AGENDA
IRVINE RANCH WATER DISTRICT
WATER RESOURCES POLICY AND COMMUNICATIONS
COMMITTEE MEETING
THURSDAY, OCTOBER 6, 2022

This meeting will be held in-person at the District's headquarters located at 15600 Sand Canyon Avenue, Irvine, California. The meeting will also be broadcasted via Webex for those wanting to observe the meeting virtually.

To observe this meeting virtually, please join online using the link and information below:

Via Web:
https://irwd.webex.com/irwd/j.php?MTID=mbaea1f24f3eb80d0863737b1d37c730f
Meeting Number (Access Code): 2484 724 1294
Meeting Password: zxFyuQ8CQ45

As courtesy to the other participants, please mute your phone when you are not speaking.

PLEASE NOTE: Participants joining the meeting will be placed into the Webex lobby when the Committee enters closed session. Participants who remain in the "lobby" will automatically be returned to the open session of the Committee once the closed session has concluded. Participants who join the meeting while the Committee is in closed session will receive a notice that the meeting has been locked. They will be able to join the meeting once the closed session has concluded.

CALL TO ORDER 1:30 p.m.

ATTENDANCE
Committee Chair: John Withers _____
Member: Karen McLaughlin _____

ALSO PRESENT

Paul Cook	_____	Paul Weghorst	_____
Wendy Chambers	_____	Cheryl Clary	_____
Fiona Sanchez	_____	Jim Colston	_____
Christine Compton	_____	Kellie Welch	_____
Mark Tettemer	_____	Amy McNulty	_____
John Fabris	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

PUBLIC COMMENT NOTICE

If you wish to address the Committee on any item, please submit a request to speak via the "chat" feature available when joining the meeting virtually. Remarks are limited to three minutes per speaker on each subject. Public comments are limited to three minutes per speaker on each subject. You may also submit a public comment in advance of the meeting by emailing comments@irwd.com before 9:00 a.m. on Thursday, October 6, 2022.

COMMUNICATIONS

1. Notes: Weghorst
2. Public Comments
3. Determine the need to discuss and/or take action on item(s) introduced that came to the attention of the District subsequent to the agenda being posted; and determine which items may be approved without discussion.

INFORMATION

4. 2022 LEGISLATIVE AND REGULATORY UPDATE – COMPTON / COOK

   Recommendation: Receive and file.

ACTION

5. 2023-2024 LOBBYING AND ADVOCACY SERVICES – COMPTON / COOK

   Recommendation: That the Board authorize the General Manager to execute a Professional Services Agreement with Kadesh & Associates for federal advocacy services for the period of January 1, 2023, through December 31, 2024, at a rate of $10,200 per month in 2023 and $108.21 per month in 2024 plus reasonable reimbursement of direct expenses for a total contract amount not to exceed $265,000.

6. CONSULTANT SELECTIONS FOR IRWD'S WATER SUPPLY RELIABILITY EVALUATION UPDATE – HUANG / SANCHEZ / WEGHORST

   Recommendation: That the Board authorize an increase to the Fiscal Year 2022-23 Capital Budget for Project 11799 in the amount of $405,000 and authorize the General Manager to execute Professional Services Agreements with DCSE in the amount of $194,360 and HDR in the amount of $316,800 to conduct IRWD's 2022 Water Supply Reliability Evaluation.

OTHER BUSINESS

7. Directors' Comments

8. Adjourn

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Availability of agenda materials: Agenda exhibits and other writings that are disclosable public records distributed to all or a majority of the members of the above-named Committee in connection with a matter subject to discussion or consideration at an open meeting of the Committee are available for public inspection in the District's office, 15600 Sand Canyon Avenue, Irvine, California ("District Office"). If such writings are distributed to members of the Committee less than 72 hours prior to the meeting, they will be available from the District Secretary of the District Office at the same time as they are distributed to Committee Members, except that if such writings are distributed one hour prior to, or during, the meeting, they will be available electronically via the Webex meeting noted. Upon request, the District will provide for written agenda materials in appropriate alternative formats, and reasonable disability-related modification or accommodation to enable individuals with disabilities to participate in and provide comments at public meetings. Please submit a request, including your name, phone number and/or email address, and a description of the modification, accommodation, or alternative format requested at least two days before the meeting. Requests should be emailed to comments@irwd.com. Requests made by mail must be received at least two days before the meeting. Requests will be granted whenever possible and resolved in favor of accessibility.

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October 6, 2022
Prepared and
submitted by: C. Compton
Approved by: Paul A. Cook

WATER RESOURCES POLICY AND COMMUNICATIONS COMMITTEE

2022 LEGISLATIVE AND REGULATORY UPDATE

SUMMARY:

This report provides an update on the 2021-2022 legislative session, regulatory issues, and IRWD priorities. As legislation and regulations develop, staff will provide updates and recommendations to the Water Resources Policy and Communications Committee and the Board, as appropriate. Staff recommends the Board receive and file this report.

BACKGROUND:

On August 31, 2022, the California Legislature adjourned for Final Recess of the 2021-22 legislative session. A total of 4,476 bills were introduced during the two-year session. A total of 2,421 bills were introduced in 2021, comprising 828 Senate bills and 1,593 Assembly bills. A total of 2,055 bills in 2022, consisting of 672 Senate bills and 1,383 Assembly bills, were introduced in 2022. The Governor had until September 30 to act on any bills from the end of the 2021-2022 legislation session. The Legislature will convene for the 2023-24 Regular Session on December 5, when newly-elected members will be sworn in. The Legislature will then reconvene for the 2023-24 session at the beginning of January.

A copy of the 2022 Legislative Matrix is provided as Exhibit "A". Staff will provide an update on key bills of interest to IRWD and the Governor's recent actions on legislation. Links to the bills discussed below are included with each discussion unless a separate exhibit is noted.

2023 Legislative Planning:

Legislative Planning and Call for Legislative Proposals:

Staff has begun planning for the 2023 legislative session. As has been done in previous years, staff will seek the Board's input in the coming months on proposed 2023 regional, state, and federal legislative issues of interest to IRWD.

Staff is also participating in 2023 legislative planning for IRWD's associations. Each year the Association of California Water Agencies (ACWA), Bioenergy Association of California (BAC), California Municipal Utilities Association (CMUA), California Association of Sanitation Agencies (CASA), California Special Districts Association (CSDA) and WateReuse California conduct annual legislative planning for the next year and solicit legislative proposals from their members. The ACWA State Legislative Committee, the CMUA Legislative Committee, and the CSDA Legislative Committee have set September 30 as the deadline for their members to submit proposals for consideration. They have also set dates for their legislative planning meetings: CSDA's is October 27, ACWA's on October 28, and CMUA's on November 10. The other associations have not set their proposal deadline and planning meeting dates.

2022 State and Regional Regulatory Update:

The following is a list of some of the State regulations and agency reports staff is monitoring, tracking, or planning to engage in discussions regarding over the next three to 12 months:

- Executive and regulatory actions on COVID-19;
- Executive and regulatory actions related to the drought;
- California Air Resources Board (CARB) AB 32 Climate Change Scoping Plan Update;
- CARB's Proposed Advanced Clean Fleets Regulation;
- CARB's Proposed In-use Off-road Diesel-Fueled Fleets Regulation Amendments;
- California Endangered Species Act Listing for the Southern California steelhead;
- California Natural Resources Agency (CNRA) 30 x 30 California Implementation;
- CNRA's Water Resilience Portfolio Implementation and Resiliency 2.0 Implementation;
- DWR's 2023 California Water Plan Update;
- DWR and the State Board's implementation of the "Making Water Conservation a California Way of Life" legislation;
    - DWR and the State Board's Indoor Water Use Study and Indoor Water Use Standard Recommendations;
    - DWR's Outdoor Standard Recommendations;
    - DWR's Work Group on CII performance measures; and
    - State Board's Water Loss Performance Standards Regulations;
- OPR's Integrated Climate Adaptation and Resiliency Program (ICARP) Grant Programs;
- State Board's development of a "Cross Connection Policy Handbook;"
- State Board's Direct Potable Reuse Regulations;
- State Board's actions on lead service lines;
- State Board's Draft Statewide Sanitary Sewer System General Order;
- State Board's Safe and Affordable Funding for Equity and Resilience (SAFER) Drinking Water Program;
- State Board's Proposed Vapor Intrusion Assessment Amendment to Resolution 92-49; and
- South Coast AQMD's Cumulative Impacts from Air Toxics for CEQA Projects.

As the next drafts of the regulations or reports are released for public review and comment, staff will engage, as appropriate.

2022 Federal Legislative and Regulatory Update:

Kern Fan Groundwater Storage Project Outreach:

IRWD's federal advocacy efforts in 2022 continue to largely focus on seeking federal funding for the Kern Fan Groundwater Storage Project and advocating for an increased funding authorization for the federal Water Storage Program. Staff will provide an update on those efforts.

Syphon Reservoir Funding:

On August 18, 2022, IRWD received notice of funding for the Syphon Reservoir Improvement Project under the WaterSMART: Title XVI Water Reclamation and Reuse Program Funding in the amount of $12,245,625. The Final Environmental Impact Report for the project was prepared in accordance with CEQA-Plus considerations to fulfill the requirements under the National Environmental Policy Act (NEPA). Staff has initiated discussions with the Bureau of Reclamation on the NEPA compliance for the project and will be developing a schedule to complete this work.

Proposed Designation of PFOA and PFOS as Hazardous Substances Under CERCLA:

On September 6, 2022, the U.S. Environmental Protection Agency (EPA) published a proposed rule designating Perfluorooctanoic Acid (PFOA) and Perfluorooctanesulfonic Acid (PFOS) as hazardous substances under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). This proposed designation has been discussed and debated for at least a few years and was included in the EPA's PFAS Strategic Roadmap, released in October 2021.

The hazardous substances designation, if finalized, would trigger a requirement for facilities to report on PFOA and PFOS releases that meet or exceed the one pound or more in a 24-hour period reportable quantity, and would enhance the ability of federal, Tribal, state, and local authorities to obtain information about the location and extent of PFOA and PFOS releases. The designation would also enable the EPA, other agencies, and others to seek recovery of costs incurred for cleanup.

The EPA has emphasized that it is focused on holding responsible those who have manufactured and released significant amounts of PFOA and PFOS into the environment, and "not taxpayers," but the proposed rule does not provide an exemption for water or wastewater utilities. The EPA claims that it does not have authority to exempt specific entities from liability, and it references "various enforcement tools" that it could use to address liability concerns.

The agency acknowledged that some stakeholders, including water utilities and entities using biosolids, have significant concerns, and stated in its news release for the proposed rule that it is committed to doing further outreach and engagement. The news release cites wastewater utilities among stakeholders in connection with that outreach and engagement.

The 60-day public comment period is open until November 7, 2022, and the EPA plans to publish the final rule in August 2023. Staff will continue to engage with the District's associations to address liability concerns associated with the PFOA and PFOS CERCLA hazardous substances designation.

FISCAL IMPACTS:

Not applicable.

ENVIRONMENTAL COMPLIANCE:

Not applicable.

RECOMMENDATION:

Receive and file.

LIST OF EXHIBITS:

Exhibit "A" – IRWD Legislative Matrix

EXHIBIT "A"
IRWD 2022 LEGISLATIVE MATRIX
Updated 10/03/2022

Bill No. Author	Title	IRWD Position	Summary/Effects	Status
AB 84 Budget Cmt	COVID 19: Supplemental Paid Sick Leave		Provides for COVID 19 supplemental paid sick leave for covered employees who are unable to work or telework due to certain reasons related to COVID 19, including that the employee is attending a COVID 19 vaccine or vaccine booster appointment for themselves or a family member, or is experiencing symptoms, or caring for a family member experiencing symptoms, related to a COVID 19 vaccine or vaccine booster. Entitles a covered employee to a specified number of hours of COVID 19 supplemental paid sick leave.	02/09/2022 - Re-referred to SENATE Committee on BUDGET AND FISCAL REVIEW.
AB 154 Ting (D)	Budget Act		Makes appropriations for the support of state government for specified fiscal year.	08/15/2022 - In SENATE. To Inactive File.
AB 284 Rivas R (D)	Global Warming Solutions Act of 2006: Climate Goal		Requires the state board, as part of the next scoping plan update, in collaboration with the Natural Resources Agency and other relevant state agencies and departments and no later than a specified date, to identify a 2045 climate goal, with interim milestones, for the state's natural and working lands, as defined, and to integrate into the scoping plan update recommendations developed by the Natural Resources Agency and the Department of Food and Agriculture.	09/02/2021 - In SENATE. From third reading. To Inactive File.
AB 350 Villapudua (D)	Cannella Environmental Farming Act of 1995		Requires the Department of Food and Agriculture to establish and administer a 3-year grant program to fund technical assistance to support landowners located in a critically overdrafted basin, as defined, in reaching water use reduction goals established pursuant to the Sustainable Groundwater Management Act. Authorizes the department to use specified guidelines to administer this program.	09/02/2021 - In SENATE. From third reading. To Inactive File.
AB 649 Bennett (D)	Department of Resources Recycling and Recovery		Establishes the Office of Environmental Justice and Tribal Relations within the Department of Resources Recycling and Recovery. Prescribes the duties of the office, including, among	09/23/2022 - Signed by GOVERNOR.;09/23/2022 - Chaptered

Bill No. Author	Title	IRWD Position	Summary/Effects	Status
			others, ensuring that the department's programs effectively address the needs of disadvantaged communities, low-income communities, California Native American tribes, and farmworkers.	by Secretary of State. Chapter No. 2022-492
AB 975 Rivas (D)	Filing Requirements and Gifts		Permits a filing officer to retain a report or statement filed in a paper format as a copy on microfilm or other space-saving materials or as an electronic copy, as specified, without a two-year waiting period. Permits a filing officer to retain a report or statement as an electronic copy before the Secretary of State certifies an online filing and disclosure system.	08/22/2022 - In SENATE. From third reading. To Inactive File.
AB 1041 Wicks (D)	Employment Leave		Expands the class of people for whom an employee may take leave to care for to include a designated person. Defines "designated person" to mean any individual related by blood or whose association with the employee is the equivalent of a family relationship. Authorizes a designated person to be identified at the time the employee requests the leave. Expands the definition of the term "family member" to include a designated person.	09/29/2022 - Chaptered by Secretary of State. Chapter No. 2022-748
AB 1164 Flora (R)	Publicly Owned or Operated Regulating Basins		Excludes from being considered a dam a regulating basin, as defined, owned or operated by a public entity that is not across a stream channel, watercourse, or natural drainage if certain criteria are met. Includes that the owner or operator of the regulating basin, before the construction of the regulating basin, submit to the department an inundation map, stamped by a licensed civil engineer, identifying the flow and depth of water from the regulating basin in the event of a failure.	09/30/2022 - Chaptered by Secretary of State. Chapter No. 2022-943
AB 1384 Gabriel (D)	Resiliency Through Adaptation, Economic Vitality		Requires the Natural Resources Agency to release a draft of the state's climate adaptation strategy, known as the Safeguarding California Plan, by specified date and every 3 years thereafter,	09/16/2022 - Chaptered by Secretary of State. Chapter No. 2022-338

Bill No. Author	Title	IRWD Position	Summary/Effects	Status
			and to update the plan by July 1, 2024, and every 3 years thereafter.	
AB 1395 Muratsuchi (D)	The State Climate Crisis Act		Declares the policy of the state both to achieve net zero greenhouse gas emissions as soon as possible, but no later than a specified year, and achieve and maintain net negative greenhouse gas emissions thereafter, and to ensure that by a specified year, statewide anthropogenic greenhouse gas emissions are reduced to at least 90% below the 1990 levels.	08/23/2022 - In SENATE. Read second time. To third reading.
AB 1604 Holden (D)	Civil Service: The Upward Mobility Act of 2022		Requires the State Personnel Board to post notices of proposed changes to regulations for public comment. Requires the Department of Human Resources and the board to enter into a memorandum of understanding to determine areas of compliance for nonmerit-related audits and to train board staff on the areas of compliance. Requires the Department of Human Resources to establish best practices for each aspect of the design, announcement, and administration of the examinations.	09/13/2022 - Chaptered by Secretary of State. Chapter No. 2022-313
AB 1642 Salas (D)	California Environmental Quality Act: Water System Well		Exempts from the California Environmental Quality Act a well project, as defined, that meets specified conditions, including that the domestic well or the water system to which the well is connected has been designated by the state board as high risk or medium risk in the state board's drinking water needs assessment.	09/30/2022 - Chaptered by Secretary of State. Chapter No. 2022-859
AB 1687 Seyarto (R)	California Emergency Services Act: Governor's Powers		Provides that the Governor may only suspend a statute or regulation during a state of emergency or state of war emergency in connection with the specific conditions of emergency proclaimed by the Governor or state of war emergency, as applicable.	09/27/2022 - Vetoed by GOVERNOR.
AB 1711 Seyarto (R)	Privacy: Breach		Requires an agency to post a notice on the agency's internet website when a person or business operating a system on behalf	09/23/2022 - Vetoed by GOVERNOR.

Bill No. Author	Title	IRWD Position	Summary/Effects	Status
			of the agency is required to issue a security breach notification for that system.	
AB 1717 Aguiar-Curry (D)	Public Works: Definition		Expands the definition of public works to include fuel reduction work done under contract and paid for in whole or in part out of public funds performed as part of a fire mitigation project, as specified. Limits those provisions to work that falls within an apprenticable occupation in the building and construction trades for which an apprenticeship program has been approved and to contracts in excess of $100,000. Delays the application of those provisions until specified date for nonprofits.	09/28/2022 - Vetoed by GOVERNOR.
AB 1747 Quirk (D)	Contractors: Disciplinary Action		Provides that the list of violations that constitute cause for a disciplinary action by the Contractors State License Board includes a willful or deliberate disregard of any state or local law relating to the issuance of building permits, and authorizes a civil penalty not to exceed $30,000 for any violation included on the list.	09/29/2022 - Chaptered by Secretary of State. Chapter No. 2022-757
AB 1749 Garcia (D)	Community Emissions Reduction Programs		Requires the State Air Resources Board to identify in each statewide strategy update measures to reduce criteria air pollutants and toxic air contaminants. Authorizes an air district that is required to adopt a community emissions reduction program to take up to one additional year to adopt the program, if the state board and a majority of the persons who are designated by the district to participate in the development and adoption of the program agree.	09/16/2022 - Chaptered by Secretary of State. Chapter No. 2022-340
AB 1751 Daly (D)	Workers' Compensation: COVID-19: Critical Workers		Extends specified workers' compensation provisions relating to COVID-19 until specified date. Expands the specified provisions applicable to firefighters and police officers to include active firefighting members of a fire department at the State Department of State Hospitals, the State Department of Developmental Services, the Military Department, and the	09/29/2022 - Chaptered by Secretary of State. Chapter No. 2022-758

Bill No. Author	Title	IRWD Position	Summary/Effects	Status
			Department of Veterans Affairs and to officers of a state hospital under the jurisdiction of the State Department of State Hospitals.	
AB 1780 Chen (R)	Corporations: Shareholders' Meetings		Authorizes a corporation to conduct a meeting of shareholders solely by electronic transmission by and to the corporation, electronic video screen communication, conference telephone, or other means of remote communication if the meeting is conducted on or before specified date, as specified, and includes a live audiovisual feed for the duration of the meeting. Incorporates additional changes to Section 600 of the Corporations Code proposed by SB 1202 to be operative only under specified circumstances.	09/30/2022 - Chaptered by Secretary of State. Chapter No. 2022-951
AB 1783 Levine (D)	Lobbying: Administrative Actions		Expands the definition of "administrative action" under the Political Reform Act of 1974 to include any decision or approval by the Insurance Commissioner or the Director of the Department of Managed Health Care under these provisions.	09/22/2022 - Chaptered by Secretary of State. Chapter No. 2022-456
AB 1793 Quirk (D)	Hazardous Waste: Acute Aquatic Toxicity Criterion		Requires the Department of Toxic Substances Control, subject to an appropriation by the Legislature in the Budget Act of 2022 that implements a proposal to review the department's hazardous waste criteria, and as part of the department's comprehensive evaluation of its criteria and guidelines for the identification of hazardous wastes and extremely hazardous wastes, to review its acute toxicity criterion, as provided.	09/13/2022 - Chaptered by Secretary of State. Chapter No. 2022-274
AB 1811 Fong M (D)	Local Flood Protection: Planning: Climate Change		Relates to authorization of a local agency to prepare a local plan of flood protection, including a strategy to meet the urban level of flood protection. Requires this strategy, if a plan is prepared by a local agency, to also include planning for climate change and rainwater and stormwater management. Requires the plan to additionally include an update on the status of coordination with water suppliers on how the management of flood waters can bolster local water supplies.	08/26/2022 - Signed by GOVERNOR.;08/26/2022 - Chaptered by Secretary of State. Chapter No. 2022-176

IRWD 2022 LEGISLATIVE MATRIX
Updated 10/03/2022

Bill No. Author	Title	IRWD Position	Summary/Effects	Status
AB 1817 Ting (D)	Product Safety: Textile Articles: PFAS		Prohibits, beginning specified date, any person from manufacturing, distributing, selling, or offering for sale in the state any new, not previously owned, textile articles that contain regulated perfluoroalkyl and polyfluoroalkyl substances, except as specified, and requires a manufacturer to use the least toxic alternative when removing regulated PFAS in textile articles.	09/29/2022 - Chaptered by Secretary of State. Chapter No. 2022-762
AB 1824 Public Employment and Retirement Cmt	Public Employees' Retirement		Relates to the Teachers' Retirement Law, the State Teachers' Retirement System and the Defined Benefit Program of the State Teachers' Retirement Plan. Relates to the Cash Balance Benefit Program which provides a retirement plan for the benefit of participating employees who provide creditable service for less than 50% of full time. Revises the description of trustee service. Specifies that termination of creditable services does not include retired member activities or retired participant activities.	09/02/2022 - Signed by GOVERNOR.;09/02/2022 - Chaptered by Secretary of State. Chapter No. 2022-231
AB 1845 Calderon (D)	Metropolitan Water District of Southern California		Authorizes the Metropolitan Water District of Southern California to use the design-build procurement process for certain regional recycled water projects or other water infrastructure projects. Defines "design-build" to mean a project delivery process in which both the design and construction of a project are procured from a single entity. Requires the district to use a specified design-build procedure to assign contracts for the design and construction of a project, as defined.	09/13/2022 - Chaptered by Secretary of State. Chapter No. 2022-275
AB 1851 Rivas R (D)	Public Works: Prevailing Wage: Hauling		Expands the definition of public works certain purposes to include the on-hauling of materials used for paving, grading, and fill onto a public works site if the individual driver's work is integrated into the flow process of construction.	09/29/2022 - Chaptered by Secretary of State. Chapter No. 2022-764
AB 1857 Garcia (D)	Solid Waste		Requires the Department of Resources Recycling and Recovery, upon appropriation by the Legislature, to establish and administer the Zero-Waste Equity Grant Program as a	09/16/2022 - Chaptered by Secretary of State. Chapter No. 2022-342

Bill No. Author	Title	IRWD Position	Summary/Effects	Status
			competitive grant program to support targeted strategies and investments in communities transitioning to a zero-waste circular economy. Requires the department to provide grants to eligible zero-waste projects, as described.	
AB 1879 Mathis (R)	Water Quality Control Boards Frivolous Complaints		Authorizes a regional board to develop a plan or policy to address unfounded or frivolous complaints.	09/13/2022 - Vetoed by GOVERNOR.
AB 1886 Cooper (D)	Public Works: Definition		Expands the definition of public works to include street sweeping, as defined, maintenance performed for the routine cleaning of any publicly owned or publicly operated street, road, or highway done under contract and paid for in whole or in part out of public funds.	08/31/2022 - In ASSEMBLY. ASSEMBLY refused to concur in SENATE amendments.;08/31/2022 - In ASSEMBLY. Motion to reconsider.;08/31/2022 - In ASSEMBLY. Reconsideration granted.;08/31/2022 - In ASSEMBLY. ASSEMBLY refused to concur in SENATE amendments.
AB 1906 Stone (D)	Voluntary Stream Restoration: Property Owner Liability		Requires costs incurred by a qualifying state agency in settling, in addition to investigating and defending against, a claim by a real property owner to be paid from the General Fund.	09/15/2022 - Chaptered by Secretary of State. Chapter No. 2022-325
AB 1933 Friedman (D)	Property Taxation: Welfare Exemption: Nonprofit		Requires a nonprofit corporation that utilizes welfare exemption to be subject to an annual independent audit and to make the audit available to specified entities in order to continue to qualify for the exemption. Makes a nonprofit corporation liable for property tax for the years for which the property was exempt from taxation pursuant to the bill's provisions under specified conditions.	09/28/2022 - Chaptered by Secretary of State. Chapter No. 2022-643
AB 1949 Low (D)	Employees: Bereavement Leave		Makes it an unlawful employment practice for an employer to refuse to grant a request by an eligible employee to take up to 5 days of bereavement leave upon the death of a family member, as defined. Requires that leave be completed within 3 months of the	09/29/2022 - Chaptered by Secretary of State. Chapter No. 2022-767

Bill No. Author	Title	IRWD Position	Summary/Effects	Status
			date of death. Requires that leave be taken pursuant to any existing bereavement leave policy of the employer.	
AB 1985 Rivas R (D)	Organic Waste: Recovered Organic Waste Product		Requires any penalties imposed by the Department of Resources Recycling and Recovery, on a local jurisdiction that fails to meet its recovered organic waste procurement target to be imposed pursuant to a specified schedule based on the percentage of the local jurisdiction's recovered organic waste product procurement target achieved. Exempts jurisdictions in possession of a specified rural exemption from these requirements until specified date.	09/16/2022 - Chaptered by Secretary of State. Chapter No. 2022-344
AB 2059 Carrillo (D)	Hazardous Materials Business and Area Plans		Expands the scope of hazardous materials subject to regulation pursuant to the hazardous waste control laws by narrowing the definition of "consumer product" to require that the commodity be present in the same form, concentration, and quantity as a product prepackaged for distribution to a consumer for personal, family, or household purposes, instead of for use by the general public, and by otherwise narrowing the exemption for consumer products from regulation of hazardous materials, as provided.	09/13/2022 - Chaptered by Secretary of State. Chapter No. 2022-278
AB 2061 Ting (D)	Transportation Electrification: Electric Vehicle Charge		Requires the Energy Commission, in consultation with the Public Utilities Commission, to develop uptime recordkeeping and reporting standards for electric vehicle chargers and charging stations by specified date.	09/16/2022 - Chaptered by Secretary of State. Chapter No. 2022-345
AB 2075 Ting (D)	Energy: Electric Vehicle Charging Standards		Specifies the State Energy Resources Conservation and Development Commission (Energy Commission) is an interested party that the California Building Standards Commission and the Department of Housing and Community Development are required to consult with in proposing and adopting standards related to electric vehicle charging standards.	09/16/2022 - Chaptered by Secretary of State. Chapter No. 2022-346

