costs (\$) (2)	189,219
Benefit/Cost Ratio	7.26

- (1) From Tables 4d, row (d): Total Annual Water Supply Benefits
(2) From Table 3, column (c) : Total Annual Costs

Appendix II

Preliminary Plans & Specifications

Appendix III

Letters of Support

Appendix IV

Resume

David E. Powell

Experience Summary:

David Powell has over 21 years of diverse engineering experience working in both the private and public sectors. Mr. Powell has a wide range of experience including construction, construction inspection, construction management, engineering design, water and sewer master planning, and project management. He also has performed environmental engineering work including the preparation of watershed sanitary surveys, initial studies, and negative declarations. Mr. Powell has experience in reviewing and critiquing environmental impact reports. He has worked extensively with the California Regional Water Quality Control Board and the California State Department of Health Services.

David Powell has extensive experience in hydraulic analysis and design. Design of pumping stations and pipelines, sewage lift stations and force mains, water distribution system analysis, and sewer system analysis are strong areas of experience. Water resources, water system and sewer system master planning are also strong areas of expertise. He has been project director on the design and construction of numerous water treatment and sewage treatment plants. Mr. Powell has also developed policy documents for public agencies for water supply and reclaimed water. Mr. Powell has also authored design and construction standards for water distribution, sewer collection, and reclaimed water systems.

David Powell currently holds the position of Director of Facilities Management. This department head position is responsible for the functions of engineering, operations, maintenance, and laboratory analysis. He has a span of responsibility including Drinking Water, Wastewater/Recycled Water, and Hydroelectric Divisions.

The El Dorado Irrigation District is a public agency located in the foothills of California east of Sacramento. The District has a 220 square mile service area ranging in elevation from 500 ft. MSL to over 4,000 ft. MSL. The District has water, sewer, recycled water, hydroelectric, and recreation services. The water system supports a population of over 100,000. The wastewater treatment plants are some of the most advanced facilities in the State, serving high quality recycled water to golf courses, parks, schools, and residential home landscaping.

Experience Record:

2001 to Present - El Dorado Irrigation District, Director of Facilities Management

1999 to 2001 - El Dorado Irrigation District, Director of Engineering

1995 to 1999 - El Dorado Irrigation District, Senior Engineer, Wastewater Division.

1990 to 1995 - El Dorado Irrigation District, Senior Engineer, Planning and Environmental Division.

1989 to 1990 - Psomas and Associates, Project Manager.

1987-1989 - HDR Engineering, Project Engineer.

1985-1987 - Raymond Vail and Associates, Project Engineer.

1984-1985 – US Army Corps of Engineers, Project Engineer

1981-1984 - Chilton Engineering, Project Engineer

Education:

BS Civil Engineering, Seattle University, 1981

MS Civil Engineering, California State University Sacramento, 1990

MA Organizational Management, University of Phoenix, 2002

Member Tau Beta Pi

Professional Registration:

Registered Professional Engineer, State of California, No. 38650

Professional Affiliations:

California Water Environment Association (CWEA)

Water Environment Federation (WEF)

American Water Works Association (AWWA)

Appendix V

USGS Project Area Map

Appendix VI

Environmental Checklist Earlier Analysis

Appendix VII

Evidence of Authority