IRWD 2022 LEGISLATIVE MATRIX
Updated 10/03/2022

Bill No. Author	Title	IRWD Position	Summary/Effects	Status
AB 2106 Rivas R (D)	Water Quality: Permits		Requires the State Water Resources Control Board to establish a statewide commercial, industrial, and institutional national pollutant discharge elimination system order regulating stormwater and authorized nonstormwater discharges from facilities with impervious surfaces that are significant contributors of pollutants to federally protected surface waters. Requires the board to contemporaneously develop a model memorandum of understanding.	09/28/2022 - Vetoed by GOVERNOR.
AB 2108 Rivas R (D)	Water Policy: Environmental Justice		Requires the State Water Resources Control Board and each regional board to engage in equitable, culturally relevant community outreach to promote meaningful civic engagement from potentially impacted communities of proposed discharges of waste that may have disproportionate impacts on water quality in disadvantaged communities or tribal communities and ensure that outreach and engagement shall continue throughout the waste discharge planning, policy, and permitting processes.	09/16/2022 - Chaptered by Secretary of State. Chapter No. 2022-347
AB 2133 Quirk (D)	California Global Warming Solutions Act of 2006		Requires the State Air Resources Board to ensure that statewide greenhouse gas emissions are reduced to at least 55% below the 1990 level by no later than specified date.	08/31/2022 - In SENATE. Read third time. Passed SENATE. *****To ASSEMBLY for concurrence.;08/31/2022 - In ASSEMBLY. ASSEMBLY refused to concur in SENATE amendments.
AB 2135 Irwin (D)	Information Security		Requires state agencies to adopt and implement information security and privacy policies, standards, and procedures based upon standards issued by the National Institute of Standards and Technology and the Federal Information Processing Standards. Requires to certify, to the President pro Tempore of the Senate and the Speaker of the Assembly that the agency is in compliance with all adopted policies, standards, and procedures and to include a plan of action and milestones.	09/29/2022 - Chaptered by Secretary of State. Chapter No. 2022-773

IRWD 2022 LEGISLATIVE MATRIX
Updated 10/03/2022

Bill No. Author	Title	IRWD Position	Summary/Effects	Status
AB 2142 Gabriel (D)	Income Taxes: Exclusion: Turf Replacement Program	SUPPORT	Relates to the Personal Income Tax Law and the Corporation Tax Law. Provides that this bill would, for taxable years beginning on or after January 1, 2022, and before January 1, 2027, under both of these laws, provide an exclusion from gross income for any amount received as a rebate, voucher, or other financial incentive issued by a public water system, as defined, local government, or state agency for participation in a turf replacement water conservation program.	09/28/2022 - Chaptered by Secretary of State. Chapter No. 2022-674
AB 2143 Carrillo (D)	Net Energy Metering		Applies specified public works project requirements to the construction of any renewable electrical generation facility, and any associated battery storage, after specified date, that receives service pursuant to the 2nd standard contract or tariff, with specified exceptions.	09/29/2022 - Chaptered by Secretary of State. Chapter No. 2022-774
AB 2146 Bauer-Kahan (D)	Neonicotinoid Pesticides: Prohibited Nonagricultural		Prohibits, beginning January 1, 2024, the sale, possession, or use of neonicotinoid pesticides, as defined, for application to outdoor ornamental plants, trees, or turf, except for use on on, or for the protection of, an agricultural commodity, as defined. Authorizes a certified qualified applicator to possess or use a neonicotinoid pesticide and a licensed pest control dealer to sell a neonicotinoid pesticide as provided.	09/28/2022 - Vetoed by GOVERNOR.
AB 2154 Cooley (D)	California Insurance Guarantee Association		Provides that under existing law, if a natural disaster results in covered claim obligations currently payable and owed to the California Insurance Guarantee Association in excess of its capacity to pay from current funds and current premium assessment, the board of CIGA may ask the Department of Insurance to issue bonds. Authorizes CIGA to ask the California Infrastructure and Economic Development Bank to issue bonds if CIGA makes specified determinations.	09/18/2022 - Chaptered by Secretary of State. Chapter No. 2022-508

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Bill No. Author	Title	IRWD Position	Summary/Effects	Status
AB 2188 Quirk (D)	Discrimination in Employment: Use of Cannabis		Makes it unlawful for an employer to discriminate against a person in hiring, termination, or any term or condition of employment, or otherwise penalize a person, if the discrimination is based upon the person' s use of cannabis off the job and away from the workplace, except for preemployment drug screening, as specified, or upon an employer-required drug screening test that has found the person to have nonpsychoactive cannabis metabolites in their hair, blood, urine, or other bodily fluids.	09/18/2022 - Chaptered by Secretary of State. Chapter No. 2022-392
AB 2201 Bennett (D)	Groundwater Sustainability Agency: Extraction Permit		Prohibits a county, city, or any other water well permitting agency from approving a permit for a new groundwater well or for an alteration to an existing well in a basin subject to the act and classified as medium or high priority unless specified conditions are met.	08/29/2022 - In SENATE. Read third time. Passed SENATE. *****To ASSEMBLY for concurrence.
AB 2206 Lee (D)	Nonattainment Basins: Employee Parking		Revises the definitions of employer, parking cash-out program, and parking subsidy. Requires an employer to maintain a record of communication with each employee who receives a parking subsidy that those employees have been informed of their right to receive the cash equivalent of the parking subsidy. Imposes specified duties upon the State Air Resources Board.	09/30/2022 - Chaptered by Secretary of State. Chapter No. 2022-866
AB 2208 Kalra (D)	Fluorescent Lamps: Sale and Distribution: Prohibition		Prohibits, on and after specified date, a screw or bayonet base type compact fluorescent lamp, as defined, and, on and after specified date, a pin base type compact fluorescent lamp or a linear fluorescent lamp, as defined, from being offered for final sale, sold at final sale, or distributed in this state as a new manufactured product. Exempts various lamps that meet specified criteria from that prohibition.	09/18/2022 - Chaptered by Secretary of State. Chapter No. 2022-409
AB 2221 Quirk-Silva (D)	Accessory Dwelling Units		Specifies that an accessory dwelling unit that is detached from the proposed or existing primary dwelling may include a detached garage. Requires a permitting agency to approve or deny an application to serve an accessory or junior accessory	09/28/2022 - Chaptered by Secretary of State. Chapter No. 2022-650

Bill No. Author	Title	IRWD Position	Summary/Effects	Status
			dwelling unit within the specified timeframes. Provides that if an application for an accessory dwelling unit or junior accessory dwelling unit is denied, an agency shall return to the applicant a list of items that are defective or deficient and describe remedies.	
AB 2233 Quirk-Silva (D)	Excess State Land: Development of Affordable Housing		Requires the Department of General Services to develop, in consultation with the Department of Housing and Community Development, a set of criteria to consistently evaluate state-owned parcels for suitability as affordable housing sites. Requires, on or before July 1, 2024, and every 4 years thereafter, the DGS to, among other things, conduct a review of all state-owned property and identify state-owned parcels that are potentially viable for affordable housing based on those criteria.	09/19/2022 - Chaptered by Secretary of State. Chapter No. 2022-438
AB 2234 Rivas R (D)	Planning and Zoning: Housing: Postentitlement Phase		Relates to the Housing Accountability Act. Requires a local agency to compile a list of information needed to approve or deny a postentitlement phase permit, as defined, to post an example of a complete, approved application and an example of a complete set of postentitlement phase permits for at least 5 types of housing development projects, as defined, in the jurisdiction, as specified, and to make those items available to all applicants for these permits no later than January 1, 2024.	09/28/2022 - Chaptered by Secretary of State. Chapter No. 2022-651
AB 2238 Rivas (D)	Extreme Heat: Statewide Extreme Heat Ranking System		Requires the California Environmental Protection Agency to develop a statewide extreme heat ranking system in coordination with the ICARP, the State Department of Public Health, and the Department of Insurance, as provided. Requires the Department of Insurance to transmit a study of, among other things, past extreme heat events and the effectiveness of insurance coverages, as specified, to prevent losses or help communities plan public health initiatives related to combating the effects of extreme heat.	09/09/2022 - Signed by GOVERNOR.;09/09/2022 - Chaptered by Secretary of State. Chapter No. 2022-264

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Bill No. Author	Title	IRWD Position	Summary/Effects	Status
AB 2243 Garcia E (D)	Occupational Safety and Health Standards: Heat Illness		Requires the Division of Occupational Safety and Health, before December 1, 2025, to submit to the Health Standards Board a rulemaking proposal to consider revising the heat illness standard and wildfire smoke standard. Requires a rulemaking proposal to consider revising the wildfire smoke standard, with regard to farmworkers, to reduce the existing air quality index threshold for PM2.5 particulate matter at which control by respiratory protective equipment becomes mandatory for farmworkers.	09/29/2022 - Chaptered by Secretary of State. Chapter No. 2022-778
AB 2247 Bloom (D)	Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS)		Requires, as part of the hazardous waste control laws, the Department of Toxic Substances Control to contract with an existing multistate chemical data collection entity that is used by other states and jurisdictions to implement, by January 1, 2026, a publicly accessible data collection interface to collect information about perfluoroalkyl and polyfluoroalkyl substances (PFAS) and products or product components containing intentionally added PFAS.	09/29/2022 - Vetoed by GOVERNOR.
AB 2248 Garcia E (D)	Water Quality: California Mexico Cross Border Rivers		Makes specified sum available from the General Fund, upon appropriation by the Legislature in the annual Budget Act or another statute, to the State Water Resources Control Board for grants and direct expenditures to address water quality problems arising in California-Mexico cross-border rivers.	09/18/2022 - Vetoed by GOVERNOR.
AB 2260 Rodriguez (D)	Emergency Response: Trauma Kits		Defines trauma kit to mean a first aid response kit that contains specified items, including, among other things, a tourniquet. Allows medical materials and equipment and any additional items that are approved by the medical director of the local emergency medical services agency to be included as supplements in addition to the specified items that are required to be included in a trauma kit if they adequately treat a traumatic injury and can be stored in a readily available kit.	09/27/2022 - Chaptered by Secretary of State. Chapter No. 2022-586

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Bill No. Author	Title	IRWD Position	Summary/Effects	Status
AB 2278 Kalra (D)	Natural Resources: Biodiversity and Conservation Report		Requires the Natural Resources Agency, in implementing actions to achieve the goal to conserve at least 30% of the state's lands and coastal waters by 2030 established by the executive order, to prioritize specified actions. Requires the Secretary of the Natural Resources Agency to prepare and submit an annual report to the Legislature on the progress made during the prior calendar year toward achieving that goal, as provided.	09/16/2022 - Chaptered by Secretary of State. Chapter No. 2022-349
AB 2316 Ward (D)	Public Utilities Commission: Customer Renewable Energy		Requires the Public Utilities Commission, on or before specified date, to evaluate each customer renewable energy subscription program to determine if the program meets specified goals, to authorize the termination or modification of a program that does not meet those goals, to determine whether it would be beneficial to ratepayers to establish a community renewable energy program, and to establish that program if doing so would be beneficial to ratepayers.	09/16/2022 - Chaptered by Secretary of State. Chapter No. 2022-350
AB 2319 Bonta M (D)	Surplus Land: Former Military Base Land		Adds to the definition of exempt surplus land, land that is a former military base conveyed by the federal government to a local agency, is subject to certain provisions governing the Alameda Naval Air Station and the Fleet Industrial Supply Center, and meets other specified conditions.	09/30/2022 - Chaptered by Secretary of State. Chapter No. 2022-963
AB 2334 Wicks (D)	Density Bonus Law: Affordability: Incentives		Relates to the Density Bonus Law. Applies amendment regarding maximum controls on density only to the Counties of Alameda, Contra Costa, Los Angeles, Marin, Napa, Orange, Riverside, Sacramento, San Bernardino, San Diego, San Francisco, San Mateo, Santa Barbara, Santa Clara, Solano, Sonoma, and Ventura.	09/28/2022 - Chaptered by Secretary of State. Chapter No. 2022-653
AB 2362 Mullin (D)	Publicly and Environmentally Beneficial Projects		Requires the Natural Resources Agency, on or before specified date, in coordination with the California Environmental Protection Agency, to convene the Interagency Working Group comprised of regulatory agencies under the auspices of the	08/22/2022 - In SENATE. From third reading. To Inactive File.

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			agency and the California Environmental Protection Agency that are responsible for permitting environmentally beneficial projects, that include procedures and ongoing management for the protection of the environment.	
AB 2449 Rubio (D)	Open Meetings: Local Agencies: Teleconferences		Relates to law that authorizes a local agency to use teleconferencing without complying with specified teleconferencing requirements in specified circumstances when a declared state of emergency is in effect, or in other situations related to public health. Revises and recasts those teleconferencing provisions and, until January 1, 2026, authorizes a local agency to use teleconferencing without complying with certain teleconferencing requirements.	09/13/2022 - Chaptered by Secretary of State. Chapter No. 2022-285
AB 2463 Lee (D)	Public Works: Exemption		Relates to existing law defines "public works," for purposes of regulating public works contracts, as, among other things, construction, alteration, demolition, installation, or repair work that is performed under contract and paid for in whole or in part out of public funds. Relates to pursuant to existing law, all workers employed on public works projects are required to be paid not less than the general prevailing rate of per diem wages for work, except as specified.	08/29/2022 - Signed by GOVERNOR.;08/29/2022 - Chaptered by Secretary of State. Chapter No. 2022-210
AB 2503 Garcia (D)	Landlords and Tenants: California Law Revision		Requires the California Law Revision Commission to, on or before specified date, deliver to the Legislature a study regarding, among other things, the establishment of consistent terminology across the California codes to describe the parties to an agreement, lease, or other contract for the rental of residential real property, including in mobilehome parks, that meets certain criteria, specifically, among other things, that the study addresses whether the continued use of the terms landlord and tenant.	09/22/2022 - Chaptered by Secretary of State. Chapter No. 2022-462
AB 2556 O'Donnell (D)	Local Public Employee Organizations		Authorizes a recognized employee organization to charge an employee covered by the Firefighters Procedural Bill of Rights	09/18/2022 - Chaptered by Secretary of State. Chapter No. 2022-412

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			Act for the reasonable cost of representation when the employee holds a conscientious objection, as specified, or declines membership in the organization and requests individual representation in a discipline, grievance, arbitration, or administrative hearing from the organization.	
AB 2559 Ward (D)	Reusable Tenant Screening Reports		Defines the term reusable tenant screening report to mean a consumer report, as defined, that was prepared within the previous 30 days by a consumer reporting agency at the request and expense of an applicant, is made directly available to the landlord for use in the rental application process or is provided through a third-party website that regularly engages in the business of providing reusable tenant screening reports that are available to landlords and complies with all state and federal laws.	09/13/2022 - Chaptered by Secretary of State. Chapter No. 2022-288
AB 2582 Bennett (D)	Recall Elections: Local Offices		Requires a recall election for a local officer to include only the question of whether the officer sought to be recalled shall be removed from office. Provides that if a local officer is removed from office in a recall election, the bill would provide that the office is vacant until it is filled according to law. Incorporates additional changes to Section 11041 of the Elections Code proposed by AB 2584 to be operative only if this bill and AB 2584 are enacted and this bill is enacted last.	09/29/2022 - Chaptered by Secretary of State. Chapter No. 2022-790
AB 2638 Bloom (D)	School Facilities: Drinking Water: Filling Stations		Requires new construction or modernization project submitted to the Division of the State Architect by a school district or the governing body of a charter school to include water bottle filling stations, as specified. Requires, for modernization projects, a minimum of one water bottle filling station for each school undergoing modernization, and for new construction projects, a minimum of one water bottle filling station per 350 people at each school being constructed.	09/29/2022 - Chaptered by Secretary of State. Chapter No. 2022-793

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Bill No. Author	Title	IRWD Position	Summary/Effects	Status
AB 2647 Levine (D)	Local Government: Open Meetings		Requires a local agency to make certain writings distributed to the members of the governing board available for public inspection at a public office or location that the agency designates and list the address of the office or location on the agenda for all meetings of the legislative body of the agency unless the local agency meets certain requirements, including the local agency immediately posts the writings on the local agency's internet website in a position and manner that makes it clear.	09/30/2022 - Chaptered by Secretary of State. Chapter No. 2022-971
AB 2667 Friedman (D)	Distributed Energy Resources: Incentives		Requires the Energy Commission to use funds appropriated by the Legislature to provide incentives to eligible customers who install behind-the-meter energy storage systems, or self-generation systems paired with energy storage systems, to support statewide customer adoption of clean distributed energy resources, as specified. Requires the Energy Commission to establish a system to equitably award incentives and set incentive levels, as specified, and to prioritize certain resources.	08/29/2022 - In SENATE. Read third time. Failed to pass SENATE.;08/29/2022 - In SENATE. Motion to reconsider.;08/29/2022 - In SENATE. Reconsideration granted.;08/30/2022 - In SENATE. Read third time. Failed to pass SENATE.
AB 2677 Gabriel (D)	Information Practices Act of 1977		Relates to law that provides that the intentional disclosure of medical, psychiatric, or psychological information in violation of the Information Practices Act, that is not permitted by law, is punishable as a misdemeanor if the wrongful disclosure results in economic loss or personal injury to the individual to whom the information pertains. Provides that this bill would, for a violation to be punishable as a misdemeanor, require that the disclosure be known or should be known to be in violation.	09/19/2022 - Vetoed by GOVERNOR.
AB 2693 Reyes (D)	COVID-19: Exposure		Provides that if an employer or representative of the employer receives a notice of potential exposure to COVID-19, the employer is required to take specified actions within one business day of the notice of potential exposure, including providing written notice to all employees on the premises that they may have been exposed. Revises and recasts those notification requirements to, among other things, authorize an	09/29/2022 - Chaptered by Secretary of State. Chapter No. 2022-799

Bill No. Author	Title	IRWD Position	Summary/Effects	Status
			employer to satisfy the notification requirements by prominently display a notice.	
AB 2780 Arambula (D)	Enhanced Infrastructure Financing Districts		Authorizes the City of Selma to initiate, participate in, govern, or finance an enhanced infrastructure financing district if specified events have occurred, except the requirement to have received a finding of completion, and if the City of Selma, acting as the successor agency to the former Selma Redevelopment Agency, has paid in full the amount outstanding demanded by the county auditor-controller from the funds of the successor agency for subsequent distribution to taxing entities, as specified.	09/27/2022 - Chaptered by Secretary of State. Chapter No. 2022-598
AB 2805 Bauer-Kahan (D)	Department of Fish and Wildlife: Advance Mitigation		Authorizes a federally recognized tribe to propose a regional conservation investment strategy, as provided. Eliminates a restriction on the Department of Fish and Wildlife that authorizes the department to approve a regional conservation investment strategy only if one or more state agencies request approval through a letter sent to the Director of Fish and Wildlife.	09/22/2022 - Chaptered by Secretary of State. Chapter No. 2022-463
AB 2877 Garcia E (D)	Safe and Affordable Drinking Water Fund: Tribes		Specifies that any waiver of tribal sovereignty that is required by the Water Resources Control Board for a tribe that is an eligible recipient to access funding from the Safe and Affordable Drinking Water Fund shall be narrowly drafted to serve both the individual needs of the tribe and make the funding agreement enforceable. Requires the board to include its designated tribal liaison, as defined, in all discussions with eligible recipients, except as specified.	09/23/2022 - Signed by GOVERNOR.;09/23/2022 - Chaptered by Secretary of State. Chapter No. 2022-481
AB 2895 Arambula (D)	Water: Permits and Licenses: Temporary Changes		Establishes a new process for petitions for which notice is submitted to the State Water Resources Control Board no later than January 31 for a temporary change due to a transfer or exchange of water rights initiated in the same year, and imposes on the State Water Resources Control Board related notice, decision, and hearing requirements.	09/28/2022 - Chaptered by Secretary of State. Chapter No. 2022-675

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Bill No. Author	Title	IRWD Position	Summary/Effects	Status
ACA 1 Aguiar-Curry (D)	Local Government Financing: Affordable Housing		Creates an additional exception to the 1% ad valorem tax rate limit on real property that would authorize a city, county, or special district to levy an ad valorem tax to service bonded indebtedness incurred to fund the construction, reconstruction, rehabilitation, or replacement of public infrastructure, affordable housing, or permanent supportive housing, if the proposition proposing the tax is approved by 55% of the voters of the city or county, and the proposition includes accountability requirements.	04/22/2021 - To ASSEMBLY Committees on LOCAL GOVERNMENT and APPROPRIATIONS.
ACA 13 Mathis (R)	Water Infrastructure Projects: Minimum Funding		Requires the Treasurer to annually transfer an amount equal to 2% of all state revenues from the General Fund to the Water Infrastructure Trust Account, which the measure would create. Continuously appropriates moneys in the account to the California Water Commission for its actual costs of implementing these provisions and for specified water infrastructure projects. Enacts the Water Infrastructure Bond Act of 2022.	04/07/2022 - To ASSEMBLY Committees on WATER, PARKS AND WILDLIFE and NATURAL RESOURCES.
SB 37 Cortese (D)	Contaminated Site Cleanup and Safety Act		Repeals the requirement for the State Department of Health Care Services to compile a list of all public drinking water wells. Provides that a project located on a site that is included on any list compiled by the state agencies specified above and posted on the California Environmental Protection Agency' s internet website is exempted from CEQA if the project meets specified conditions.	08/29/2022 - In ASSEMBLY. To Inactive File.
SB 45 Portantino (D)	Short-Lived Climate Pollutants: Organic Waste Reduction		Requires the Department of Resources Recycling and Recovery, in consultation with the State Air Resources Board, to assist local jurisdictions in complying with specified provisions, including any regulations adopted by the department.	09/19/2022 - Chaptered by Secretary of State. Chapter No. 2022-445

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Bill No. Author	Title	IRWD Position	Summary/Effects	Status
SB 222 Dodd (D)	Water Rate Assistance Program	OPPOSE UNLESS AMENDED	Establishes the Water Rate Assistance Fund in the State Treasury to help provide water affordability assistance, for both drinking water and wastewater services, to low-income residential ratepayers. Makes moneys in the fund available upon appropriation by the Legislature to the state board to provide direct water bill assistance to low-income residential ratepayers served by eligible systems, as defined, and would require 80% of total expenditures from the fund to be directly applied.	09/28/2022 - Vetoed by GOVERNOR.
SB 230 Portantino (D)	State Water Resources Control Board		Requires the State Water Resources Control Board to build upon its existing work dealing with, and work to improve its knowledge of, constituents of emerging concern (CEC) in water and, waters of the state and drinking water. Requires, as part of this work, the deputy director appointed by the state board, to work to improve its the knowledge of CECs in drinking water by assessing the state of information, as specified.	09/28/2022 - Chaptered by Secretary of State. Chapter No. 2022-676
SB 459 Allen (D)	Political Reform Act of 1974: Lobbying		Relates to periodic reports related to lobbying. Requires lobbyists, lobbying firms, and lobbyist employers to include information in the periodic reports that identifies each bill or administrative action subject to lobbying activity during that period. Provides that for certain activities involving issue lobbying advertisements, the bill would require disclosure of the position on the bill or administrative action advocated by the advertisement.	09/30/2022 - Chaptered by Secretary of State. Chapter No. 2022-873
SB 649 Cortese (D)	Local Governments: Affordable Housing: Local Tenant		Provides that the low-income housing tax credit program and tax-exempt bonds for qualified residential rental property used for affordable housing may be used to support access to housing that would allow households at risk of displacement to remain in the community. Specifies that a local tenant preference adopted pursuant to the bill's provisions is subject to the duty of public agencies to affirmatively further fair housing, as specified.	09/28/2022 - Chaptered by Secretary of State. Chapter No. 2022-660

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Bill No. Author	Title	IRWD Position	Summary/Effects	Status
SB 844 Min (D)	Cybersecurity Improvement: Reports		Establishes a program to award grants to eligible entities to address cybersecurity risks and cybersecurity threats to information systems owned or operated by, or on behalf of, state, local, or tribal governments. Requires the center to create four reports, to be delivered to the Legislature. Relates to federal State and Local Cybersecurity Improvement Act.	09/23/2022 - Chaptered by Secretary of State. Chapter No. 2022-505
SB 852 Dodd (D)	Climate Resilience Districts: Formation: Funding		Authorizes a city, county, city and county, special district, or a combination of any of those entities to form a climate resilience district, as defined, for the purposes of raising and allocating funding for eligible projects and the operating expenses of eligible projects.	09/09/2022 - Signed by GOVERNOR.;09/09/2022 - Chaptered by Secretary of State. Chapter No. 2022-266
SB 867 Laird (D)	Sea Level Rise: Planning and Adaptation		Requires a local government lying, in whole or in part, within the coastal zones or within the jurisdiction of the San Francisco Bay Conservation and Development Commission to implement sea level rise planning and adaptation through either submitting, and receiving approval for, a local coastal program to the California Coastal Commission or submitting, and receiving approval for, a subregional San Francisco Bay shoreline resiliency plan.	09/29/2022 - Vetoed by GOVERNOR.
SB 880 Laird (D)	Water Diversion: Monitoring and Reporting		Extends indefinitely existing law which requires any diverter, who has completed an instructional course regarding the devices or measurement method administered by the University of California Cooperative Extension, including passage of a proficiency test before the completion of the course, to be considered a qualified individual when installing and maintaining devices or implementing methods of measurement that were taught in the course for the diverter's diversion.	08/29/2022 - Signed by GOVERNOR.;08/29/2022 - Chaptered by Secretary of State. Chapter No. 2022-221
SB 892 Hurtado (D)	Cybersecurity Preparedness: Food and Agriculture Sector		Requires the Office of Emergency Services to direct Cybersecurity Integration Center to prepare, and OES to submit to the Legislature a strategic, multiyear outreach plan to assist the food and agriculture sector and the water and wastewater sector	09/29/2022 - Chaptered by Secretary of State. Chapter No. 2022-820

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			in their efforts to improve cybersecurity and an evaluation of options for providing grants or alternative forms of funding to, and potential voluntary actions that do not require funding and that assist, those sectors in their efforts to improve cybersecurity.	
SB 896 Dodd (D)	Wildfires: Defensible Space: Grant Programs		Requires any local governmental entity that is qualified to conduct defensible space assessments in very high and high fire hazard severity zones, as specified, and that reports that information to the Department of Forestry and Fire Protection, to report that information using the common reporting platform.	08/29/2022 - Signed by GOVERNOR.;08/29/2022 - Chaptered by Secretary of State. Chapter No. 2022-222
SB 897 Wieckowski (D)	Accessory Dwelling Units: Junior Units Dwelling Units		Relates to law that authorizes a local agency to impose standards on accessory dwelling units that include, but are not limited to, parking, height, setback, landscape, architectural review, and maximum size of a unit. Requires that the standards imposed on accessory dwelling units be objective. Increases the maximum height limitation that may be imposed by a local agency on an accessory dwelling unit to 18 feet if the accessory dwelling unit meets specified requirements.	09/28/2022 - Chaptered by Secretary of State. Chapter No. 2022-664
SB 931 Leyva (D)	Deterring Union Membership: Violations		Authorizes an employee organization, as described, to bring a claim before the Public Employment Relations Board alleging that a public employer committed certain violations. Provides for civil penalties for violations. Requires the board to apply specified criteria when assessing the civil penalty.	09/29/2022 - Chaptered by Secretary of State. Chapter No. 2022-823
SB 954 Archuleta (D)	Public Works: Wages: Electronic Payroll Records		Requires the Department of Industrial Relations to establish an online database of electronic certified payroll records, which the bill requires to be accessible only to certain trust funds established under federal law and certain committees established under federal law, as specified. Requires that this online database contain only nonredacted information that may be provided to those trust funds and committees.	09/29/2022 - Chaptered by Secretary of State. Chapter No. 2022-824

Bill No. Author	Title	IRWD Position	Summary/Effects	Status
SB 984 Archuleta (D)	Military Service: Leave of Absence: Pay and Benefits		Relates to law that authorizes National Guard employee members to elect to use vacation time or accumulated compensatory time off to attend scheduled reserve drill periods or perform other inactive duty reserve obligations. Recasts those provisions to instead require that employee members of reserve military units and the National Guard required to perform inactive duty obligations, other than inactive and active duty training drill periods, as specified, be granted military leave of absence without pay.	09/17/2022 - Chaptered by Secretary of State. Chapter No. 2022-384
SB 991 Newman (D)	Public Contracts: Progressive Design-Build		Authorizes local agencies, defined as any city, county, city and county, or special district authorized by law to provide for the production, storage, supply, treatment, or distribution of any water from any source, to use the progressive design-build process for up to 15 public works projects in excess of a specified amount for each project, similar to the progressive design-build process authorized for use by the Director of General Services.	09/02/2022 - Signed by GOVERNOR.;09/02/2022 - Chaptered by Secretary of State. Chapter No. 2022-243
SB 1010 Skinner (D)	Air Pollution: State Vehicle Fleet		Requires the Department of General Services to develop criteria to evaluate bidders, at least in part, based on the number of zero-emission vehicles or plug-in hybrid electric vehicles in their rental car fleet when seeking to award a contract for commercial rental car services. States that the installation of electric vehicle supply equipment or supporting electrical and hydrogen fueling infrastructure by state entities to support specified state fleet operations do not constitute gifts of public funds.	09/16/2022 - Chaptered by Secretary of State. Chapter No. 2022-360
SB 1017 Eggman (D)	Leases: Termination of Tenancy: Abuse or Violence		Relates to law that authorizes a tenant to provide a landlord with 180-day written notice, as specified, that the tenant, household member, or immediate family member was a victim of an act of domestic violence or other specified crimes, and that the tenant intends to terminate the tenancy. Makes a landlord or agent liable to the tenant for actual damages and, except as specified,	09/27/2022 - Chaptered by Secretary of State. Chapter No. 2022-558

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			statutory damages of not less than specified amount and more than specified amount in a civil action for violations.	
SB 1020 Laird (D)	Clean Energy, Jobs, and Affordability Act of 2022		Relates to the state Global Warming Solutions Act, which requires the State Air Resources Board to conduct a series of public workshops to give interested parties an opportunity to comment on the plan and requires a portion of those workshops to be conducted in regions of the state that have the most significant exposure to pollutants. Includes as regions for these workshops federal extreme nonattainment areas that have communities with minority populations, communities with low-income populations, or both.	09/16/2022 - Chaptered by Secretary of State. Chapter No. 2022-361
SB 1044 Durazo (D)	Employers: Emergency Condition: Retaliation		Prohibits an employer, in the event of an emergency condition, as defined, from taking or threatening adverse action against any employee for refusing to report to, or leaving, a workplace or worksite within the affected area because the employee has a reasonable belief that the workplace or worksite is unsafe, except as specified.	09/29/2022 - Chaptered by Secretary of State. Chapter No. 2022-829
SB 1058 Durazo (D)	Disability Insurance: Paid Family Leave: Demographic		Requires the Employment Development Department to collect demographic data for individuals who claim disability benefits under those programs, including race and ethnicity data and sexual orientation and gender identity data. Requires the department to adopt and update demographic data collection standards, procedures, and processes to implement the bill, as prescribed.	09/13/2022 - Chaptered by Secretary of State. Chapter No. 2022-317
SB 1063 Skinner (D)	Energy: Appliance Standards and Cost-Effective Measures		Authorizes the State Energy Resources Conservation and Development Commission, upon considering specified factors and making a finding of good cause, to make appliance standards effective sooner than one year after their date of adoption or revision, as specified. Requires that those other cost-effective measures prescribed by the commission also not result in any	09/16/2022 - Chaptered by Secretary of State. Chapter No. 2022-362

Bill No. Author	Title	IRWD Position	Summary/Effects	Status
			added total costs for consumers over the designed life of the impacted appliances.	
SB 1066 Hurtado (D)	State Farmworkers Drought Resilience Pilot Project		Requires the State Department of Social Services, subject to an appropriation by the Legislature, to administer the California Farmworkers Drought Resilience Pilot Project to provide supplemental pay in the form of cash assistance for eligible households to help meet their basic needs. Defines terms. Requires the department to implement the pilot project by awarding grants to eligible entities, as defined.	09/29/2022 - Vetoed by GOVERNOR.
SB 1075 Skinner (D)	Hydrogen: Green Hydrogen: Emissions of Greenhouse Gases		Relates to the California Global Warming Solutions Act of 2006, which designates the State Air Resources Board as the state agency charged with monitoring and regulating sources of emissions of greenhouse gases. Requires the state board, in consultation with the State Energy Resources Conservation and Development Commission and Public Utilities Commission, to prepare an evaluation posted to the state board's internet website by specified date, that includes specified information.	09/16/2022 - Chaptered by Secretary of State. Chapter No. 2022-363
SB 1078 Allen (D)	Sea Level Rise Revolving Loan Pilot Program		Requires the Ocean Protection Council in consultation with the Coastal Conservancy, to develop the Sea Level Rise Revolving Loan Pilot Program, within 12 months of receiving specified requests from local jurisdictions to do so, for purposes of providing low-interest loans to local jurisdictions, as defined, for the purchase of coastal properties in their jurisdictions identified as vulnerable coastal property, as defined, located in specified communities. Establishes the Sea Level Rise Revolving Loan Fund.	09/29/2022 - Vetoed by GOVERNOR.
SB 1084 Hurtado (D)	Agricultural Land: Foreign Ownership and Interests		Prohibits a foreign government from purchasing, acquiring, or holding an interest, as defined, in agricultural land within the State of California. Exempts land held by foreign governments before specified date, from that prohibition, and specifies that it	09/27/2022 - Vetoed by GOVERNOR.

Bill No. Author	Title	IRWD Position	Summary/Effects	Status
			does not apply to federally recognized Indian tribes or their government units and enterprises.	
SB 1100 Cortese (D)	Open Meetings: Orderly Conduct		Authorizes the presiding member of the legislative body conducting a meeting to remove an individual for disrupting the meeting. Requires removal to be preceded by a warning to the individual by the presiding member of the legislative body or their designee that the individual's behavior is disrupting the meeting and that the individual's failure to cease their behavior may result in their removal.	08/22/2022 - Signed by GOVERNOR.;08/22/2022 - Chaptered by Secretary of State. Chapter No. 2022-171
SB 1101 Caballero (D)	Carbon Sequestration		Establishes the State Air Resources Board as the state agency responsible for monitoring and regulating sources emitting greenhouse gases. Requires the state board to ensure that statewide greenhouse gas emissions are reduced to at least 40% below the 1990 level by 2030. Requires the state board to prepare and approve a scoping plan for achieving the maximum technologically feasible and cost-effective reductions in greenhouse gas emissions and, as part of its scoping plan.	08/31/2022 - In ASSEMBLY. To Inactive File.
SB 1109 Caballero (D)	California Renewables Portfolio Standard Program		Extends the electrical corporations' obligation to collectively procure their proportionate share of 125 megawatts of cumulative rated generating capacity from existing bioenergy projects commencing operation before specified date, through financial commitments of 5 to 15 years, inclusive. Exempts from these requirements a local publicly owned electric utility that previously entered into a 5-year financial commitment under existing law under certain conditions.	09/16/2022 - Chaptered by Secretary of State. Chapter No. 2022-364
SB 1127 Atkins (D)	Workers Compensation: Liability Presumptions		Requires, if liability for an injury has been unreasonably rejected for specified claims of injury or illness, including hernia, heart trouble, pneumonia, or tuberculosis, among others, sustained in the course of employment of a specified member of law enforcement or a specified first responder, the amount of the	09/29/2022 - Chaptered by Secretary of State. Chapter No. 2022-835

Bill No. Author	Title	IRWD Position	Summary/Effects	Status
			penalty to be 5 times the amount of the benefits unreasonably delayed due to the rejection of liability.	
SB 1136 Portantino (D)	Expedited Environmental Review: Climate Change		Requires specified public agencies, at the time of adoption of a rule or regulation requiring the reduction in emissions of greenhouse gases, criteria air pollutants, or toxic air contaminants, to perform an environmental analysis of the reasonably foreseeable methods of compliance.	09/28/2022 - Vetoed by GOVERNOR.
SB 1144 Wiener (D)	Water Efficiency and Quality Assessment Reports		Requires, no later than January 1, 2027, except as provided, an operating agency, as defined, to complete a water efficiency and quality assessment report, as specified, for each covered building. Requires various mitigation and remediation actions with respect to lead-contaminated potable water systems, lead pipes, and non-lead-free pipes, as determined in the water efficiency and quality assessment reports, dependent on funding expressly earmarked for specified actions.	09/29/2022 - Vetoed by GOVERNOR.
SB 1157 Hertzberg (D)	Urban Water Use Objectives	OPPOSE	Eliminates the option of using the greater of 52.5 gallons per capita daily and the greater of 50 gallons per capita daily, as applicable, or a standard recommended by the Department of Water Resource and the Water Resources Control Board as the standard for indoor residential water use the department, in coordination with the board, to summarize the findings of these studies and investigations in a report to the Legislature.	09/28/2022 - Chaptered by Secretary of State. Chapter No. 2022-679
SB 1162 Limon (D)	Employment: Salaries and Wages		Requires a private employer that has 100 or more employees to submit a pay data report to the Civil Rights Department. Revises the timeframe in which a private employer is required to submit specified information to require that it be provided on or before the second Wednesday of May 2023, and for each year thereafter on or before the second Wednesday of May.	09/27/2022 - Chaptered by Secretary of State. Chapter No. 2022-559

IRWD 2022 LEGISLATIVE MATRIX
Updated 10/03/2022

Bill No. Author	Title	IRWD Position	Summary/Effects	Status
SB 1168 Cortese (D)	Public Employees' Retirement: Beneficiary Payment		Relates to Public Employees' Retirement System (PERS) required payment of $500 to be made to a beneficiary upon the death of a member after retirement and while receiving a retirement allowance from PERS, unless otherwise provided. Increases this benefit to specified amount.	08/26/2022 - Signed by GOVERNOR.;08/26/2022 - Chaptered by Secretary of State. Chapter No. 2022-193
SB 1188 Laird (D)	Safe Drinking Water State Revolving Fund: Assistance		Deletes provisions of the Safe Drinking Water State Revolving Fund relating to 0% financing and interest and would instead generally authorize the board, to the extent authorized by federal law, to provide reduced or 0% financing to further the purposes of the Safe Drinking Water State Revolving Fund Law of 1997. Deletes certain limitations on the financial assistance provided to water corporations regulated by the Public Utilities Commission.	09/28/2022 - Chaptered by Secretary of State. Chapter No. 2022-680
SB 1194 Allen (D)	Public Restrooms: Building Standards		Authorizes jurisdiction be designed to serve all genders, as specified, instead of complying with the plumbing standards set forth in the California Building Standards Code. Provides that this authority will become inoperative and be repealed on the date that standards that address all gender multiuser facilities take effect in the California Building Standards Code.	09/29/2022 - Chaptered by Secretary of State. Chapter No. 2022-839
SB 1205 Allen (D)	Water Rights: Appropriation		Requires the State Water Resources Control Board to develop and adopt regulations to govern consideration of climate change effects in water availability analyses used in the board's review of applications for water rights permits, including consideration of the effects of climate change, as specified, upon watershed hydrology, as specified.	09/16/2022 - Chaptered by Secretary of State. Chapter No. 2022-369
SB 1224 Bates (R)	Watersheds: Wildlife Habitat: Orange and San Diego		Authorizes the Wildlife Conservation Board, upon an appropriation by the Legislature, to make grants to acquire fee title or conservation easements or to perform restoration, or a combination thereof, in watersheds with habitats for sensitive wildlife populations in specified regions in the Counties of Orange and San Diego, as provided.	09/28/2022 - Vetoed by GOVERNOR.

Bill No. Author	Title	IRWD Position	Summary/Effects	Status
SB 1230 Limon (D)	Zero Emission and Near Zero Emission Vehicle Incentive		Requires the State Air Resources Board, with respect to the various zero emission and near zero emission vehicle incentive programs administered or funded by the state board, to adopt certain revisions to those programs if the state board finds those revisions to be feasible.	09/16/2022 - Chaptered by Secretary of State. Chapter No. 2022-371
SB 1253 Melendez (R)	Infrastructure Plan: Flood Control: Delta Levees		Require the plan to set out infrastructure priorities relating to specified flood prevention and maintenance projects.	08/26/2022 - Signed by GOVERNOR.;08/26/2022 - Chaptered by Secretary of State. Chapter No. 2022-195
SB 1254 Hertzberg (D)	Drinking Water: Administrator: Managerial Services		Revises the definition of designated water system and limits the liability of an administrator when the State Water Resources Control Board appoints an administrator to a designated water system, as prescribed.	09/28/2022 - Chaptered by Secretary of State. Chapter No. 2022-681
SB 1372 Stern (D)	Sustainable Groundwater Management Act		Provides that the approval of a groundwater sustainability plan by the department shall not be construed to be a determination by or otherwise an opinion of the department that the allocation of groundwater pumping rights in the plan are consistent with groundwater rights law.	09/28/2022 - Chaptered by Secretary of State. Chapter No. 2022-682
SB 1373 Kamlager (D)	Surplus Land Disposal		Extends the date by which the disposition of property must be completed to specified date if the property is located in a charter city with a population of over 2,000,000 persons and a local agency has an option agreement duly authorized by the local agency's governing body to purchase the property from the former redevelopment agency.	09/28/2022 - Chaptered by Secretary of State. Chapter No. 2022-724
SB 1396 Bradford (D)	Tenancy: Credit Reporting: Lower Income Households		Relates to law that requires a landlord of an assisted housing development, as defined, to offer tenants obligated on the lease of units in the development the option of having their rental payments reported to at least one consumer reporting agency. Requires an independent evaluator, upon appropriation by the	09/28/2022 - Chaptered by Secretary of State. Chapter No. 2022-670

Bill No. Author	Title	IRWD Position	Summary/Effects	Status
			Legislature for this purpose, to be selected by the Department of Financial Protection and Innovation and to be responsible for conducting an evaluation on the impact of rental payment reporting.	
SB 1439 Glazer (D)	Campaign Contributions: Agency Officers		Relates to the prohibition of an officer of an agency from accepting, soliciting, or directing a contribution of more than $250 from any party, participant, or their agent, while a proceeding involving a license, permit, or other entitlement for use is pending before the agency and for 3 months following the date a final decision is rendered in the proceeding, under certain circumstances. Requires the party to a proceeding to disclose whether the party has made a contribution of more than $250.	09/29/2022 - Chaptered by Secretary of State. Chapter No. 2022-848
SB 1494 Governance and Finance Cmt	Property Taxation: Revenue Allocations: Property Sales		Provides that existing property tax law defines fiscal adjustment period for specified purposes as the period beginning with the 2004-05 fiscal year and continuing through the later of the fiscal year in which the Director of Finance notifies the State Board of Equalization, or the fiscal year in which an additional countywide adjustment amount, as described, is determined. Changes the references above to the State Board of Equalization to the California Department of Tax and Fee Administration.	09/19/2022 - Chaptered by Secretary of State. Chapter No. 2022-451
SCA 1 Hertzberg (D)	Elections: Referenda		Requires that the ballot for a referendum measure provide that a Yes vote is in favor of the referendum and rejects the statute or part of the statute subject to the referendum, and a No vote is against the referendum and approves the statute or part of the statute subject to the referendum, thus requiring a majority vote in favor of the referendum to reject the statute or part of the statute subject to the referendum.	09/01/2021 - In SENATE. From third reading. To Inactive File.
SCA 9 Gonzalez (D)	Personal Rights: Right to Housing		Declares that the fundamental human right to housing exists in this state. Specifies that it is the shared obligation of state and local jurisdictions to respect, protect, and fulfill this right through	03/23/2022 - To SENATE Committees on HOUSING and ELECTIONS AND

Bill No. Author	Title	IRWD Position	Summary/Effects	Status
			progressively implemented measures, consistent with available resources, within an aggressive but reasonable timeframe.	CONSTITUTIONAL AMENDMENTS.
HR 616 Tlaib (D)	Water Shutoffs Prohibition		Prohibits water shutoffs during the Coronavirus disease 2019 emergency period, provides drinking and waste water assistance to households.	01/28/2021 - INTRODUCED.;01/28/2021 - To HOUSE Committee on ENERGY AND COMMERCE.;01/28/2021 - To HOUSE Committee on EDUCATION AND LABOR.
HR 737 Valadao (R)	California Operational Flexibility and Drought Relief		Extends the authorities under the Water Infrastructure Improvements for the Nation Act of 2016 providing operational flexibility, drought relief, and other benefits to the State of California.	02/02/2021 - INTRODUCED.;02/02/2021 - To HOUSE Committee on NATURAL RESOURCES.
HR 1015 Napolitano (D)	Water Recycling and Reuse Project Grants	SUPPORT	Establishes a grant program for the funding of water recycling and reuse projects.	02/11/2021 - INTRODUCED.;02/11/2021 - To HOUSE Committee on NATURAL RESOURCES.
HR 1352 Lawrence (D)	Trust Fund for Water and Sewer Infrastructure		Establishes a trust fund to provide for adequate funding for water and sewer infrastructure.	04/05/2021 - In HOUSE Committee on AGRICULTURE: Referred to Subcommittee on CONSERVATION AND FORESTRY.
HR 1848 Pallone (D)	National Infrastructure		Rebuilds and modernizes the Nation's infrastructure to expand access to broadband and Next Generation 9-1-1, rehabilitate drinking water infrastructure, modernize the electric grid and energy supply infrastructure, redevelop brownfields, strengthen health care infrastructure, create jobs, and protect public health and the environment.	01/20/2022 - In HOUSE Committee on NATURAL RESOURCES: Referred to Subcommittee on INDIAN, INSULAR AND ALASKA NATIVE AFFAIRS.;01/20/2022 - In HOUSE Committee on NATURAL RESOURCES: Referred to Subcommittee on ENERGY AND MINERAL RESOURCES.
HR 1915 DeFazio (D)	Federal Water Pollution Control Act		Amends the Federal Water Pollution Control Act to reauthorize certain water pollution control programs.	06/22/2021 - From HOUSE Committee on TRANSPORTATION AND INFRASTRUCTURE: Reported as

Bill No. Author	Title	IRWD Position	Summary/Effects	Status
				amended.;06/22/2021 - In HOUSE. Placed on HOUSE Union Calendar.
HR 2238 Lowenthal A (D)	Single Use Plastic Production Reduction		Amends the Solid Waste Disposal Act to reduce the production and use of certain single-use plastic products and packaging, to improve the responsibility of producers in the design, collection, reuse, recycling, and disposal of their consumer products and packaging, to prevent pollution from consumer products and packaging from entering into animal and human food chains and waterways.	03/29/2021 - In HOUSE Committee on TRANSPORTATION & INFRASTRUCTURE: Referred to Subcommittee on WATER RESOURCES AND ENVIRONMENT.
HR 2467 Dingell D (D)	Hazardous Substances		Requires the Administrator of the Environmental Protection Agency to designate per- and polyfluoroalkyl substances as hazardous substances under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980.	07/22/2021 - In SENATE. Read second time.;07/22/2021 - To SENATE Committee on ENVIRONMENT AND PUBLIC WORKS.
HR 2468 Garamendi (D)	Federal Infrastructure Aid Program Materials		Ensures that certain materials used in carrying out federal infrastructure aid programs are made in the United States.	06/07/2021 - In HOUSE Committee on AGRICULTURE: Referred to Subcommittee on COMMODITY EXCHANGES, ENERGY, AND CREDIT.
HR 3291 Tonko (D)	Water System Assistance		Amends the Safe Drinking Water Act to provide assistance for states, territories, areas affected by natural disasters, and water systems and schools affected by PFAS or lead, and to require the Environmental Protection Agency to promulgate national primary drinking water regulations for PFAS, microcystin toxin, and 1,4-dioxane.	06/29/2021 - From HOUSE Committee on ENERGY AND COMMERCE: Reported as amended.;06/29/2021 - In HOUSE. Placed on HOUSE Union Calendar.
HR 3292 Dingell D (D)	Residential Emergency Relief Program		Requires the Administrator of the Environmental Protection Agency to carry out a residential emergency relief program to provide payment assistance for households to retain water service.	05/18/2021 - INTRODUCED.;05/18/2021 - To HOUSE Committee on ENERGY AND COMMERCE.;05/19/2021 - In HOUSE Committee on ENERGY AND COMMERCE: Referred to Subcommittee on ENVIRONMENT.

IRWD 2022 LEGISLATIVE MATRIX
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Bill No. Author	Title	IRWD Position	Summary/Effects	Status
HR 3293 Blunt Rochester (D)	Drinking Water and Wastewater Service Assistance		Amends the Safe Drinking Water Act and the Federal Water Pollution Control Act to establish programs to assist low-income households in maintaining access to drinking water and wastewater services.	06/29/2021 - From HOUSE Committee on ENERGY AND COMMERCE: Reported as amended.
HR 3404 Huffman (D)	Drought Preparedness	SEEK AMENDMENTS	Provides drought preparedness and improved water supply reliability to the nation.	07/05/2021 - In HOUSE Committee on NATURAL RESOURCES: Referred to Subcommittee on WATER, OCEANS AND WILDLIFE.
HR 3622 Pappas (D)	Water Quality Criteria		Requires the Administrator of the Environmental Protection Agency to develop effluent limitations guidelines and standards and water quality criteria for PFAS under the Federal Water Pollution Control Act, provides Federal grants to publicly owned treatment works to implement such guidelines and standards.	06/01/2021 - In HOUSE Committee on TRANSPORTATION & INFRASTRUCTURE: Referred to Subcommittee on WATER RESOURCES AND ENVIRONMENT.
HR 4099 Napolitano (D)	Water Recycling and Reuse Projects		Directs the Secretary of the Interior to establish a grant program to provide grants on a competitive basis to eligible entities for large-scale water recycling and reuse projects.	06/29/2021 - Subcommittee on WATER, POWER AND OCEANS hearings held.
HR 4602 Lowenthal A (D)	Do Not Flush Labeling	SUPPORT	Directs the Federal Trade Commission to issue regulations requiring certain products to have "Do Not Flush" labeling.	07/21/2021 - INTRODUCED.;07/21/2021 - To HOUSE Committee on ENERGY AND COMMERCE.;07/22/2021 - In HOUSE Committee on ENERGY AND COMMERCE: Referred to Subcommittee on DIGITAL COMMERCE AND CONSUMER PROTECTION.
HR 5118 Neguse (D)	Continental Divide National Scenic Trail		Directs the Secretary of Agriculture to prioritize the completion of the Continental Divide National Scenic Trail, and for other purposes.	07/29/2022 - In HOUSE. HA Amendment offered by Representative Westerman.;07/29/2022 - In HOUSE. HA . Representative Westerman amendment agreed to on HOUSE floor.;07/29/2022 - In HOUSE. HA

Bill No. Author	Title	IRWD Position	Summary/Effects	Status
				Amendment offered by Representative Schrier.;07/29/2022 - In
HR 5689 DeFazio (D)	Private Nonprofit Organizations	SUPPORT	Improves the provision of Federal resources to help build capacity and fund risk-reducing, cost-effective mitigation projects for eligible state, local, tribal, and territorial governments and certain private nonprofit organizations.	04/06/2022 - In SENATE. Read second time.;04/06/2022 - To SENATE Committee on HOMELAND SECURITY AND GOVERNMENTAL AFFAIRS.
HR 6591 McClain (R)	Disposable Nonwoven Wipes Flushability	SUPPORT	Requires the Administrator of the Environmental Protection Agency to publish a rule that establishes standards for the flushability of disposable nonwoven wipes.	02/03/2022 - INTRODUCED.;02/03/2022 - To HOUSE Committee on ENERGY AND COMMERCE.
HR 6705 Blunt Rochester (D)	Improvements to Rivers and Harbors		Provides for improvements to the Rivers and harbors of the United States, to provide for the conservation and development of water and related resources.	02/14/2022 - In HOUSE Committee on TRANSPORTATION & INFRASTRUCTURE: Referred to Subcommittee on WATER RESOURCES AND ENVIRONMENT.
HR 7900 Smith A (D)	Department of Defense Appropriations		Authorizes appropriations for Fiscal Year 2023 for military activities of the Department of Defense and for military construction, prescribes military personnel strengths for such fiscal year.	08/03/2022 - In SENATE. Read second time. Placed on Legislative Calendar under General Orders.
S 914 Duckworth (D)	Safe Drinking Water Act		Amends the Safe Drinking Water Act and the Federal Water Pollution Control Act to reauthorize programs under those Acts.	04/29/2021 - In SENATE. Amendment SA 1471 proposed by Senator Rubio to Amendment SA 1460.;04/29/2021 - In SENATE. Amendment SA 1461 proposed by Senator Shaheen to Amendment SA 1460.;04/29/2021 - In SENATE. Amendment SA 1469 proposed by Senator Kennedy
S 1907 Gillibrand (D)	Water Quality Criteria		Requires the Administrator of the Environmental Protection Agency to develop effluent limitations guidelines and standards and water quality criteria for PFAS under the Federal Water	05/27/2021 - INTRODUCED.;05/27/2021 - In SENATE. Read second

Bill No. Author	Title	IRWD Position	Summary/Effects	Status
			Pollution Control Act, to provide Federal grants to publicly owned treatment works to implement such guidelines and standards.	time.;05/27/2021 - To SENATE Committee on ENVIRONMENT AND PUBLIC WORKS.
S 2334 Cortez-Masto (D)	Water Recycling and Reuse Project Grants		Directs the Secretary of the Interior to establish a grant program to provide grants on a competitive basis to eligible entities for large-scale water recycling and reuse projects, amends the Omnibus Public Land Management Act of 2009 to make certain modifications to the Cooperative Watershed Management Program, provides emergency drought funding.	05/25/2022 - Subcommittee on WATER AND POWER hearings held.
S 2454 Padilla (D)	Alternative Water Source Projects		Amends the Federal Water Pollution Control Act to reauthorize the pilot program for alternative water source projects.	07/22/2021 - In SENATE. Read second time.;07/22/2021 - To SENATE Committee on ENVIRONMENT AND PUBLIC WORKS.
S 3600 Peters G (D)	Cybersecurity Improvement		Improves the cybersecurity of the Federal Government.	03/01/2022 - In SENATE. Amendment SA 4953 proposed by Senator Peters.;03/01/2022 - In SENATE. SA 4953 agreed to on SENATE floor by unanimous consent.;03/01/2022 - In SENATE. Amendment SA 4954 proposed by Senator Peters for Senator Wicker.;03/01/2022 -
S 3624 Carper (D)	Improvements to Rivers and Harbors		Provides for improvements to the rivers and harbors of the United States, to provide for the conservation and development of water and related resources.	02/10/2022 - INTRODUCED.;02/10/2022 - In SENATE. Read second time.;02/10/2022 - To SENATE Committee on ENVIRONMENT AND PUBLIC WORKS.
S 3956 Merkley (D)	Do Not Flush Labeling Requirements	SUPPORT	Directs the Administrator of the Environmental Protection Agency to establish a grant program to improve the effectiveness of education and outreach on Do Not Flush labeling, and to require the Federal Trade Commission, in consultation with the	03/30/2022 - INTRODUCED.;03/30/2022 - In SENATE. Read second time.;03/30/2022 - To SENATE

Bill No. Author	Title	IRWD Position	Summary/Effects	Status
			Administrator, to issue regulations requiring certain products to have Do Not Flush labeling.	Committee on COMMERCE, SCIENCE, AND TRANSPORTATION.
S 4231 Feinstein (D)	Water Infrastructure	SUPPORT	Supports water infrastructure in reclamation States.	05/25/2022 - Subcommittee on WATER AND POWER hearings held.

October 6, 2022
Prepared and
submitted by: C. Compton
Approved by: Paul A. Cook

WATER RESOURCES POLICY AND COMMUNICATIONS COMMITTEE

2023-2024 LOBBYING AND ADVOCACY SERVICES

SUMMARY:

IRWD has retained Kadesh & Associates for federal lobbying and consulting services, The Oñate Group and Resolute for state legislative lobbying and consulting services, and Cliff Moriyama Consulting for State regulatory agency lobbying and consulting services. Each of these firms has provided a high level of service, knowledge, credibility, and access to the federal and state officials and agencies it engages with on behalf of IRWD. Based on the effectiveness of these consultants, staff recommends that IRWD enter into new 24-month agreements with each of these firms for the 2023-2024 legislative sessions. Specifically:

- Staff recommends the Board authorize the General Manager to execute sole-source, 24-month Professional Services Agreements, from January 1, 2023, to December 31, 2024, with Kadesh & Associates for federal lobbying and advocacy services during the 118th Congress.
- The General Manager, within his authority, will executive execute sole-source 24-month Professional Services Agreements, from January 1, 2023, to December 31, 2024, with The Oñate Group and Resolute for State legislative lobbying and advocacy services during the 2023-2024 legislative session.
- The General Manager will also execute a sole-source 24-month Professional Services Agreements, from January 1, 2023, to December 31, 2024, with Cliff Moriyama Consulting for State regulatory lobbying and advocacy services during the 2023-2024 legislative session.

BACKGROUND:

IRWD continues to be a leader in water resources public policy and governance. During 2021 and 2022, the District engaged in a number of federal and state policy discussions regarding water infrastructure, supply reliability and governance. The District was assisted in these discussions by both its federal and state lobbyists and consultants.

Many of the policy discussions are expected to carry over into the 2023-2024 legislative sessions. Entering into 24-month contracts with Kadesh & Associates, The Oñate Group, Resolute, and Cliff Moriyama Consulting will allow the District to maintain continuity in its Washington, D.C. and Sacramento representation throughout the 2023-2024 session. IRWD's current 24-month contracts with Kadesh & Associates for federal lobbying and consulting services with The Oñate Group and Resolute for state legislative lobbying and consulting services, and Cliff Moriyama Consulting for State regulatory agency lobbying and consulting services, will expire on December 31, 2022.

Federal Lobbyist and Advocate:

Kadesh & Associates provides IRWD with a high level of service, knowledge, credibility and access in Washington, D.C. Additionally, Kadesh & Associates assists the District in ongoing efforts to build and maintain relationships with key policymakers in Congress, the Administration and within federal agencies.

To aid IRWD in its federal advocacy efforts, staff recommends the Board authorize the execution of new Professional Services Agreements with Kadesh & Associates for a 24-month period, beginning January 1, 2023, through December 31, 2024. The new contract would each include a $10,506 monthly retainer for 2023 and a $10,821 month retainer for 2024 plus reimbursement of reasonable direct expenses for a total amount not to exceed $265,000. The proposed new agreement reflects a three percent increase per year in the amount of the monthly retainer, but not an increase in the total contract amount.

State Legislative Lobbyist and Advocate:

The Oñate Group and Resolute provide IRWD with a high level of service, knowledge, credibility and access in Sacramento. Additionally, The Oñate Group and Resolute assist the District in ongoing efforts to build and maintain relationships with key policymakers in the Governor's Office and the Legislature.

To aid IRWD in its state advocacy efforts, the General Manager, within his authority, will execute a new sole-source Professional Services Agreement with The Oñate Group and with Resolute for a 24-month period, beginning January 1, 2023, through December 31, 2024. The new contracts would each include a $5,800 monthly retainer plus reimbursement of reasonable direct expenses for a total amount not to exceed $145,0000. The proposed new agreement reflects a 12.6 percent increase in the amount of the currently monthly retainer, which was set in October 2020.

State Regulatory Lobbyist and Advocate:

Cliff Moriyama Consulting provides IRWD with a high level of service, knowledge, credibility and access in Sacramento. Additionally, Cliff Moriyama Consulting assists the District in ongoing efforts to build and maintain relationships with key policymakers in the Governor's Office and State agencies.

To aid IRWD in its state advocacy efforts, the General Manager, within his authority, will execute a new sole-source Professional Services Agreement with Cliff Moriyama Consulting for a 24-month period, beginning January 1, 2023, through December 31, 2024. The new contract would include a $5,000 monthly retainer plus reimbursement of reasonable direct expenses for a total contract amount not to exceed $125,000. The proposed new agreement reflects a 25 percent increase in the amount of the monthly retainer, which has not been increased since 2018.

Next Steps – Planning:

Once the 2023-2024 agreements are in place, staff will engage with Kadesh & Associates, The Oñate Group, Resolute and Cliff Moriyama Consulting to plan for the 2023 legislative year and provide to the Water Resources, Policy and Communications Committee and the Board an overview of expected 2023 legislative and regulatory issues in Washington, D.C., Sacramento, and regionally, and an initial 2023 staff resource allocation plan for legislative and regulatory issues of importance to IRWD in the coming year. As has been done in the past, the District's advocates will attend one of those discussions.

FISCAL IMPACTS:

The current contracts with Kadesh & Associates, The Oñate Group, Resolute, and Cliff Moriyama Consulting expire on December 31, 2022. Cumulatively, they are $24,500 per month plus reimbursement of reasonable direct expenses. The current contract is for a 24-month term and has a not-to-exceed value of $622,000.

The proposed contract with Kadesh & Associates, The Oñate Group, Resolute, and Cliff Moriyama Consulting would be effective from January 1, 2023, through December 31, 2024, and is proposed at a cumulative amount of $27,106 in 2023 and $27,421 in 2024 per month plus reimbursement of reasonable direct expenses. If approved by the Board, the new contract will be charged against the Fiscal Year (FY) 2022-2023, FY 2023-2024 and FY 2024-2025 Operating Budgets. The total requested contract authorization is $680,000.

ENVIRONMENTAL COMPLIANCE:

Not applicable.

RECOMMENDATION:

That the Board authorize the General Manager to execute a Professional Services Agreement with Kadesh & Associates for federal advocacy services for the period of January 1, 2023, through December 31, 2024, at a rate of $10,200 per month in 2023 and $108.21 per month in 2024 plus reasonable reimbursement of direct expenses for a total contract amount not to exceed $265,000.

LIST OF EXHIBITS:

None.

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October 6, 2022
Prepared by: R. Huang
Submitted by: F. Sanchez / P. Weghorst
Approved by: Paul A. Cook

WATER RESOURCES POLICY AND COMMUNICATIONS COMMITTEE

CONSULTANT SELECTIONS FOR IRWD'S WATER SUPPLY RELIABILITY EVALUATION UPDATE

SUMMARY:

Staff is preparing to update IRWD's 2016 Water Supply Reliability Evaluation to assess potential impacts of various hydrologic, system outage and emergency scenarios on the District's water supply reliability. Significant long-term drought and climate change impacts have occurred since the 2016 evaluation resulting in reductions in State Water Project (SWP) and Colorado River supplies. Changes to IRWD's facilities and distribution system have also occurred. Updating the Water Supply Reliability Evaluation will require updating supply and demand projections, developing new hydrologic, system outage and emergency scenarios and simulating the scenarios using the District's Integrated Resources and Planning Distribution System Model (IRPDSM). The update will also require developing conclusions and recommendations. Once completed, the 2022 Water Supply Reliability Evaluation will be integrated with the District's Energy and Greenhouse Gas Master Plan into an IRWD Climate Action Plan. Staff has negotiated scopes of work and cost estimates with two consulting firms that will work with staff to prepare the 2022 Water Supply Reliability Evaluation. Staff recommends the Board:

- Authorize the General Manager to execute a Professional Services Agreement with DCSE, Inc. in the amount of $194,360 for Project 11799 to update and run the IRPDSM to support the preparation of IRWD's 2022 Water Supply Reliability Evaluation;
- Authorize the General Manager to execute a Professional Services Agreement with HDR Engineering, Inc. in the amount of $316,800 for Project 11799 to prepare the 2022 Water Supply Reliability Evaluation; and
- Authorize an increase to Project 11799 in the amount of $405,000 to the FY 2022-23 Capital Budget.

BACKGROUND:

In 2016, IRWD completed a Water Supply Reliability Evaluation to analyze IRWD's ability to maintain a minimum level of potable water service under reasonably foreseeable hydrologic, system outage and emergency scenarios, or combination of such scenarios. The preparation of the evaluation required rigorous analysis. The 2016 Reliability Evaluation included development of the District's IRPDSM that simulates and optimizes IRWD supplies, storage and demands under various shortage scenarios. The model uses Monte Carlo simulation methods to assess the probabilities, frequencies and durations of independent events that comprise separate scenarios. The model solves for multiple objectives and the optimization of goals such as minimizing shortages or using certain supplies preferentially. The 2016 Reliability Evaluation was completed at a cost of approximately $614,000.

The scenarios modeled in the 2016 Reliability Evaluation involved long-term drought, climate change, regional water treatment and conveyance facility failures or disruptions of service, and environmental restrictions that result in reduced allocations of water supply from the SWP.

Conclusions of 2016 Reliability Evaluation:

The 2016 Water Supply Reliability Evaluation concluded that in various scenarios:

- No future water supply shortages were to be expected given the projections of water supplies available to IRWD;
- Groundwater is an important element of IRWD's potable water supply portfolio;
- IRWD would likely need to rely on "extraordinary supplies" from the IRWD Water Bank to meet projected demands; and
- Various Metropolitan Water District efforts to increase supply and alternative Delta conveyance could reduce reliance on the IRWD Water Bank.

The 2016 Reliability Evaluation recommended that the District periodically update the IRPDSM to incorporate new and updated information for demands, key water resources and associated assumptions.

Need for 2022 Reliability Evaluation:

Since the completion of the 2016 Reliability Evaluation, IRWD water supply and demand estimates have shifted. Local, state and federal water policies to address long-term resiliency and drought are also evolving. Furthermore, supplies are decreasing from the Colorado River and the SWP. A 2022 Water Supply Reliability Evaluation will be prepared to incorporate changed conditions and to evaluate the impacts of various hydrologic, system outage and emergency scenarios. Changes that have occurred since 2016 that may affect IRWD's supply and system reliability include:

- Significant reductions to imported water supplies from the Colorado River and the SWP;
- Uncertainty as to whether the Delta Conveyance Project will be permitted and constructed;
- Proposed development of the Kern Fan Groundwater Storage Project in the Central Valley and participation in the Sites Reservoir Project;
- Updates to Metropolitan's Integrated Resource Plan and corresponding updates to Municipal Water District of Orange County's (MWDOC) water supply reliability projections;
- Recent updates to IRWD's Groundwater Workplan and potential changes to the Orange County Water District (OCWD) Basin Production Percentage;
- Accumulating risks of Delta Levee failures as well as local, regional and state conveyance facility failures due to major earthquakes;

- IRWD service area projects currently under construction or in the planning phase;
- IRWD commitments to other agencies through emergency inter-ties or shared reliability programs;
- Potential development of local and regional potable reuse projects; and
- Foreseeable regional water supply projects to be implemented by Metropolitan.

Ultimately, the results, conclusions and recommendations from the 2022 Reliability Evaluation will be integrated with the results of an ongoing update to IRWD's Energy and Greenhouse Gas Master Plan into a Climate Action Plan for the District.

Consultant Selection Process:

Two separate consultants will be needed to prepare IRWD's 2022 Reliability Evaluation. The IRPDSM is a custom model that was originally developed by DCSE as part of the 2016 evaluation. Because of its unique capabilities, staff proposes that DCSE serve as the modeling consultant that will provide IRPDSM modeling results to a separate consultant that will prepare the 2022 Reliability Evaluation.

Staff issued a request for proposal to various consulting firms to solicit proposals to prepare the 2022 Reliability Evaluation using modeling information provided by DCSE. HDR was the only firm that proposed to conduct the work. Following is an overview of the negotiated scopes of work and cost estimates with DCSE and HDR to work together to prepare the 2022 Reliability Evaluation.

Modeling Scope of Work with DCSE:

To leverage IRWD's previous investment in the IRPDSM, staff recommends using the same modeling approach and tool in the 2022 Reliability Evaluation that was used in the 2016 evaluation. DCSE originally developed the IRPDSM model for Metropolitan and then adapted it for IRWD's use in the 2016 Reliability Evaluation. Accordingly, DCSE is uniquely qualified to update the IRPDSM for the 2022 Reliability Evaluation. Staff negotiated the scope of work and cost estimate with DCSE, summarized in Exhibit "A". The complete scope of work and cost estimate to update and run the IRPDSM for the 2022 Reliability Evaluation is provided as Exhibit "B". Staff believes that DCSE's cost for completing the work, in the amount of $194,360, is appropriate. The amount is within staff's expectation for completing work. Key DCSE tasks include:

- Updating the IRPDSM network schematic to represent changes to IRWD's potable distribution system and demands that have occurred since 2016;
- Collaborating with staff and the consultant selected to prepare the 2022 Reliability Evaluation to develop the supply and demand inputs for the IRPDSM;
- Formulate and perform up to 10 IRPDSM scenario runs and summarize the results and associated reliability curves;

- Conduct a statistical analysis to assess the sensitivity of the results;
- Prepare a modeling-related technical memorandum; and
- Train IRWD staff on the use of the IRPDSM.

2022 Reliability Evaluation Scope of Work with HDR:

In addition to updating and running the IRPDSM model, additional work on the 2022 Reliability Evaluation includes collecting information, updating the supply and demand projections, developing scenarios to reflect changed conditions since 2016, assessing risks and probabilities associated with the scenarios, developing recommendations based on the IRPDSM results and preparing a report. Staff issued an RFP to 11 firms to perform this work. HDR was the only firm to submit a proposal. Staff has negotiated a scope of work and cost estimate for HDR to prepare the 2022 Reliability Evaluation using modeling information to be provided by DCSE. HDR provides the following key strengths to preparing the 2022 evaluation:

- A team with specialized expertise in Colorado River, SWP and Bay-Delta issues;
- Strong relationships with the Department of Water Resources, Metropolitan, MWDOC and the OCWD;
- A thorough understanding of IRWD's water systems and supplies including work on prior studies for IRWD, such as the 2016 Reliability Evaluation and the Sewage Treatment Master Plan;
- Technical expertise in climate change, water banking, water conservation and risk analysis;
- A fresh approach to collaborative thinking, strategic discussions, and conducting project workshops that will be key to reliability scenario development; and
- Previous work and collaboration with modeling consultants at DCSE on the 2016 Reliability Evaluation.

HDR's negotiated scope of work and cost estimate, summarized in Exhibit "C", are reasonable and within staff's expectations. HDR's full scope of work and cost estimate is provided as Exhibit "D".

The total combined cost of DSCE's and HDR's proposed work is $511,160, which is approximately $100,000 less than the cost of the 2016 study and reflects the ability of both firms to leverage prior modeling work and technical expertise. Staff recommends the Board authorize the General Manager to execute a Professional Services Agreement with DCSE in the amount of $194,360 for IRPDSM modeling work and authorize the General Manager to execute a Professional Services Agreement with HDR Engineering, Inc. in the amount of $316,800 to prepare the 2022 Reliability Evaluation.

FISCAL IMPACTS:

The total cost to prepare the 2022 Reliability Evaluation is $566,160 including $50,000 for staff time and $5,000 for legal costs. This cost will be funded by Project 11799, which is included in the FY 2022-23 Capital Budget. Staff recommends a budget increase in the amount of $405,000, as shown below:

Project No.	Current Budget	Addition <Reduction>	Total Budget
11799	$1,470,000	$405,000	$1,875,000

ENVIRONMENTAL COMPLIANCE:

This study is exempt from the California Environmental Quality Act (CEQA) as authorized under the California Code of Regulations, Title 14, Chapter 3, Section 15262, which provides exemption for planning studies.

RECOMMENDATION:

That the Board authorize an increase to the Fiscal Year 2022-23 Capital Budget for Project 11799 in the amount of $405,000 and authorize the General Manager to execute Professional Services Agreements with DCSE in the amount of $194,360 and HDR in the amount of $316,800 to conduct IRWD's 2022 Water Supply Reliability Evaluation.

LIST OF EXHIBITS:

Exhibit "A" – DCSE Proposal Summary
Exhibit "B" – DCSE Scope of Work and Cost Estimate
Exhibit "C" – HDR Proposal and Cost Summary
Exhibit "D" – HDR Scope of Work and Cost Estimate

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Exhibit "A"

Summary of DCSE's Proposal and Costs

Item	Description	DCSE Evaluation		
A	TECHNICAL APPROACH			
1	Understanding of required services/ project details	Excellent. DSCE project team has extensive experience with IRWD's distribution system and has configured the IRPDSM to quantify water reliability concerns at multiple water agencies.		
2	Approach and Methodology	Excellent. DSCE project team developed a detailed scope of work with not only DSCE tasks but with specific roles and responsibilities for HDR and IRWD.		
3	Schedule	Not applicable.		
B	QUALIFICATIONS AND EXPERIENCE			
1	Principal Engineer:	*Ali Diba (PE, PhD, 40 yrs. exp)*		Dr. Diba has worked with over 50 agencies both public and private in the California region in addressing all aspects of data management and systems integration in the GIS environment.
2	Supervising GIS Analyst:	*Haritha Vendra (PE, GISP,MS, 20 yrs. exp)*		Ms. Vendra is an expert in GIS and hydraulic modeling and has analyzed data for more than 60 municipal agencies for data conversion, migration and workflow designs.
3	Senior Software Engineer:	*Ming-Chin Jeng (PE, PhD, 28 yrs. exp)*		Dr. Jeng has developed an integrated resources planning model using both C and Java languages whose core code has been used by numerous water agencies.
4	Project Team Experience:	DCSE project team has forged a strong working relationship with IRWD across a series of complex projects (e.g., demand forecasting tool, numerous hydraulic models, GIS data conversion and maintenance). In addition, the project team is comprised of the original developers of the first IRPDSM, built for the Metropolitan Water District of Southern California in 1998, and adapted for IRWD in 2016.		
5	Firm's Relevant Experience:	DCSE has extensive experience in water resources planning and engineering and the incorporation of computer technology into this process. The firm has developed integrated resources planning and management models, GIS-based water supply master plans and decision support systems for numerous water agencies.		
C	SCOPE OF WORK			
	TASK		Task Hours	FEE
1	Assist IRWD with IRPDSM Introduction to Potential Consultants		16	$3,760
2	Update IRPDSM Schematic representing IRWD water transmission system		160	$33,440
3	Collaborate with Selected Consultant to Prepare input (Supply & Demand) for IRPDSM model		124	$25,920
4	Formulate disruption scenarios into up to 10 IRPDSM scenarios		168	$34,000
5	Perform up to 10 IRPDSM scenario runs		164	$32,440
6	Evaluate IRPDSM results and create supply sources reliability curves		92	$19,040
7	Prepare Statistical Analysis of Potable Water Supply Sources		36	$7,120
8	Prepare TM summarizing model results for each scenario using the SQL Server database spreadsheet tooland the Statistical Analysis results.		136	$24,080
9	Provide training to IRWD staff		72	$14,560
10	SUB-TOTAL ENGINEERING SERVICES, FEES (Does Not Include Optional Items)		**968**	**$194,360**
11	Optional Items			
12	TOTAL ENGINEERING SERVICES, FEE		**968**	**$194,360**
13	Avg $/hr. (Does not include optional tasks)			$201
D	OTHER			
1	**Miscellaneous Items**			
2	Multiplier		None	
3	Conflict of Interest		No	
4	Joint Venture		No	
5	Scope of Work Exclusions		No	
6	Exceptions taken to IRWD Std. Contract		No	
7	Insurance (Professional & General Liability)		Yes	

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Irvine Ranch Water District

IRWD IRPDSM Reliability Model Update

August 3, 2022

Introduction

DCSE developed IRWD's Integrated Resources and Planning Distribution System Model (IRPDSM) reliability model (Model) as part of IRWD's 2016 Water Supply Reliability Evaluation. The model was used to identify areas of IRWD potable system expected to incur water supply shortages based on estimated future demands and a series of water supply scenarios. IRPDSM is based on a combination of Monte Carlo simulations used to derive probabilities and multi-objective optimization of achieving planning goals such as minimizing shortage or using preferred supplies. IRWD intends to update the 2016 Water Supply Reliability Evaluation in light of supply, demand, and system infrastructure changes since 2016. The following scope of work and cost estimate document the approach and necessary resources required to update the IRPDSM as a component of updating IRWD's reliability study.

Approach

The following input is required to run IRPDSM:

- Distribution System Configuration - This defines the elements of the model, including supplies, demands, surface and groundwater storage, transmission and distribution facilities, and their associated configuration. The system configuration also includes the operational rules of the system, if any. The existing system configuration of the model will be reviewed against IRWD's latest hydraulic model configuration to update the distribution system configuration.
- Supply Data – The supply data for IRWD is comprised of different sources, including imported water, local groundwater, and groundwater banking. Supply data for IRWD is tied to the supply data from MWDOC (for the imported water) and Orange County Water District (for the local groundwater).
- Demand Data – Water demand data at the IRPDSM nodes. This data is typically linked to the adjusted demands in the IRWD's Demand Forecasting Tool (DFT). A Demand Adjustment Tool (DAT) was developed in the 2016 study to perform these adjustments.
- Scenario Configuration – Scenario configuration configures a model run by combining a system configuration, supply, and demand data.

Another goal of this project is to set up the model and train the IRWD staff to conduct their own modeling analyses.

Tasks

Task 1 - Assist IRWD with IRPDSM Introduction to Potential Consultants

The purpose of this task is to prepare and provide a presentation to potential IRWD consultants that will be conducting the reliability study. This presentation aims to provide sufficient background on the modeling aspect of the reliability study so that the consultants can estimate the level of work necessary to prepare the input data and analyze the model results.

Assumptions: *None*

District Responsibility: *Review draft presentation. Coordinate the consultant meeting.*

Deliverables: *Prepare draft and final presentation on IRPDSM, including showing sample input and results from IRPDSM.*

Task 2 - Update IRPDSM Schematic representing the IRWD water transmission system

This task aims to review and update the schematic representation of the IRWD's system to reflect the changes since the 2016 study. DCSE will also review the IRWD's Demand Forecasting Tool (DFT) and Demand Adjustment Tool (DAT) to verify and update the mappings of the IRPDSM demand model nodes and those of the DAT. DCSE will also review the latest hydraulic model from IRWD to update the IRPDSM model nodes and connectivity. The proposed subtask are:

Task 2.1: Update the schematic to include new/future infrastructures (Compare with the Latest Hydraulic Model).

Task 2.2: Update Demand/Supply nodes restrictions.

Task 2.3: Update transmission capacities.

Task 2.4: Update model run objectives.

Assumptions: *None*

District Responsibility: *Provide the latest hydraulic, DFT, and DAT models. Assist by responding to project team questions related to the IRPDSM model configuration.*

Deliverables: *IRPDSM model demand nodes setup.*

Task 3 - Collaborate with Selected Consultant to Prepare input (Supply & Demand) for the IRPDSM model

This task covers collaborating with the selected consultant to prepare supply and demand data for IRPDSM. The selected consultant will be responsible, in coordination with IRWD, for providing DCSE with updated supply and demand data. DCSE will assist the consultant in setup and verifying the supply and demand data for the cases and scenarios identified by IRWD and the selected consultant. The proposed subtask are:

Task 3.1: Review Objectives and Propose Configuration on Schematic.

Task 3.2: Review Objectives and Propose Configuration on Supply, Demand, and Timings.

Assumptions: *Selected Consultants and IRWD will identify the scenarios to be evaluated by*

IRPDSM.

District Responsibility: *Participate in defining the supply and demand scenarios. IRWD and selected consultant to provide updated supply and demand data.*

Deliverables: *IRPDSM model supply and demand nodes setup.*

Task 4 - Formulate disruption scenarios into up to ten IRPDSM scenarios

This task covers the formulation of up to ten IRPDSM scenarios identified by IRWD and the selected consultant. This includes the model input, structure, demand, and supply scenarios. The task includes setting up and verification of the input data. The proposed subtask are:

Task 4.1: Formulate Structural Disruptions.

Task 4.2: Formulate Supply Disruptions.

Task 4.3: Formulate Other User-Defined Constraints.

Assumptions: *Selected Consultants and IRWD will identify the scenarios to be evaluated by IRPDSM.*

District Responsibility: *Identify the scenarios to be evaluated.*

Deliverables: *IRPDSM model input for up to ten scenarios.*

Task 5 - Perform up to ten IRPDSM scenario runs

This task covers the running of up to ten IRPDSM scenarios based on input data prepared in Task 4. The model runs will be monitored and the results collected and saved for further evaluation in Task 6. The proposed subtask are:

Task 5.1: Utilize Water Demand Forecasting (WDF) model water demands for IRWD through 2045.

Task 5.2: Utilize the un-adjusted demands to calculate an updated Basin Production Percentage (BPP) and corresponding OCWD supply available to IRWD for each year of the Model runs.

Task 5.3: Update the supply and demand inputs for every Model scenario.

Task 5.4: Run all model scenarios using the updated schematic, demand, and supply data.

Task 5.5: Summarize model results for each scenario.

Assumptions: *Selected Consultants and IRWD will identify the scenarios to be evaluated by IRPDSM.*

District Responsibility: *Identify the scenarios to be evaluated.*

Deliverables*:* IRPDSM model results for up to ten scenarios. The results will be documented and presented using Microsoft Excel.

Task 6 - Evaluate IRPDSM results and create supply sources reliability curves

This task covers evaluating the results and the creation of supply-demand reliability curves for each run based on the ten IRPDSM scenarios prepared in Tasks 4 and 5. The reliability curves will be checked against the input data, and any anomalies will be identified. The draft results will be shared with IRWD and the selected consultant. The proposed subtask are:

Task 6.1: Develop and configure Excel charts.

Task 6.2: Dynamic Data Connection from Excel to SQL Server DB.

Assumptions: *None*

District Responsibility: *None.*

Deliverables: *IRPDSM model results for up to ten scenarios shared with the selected consultant. The results will be shared using Microsoft Excel.*

Task 7 – Statistical Analysis of Potable Water Supply Sources

This task will perform additional statistical analysis on the model results to identify the range of each water supply source's contribution to meeting the simulated demands DCSE will use monthly supply results to calculate the annual supply for each year and trials for up to 10 selected supply sources. DCSE will perform statistical analysis to identify the Maximum, Mean, Minimum, and 95th Percentile of each supply source for all trials. The results will be tabulated and graphed for up to 10 scenarios. The proposed subtask are:

Task 7.1: Calculate annual supplies for each of the 25 years, for each of the 94 trials for all supply sources

Task 7.2: Perform statistical analysis for each of the 25 years

Assumptions: *None*

District Responsibility: *The district identifies the supply sources and scenarios to be used for the statistical analysis.*

Deliverables: *Statistical analysis, tabulations, and graphs for up to 10 supply sources and four scenarios*

Task 8 – Prepare a Technical Memorandum that summarizes model results for each scenario using the SQL Server database spreadsheet tool and the results of the Statistical Analysis.

This task intends to summarize and document the scenario modeling and statistical analysis results in a Technical Memorandum. It will also include the MS Excel result files for incorporation into the selected consultant's overall water reliability study project report. DCSE will provide a draft and final version of the Technical Memorandum and excel files after incorporating comments from IRWD and the selected consultant. The proposed subtask are:

Task 8.1: Prepare a draft report.

Task 8.2: Prepare the final report.

Assumptions: *None*

District Responsibility: *Selected Consultant and District to provide comments on the Draft Report.*

Deliverables: *Summarization of the model results, statistical analysis, draft, and final Technical Memorandum. MS Excel files contain the model output.*

Task 9 - Provide training to IRWD staff

This task intends to set up the model on two desktop environments with a shared database at IRWD. Once the model is set up, hands-on training sessions will be provided to designated IRWD staff. The training will review some of the modeled scenarios as sample runs. The training will provide IRWD with sufficient understanding to adjust the model, re-run scenarios, or create new scenarios with updated datasets. DCSE also will provide a user training guidebook to IRWD. The proposed subtask are:

Task 9.1: Prepare training material.

Task 9.2: Conduct on-site training.

Assumptions: *None*

District Responsibility: *The district identifies the individuals to be trained. District to provide MS SQL Server access to host the IRPDSM database. District to assist with the installation of the system on two desktops.*

Deliverables: *Installation, testing, and training of the IRWD project team and a user training guidebook.*

Project Cost

The labor rates used to estimate the cost are approved in the 2020 GIS On-Call Support contract.

DCSE Labor Rates

Labor Classifications	Labor Rates ($/hr.)
Principal Engineer	$260
Supervising GIS Analyst	$210
Sr. Software Engineer	$170
Technical Writer	$100

The table on the following page shows project costs broken down at the sub-task level. A cost estimate of $6,000 per average scenario run is also provided.

Tasks	Project Manager $260	Supervising Engineer $210	Sr. Software Engineer $170	Technical Writer $100	Hours	Cost
Task 1 - Assist IRWD with IRPDSM Introduction to Potential Consultants	**8**	**8**			**16**	**$3,760**
Task 2 - Update IRPDSM Schematic representing IRWD water transmission system	**48**	**48**	**64**	**0**	**160**	**$33,440**
Task 2.1 – Update the schematic to include new/future infrastructures (Compare with the Latest Hydraulic Model)	*16*	*16*	*24*		*56*	*$11,600*
Task 2.2 – Update Demand/Supply nodes restrictions	*8*	*8*	*12*		*28*	*$5,800*
Task 2.3 – Update transmission capacities	*8*	*8*	*12*		*28*	*$5,800*
Task 2.4 – Update model run objectives	*16*	*16*	*16*		*48*	*$10,240*
Task 3 - Collaborate with Selected Consultant to Prepare input (Supply & Demand) for IRPDSM model	**36**	**40**	**48**	**0**	**124**	**$25,920**
Task 3.1 – Review Objectives and Propose Configuration on Schematic	*12*	*16*	*16*		*44*	*$9,200*
Task 3.2 – Review Objectives and Propose Configuration on Supply, Demand, and Timings	*24*	*24*	*32*		*80*	*$16,720*
Task 4 - Formulate disruption scenarios into up to 10 IRPDSM scenarios	**32**	**64**	**72**	**0**	**168**	**$34,000**
Task 4.1 – Formulate Structural Disruptions	*8*	*16*	*20*		*44*	*$8,840*
Task 4.2 – Formulate Supply Disruptions	*8*	*16*	*20*		*44*	*$8,840*
Task 4.3 – Formulate Other User-Defined Constraints	*16*	*32*	*32*		*80*	*$16,320*
Task 5 - Perform up to 10 IRPDSM scenario runs	**24**	**60**	**80**	**0**	**164**	**$32,440**
Task 5.1 - Utilize Water Demand Forecasting (WDF) model water demands for IRWD through year 2045	*4*	*8*	*12*		*24*	*$4,760*
Task 5.2 - Utilize the un-adjusted demands to calculate an updated Basin Production Percentage (BPP) and corresponding OCWD supply available to IRWD for each year of the Model runs	*8*	*8*	*12*		*28*	*$5,800*
Task 5.3 - Update the supply and demand inputs for every Model scenario	*4*	*16*	*32*		*52*	*$9,840*
Task 5.4 - Run all model scenarios using the updated schematic, demand and supply data	*4*	*16*	*12*		*32*	*$6,440*
Task 5.5 - Summarize model results for each scenario	*4*	*12*	*12*		*28*	*$5,600*
Task 6 - Evaluate IRPDSM results and create supply sources reliability curves	**20**	**40**	**32**	**0**	**92**	**$19,040**
Task 6.1 - Develop and Configure Excel Charts	*10*	*20*	*16*		*46*	*$9,520*
Task 6.2 - Dynamic Data Connection from Excel to SQL Server DB	*10*	*20*	*16*		*46*	*$9,520*
Task 7 -Statistical Analysis of Potable Water Supply Sources	**4**	**16**	**16**	**0**	**36**	**$7,120**
Task 7.1 – Calculate annual supplies for each of the 25 years, for each of the 94 trials for all supply sources	*2*	*8*	*8*		*18*	*$3,560*
Task 7.2 – Perform statistical analysis for each of the 25 years	*2*	*8*	*8*		*18*	*$3,560*
Task 8 - Prepare a Technical Memorandum that summarizes model results for each scenario using the SQL Server database spreadsheet tool, and the results of the Statistical Analysis.	**24**	**40**	**32**	**40**	**136**	**$24,080**
Task 8.1 – Prepare draft report	*16*	*32*	*24*	*32*	*104*	*$18,160*
Task 8.2 – Prepare the final report	*8*	*8*	*8*	*8*	*32*	*$5,920*
Task 9 - Provide training to IRWD staff	**8**	**40**	**24**	**0**	**72**	**$14,560**
Task 9.1 – Prepare training material	*2*	*16*	*16*		*34*	*$6,600*
Task 9.2 – Conduct on-site training	*6*	*24*	*8*		*38*	*$7,960*
Total	**204**	**356**	**368**	**40**	**968**	**$194,360**

**** Average Cost per Scenario for Tasks 5-7 is $6,000.***

Project Duration

The duration of this project will be estimated once the overall project is defined and scheduled. The schedule may be revised based on findings in the kick-off meeting, availability of IRWD staff, time to formulate the different scenarios, and other project requirements.

Exhibit "C"

Summary of HDR's Proposal and Costs

Item	Description	HDR Evaluation		
A	TECHNICAL APPROACH			
1	Adherence to RFP Requirements	Met requirements.		
2	Understanding of required services/ project details	Excellent. Demonstrated strong and thorough understanding.		
3	Approach and Methodology	Excellent. Comprehensive approach and strong technical expertise.		
4	Schedule	Very Good. Meets requested timeframe.		
B	QUALIFICATIONS AND EXPERIENCE			
1	Project Manager :	*Leanne Hammond (PE, ENV SP, BS, 20 yrs. exp)*	Ms. Hammond has managed many large-scale planning projects over the last decade.	
2	Principal-in-Charge:	*Amy Omae (PE, LEED AP, MS, 18 yrs. exp)*	Ms. Omae has worked with IRWD for over a decade and managed development of IRWD's Sewage Treatment Master Plan and the Recycled Water Salt Management Plan.	
3	Technical Leads:	*Chris Behr (LEED AP, MS, 28 yrs. exp) Risk/Statistical Analysis*	Each technical lead provides deep experience (ranging from 16 to 42 years) and expertise in complicated policy, science, and engineering issues that inform inputs to the IRPDSM.	
		Yu Jung Chang (PhD, 38 yrs. exp) Water Quality Vulnerability		
		Blaine Dwyer (PE, MS, 42 years exp) Colorado River		
		Joey Engleson (PhD, 19 yrs. exp) Hydraulic Modeling		
		Gregorio Estrada (PE, LEED AP, BS, 16 yrs. exp) QA/QC		
		Jafar Faghih (PE, MS, 23 yrs. exp) Demand and Supply Inputs		
		Steve Friedman (PE, PhD., 20 yrs. exp) MWD, Groundwater		
		Jeff Hanson (PE, MS, 24 yrs. exp) Water Conservation		
		Les Harder (PE, GE, PhD, 30 yrs. exp) Bay Delta Vulnerability		
		Mike McMahon (ENV SP, BS, 37 years exp) Climate Change		
		Kristi Shaw (PE, ENV SP, MS, 26 yrs. exp) Water Banking		
		Ed Winkler (PE, MS, 38 yrs. exp) State Water Project		
4	Project Team Experience:	HDR project team has the technical, public policy, planning, and facilitation expertise and experience needed for the Reliability Evaluation Update.		
5	Firm's Relevant Experience:	Having worked with IRWD for the past 16 years and delivered 35 projects, HDR has strong institutional knowledge and understanding of working with IRWD.		
C	SCOPE OF WORK			
	TASK		Task Hours	FEE
1	Project Management and Meetings		262	$67,000
2	Develop Demand Input		76	$18,700
3	Develop Existing and Future Supply Input		110	$29,400
4	Develop Scenarios for Supply System Disruption or Constraint		170	$45,300
5	Water Supply and System Requirements Analysis and Report		144	$35,800
6	Preliminary Evaluation Update Recommendations		52	$14,000
7	Final Evaluation Update Recommendations		72	$19,300
8	Deliverables		374	$87,300
9	SUB-TOTAL ENGINEERING SERVICES, FEES (Does Not Include Optional Items)		**1,260**	**$316,800**
10	Optional Items			
11	TOTAL ENGINEERING SERVICES, FEE		**1,260**	**$316,800**
12	Avg $/hr. (Does not include optional tasks)			$251
D	OTHER			
1	**Miscellaneous Items**			
2	Multiplier			2.5%
3	Conflict of Interest			No
4	Joint Venture			No
5	Scope of Work Exclusions			No
6	Exceptions taken to IRWD Std. Contract			No
7	Insurance (Professional & General Liability)			Yes

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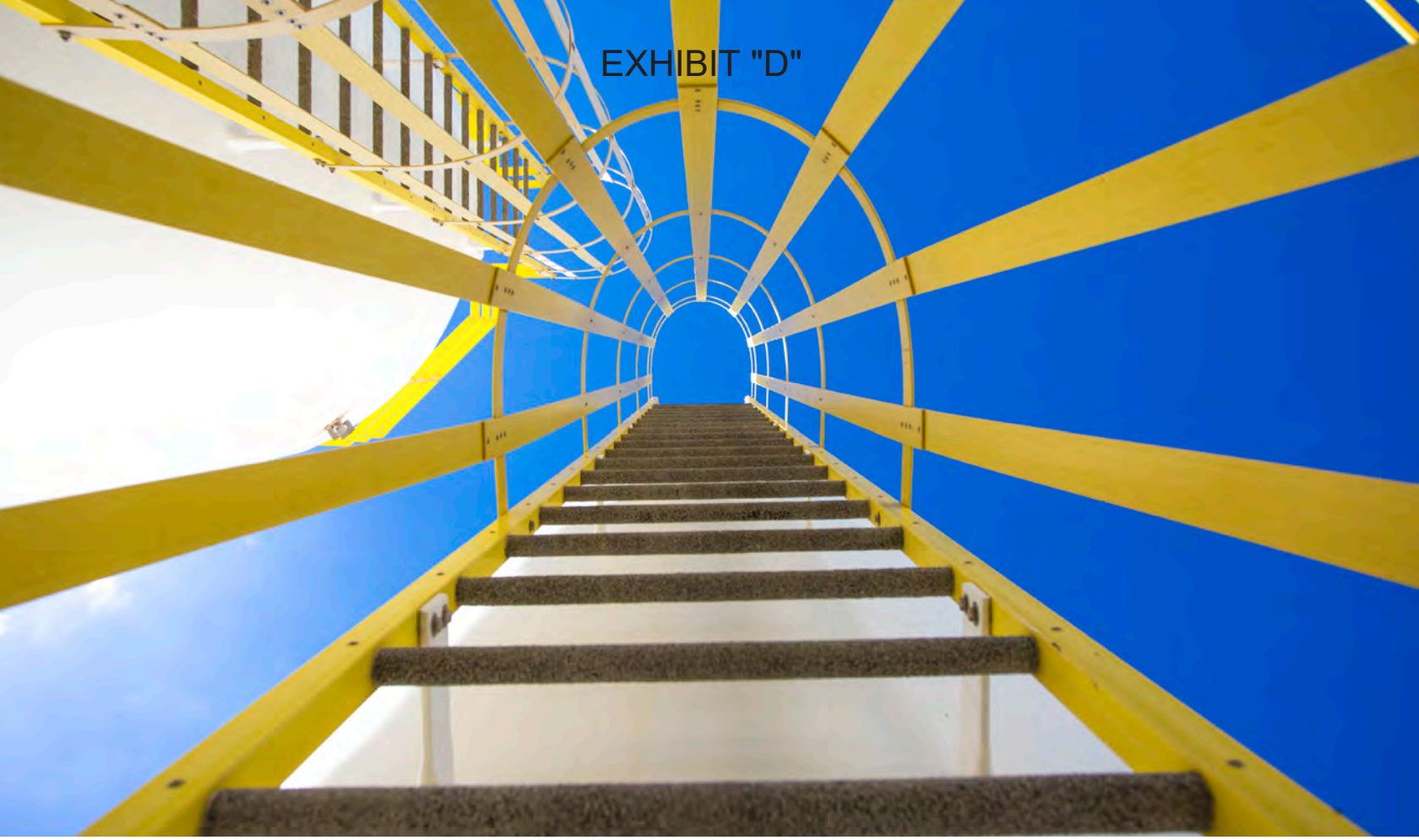
EXHIBIT "D"



Irvine Ranch WATER DISTRICT

Proposal

Water Supply Reliability Evaluation Update

Irvine, California

September 21, 2022

I Cover Letter

September 21, 2022

Irvine Ranch Water District
Robert Huang, Project Manager
15600 Sand Canyon Avenue
Irvine, CA, 92618

RE: Request for Proposal - Water Supply Reliability Evaluation Update

Dear Mr. Huang and Members of the Selection Committee,

Thank you for inviting HDR Engineering, Inc. (HDR) to propose on your Water Supply Reliability Evaluation Update Project. We are excited about this opportunity and have met with your staff over the course of the last year to fully understand your goals for this project. This project is important because changes in local and regional water supply sources, as well as new Irvine Ranch Water District (District) facilities and emerging climate change impacts, warrant an updated perspective in managing your water supply system. Similar to the previous study, we understand that the District desires an updated understanding of how current and projected conditions, such as imported water supply shortages, climate change, facility outages and emergencies, affect water supply and to develop a plan for assessing water supply reliability and risk.

The HDR team has a long history of successfully working with the District on many critical issues. We have assembled a multi-disciplinary team, bringing history and knowledge from working on the previous study, that will deliver in-depth and defensible water resiliency planning documents and risk analyses. Selecting HDR will provide the District the following key benefits to deliver your project goals:

Leadership to Deliver Innovative Water Reliability - HDR's project manager, Leanne Hammond, PE, brings proven success in water planning and supply assessment studies in southern California. Her experience will provide the District insight to local and regional water supply issues.

District Experienced Team - The HDR Team includes Amy Omae, Gregorio Estrada, Steve Friedman, Joel Engleson and others who have worked on many District projects; we will leverage their knowledge of District operations and future planned facilities to drive innovative ideas.

Specialized Resources - HDR's team of experts include Ed Winkler, formerly with CA DWR, who will address State Water Project and Bay Delta vulnerabilities; Mike McMahon, HDR's very own expert in climate change, Blaine Dwyer for Colorado River strategies, and Kristi Shaw who is our National Groundwater Banking and Augmentation Lead. These experts offer the most up-to-date technical (and political) knowledge to the District.

Relationships - Our relationships and past work with the regional water agencies, including Metropolitan Water District, Orange County Water District, Municipal Water District of Orange County, DWR and the Colorado River Basin, bring insight to regional vulnerabilities that may affect your system. We will leverage these relationships to obtain their most current resiliency planning ideas and test those ideas and assumptions against our own expertise and modeling results.

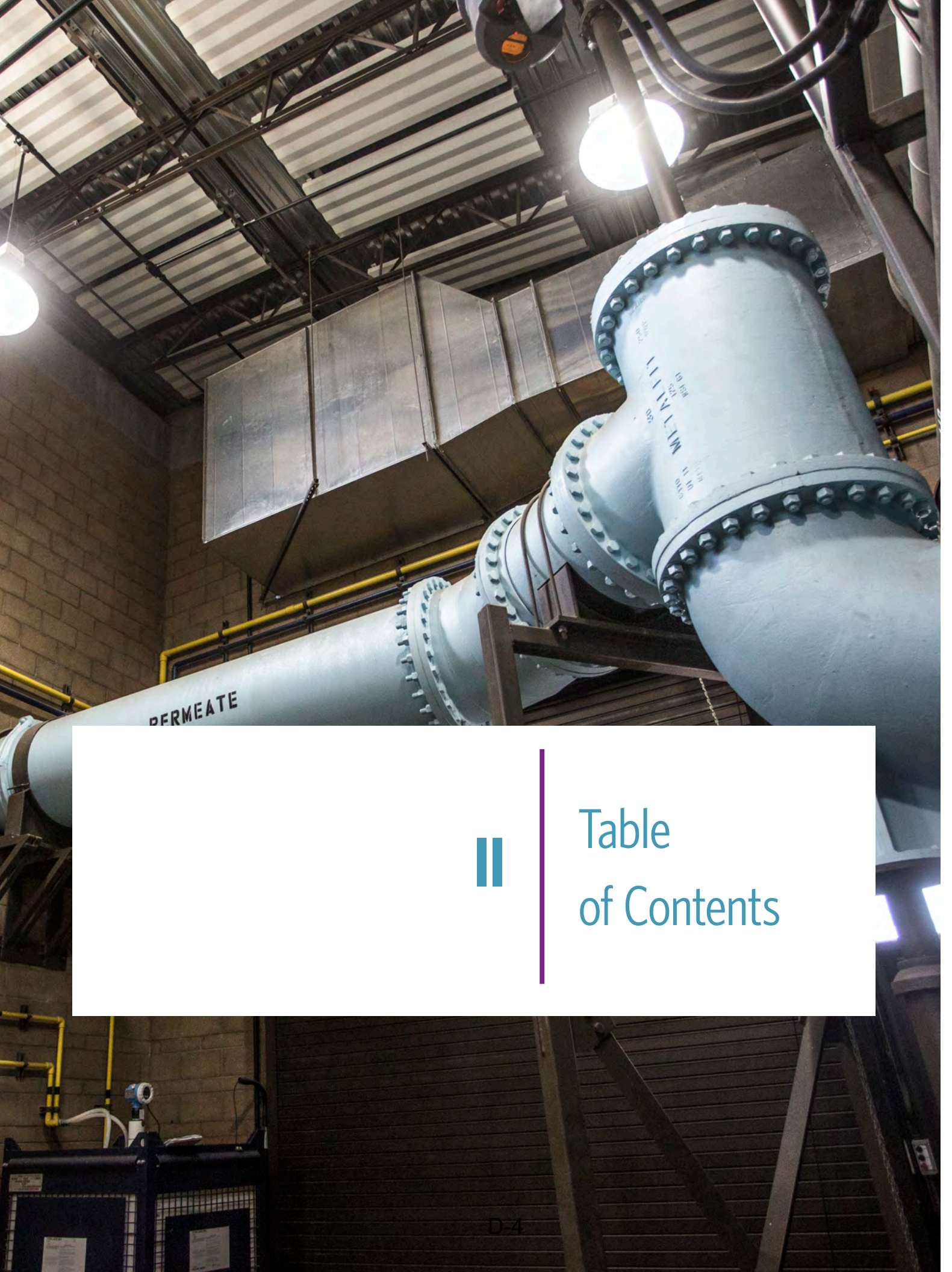
Thank you for inviting us to propose on this project. HDR has been partnering with the District for many years bringing knowledge of your systems and successful project delivery, and we are excited for the opportunity to collaborate and partner with you. Leanne and her team have the full support of HDR and our personal commitment that we will deliver a successful project that will evaluate and analyze various impacts to projected water demands through to serve the District for years to come in maintaining minimum service levels through drought and emergency scenarios. Please contact Leanne Hammond at 858.712.8203 or Leanne.Hammond@hdrinc.com if you have any questions regarding our proposal.

Sincerely,
HDR Engineering, Inc.

Leanne Hammond, PE, ENV SP
Project Manager

Anna Lantin, PE
Vice President

hdrinc.com 3230 El Camino Real, Suite 200, Irvine, California 92618-1137
T 714.230.2300



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Section 1

Scope of Work

PROJECT UNDERSTANDING

Irvine Ranch Water District (District or IRWD) has taken a diligent approach to developing a reliable and resilient water supply system to serve its growing community and provide sufficient supply under normal operating conditions through buildout. The 2016 Water Supply Reliability Study identified a variety of drought and emergency scenarios that could impact the District's ability to deliver water to its customers and, subsequently, put into place a prioritized portfolio of sound and cost-effective responses.

This Water Supply Reliability Evaluation Update (Evaluation Update) will reanalyze and improve upon the District's 2016 Water Reliability Study, focusing on the District's ability to maintain a minimum level of service under various emergency scenarios that include multiple outages occurring simultaneously, based on a rigorous and transparent probability of risk analysis. Changing conditions suggest a potential for emergency conditions could be more severe than historic data could predict, and changes in the regional water supply landscape have evolved, suggesting that an update to the 2016 Study is warranted. With recent findings in climate change research and the projected reliability of imported water sources, including conservation mandates from the Colorado River, the District is reassessing their definition of risk and level of service expectations, and developing improved and robust mitigation strategies. This analysis will provide sufficient documentation to justify future operational and capital water reliability improvements, and investments, from both a local and regional perspective.

HDR has a thorough understanding of the challenges facing Evaluation Update and has developed a winning approach to help District meet the objectives of the project. **Table 1** below presents our understanding of the key challenges or issues that will be addressed by this project. Our approach provides the District with a fresh perspective to the project while addressing issues with innovative solutions.

PROJECT APPROACH

We believe that the workshop elements of the project are critical to meeting IRWD's goal of a robust and scientifically based assessment of risk and the development of cost- effective mitigation recommendations. To achieve buy-in, these workshops will be facilitated by our Project Manager, Leanne Hammond, and include presentations and discussion with our technical experts. These workshops will serve to provide IRWD decision makers with a fresh understanding of the overlying complexities of water supply risks, and to elicit their input on establishing level of service goals under a variety of supply and demand conditions.

Table 1 below presents our understanding and approach to helping IRWD develop a robust Evaluation Update. We have highlighted the benefit of choosing HDR to address these challenges.

Table 1: HDR's understanding of the key issues surrounding the Water Reliability Project.

PROJECT CHALLENGE	HDR'S APPROACH	BENEFIT TO IRWD
To maintain a minimum level of water supply to provide system reliability during various drought and emergency scenarios or combination of scenarios	Develop robust, scientifically defensible planning documents and modeling tools to predict water shortages and develop solutions to optimize investments and minimize risk.	HDR has assembled a multi-disciplinary team that will deliver in-depth and scientifically defensible water resiliency planning documents and risk analyses. Our proven experience in water reliability planning are critical to developing cost- effective solutions for IRWD.
To understand and mitigate impacts of regional and local water supply vulnerabilities on District supply scenarios	Re-evaluate IRWD's supply reliability through a collaborative approach, capturing District staff knowledge of their system and desired levels of service during single or multiple water shortage scenarios and enhancing that knowledge with technical expert experience and recommendations	Our workshops will include District decision makers and HDR experts to develop a comprehensive understanding of system vulnerabilities, and minimum level of service criteria for a variety of shortage scenarios. This collaborative approach creates buy in among your decision makers regarding service levels and prioritization of investment strategies. The workshops also provide the opportunity to examine supply priorities and present alternative solutions for mitigating potential shortages.
To support evaluation tools that will continue to help the District address evolving water shortage scenarios for years to come.	Coordinate updated demand and supply inputs with the scenario model developed under the 2016 Water Reliability Study to provide a new analysis that incorporates hydraulic constraints in delivering water supply to the District and its users under multiple demand input scenarios.	The Integrated Resource Planning Distribution System Model is a comprehensive tool that simulates and optimizes delivery and storage of imported water specifically through Metropolitan Water District's system. HDR will develop new demand forecast and water supply scenarios to be used as inputs to the model while developing solutions to water shortage scenarios based on model data.

A successful approach to the Evaluation Update requires: 1) an in-depth understanding of IRWD's water supply availability and demands under a variety of conditions; 2) an ability to evaluate the parameters of risk associated with those conditions; 3) the comprehension of data from the reliability model that simulates the risk and assesses the probability of supply shortages; and 4) innovative thinking in proposing solutions to offset potential shortfall scenarios.

The HDR Team will develop a comprehensive reliability study that evaluates three categories of variables:

- **Demand Variables:** Changes in demand may be based on land use development, population growth, and economic conditions; water conservation programs; climate change; rate sensitivity; and/or mandatory cutbacks.
- **Supply Variables:** Changes in supply may be based on drought; water quality issues; and/or policy changes in water management throughout the state of California and across the Colorado River Lower Basin. Supplies will incorporate changes in imported water from MWDOC, including SWP, interagency agreements, and any recent facility improvements.
- **Transmission Variables:** Changes in infrastructure's ability to deliver supply may be based on routine shut down of facilities for maintenance; and/or disruption of service for varying lengths of time due to earthquakes or other natural disasters.

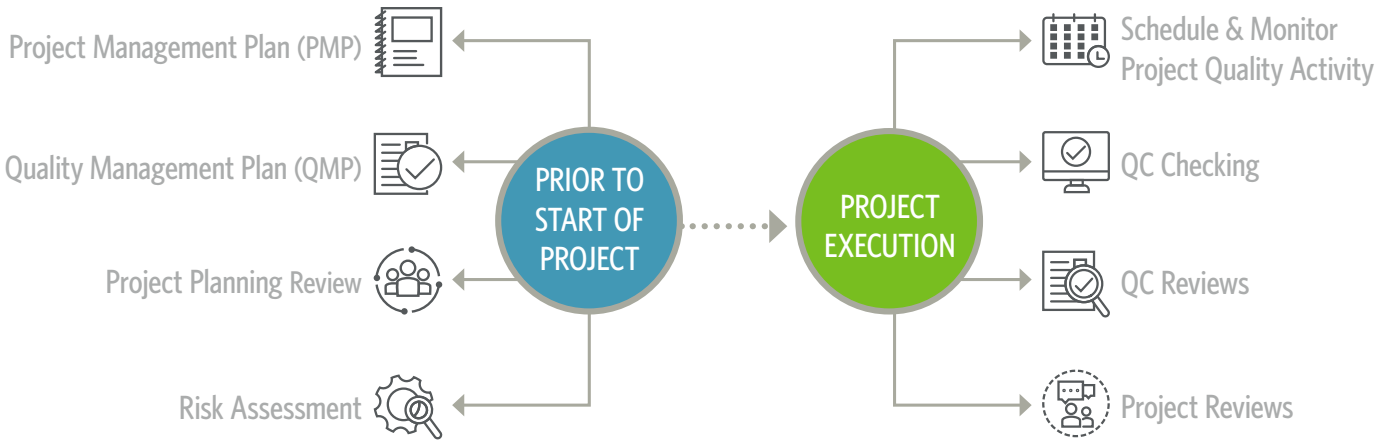
We will coordinate with findings from the District's reliability assessment model, which optimized imported water delivery and storage for Metropolitan Water District (MWD), to analyze water reliability for IRWD. We will rely on the statistical analysis developed in the Municipal Water District of Orange County's (MWDOC) Water Reliability Study to enhance the input data used to evaluate reliability, and also use HDR's local and regional experts on the State Water Project, Colorado River water supply, climatology, water banking, demand forecasting, water conservation, risk assessment and sustainable return on investment. They will provide input into developing the reliability scenarios and risk parameters, which will be provided to the District's modeling consultant for model analysis. We will leverage our local knowledge with national expertise to develop risk assessment scenarios and generate innovative solutions.

QUALITY CONTROL & ASSURANCE

Our expectation is to set the industry benchmark for excellence in services we provide to our clients. We accomplish this through work well done, staying true to purpose, and exercising discipline. It is our policy to consistently provide professional services that satisfy statutory and regulatory requirements that meet or exceed your expectations. To achieve quality in our work, we have developed a Quality Management System (QMS) that provides an important framework for ensuring that we are reaching the highest levels of quality—both for you and for ourselves. We remain focused on continual opportunities for improvement throughout our daily activities to achieve client satisfaction and meet performance expectations.

Our rigorous Quality Assurance and Quality Control (QA/QC) process builds quality into every step pf the plan. **Gregorio Estrada** will serve as QA/QC lead. Gregorio has an extensive background in facility planning and plant design in California, and has been at HDR more than 20 years.

Our QA/QC Plan will be incorporated into the PMP and presented at the kick-off meeting. Implementation of the plan will be documented throughout the project. The QA/QC Program promotes prevention rather than detection, and being proactive rather that reactive. This project-specific approach begins even before the project is awarded. Project reviews begin during project initiation at 0% complete and is continuous throughout the project. This QA/QC program involves the preparation of project guides that monitor communications, project fling, reviews, delivery of documents, document productions standards, and project close-out.



SCOPE OF WORK

Based on our understanding of the project, we have developed a detailed scope of work for the preparation of the Evaluation Update. The following tasks describe our proposed approach to executing the project. The following sections of this scope of work describe the proposed model in great detail. We are confident the Evaluation Update will address all the objectives set forth by IRWD in this RFP and will provide additional functionality that will benefit both the planners and operators of the system.

Task 1 - Project Management & Meetings

HDR recognizes the importance of customizing and implementing a strong project management approach led by experienced project managers. Leanne Hammond has managed dozens of large scale planning projects in the past decade. She brings a strong sense of teamwork and the ability to recognize and expediently solve project challenges. Communication is a critical component of her management style and she will work closely with IRWD staff in implementing this project in accordance with your schedule and budget. Regular telephone and email communications will be supplemented with periodic team meetings to provide status updates, discuss and resolve project issues and verify that the study is on schedule.

We believe that the facilitation of the Project Workshops is a critically important element of this project. Through collaborative thinking and strategic discussion, we will capture innovative and fresh approaches to water reliability planning for IRWD. We believe that the best value of these workshops is in gathering your staff, decision makers and stakeholders to define the District's anticipated level of service under different durations and magnitudes of failure and potential mitigation measures, which will guide the development of the scenarios to be modeled. In order to do that, the participants will need a full understanding of the water demands within the District, and the risk elements associated with IRWD's current supply portfolio.

Our proposed approach is to include the two 4-hour workshops at the onset of the Scenario Planning task (Task 4). These workshops will be held on two separate half-days to allow for attendees to digest the information, and for HDR staff to assimilate information elicited from the group. We will work with District staff to identify attendees from both within the District and from other agencies, such as MWD or the Municipal Water District of Orange County (MWDOC), if their input is deemed beneficial to the discussion. The Scenario Planning Workshop will include presentations and discussion with our technical experts.

At the first workshop, we will present water demand and supply characteristics developed in Tasks 2 and 3 (Demand and Supply Input), discuss existing documentation and proposed updates to this information and facilitate initial discussion on the reliability factors that could impact the Evaluation Update scenarios. This is where our technical experts will prove their value. As discussed in much more detail in our Task 4 approach, HDR's experts bring a thorough understanding of the vulnerabilities associated with each of the supply and demand elements within IRWD's tool box. They offer a fresh perspective from outside of the regional planning arena, and an opportunity to vet the assumptions and analyses conducted by MWD, MWDOC and other regional planning agencies. In addition to being able to understand and articulate the risk factors, they also offer solutions to mitigating these risk factors.

At the second workshop, we will facilitate the development of the scenarios to be modeled, building from the scenarios presented in MWDOC's draft Water Reliability Study. Building on the information provided in the first workshop, the workshop will elicit level of service goals, as well as the key parameters and variables that the attendees agree will define the scenarios to be assessed in the model. While we can't anticipate all risk factors for every scenario, in collaboration with the Workshop attendees, we can use our expert evaluation of the system and demands to efficiently define and evaluate the risks with the largest exposure. There could likely be several levels of failure in terms of magnitude and duration of loss. For each type of failure, we would discuss how such a failure could occur and what mitigating

Where Have We Done This?

Through successful collaboration developed via project workshops with LBWD, all stakeholder perspectives and desired goals were reviewed to achieve consensus and, most importantly, gain buy-in across invested parties.

measures can be taken to offset the potential water shortage. There are a multitude of potential mitigation measures, so the order of implementation would also need to be prioritized. At the conclusion of this workshop, the HDR team will be able to move forward with a fully vetted list of scenarios to model in Task 5. We propose using the second workshop to outline probability of occurrence scenarios, which will be further developed and reviewed in a follow up meeting with IRWD.

The Scenario Planning Workshop is an extraordinary effort that will take close coordination with IRWD staff to be successful. Leanne Hammond's experience in organizing Workshops for the Long Beach Water Department Water Supply Optimization Study, which set the foundation for the Department's groundwater program and well development schedule, will be invaluable in bringing technical resources together with utility staff, decision makers and stakeholders, and eliciting valuable discussion and consensus.

And finally, as part of our Project Management task, we present our approach to quality control. Quality is a mindset that is shared by every member of the HDR Team. It starts with clearly understanding your expectations and making a commitment to meeting them. Additionally, HDR conducts internal Project Approach and Resource Review (PARR) on every project. PARR is a comprehensive technical review of our projects in the early stages of development to confirm the right expertise is involved, appropriate alternatives and concepts are being considered, and the project is on the right track to meet or exceed our client's needs. It is performed by one or more individuals with extensive experience in the key technical issues associated with the project. For this task HDR will perform the following:

1.1 Project Work Plan & Administration

Develop a comprehensive project management plan (PMP) containing project expectations and key issues, detailed scope, budget, schedule, meeting schedule, deliverables, communication protocols, contact details, and safety protocols. Perform the required tasks to confirm effective project management. Project administration tasks include contract administration, preparation of invoices, and management of project resources, budget and schedule.

HDR will maintain and update the project schedule using MS Project. The schedule will track all tasks and milestones including critical data requests, workshops and meetings, reports and key deliverables. Project meetings and workshops will be scheduled in accordance with the District's availability with meeting invites sent in-advance via MS Outlook. The project schedule will be presented at the project meetings.

1.2 Data Request & Review

Provide a data request list at the onset of the project. Meet with IRWD and MWDOC staff to gather the latest information regarding resiliency and reliability plans and policies. The project team will collect, track and review data provided. Data gaps will be noted and expeditiously resolved in coordination with IRWD staff. The data review will include review and assumptions with the Integrated Resources and Planning Distribution Model (IRPDSM).

1.3 Project Meetings & Progress Reports

Coordinate and attend a Project Kick-off meeting with the District to review project objectives and introduce key members of the project team. Coordinate and attend regular meetings, Project Coordination Meetings with the District. Prepare and submit an agenda at least one week in advance of the meeting. Within one week after the meeting, provide meeting minutes to the District. At each project meeting, submit a Project Progress Report that provides a summary of the project's progress. A presentation to the Board is included in Task 6 and Task 7.

1.4 Project Workshops

HDR will coordinate and conduct two 4-hour workshops at IRWD's offices at the onset of Task 4, Scenario Planning. Facilitate workshops and provide collateral materials and technical presentations to workshop attendees.

1.5 QA/QC

Organize and develop an effective QA/QC program specific to the project to confirm project success and accuracy. Present a draft QA/QC plan at the kickoff meeting for review and approval by IRWD staff. Conduct technical reviews throughout the project for the various deliverables. A qualified technical review team and sufficient schedule and budget to coordinate a thorough review of work products shall be provided.

DELIVERABLES

- Evaluation Update Project Management Plan, including QA/QC Plan
- Data Request and Tracking List
- Regularly Scheduled Status Reports and Schedules
- Agendas and Minutes for all Meetings and Workshops
- Workshop Presentations/Collateral Materials
- Monthly invoices

Task 2 - Develop Input Data: Demands

The District uses a GIS based Demand Forecasting Tool (DFT), developed for IRWD, for projecting average year demands through build-out. Under this task, HDR will develop baseline demands for the District's DFT by their modeling consultant. With input from IRWD staff, based on their inherent knowledge of the system and the community demand patterns, the HDR team will develop demand multipliers for a variety of factors that will be used as input for the DFT, as well as develop new projection scenarios. Considerations in developing the demand multipliers under a variety of demand conditions are provided in **Table 2** on the following page.

Table 2: HDR will collaborate with IRWD staff to develop demand multipliers for factors that will be used as input for the demand forecast and IPRDSM.

FACTOR	CONSIDERATIONS/APPROACH
Conservation efforts during droughts and emergencies, including demand reductions	To assess the magnitude of short-term responses by the public to requests/mandates for emergency water use reduction, assess IRWD's experiences over recent years that have reduced per capita demands to 95 gpcd. Assess permanency of these reduced demands during drought recovery periods using historic data. MWD is currently considering conservation efforts regarding functional vs. non-functional turf irrigation.
Compliance with 2018 "Conservation as a Way of Life" legislation, local and regional mandates, and changes to plumbing codes and standards	IRWD has observed the impact of changes to plumbing codes and standards that have reduced water demand. The impact of these codes and standards will be assessed for their impact on future demands for new construction. New state legislation proposes future indoor water use reductions to 42 gallons per capita per day (GPCD) by year 2030. MWD is updating their Integrated Water Resources Plan, which develops assumptions related to new plumbing standard, the number of devices per household, compliance rate and natural replacement rate. This approach can also be applied to IRWD to develop projected decreases in demand, as more devices are replaced.
Economic impacts	Consider lingering effects of the 2008 economic recession and increasing inflation costs on household formation and household size. Model future changes in households related to recovery from the recession. Potentially link historic changes in local unemployment percentages with per capita water use.
Customer Rate impacts	IRWD is well-known for using innovative rate structures to encourage water conservation. Correlate past rate increases with decreases in demand to assess degree of influence of price elasticity.
Weather and multiple dry-year demand impacts	Include local climate change effects on evapotranspiration (E-T) and outdoor landscape irrigation requirements, as one of the factors for adjusting demand projections. Use the best available science related to downscaled climate change models for southern California. Integrate the District's Water Shortage Continency Plan and mitigation strategies under dry-year scenarios.
Unaccounted for water system losses.	The District is taking a proactive approach to evaluating their water system with recent asset management and condition assessment efforts. A water supply balance provides a look at unaccounted for water; coordination with condition assessment recommendations will provide strategies for reducing potential water system losses in the future.

In addition to adding factors to the list above, uncertainty analysis can be applied to the multipliers that are developed (e.g., varying levels of climate change impacts on demand). Once the demand factors are established and the model is developed, the District's proposed modeling consultant will use the demand input to evaluate projections of demands, imported supplies, and storage portfolio based on an assumed pattern of future climate. Climate change models, aligned with scenarios developed by MWDOC, will be incorporated into the demand and supply inputs and further refined during the scenario planning probability evaluation. The baseline demand scenario will include both current demands and a buildout demand projection; in addition, HDR will develop a range of demand scenarios that take into consideration imported supplies and interagency agreements, emergency response actions, new growth forecasts, and new facilities constructed or planned for construction in the near-term.

For this task HDR will perform the following:

DELIVERABLES

- Technical Memorandum summarizing the development process of the demand inputs
- Baseline demand input, including one low and one high range demand projection, for use as input to the DFT and IPRDSM. HDR assumes that the District and/or separate consultant will update and run the DFT and IPRDSM and provide output data to HDR to refine for use in this study.

Task 3 – Develop Input Data – Existing and Future Supply Sources

The IPRDSM evaluates the probability of being in shortage or surplus for each scenario over a designated time period. Infrastructure upgrades or new supply sources developed and prioritized as part of the development of scenarios in Task 4 will be modeled to assess their impact on system reliability. In addition, the analysis will indicate the amount of surplus capacity that IRWD might be able to provide to other agencies through existing inter-tie facilities. The final supply recommendations will be characterized in terms of a percent of normal year demands (e.g. supply requirement = 150% of normal year demands). As part of the 90% draft report, the analysis will be presented with alternatives and cost estimates for achieving various levels of supply and system reliability.

Under this task, the HDR team will fully explore the characteristics of each of these water supply sources and identify the opportunities and constraints associated with each. We will use these characteristics and documented risk parameters to develop the scenarios in Task 4.

IRWD has developed a diverse array of water supply sources to meet demand conditions in both wet and dry year conditions. Supplies include imported water, local groundwater, and groundwater banking and the Evaluation Update will integrate supply data from MWD, MWDOC and Orange County Water District (OCWD). As demands grow and external factors impact the reliability of imported and local potable water resources, the risks associated with these supply sources should re-analyzed. With the most recent update of MWD's Integrated Resources Plan, MWDOC's draft Water Reliability Study Update, the District's Water Resources planning documents and the most recent Urban Water Management Plan, much of this information is anticipated to be available through existing documentation. We will vet this information with the regional agencies that deliver water to IRWD and with our HDR experts in State Water Project and Colorado River Basin operations, and climatological modeling, and update any assumptions we find to be appropriate.

IRWD's current supply sources of potable water include:

- Local groundwater wells
- Colorado River Water
- State Water Project (SWP) Water
- Imported water from MWD
- Imported water from MWDOC
- Local runoff stored in Irvine Lake
- Local Interagency Agreements
- Water Banking in Kern County with the Rosedale Rio Bravo Water Storage District

IRWD is also dependent on the transmission, treatment and storage facilities that deliver potable water to the District. Short term disruptions in service for annual routine maintenance, as well as potential long term emergency disruptions, will be included in this analysis. These transmission facilities include:

- Diemer Regional Water Treatment Plant
- Baker Water Treatment Plant
- Aqueduct Systems that deliver imported water, including pumping facilities
- Local Storage Facilities/Reservoirs

Future supply sources of water, or infrastructure projects that will make the transmission system more resilient, will be assessed in the Evaluation Update. Opportunities to maximize future supply sources and increase availability of current sources under emergency conditions may include:

- Proposed 2.6 cfs capacity within the Delta Conveyance Project tunnel
- Kern Fan Groundwater Storage Project
- Raw water augmentation at Baker Water Treatment Plant
- Participation in the Sites Reservoir Project
- Policy changes that allow increased use of resources
- Offsets gained through increased recycled use
- Additional storage of potable and non-potable water

Short-term and long-term impacts and documented risk factors for service disruption associated with each of these supply sources and infrastructure facilities will be presented at the Scenario Planning Workshop. At that workshop, we will seek to include additional input from the participants, which will be used to develop the supply constraint scenarios in Task 4.

3.1 Characterize Existing and Future Water Supply Source Inputs

Characterize available supply sources and conveyance facilities for delivering potable supplies to the District including hydraulic and contracted capacities, age and expected useful life of current facilities, and potential for risk of service disruption. Existing supply sources will be reviewed and updated based on changes to data on imported water from MWDOC, water from the Colorado River or SWP, interagency agreements, and planned facilities or facility improvements. Updated supplies and future supply impacts presented in MWDOC's draft Water Reliability Study update will be reviewed and incorporated into the supply input data.

Characterize potential future supply sources and conveyance facilities for delivering potable supplies to the District including capacities and interagency agreements or contracts required. Potential for mitigating service disruptions associated with the District's current water supply sources will also be evaluated.

HDR will provide supply source data as inputs for the District's modeling consultant to use with the IPRDSM.

3.2 Coordinate with Regional Agencies

HDR will organize, attend, and up to two (2) meetings in total for coordination with MWDOC and/or OCWD to obtain other information as required for imported facilities or changes in supplies.

For this task HDR will perform the following:

DELIVERABLES

- Technical memorandum characterizing existing and future water supply sources and assumptions considered for supply input
- Meeting agendas and minutes

Task 4 – Develop Scenarios for Supply System Disruption or Constraint

Water reliability at IRWD depends on the independent functioning of a series of components that include multiple sources, pipelines, reservoirs, and pumping stations. Failures to one or more of these components have the potential to cause overall system failure.

At the onset of Task 4, the HDR team will facilitate two separate 4-hour Scenario Planning Workshops. At that workshop, we will present our findings from Task 2 (Water Demand Input) and 3 (Water Supply Input). We will also present a summary of current local and regional agencies reliability studies and describe their approach and assumptions in evaluating water supply reliability. Our team of experts will be on-hand to validate or provide additional data to consider regarding these assumptions and approaches. Following the presentation, the HDR team will facilitate a brainstorming session with IRWD staff and stakeholders to develop a comprehensive list of scenarios that could impact IRWD's water reliability. Factors considered in the comprehensive list will be prioritized to develop an appropriate list of scenarios that cover outages and constraints of varying duration and magnitude. HDR will document eliminated scenarios for reconsideration at a later time.

Imported water from the SWP and the Colorado River Basin is delivered to IRWD through the MWD system. Potential issues affecting the reliability of these systems include:

- Delta failure
- Environmental restrictions (i.e. Delta smelt)
- SWP delivery failure (includes major earthquake)
- Colorado River basin drought
- Colorado Aqueduct delivery failure (includes major earthquake)

Climate change impacts potentially pose significant long-term risks to the IRWD through supply and system disruption and constraint. Mike McMahon performed an impact analysis of climate change on the Bay Delta Conservation Plan (BDCP) using the factors quantified by global climate model (GCM) data for 112 different climate scenarios and he has learned from experience to appreciate the importance of scenario characterization.

The far-reaching impacts of climate change and their relationship to the operations of IRWD will need to be addressed on several levels of geographic scale (global to community), as well as in a way that addresses climate change impacts on the consequential interaction with other risks such as system failures, evolving environmental restrictions, or changes in regulatory guidance. As has been learned during other studies, the risks posed by climate change and variability will be there regardless of the consequences of the other identified risks. Climate change/variability impacts on supply and demand scenarios include changes in:

- Precipitation patterns that will impact water supply storage as well as decision making for flood control, minimum in- stream flows, and reservoir operation
- Temperature regimes that will have a profound impact on demand, as well as watershed ecology and water quality
- Snowpack and snowmelt timing in the Sierras and the Rockies, which may have the greatest impact on water supply resiliency within the region
- Intensity and duration of storm events, which could significantly alter design criteria (design storm) for infrastructure projects
- Groundwater supply, which would work in concert with demand changes to potentially deplete aquifers and result in land subsidence
- Flood recurrence, which could greatly impact reservoir/levee and water management in the region
- Drought cycles that would become an issue for water management from the watershed to the end user

The Scenario Planning Workshop will collaboratively derive a set of reasonable climate change scenarios, that will be used as model input for water supply and demand. MWDOC's Water Reliability Study update developed five planning scenarios to determine impacts of climate change on water demands and supplies, considering Warm/Wet, Warm/Dry, and Hot/Dry climate futures. This Evaluation Update will determine, through the Scenario Planning Workshops, which climate scenarios from MWDOC's draft study to use for inputs to the IPRDSM.

Water banking is already being practiced by IRWD by capturing low cost water for underground storage during wet periods and recovering this water for later use and importation into the IRWD service area during emergency periods. The goal of IRWD's water banking program is to provide enough water to meet approximately 15 percent of IRWD customers' needs during critically dry years. The water bank is an important part of IRWD's commitment to meet the water customers' needs during critical shortage conditions while maintaining reasonable rates. Water banking provides an opportunity to provide water storage of water that is not local and does not rely on local climate. In developing our scenarios for water banking, we will summarize the current IRWD program and assess available water supply from this resource in future years. These scenarios will also consider IRWD's access to up to 2.6 cfs of supply via the DCP tunnel and future participation in the Sites Reservoir project.

Water quality vulnerabilities could come in many forms. For the second Scenario Planning Workshop, we propose potential water quality problems be considered initially for all sources and locations. We would then screen the potential problems based on likelihood of occurrence and degree of consequence, to identify the largest vulnerabilities and risks. The types of water quality issues vary by type of source, but they generally include:

- Short term incident, which might include intentional contamination, accidental chemical spills or fire impacts to water quality

- Longer term problems, which might include reservoir stratification, groundwater contamination, or increasing salinity due to drought
- Changing regulations that may identify new contaminants of concern

Once the potential water quality vulnerabilities are identified, mitigation or prevention measures would be developed. A comprehensive list of water quality prevention and mitigation measures would be developed for assessment and screening. Assessment would include evaluation of feasibility and cost, as well as performance in reducing vulnerability to water quality problems. Some of the strategies and mitigation measures that could be considered at the Scenario Planning Workshop include:

1. Evaluation of the flexibility in use of existing sources considering potential outages due to water quality problems
2. Evaluation of alternative sources of supply;
    a. Including potential connections to adjacent water suppliers
3. Coordination with other water suppliers and authorities to develop an early warning network;
4. Public education and communication
5. Early warning water quality systems / instrumentation;
6. Treatment upgrades;
7. Provision of additional raw or finished water storage
8. Watershed access controls / wellhead protection

For this task HDR will perform the following:

4.1 Review and document past reliability assessments associated with IRWD's current or potential water supply sources and transmission facilities.

To be efficient, we will draw on past studies to document past reliability assessments as they affect the components of IRWD's water supply system. We will also rely on scenarios and analysis already developed under MWDOC's Water Reliability Study update.

4.2 Update reliability factors based on input from our experts.

Evaluate documents reviewed in Task 4.1 to determine if the assumptions and data used in those assessments is still valid, or if more recent data or information is available that will make the analysis more current. Update those reliability factors and assumptions for use in the development of the model in Task 5.

4.3 Develop water supply constraint scenarios and potential mitigation measures.

Following the Scenario Planning Workshops described in Task 1, develop up to ten (10) supply and system disruption scenarios for review by IRWD. The supply disruptions may include drought allocations of imported or groundwater supplies or emergency shutdown of their respective production or conveyance facilities. The outage scenarios will include a probability of the outages and the probability of multiple outage scenarios occurring simultaneously.

Short-term outages, and longer-term multi-year scenarios will be identified. Potential scenarios and factors that could be considered include, but are not limited to:

- Major earthquakes;
- Delta levee failures;
- State Water Project (SWP) facility failures;
- Colorado River Aqueduct facility failures;
- Long term drought on the Colorado River;
- Climate change impacts;
- Lake Mead water levels and water shortage triggers, as determined through Bureau of Reclamation (BOR) conservation mandates;
- MWD treatment and conveyance facility failures;
- IRWD well, treatment and conveyance facility failures;
- Environmental restrictions, such as implementing actions in the Bay Delta Conservation Plan (BDCP), taking into consideration various alternative conveyance scenarios; and
- Changes to the OCWD groundwater basin production percentage, including a long- term accumulated overdraft of over 500,000 acre-feet (AF).

Potential mitigation measures for each scenario will be developed and prioritized to offset any water shortages that result from the scenarios modeled. Costs and benefits of each mitigation measure will be developed.

DELIVERABLES

- Technical Memo that documents the Scenario Planning process and outcome; develops a range of scenarios and prioritized mitigation measures that will be modeled in Task 5; and establishes the cost and benefits of the proposed mitigation measures.

Task 5 – Water Supply and System Requirements Analysis and Report

Supply sources and regional demands are greatly impacted by the weather patterns, development and redevelopment plans, and water related policies. Additionally, natural disasters such as earthquake that may disrupt a supply requires that the transmission capacity of the system for different areas of the system to be taken into account to ensure that alternative supplies can be transferred to the impacted areas. This reliability analysis will evaluate the independent and combined effects of risks to each of these systems and assess whether existing redundancy is sufficient or if options for new supply sources would be required, and at what cost.

The District's modeling consultant will provide the results and supply-demand reliability curves for the ten scenarios developed in Task 4. Draft results will be presented and HDR will review and provide comments to the modeling consultant for incorporation into the model. The modeling consultant will provide statistical analysis results (Maximum, Mean, Minimum and 95th Percentile of each supply source) for up to four (4) selected scenarios.

HDR will incorporate the District's modeling consultant's Technical Memorandum with summarized results of their analysis into Task 5 deliverables.

HDR worked successfully with the District's proposed modeling consultant under the 2016 Water Reliability Study, so we understand how the proposed modeling consultant utilizes demand and supply inputs, as well as how to prepare the water system reliability analysis based on results from the IPRDSM and statistical results. The water supply and system reliability recommendations will provide strategies for each scenario or alternative to support the District's plan for reliable and achievable service.

DELIVERABLES

- Technical Memorandum summarizing the development process scenarios, a description of the scenarios evaluated and findings of the model runs. The Technical Memorandum deliverable from the District's modeling consultant summarizing the results of the scenario modeling and statistical analysis will be incorporated into the draft and final report.

Task 6 – Preliminary Evaluation Update Recommendations

As described below in Task 8, report chapters will be compiled and submitted for a 75% and 90% draft review, as requested in the RFP. Upon completion of the 90%, the HDR team will prepare and present an overview of the study and preliminary recommendations to the IRWD Board of Directors in a workshop. Findings, recommendations and justification for the recommendations will be presented. Minutes will be taken, and responses to the Board's comments will be recorded and incorporated into the Final Draft Report.

For this task HDR will perform the following:

6.1 Conduct Board Workshop

Prepare and present study overview and preliminary recommendations to the IRWD Board. Prepare presentation, handouts and boards, as needed to convey findings. Facilitate workshop to elicit comments from the Board, and respond to those comments. Prepare workshop minutes. Incorporate Board comments into Final Draft Report.

DELIVERABLES

- Workshop Agenda and Minutes
- Workshop Presentations/Collateral Materials

Task 7 – Final Evaluation Update Recommendations

For this task HDR will perform the following:

7.1 Finalize Report

Following the Board Workshop, and upon receipt of the District staff's comments, prepare a tabular response to comments for District's review. Upon resolution of comments, incorporate appropriate edits to the preliminary report and finalize a draft report, including report text, figures, tables and appendices.

7.2 Prepare Executive Summary

Prepare a clear, concise Executive Summary of the report findings and recommendations for inclusion in the Final Draft Report.

DELIVERABLES

- Table with Response to Comments
- Executive Summary
- Final Evaluate Update report

Task 8 – Deliverables

None of the work above means much if it cannot be compiled into a clearly written, transparent and comprehensive report document. HDR's proposed team members are experts at consolidating data into readable and easily referenced formats, with tables and figures to illustrate key points. A draft report outline will be presented at the kickoff meeting for your review. Our intent is to prepare the technical memoranda required in each of the above tasks as report chapters so that they can be transitioned easily into the final report. This allows IRWD staff to review draft work products as the work is being accomplished and not all at once toward the end of the project. Report chapters will be compiled and submitted for a 75% and 90% draft review, as requested in the RFP. At each submittal a project meeting will be scheduled to preview and discuss the report with District staff. Responses to District comments on the draft reports will be tabularized, for ease of review.

For this task HDR will perform the following:

8.1 Prepare 75% Draft Report

Prepare and submit a 75% complete report document, following the completion of Tasks 1 through 4. Five (5) copies of the draft report will be provided to the District. It is assumed that the District will compile their comments into a single set of comments for inclusion in the 90% draft report.

8.2 Prepare 90% Draft Report

Prepare and submit a 90% complete report document following the completion of Task 5. Five (5) copies of the report will be provided to the District. It is assumed that the District will compile their comments into a single set of comments for inclusion in the Final Draft Report.

8.3 Prepare Final Draft Report

Prepare and submit ten (10) copies of the Final Draft Reports and Appendices and an electronic copy will be submitted on CD in PDF format. The Final Draft Report will be tabbed in a 3-ring binder, with appropriately labeled Figures and Tables, and supporting documents will be included in a tabbed Appendices.

DELIVERABLES

- 75% Draft Report, 5 hard copies
- 90% Draft Report, 5 hard copies
- Final Draft Report, 10 hard copies in a 3 ring binder and appropriately tabbed
- Electronic files in PDF format of final deliverables, including their native file formats

Section 2 | Team

TEAM

HDR has developed a team to deliver high-quality services to IRWD. Our team includes professionals well known to IRWD staff, including Amy Omae, Gregorio Estrada, and Steve Friedman, who will facilitate positive communications and help reach consensus on project elements. We are backed by over 300 professional engineers, scientists, planners, and other multi-disciplinary staff in southern California. We have also included national experts in scenario planning, integrated resource model and risk analysis, water banking, climate change, Colorado River, and Water Conservation. The HDR Team proposed for IRWD's Evaluation Update offers the strength of industry leading expertise, unmatched local and regional knowledge, and a project approach designed to develop innovative, fresh perspectives.

HDR's Resiliency Services

Never has the need for long-term resiliency and reliability been greater. We have crafted a holistic approach for considering long-term community and environmental resiliency. Viewing resiliency actions through this model of human-environmental-infrastructure governance systems gives our leaders an effective strategic tool for taking action.

With our depth of expertise comes the power to craft bold and creative approaches that will address resilience management and safety while yielding cost and schedule performance. As shown in **Exhibit 1**, HDR's full suite of services allows our clients to focus on what you do best – delivering sound resiliency solutions to protect your communities and support economic growth.

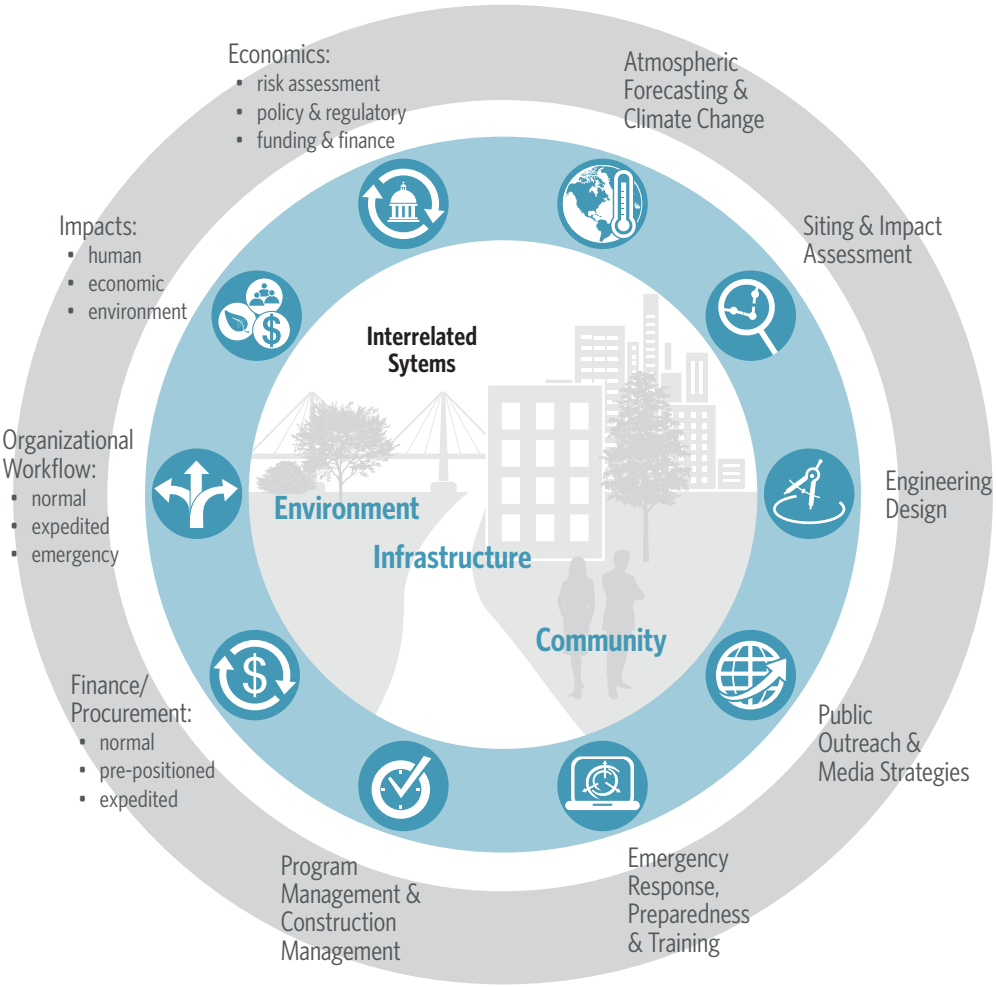


Exhibit 1. HDR will leverage our resiliency approach with our innovative project approach to deliver an Evaluation Update that meets all of IRWD's needs.

Team Organization Chart

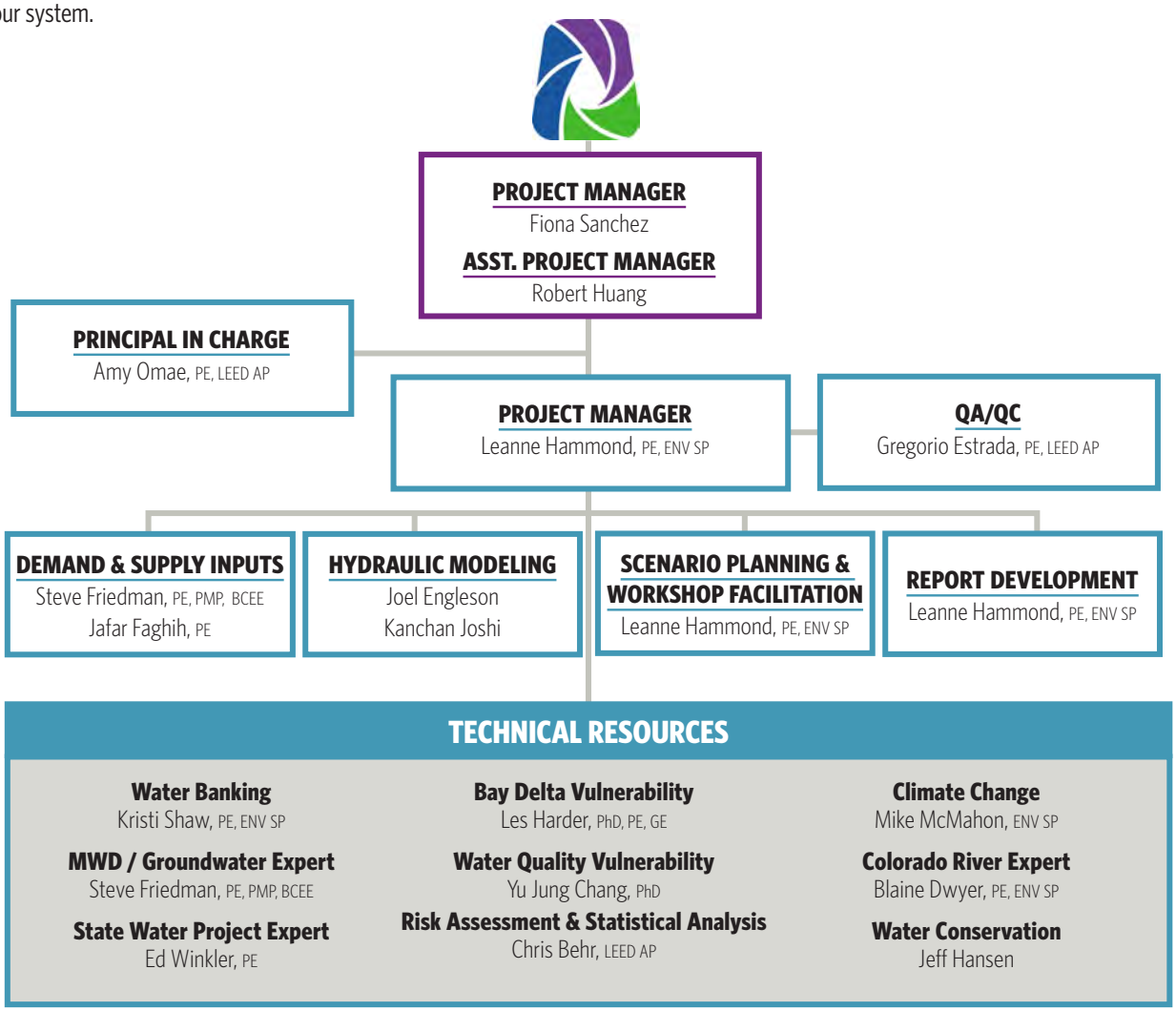
Irvine Ranch Water District requires a highly qualified, capable team of experts that can develop the Evaluation Update and develop feasible supply scenarios. HDR is proposing an experienced team of fully committed staff that will work in partnership with your staff. The organization of the HDR team profiles for key team members are provided below, including a high-level view of staff commitment to your Project. Key personnel assigned to this project shall not be reassigned without the prior written approval from IRWD.

Our proposed Project Manager and your primary point of contact for this project is **Leanne Hammond**. Leanne brings the perfect blend of technical and managerial skills and will provide technical coordination and oversight for the project. She has the confidence and corporate support to make decisions and to be accountable for the performance of this team. Leanne has over 20 years of experience leading various water planning efforts, including master plans, urban water management plans, water supply assessments, and water supply optimization studies. She will lead the HDR team and partner with IRWD staff to develop innovative ideas and cost-effective solutions for your system.

Leanne will be backed by a core team of technical experts who also have holistic knowledge from their history working for IRWD, including the 2016 Water Reliability Study, that allows us to update and advance prior work efforts.

HDR is committed to provide the right resources to achieve the District's goals for the Evaluation Update. We have selected a team of experts who are experts in water supply assessment, integrated resource modeling and risk analysis, demand assessment and scenario planning—key technical elements of this project. Staff proposed for this assignment will be committed to the project and task completion.

The organizational chart below shows our proposed Evaluation Update team and the key staff associated with each role on the project. The staff matrix on the following page summarizes these team members' qualifications and expertise. Key staff qualifications are provided on the following page.



Leanne Hammond, PE, ENV SP

Project Manager
B.S. Environmental Engineering, Cal Poly SLO
CA PE No. 73622 | ENV SP

Leanne has 20 years of experience with potable, recycled water, and wastewater master plans and hydraulic model development, urban water management plans, water and sewer technical studies. She is well-versed in engineering and project management duties including resource allocation, team performance, coordination with clients and subconsultants, and technical oversight so that quality goals are met, and budgets and schedule are maintained and achieved. She will leverage her experience and expertise to assist the District in this key assessment.

- **Recycled Water Master Plan Update**, *West Basin Municipal Water District*, Project Manager
- **Urban Water Management Plan**, *Vallecitos Water District*, Project Manager
- **Recycled Water System Condition Assessment & Optimization Plan**, *City of San Diego Municipal Wastewater Department*, Project Manager
- **Water Supply Optimization Study**, *Long Beach Water Department*, Project Manager

Amy Omae, PE, LEED AP

Principal in Charge
M.S. Environmental Engineering,
University of Miami
CA PE No. 76824 | LEED AP No. 10328834

Amy is HDR's market sector lead with 18 years of experience in wastewater and water master planning, design, and engineering services during construction projects. She recognizes that the institutional knowledge retained by her clients' engineering, operations, and maintenance staff is extensive and invaluable. Amy has worked with the District for nearly a decade and is familiar with your staff, standards, procedures, and processes. Most notably, Amy managed the Michelson WRP Tertiary Filter Improvements project and developed your Sewage Treatment Plant Master Plan.

- **Michelson WRP Tertiary Filters Improvements**, *Irvine Ranch Water District*, Project Manager
- **Sewage Treatment Master Plan**, *Irvine Ranch Water District*, Basis of Design Task Lead
- **Recycled Water Salt Management Plan**, *Irvine Ranch Water District*, Deputy Project Manager

Steve Friedman, PE, PMP, BCEE

Demand & Supply Inputs, MWD Liaison
M.S. Civil Engineering, UC Berkeley
CA PE No. 055566 | BCEE No. 7337470 | Risk Assessment Methodology for Water (CA)

Steve has 29 years of experience in engineering planning and design of water, recycled water, industrial waste, and wastewater facilities. He has both management and design experience in projects concerning transmission and distribution system piping, wastewater treatment plant upgrades, pumping stations, pressure-control stations, and water treatment. Steve has also been instrumental in conducting several hydraulic network modeling assignments including integrating results with ongoing planning and/or design efforts with MWD and other SoCal water agencies.

- **Carlsbad Seawater Desalination Plant New Intake Preliminary Design**, *Poseidon Resources*, Project Manager
- **Santa Ana River Interceptor Line Realignment, Protection, & Siphons**, *Orange County Sanitation District*, Project Manager
- **On-Call Engineering Services for Water Treatment Facilities, Conveyance, Storage & Distribution Facilities, and Large Rotating Equipment**, *Metropolitan Water District*, Project Manager

Gregorio Estrada, PE, LEED AP

QA/QC
B.S. Civil Engineering, Stanford University
CA PE No. 67066 | LEED Accredited Professioanl

Gregorio has extensive experience in the planning, design, construction, and management of wastewater, water, and stormwater projects. He is an adept leader in wastewater treatment and has expertise in advanced treatment solutions including: nutrient removal, filtration, membranes, and disinfection. He has sucessfully delivered large-scale projects in advanced treatment. He is highly-skilled in building group-consensus amongst key stakeholders, performing economic evaluations and risk assessments, and assisting in negotiations with regulatory agencies.

- **Michelson WRP Ph. 2 Expansion**, *Irvine Ranch Water District*, Project Manager, Task Lead
- **Sewage Treatment Master Plan**, *Irvine Ranch Water District*, Project Manager
- **Michelson WRP Tertiary Filters Improvements**, *Irvine Ranch Water District*, Task Lead
- **Biosolids/Energy Master Plan**, *Irvine Ranch Water Department*, Project Manager

Staff Availability

The time commitment of our team members will vary over the duration of the project, as the technical effort evolves, ranging from 100 to 0 percent as tasks are completed. The table below illustrates their percentage of time available and committed to this project over the total 15 month project schedule. Our team is available and ready to begin the Evaluation Update and is dedicated to see it through to completion.

We follow well established and time proven procedures to manage our project workload. Our strong team is available to begin work upon Notice-to-Proceed. As your trusted partner, you can rely on us to successfully manage and deliver an innovative, cost effective Evaluation Update, as we have successfully done on numerous projects for IRWD.

Team Member	Role	% Time Commitment for this Project
Leanne Hammond, PE, ENV SP	Project Manager | Report Development | Scenario Planning	30%
Amy Omae, PE, LEED AP	Principal in Charge | Scenario Planning	15%
Gregorio Estrada, PE, LEED AP	QA/QC	15%
Steve Friedman, PE, BCEE	Demand & Supply Inputs | MWD/Groundwater Expert	20%
Joel Engleson	Hydraulic Modeling	25%
Jafar Faghih, PE	Demand & Supply Inputs	25%
Kanchan Joshi	Hydraulic Modeling	25%
Kristi Shaw, PE, ENV SP	Water Banking	20%
Chris Behr, LEED AP	Risk Assessment & Statistical Analysis	15%
Les Harder, PhD, PE	Bay Delta Vulnerability	15%
Yu Jung Chang, PhD	Water Quality Vulnerability	15%
Mike McMahon, ENV SP	Climate Change	15%
Blaine Dwyer, PE	Colorado River Expert	15%
Ed Winkler, PE	State Water Project Expert	15%
Jeff Hansen	Water Conservation	15%

We understand the importance of meeting project schedules.

The capacity to accomplish work in a strict timeframe requires strong and experienced leaders backed by skilled team members. Our personnel are dedicated to providing sufficient time and effort to produce a quality product. With this in mind, our team members were carefully selected not only for their expertise, but also for their availability to work on the project for its duration. We follow well established and time proven procedures to manage our project work and have assembled a strong team that is available to begin work upon Notice-to-Proceed. You can rely on us to successfully deliver this project.

Section 3 | Experience

EXPERIENCE

Record of Performance on Similar Projects

Our depth of water planning expertise brings the ability to identify the right alternatives for your system with a focus on operational efficiency, long- term reliability, and institutional independence. The following pages demonstrate our expertise on previous projects with IRWD and other similar projects. Detailed project descriptions and client reference information can also be found on the following pages.

There is no better team for the job. The HDR Team includes the right mix of staff with the specialized experience and qualifications to deliver the Evaluation Update. The core members of this team have local offices and extensive experience at your facilities. This longstanding local expertise is supported by national resources with the ability to bring expertise and manpower to all tasks. HDR has been along side IRWD helping you make decisions and setting strategy for your system and facilities. With this knowledge, we will partner with you to bring a fresh look and provide new innovative solutions and re-evaluating decisions based on current issues with updated information and changing water supplies and customer needs.

As demonstrated throughout our proposal, HDR has worked with IRWD for the past 16 years on a wide variety of projects. **We bring with us a successful history of delivering 35 projects and institutional knowledge and understanding of your entire system.** We will tailor our approach to the specific needs of IRWD, drawing upon our experience on similar projects to provide guidance and lessons learned throughout project delivery.

FOUNDED in 1917, HDR has

10,500+ Employees Worldwide

200+ Offices Globally

2022 ENR Top 500 Design Firms Rankings

- **No. 5** Top 20 in Design Firms
- **No. 3** Top 100 Pure Designers
- **No. 5** Top 20 in Water
- **No. 6** Top 20 in Sewer & Waste
- **No. 7** Top 50 Designer in International Markets

Experience Counts.

The HDR team has a long history of working with you to develop and implement your planning goals, improve your processes, and maintain your systems for the future.

A History of Dedicated Client Service to IRWD

Of the numerous studies completed for IRWD, HDR was the author of 14! The staff who wrote those studies are still at HDR and are thoroughly invested in seeing IRWD through the next phase of water supply planning and management. In addition to the reports listed in the RFP, our work on the Sewage Treatment Master Plan, Energy Efficiency Master Plan, Recycled Water Salt Management Study, the Salt Model Update, the 2016 Water Reliability Study, and other projects is also essential to the thorough understanding of where you have been over the past two decades and what your vision is for the next 30 years.

The timeline below illustrates HDR's involvement on IRWD projects. There is no learning curve needed for us to get up to speed on past projects, alternatives considered, and lessons learned. The HDR Client Services Team, has been there every step of the way!

2002

Wastewater Treatment Facilities Expansion Master Plan
Defined a phased 20-year plan to meet wastewater treatment and water reclamation demands. Preliminary designs were prepared for the expansion of the Michelson and Los Alisos Plants.

2004

LAWRP 2005 Upgrades
Provided design and construction engineering services to expand capacity from 6.0 to 7.5 mgd and to integrate LAWRP into the IRWD system.

LAWRP SCADA Master Plan
Recommended improvements were implemented as part of the 2005 Upgrades.

LAWRP Residuals Pumping Study
Evaluated conceptual pumping and pipeline alternatives for conveying selected solids stream flows from LAWRP to MWRP through the San Diego Creek Interceptor (SDCI) system.

MWRP Analysis of Reduced Energy Treatment Alternatives
Evaluated biological treatment alternatives that could meet effluent quality requirements for the MWRP while having a lower energy demand than the existing CAS configuration.

MWRP Disinfection Evaluation
Conducted an extensive evaluation of MWRP's effluent disinfection and dechlorination systems to improve disinfection efficiency and reduce chemical costs.

MWRP Phase 2 Expansion Process Validation Study
Updated design criteria for the expansion and refined the selection of technologies for the phased expansion.

2006

MWRP Aeration and Sedimentation Basin Optimization
Increased capacity of rectangular secondary clarifiers by 45% through modeling and installation of baffles and launder modifications. Installed 500 HP Turblex blower to improve energy efficiency and meet process demands.

LAWRP Solids Handling and Odor Control
This memorandum evaluated alternatives for addressing solids handling and alleviating the production of odors from the lagoons.

LAWRP Lagoon Dredging
Prepared contract documents for dredging and dewatering of LAWRP lagoon solids by private contractor.

SOCWA Pump Station
Although this was part of the LARWP 2005 Improvements contract, IRWD had HDR expedite design of the SOCWA pump station and develop separate construction documents.

MWRP Phase 2 Expansion
Preliminary Design Report
Second phase of the MWRP Phase 2 Expansion
Final Design
Prepared 60%, 90% and final design documents for the Phase 2 Expansion.

2008

LAWRP CAF Study
Evaluated process options to improve TSS removal in Pond 4 and eliminate algae/chemical sludge return from the tertiary clarifiers to Pond 3.

LAWRP Biosolids Study
This memo evaluated biosolids management alternatives and associated financial impacts.

Study to Allocate Costs of Collection System Odor Control Between OCSD and IRWD
Identified contribution of the IRWD discharge to the formation and release of hydrogen sulfide in the OCSD collection system.

MWRP Phase 2 Expansion
Engineering Services During Construction
Provided engineering services during construction.

Energy Efficiency Master Plan and Biosolids Handling Preliminary Design Report
Basis of Planning Report
First component of the Biosolids Program and Energy Efficiency Master Plan which provides a comprehensive approach to the management of biosolids and energy at IRWD's treatment facilities.

Preliminary Evaluation of System-Wide Biosolids Management Alternatives
Identified, screened, and evaluated overall strategies for treating, reusing, and/or disposing of the biosolids generated at MWRP and LAWRP.

LAWRP Biosolids Management Plan
Identified and evaluated alternatives for improving solids handling at LAWRP. Builds on prior decisions made during the System-Wide Alternatives Study.

2010

EEMP/BHPDR

Renewable Resources and Third-Party Certification Program Evaluation
Evaluated renewable resource opportunities for MWRP and LAWRP, including biogas, solar, wind, geothermal and hydropower.

MWRP Energy Master Plan
Energy master plan summaring key findings and recommendations from an energy audit for the facility and from an evaluation of renewable energy technologies at LAWRP.

MWRP Biosolids Management
This report completed analysis and selection of the overall strategy for treating and reusing the biosolids generated at the MWRP.

MWRP Biosolids and Energy Recovery Facilities Preliminary Design Report
The report refines the design concepts selected during the MWRP Biosolids and Master Plan.

Cienega Selenium Treatment Facility
Evaluated alternatives for Selenium removal from Peter's Canyon Wash before discharge to upper Newport Bay.

2012

Potential Impact of Solids Diversion from Baker Water Treatment Plant
Evaluated routing thickened washwater and clean-in-place chemicals through the existing sewer system for processing at LAWRP.

2014

Embedded Energy Tool
HDR evaluated the embedded energy of IRWD's potable water supply, and developed a GIS-based tool to allow the District to determine where water conservation practices will be most beneficial.

LAWRP Solids Handling Interim Report
This study looked at interim solids handling measures that could buy the District time.

MWRP Hydraulic Corrections
Analysis of Influent and Primary Effluent Wastewater Characteristics
Reviewed MWRP wastewater characteristic data to develop updated loadings for use in the MBR Biowin model. Reviewed the potential process loading associated with the future dewatering centrate sidestream.

MWRP Energy Control Procedures
Prepared energy control procedures for all process areas based on review of record drawings and field investigations.

Recycled Water Salt Management Plan
Developed Salt Balance Model to identify sources of TDS and develop mitigation strategies.

2016

2016 Water Supply Reliability Evaluation
Updated the District's 2008 Draft Water Reliability Study, focusing on the District's ability to maintain a minimum level of service under various emergency scenarios.

MWRP Biosolids CM Support Services
Provided staff to the construction services team during construction of the Biosolids Complex.

MWRP Miscellaneous Improvements
Investigation, evaluation, and development of methodolgy for implementing miscellaneous improvements at MWRP.

Analysis of Potential Effects of Proposed Seawater Desalination Project on Recycled Water Quality
Expanded Salt Balance Model to include assessment of Boron and Chloride impact from groundwater injection of desalinated water.

2018

MWRP Operational Support Services
Analysis and evaluation of operational costs associated with CAS and MBR process.

MWRP Emergency Diversion Support Services
Provided water quality analysis, hydrodynamic modeling, permitting support, and system design services for the diversion of MWRP effluent to San Diego Creek.

2021

Embedded Energy Tool Update
HDR is providing updates to the embedded energy tool developed for the District in 2014.

Pump Stations & Storage Tanks Condition Assessment and Rehabilitation
HDR is providing condition assessment and rehabilitation services for various District pump stations and storage tanks.

Sewage Treatment Master Plan
Characterized sewage, determined future sewage conveyance requirements, and identified future treatment processes and associated capacities at MWRP and LAWRP. Additionally identified beneficial uses of sewage, minimized diversion to OCSD, and identified methods of managing sewage collection and treatment systems.

2022

Water Reliability Study

IRVINE RANCH WATER DISTRICT

Irvine Ranch Water District (the District) has taken a diligent approach to developing a reliable and resilient water supply system to serve its growing community. Assuming that planned capital improvement projects are constructed, the District has secured a surplus of water that provides sufficient supply under normal operating conditions through build-out. Through the Water Reliability Study the District sought to identify and evaluate a variety of drought and emergency scenarios that could threaten the District's ability to deliver water to its customers and put into place a prioritized portfolio of sound and cost-effective responses. The Water Reliability Study focused on the District's ability to maintain a minimum level of service under various emergency scenarios based on a rigorous and transparent risk analysis. With recent findings in climate change research and the projected reliability of imported water sources, the District needed to reassess its definition of risk and level of service expectations to develop improved and robust mitigation strategies. With the potential for emergency conditions to be more severe than historic data could predict, an updated model was required. HDR provided modeling and evaluation of local and imported water supply reliability under a variety of emergency scenarios. The comprehensive resource and supply distribution model simulates and optimizes deliveries and storage of potable water taking into account hydraulic constraints associated with the delivery system. Using an indexed sequential Monte Carlo simulation and 83 years of historical hydrology, the model projects demands supply and storage needs based on an assumed pattern of future climate. Level of service expectations were established and mitigation strategies were developed.

Control of Costs: HDR completed project scope and achieved project goals within the authorized budget.
Quality of Work: Client continues to invite HDR to collaborate because of our quality performance.
Ability to Meet Schedule: HDR routinely met interim and final milestones.

CLIENT REFERENCE
Paul Cook, General Manager;
Irvine Ranch Water District
15600 Sand Canyon Avenue
Irvine, CA
P: 949.453.5300
E: cook@irwd.com

DATES
2018 - 2021

CONTRACT VALUE
$401K

Recent climate change research and projected reliability of imported water resources were incorporated into the analysis.

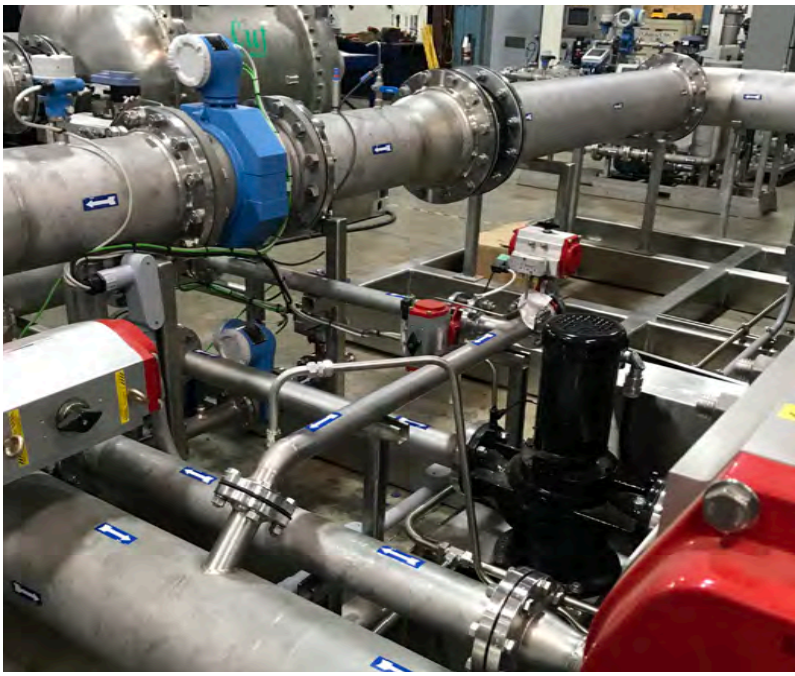
Water System Optimization & Supply Management Study

LONG BEACH WATER DEPARTMENT

Long Beach Water Department (LBWD) historically prioritized local water resources over imported water supplies and developed plans that have presented opportunities to diversify its local water supply portfolio and build system resiliency by increasing its current well field capacity. HDR was selected to prepare their Water System Optimization and Supply Management Report to compile and expand upon these discrete studies and develop a comprehensive strategic management approach, with a short and long term implementation plan for maximizing their local water resource supplies as a coordinated effort across LBWD. The Water System Optimization and Supply Management Study provides evaluates the benefits of shifting toward more local supplies while balancing water quality impacts on portions of the water system currently fed by imported water, utilizing local resources to the maximum potential, identifying potential adjustments for operational improvement and capital investment, as well as developing planning tools for both future and day to day decision-making.

As part of the project, HDR reviewed LBWD's existing hydraulic model using available data and information to identify potential data gaps and validated system boundary conditions based on planning criteria and assumptions. Following the model review and boundary conditions update, a hydraulic analysis of the existing system was performed to identify potential deficiencies and recommend system improvements and operational changes required for the shift to increased groundwater-based supply. Distribution system capacity was evaluated and operational strategies were developed and reviewed to address the constraints relevant to the supply portfolio shift. Solutions were focused on minimizing infrastructure improvements, simplifying operations, and optimizing energy use while satisfying hydraulic criteria.

HDR facilitated a series of technical workshops with LBWD stakeholders that led to the development and refinement of well capacity targets, the development of possible supply scenarios to meet those targets, and identified strategies and projects to increase local supplies into the existing water system.



The supply scenarios and project alternatives were vetted using a Decision Support System (DSS) to provide a means of comparing each scenario in a rigorous and quantifiable manner. The DSS was developed so that it can be updated as conditions change, and to serve as a long-term planning tool for years to come. The alternatives analysis resulted in a prioritized list of projects for LBWD to build into their capital planning budget and schedule. Each component of the study was summarized in a technical memorandum at key milestones throughout the project to streamline the review process and development of draft report chapters.

Control of Costs: HDR is fulfilling scoped tasks and is on track to achieve project goals within the authorized budget.
Quality of Work: Client engages in key submittal reviews and is aware of HDR's internal quality control process that contributes to successful delivery of the project.
Ability to Meet Schedule: To date, HDR conducts bi-weekly progress meetings to manage project schedule and meet project delivery milestones.

CLIENT REFERENCE
Heather Rhee, Sr. Civil Engineer
Long Beach Water Department,
Long Beach, CA
P: 562.570.2312
E: Heather.Rhee@lbwater.org

DATES
2020 - Ongoing

CONTRACT VALUE
To date: $307K

On-Call Engineering Services for Water Treatment Facilities, Conveyance, Storage & Distribution Facilities, and Large Rotating Equipment

METROPOLITAN WATER DIST. OF SOUTHERN CALIFORNIA

HDR provided engineering services on an on-call basis that include conceptual, preliminary, and final design services for new facilities and rehabilitation of existing facilities related to Water Treatment Facilities, Cnveyance, Storage, and Distribution Facilties, and Large Equipment Services. Key task orders include:

Technical Support for Delta Conveyance, Sites Reservoir, Delta Islands, and Other Bay-Delta Matters: The Delta Conveyance project will modernize the State Water Project infrastructure in the Delta that diverts fresh water to consumers in the Bay Area, the San Joaquin Valley, along the central coast, and to Southern California. The project would add new diversions in the north Delta to provide a more resilient and reliable State Water Project in the face of changing climate, earthquake risks and other uncertain future conditions. Metropolitan has an interest in supporting Delta Conveyance planning and would like to ensure that appropriate analyses are conducted to better understand and mitigate risks commonly associated with infrastructure projects of this size.

The Sites Reservoir is an environmentally beneficial, off-river reservoir that will capture excess water from major storms and save it for drier periods, helping California's farms, businesses and cities continue to supply reliable water when other sources are low.

Lake Mathews Forebay Bypass Study: The Lake Mathews discharge facility consists of an intake system, energy dissipation structures, a forebay, a small hydroelectric power plant, and outlet structures facilitating power generation and water supply.

Several factors including aging, lack of regular equipment assessment and routine maintenance, and corrosion negatively impacted the physical condition of the discharge facility and equipment. To ensure satisfactory and reliable operation of the facility and avoid potential future disruption to water delivery, five alternative energy dissipation configurations were developed, evaluated and presented to MWDSC for consideration. The alternatives were developed to span a range of construction costs and capabilities, with a similar range of flexibility provided to the Lake Mathews forebay operation and all alternatives needed to fit within the existing infrastructure at the site, and could not necessitate the shutdown of the facility for construction. The primary goal of these alternatives was to maintain water supply during construction and future maintenance activities.

Control of Costs: HDR has successfully achieved delivery of task order scopes of work within authorized budgets.
Quality of Work: Task orders have been conducted according to HDR internal quality control processes which align with Client expectations.
Ability to Meet Schedule: To date, HDR has consistently met project milestones and delivery goals within the allocated schedules by maintaining regular status check-ins with Client teams.

CLIENT REFERENCE
Tom Campbell, Contract Admin.
Metropolitan Water Dist. of Southern California,
Los Angeles, CA
P: 213.217.6767
E: TCampbell@mwdh2o.com

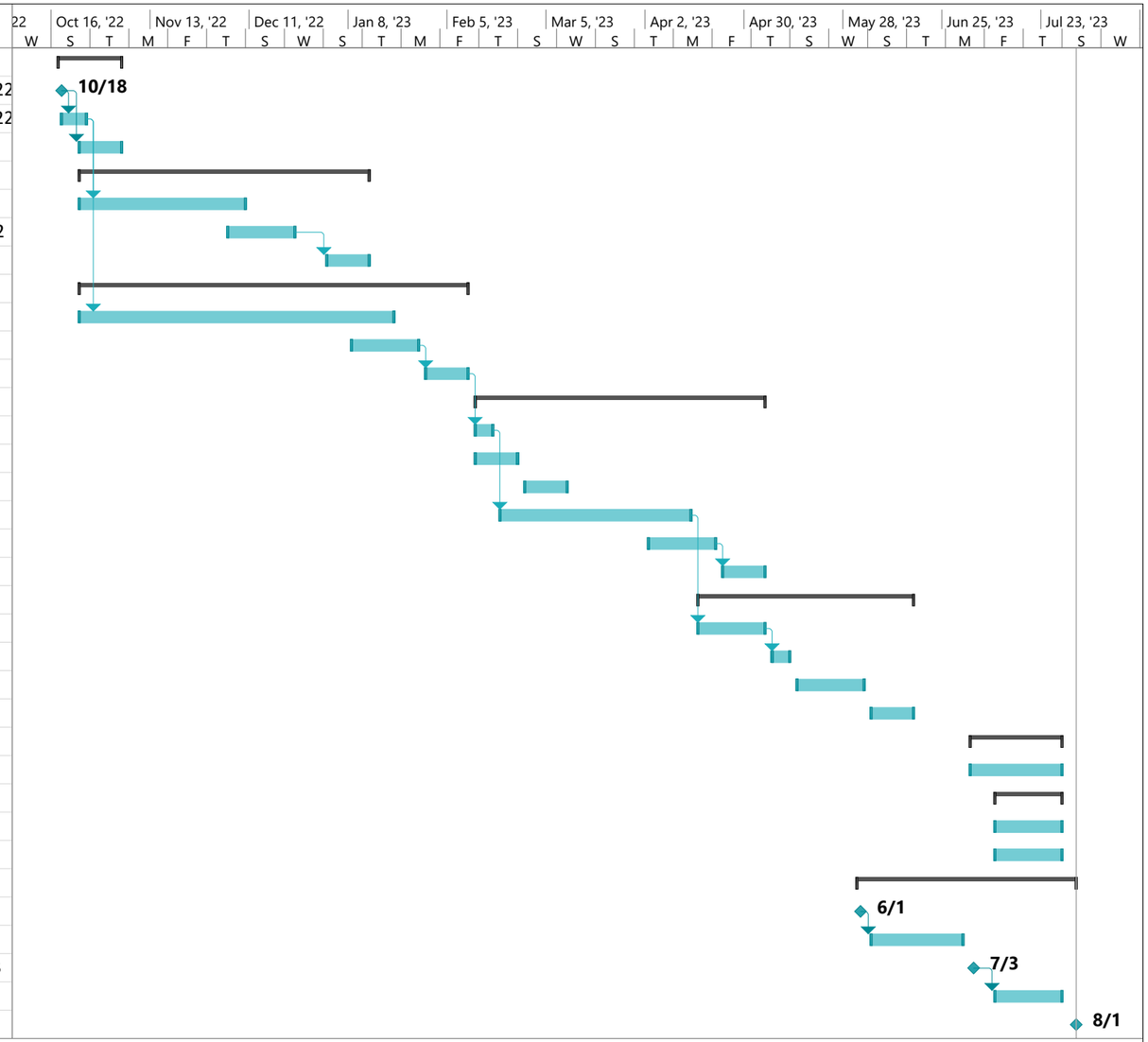
DATES
2020 - Ongoing

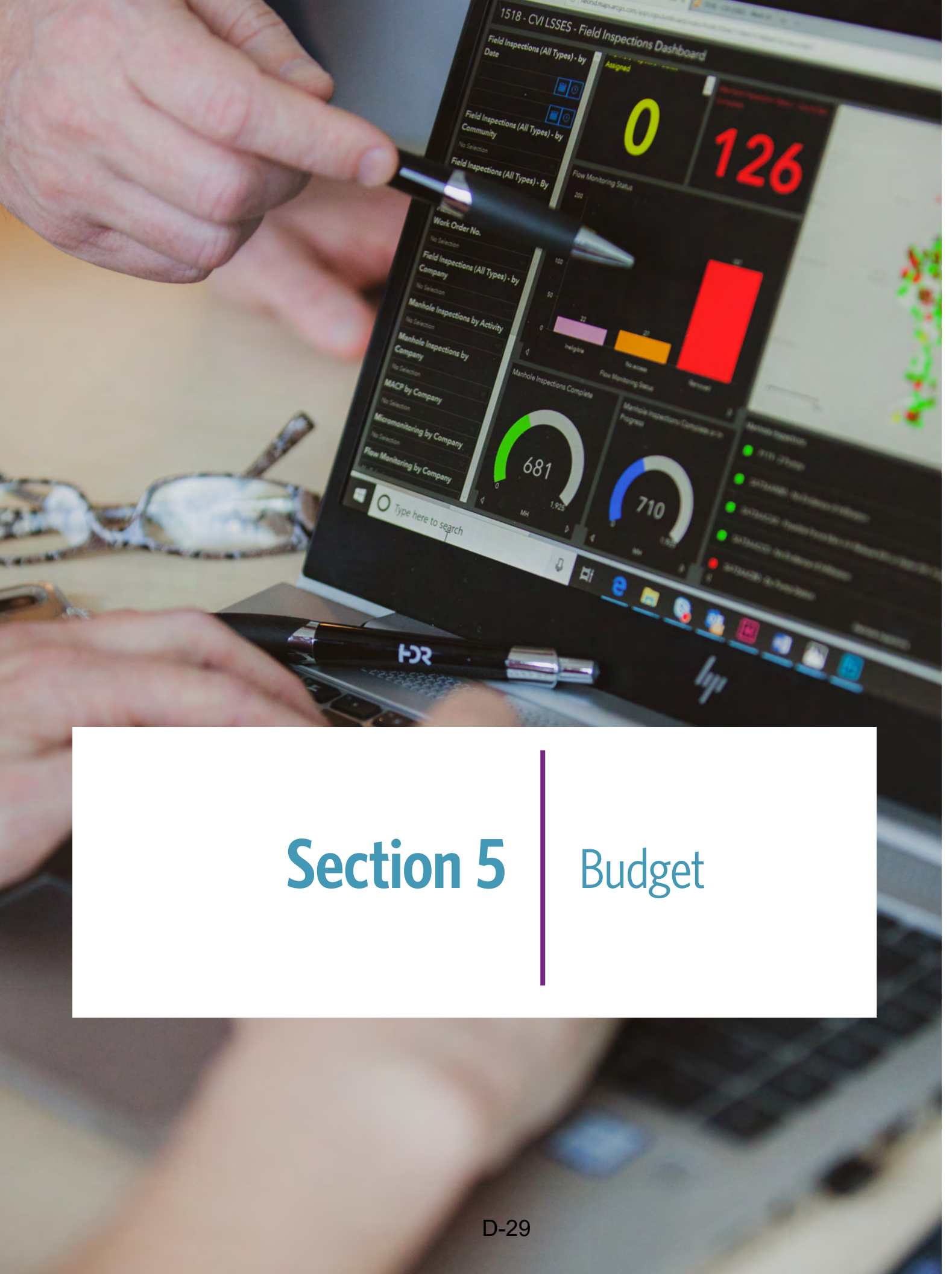
CONTRACT VALUE
To date: $606K

Section 4 | Schedule

SCHEDULE

ID	Task Name	Duration	Start	Finish
1	**Task 1 Project Management and Meetings**	**14 days**	**Tue 10/18/22**	**Fri 11/4/22**
2	Notice to Proceed	1 day	Tue 10/18/22	Tue 10/18/22
3	Kickoff Meeting	5 days	Wed 10/19/22	Tue 10/25/22
4	Data Requests	10 days	Mon 10/24/22	Fri 11/4/22
5	**Task 2. Develop Demand Input**	**60 days**	**Mon 10/24/22**	**Fri 1/13/23**
6	Develop Demand Inputs	35 days	Mon 10/24/22	Fri 12/9/22
7	Demand Input TM	15 days	Mon 12/5/22	Fri 12/23/22
8	IRWD TM Review	10 days	Mon 1/2/23	Fri 1/13/23
9	**Task 3. Develop Existing and Future Supply Input**	**80 days**	**Mon 10/24/22**	**Fri 2/10/23**
10	Develop Existing and Future Water Supply Inputs	65 days	Mon 10/24/22	Fri 1/20/23
11	Supply Input TM	15 days	Mon 1/9/23	Fri 1/27/23
12	IRWD TM Review	10 days	Mon 1/30/23	Fri 2/10/23
13	**Task 4. Develop Scenarios for Supply System Disruption or Constraint**	**60 days**	**Mon 2/13/23**	**Fri 5/5/23**
14	Supply Planning Workshop	5 days	Mon 2/13/23	Fri 2/17/23
15	Review previous reliability assessments	10 days	Mon 2/13/23	Fri 2/24/23
16	Update reliability factors	10 days	Mon 2/27/23	Fri 3/10/23
17	Develop water supply scenarios	40 days	Mon 2/20/23	Fri 4/14/23
18	Scenario Planning TM	15 days	Mon 4/3/23	Fri 4/21/23
19	IRWD TM Review	10 days	Mon 4/24/23	Fri 5/5/23
20	**Task 5. Water Supply and System Requirements Analysis and Report**	**45 days**	**Mon 4/17/23**	**Fri 6/16/23**
21	IPRDSM Modeling Consultant Analysis [by others]	15 days	Mon 4/17/23	Fri 5/5/23
22	Review IPSDSM model analysis	5 days	Mon 5/8/23	Fri 5/12/23
23	Water Supply and System TM	15 days	Mon 5/15/23	Fri 6/2/23
24	IRWD TM Review	10 days	Mon 6/5/23	Fri 6/16/23
25	**Task 6. Preliminary Evaluation Update Recommendations**	**20 days**	**Mon 7/3/23**	**Fri 7/28/23**
26	Board Workshop	20 days	Mon 7/3/23	Fri 7/28/23
27	**Task 7. Final Evaluation Update Recommendations**	**15 days**	**Mon 7/10/23**	**Fri 7/28/23**
28	Finalize 100% Report	15 days	Mon 7/10/23	Fri 7/28/23
29	Prepare Executive Summary	15 days	Mon 7/10/23	Fri 7/28/23
30	**Task 8. Deliverables**	**44 days**	**Thu 6/1/23**	**Tue 8/1/23**
31	Draft (75%) Report and Project Meeting	1 day	Thu 6/1/23	Thu 6/1/23
32	Draft Report Comments	20 days	Mon 6/5/23	Fri 6/30/23
33	Pre-Final (90%) Report Submittal and Project Meeting	1 day	Mon 7/3/23	Mon 7/3/23
34	Pre-Final Report Comments	15 days	Mon 7/10/23	Fri 7/28/23
35	Final Report (100%) Submittal and Project Meeting	1 day	Tue 8/1/23	Tue 8/1/23





Section 5 | Budget

BUDGET

NO.	TASK DESCRIPTION	LEVEL OF EFFORT (HOURS)												FEE (DOLLARS)			
		Principal	Project Manager	Quality Reviewer	Sr Technical Expert	Sr Engineer	Project Engineer	Staff Engineer	GIS Technician	Document Specialist	Accountant	Project Coordinator	Total Labor	Labor	Direct Costs	Total	TOTAL
	Client Billing Rates	*$315*	*$325*	*$345*	*$320*	*$290*	*$230*	*$130*	*$175*	*$125*	*$130*	*$125*	*$245*				
1	**Project Management**																
1.1	Project Management/Administration		24								24	12	60	12,420	311	12,731	
1.2	Data Request and Review		2			4	8	16	16				46	8,530	213	8,743	
1.3	Project Meetings and Progress		24			12	12						48	14,040	351	14,391	
1.4	Project Workshops (2)		24	4	24	4	24	8					88	24,580	615	25,195	
1.5	QA/QC	6	2	8								4	20	5,800	145	5,945	
	Subtotal 1 | Project Management	**6**	**76**	**12**	**24**	**20**	**44**	**24**	**16**	**0**	**24**	**16**	**262**	**65,370**	**1,635**	**67,005**	**67,000**
2	**Develop Demand Input**																
2.1	Develop Demand Input		8	2		8	16	16					50	11,370	284	11,654	
2.2	Demand Input TM		8	2		4	8		2	2			26	6,890	172	7,062	
	Subtotal 2 | Develop Demand Input	**0**	**16**	**4**	**0**	**12**	**24**	**16**	**2**	**2**	**0**	**0**	**76**	**18,260**	**456**	**18,716**	**18,700**
3	**Develop Supply Input**																
3.1	Existing and Future Water Supply Source Input		8	2	16	8	16	16					66	16,490	312	16,802	
3.2	Coordinate with Regional Agencies		8	2		4	8						22	6,290	157	6,447	
3.3	Supply Input TM		8	2		4	4		2	2			22	5,970	149	6,119	
	Subtotal 3 | Develop Supply Input	**0**	**24**	**6**	**16**	**16**	**28**	**16**	**2**	**2**	**0**	**0**	**110**	**28,750**	**618**	**29,368**	**29,400**
4	**Develop Scenarios for Supply System**																
4.1	Review previous reliability assessments		4			4	8	16	16				48	9,180	230	9,410	
4.2	Update reliability factors			2	24	4	8						38	11,370	284	11,654	
4.3	Develop water supply constraint scenarios	2	16	4	4	4	8	8					46	12,530	313	12,843	
4.4	Scenario Planning TM		8	2	16	4	4		2	2			38	11,090	277	11,367	
	| Develop Scenarios for Supply System	**2**	**28**	**8**	**44**	**16**	**28**	**24**	**18**	**2**	**0**	**0**	**170**	**44,170**	**1,104**	**45,274**	**45,300**
5	**Water Supply and System Analysis**																
5.1	Review model analysis results		4		24	16	16	8	36				104	24,640	616	25,256	
5.2	Analysis TM		8	2	8	4	8	8	2				40	10,240	256	10,496	
	al 5 | Water Supply and System Analysis	**0**	**12**	**2**	**32**	**20**	**24**	**16**	**38**	**0**	**0**	**0**	**144**	**34,880**	**872**	**35,752**	**35,800**
6	**Preliminary Evaluation Update Recommendations**																
6.1	Board Workshop	2	12	2	8	8	8	4	4	4			52	13,660	342	14,002	
	ry Evaluation Update Recommendations	**2**	**12**	**2**	**8**	**8**	**8**	**4**	**4**	**4**	**0**	**0**	**52**	**13,660**	**342**	**14,002**	**14,000**
7	**Final Evaluation Update Recommendations**																
7.1	Final Report	2	4	2		8	8			4			28	7,280	182	7,462	
7.2	Executive Summary	2	8	2		12	16			4			44	11,580	290	11,870	
	al Evaluation Update Recommendations	**4**	**12**	**4**	**0**	**20**	**24**	**0**	**0**	**8**	**0**	**0**	**72**	**18,860**	**472**	**19,332**	**19,300**
8	**Deliverables**																
8.1	75% Report	2	16	4	10	20	24	24	24	16			140	31,050	776	31,826	
8.2	90% Report	2	16	4	10	20	24	24	16	8			124	28,650	716	29,366	
8.3	Final Draft Report	2	16	4	8	16	24	24	8	8			110	25,450	636	26,086	
	Subtotal 8 | Deliverables	**6**	**48**	**12**	**28**	**56**	**72**	**72**	**48**	**32**	**0**	**0**	**374**	**85,150**	**2,128**	**87,278**	**87,300**
	TOTAL, hours	**20**	**228**	**50**	**152**	**168**	**252**	**172**	**128**	**50**	**24**	**16**	**1,260**				
	TOTAL, dollars													**309,100**	**7,627**	**316,727**	**316,800**
	TOTAL for all Tasks (including Optiona	**20**	**228**	**50**	**152**	**168**	**252**	**172**	**128**	**50**	**24**	**16**	**1,260**				
	TOTAL for all Tasks (including Optional Tasks), dollars													**309,100**	**7,627**	**316,727**	**316,800**

STAFF ROLES & RATES

Role	Staff	Billable Rate
Principal	Amy Omae	$315
Project Manager	Leanne Hammond	$325
Quality Reviewer	Gregorio Estrada	$345
Sr. Technical Expert	Steve Friedman, Chris Behr, Les Harder, Michael McMahon, Jeff Hansen, Yu Jung Chang, Blaine Dwyer, Ed Winkler	$320
Sr. Engineer	Kristi Shaw	$290
Project Engineer	Joel Engleson	$230
Staff Engineer	Kanchan Joshi	$130
GIS Technician	Anders Burvall	$175
Document Specialist	Katherine Turner	$125
Accountant	Brenan Nagamine	$130
Project Coordinator	Patti Pittman	$125

Section 6

Joint Venture

JOINT VENTURE

HDR is submitting as the prime consultant and not as a joint venture.

We will not be utilizing any subconsultants on this project.

Section 7

Conflict of Interest

CONFLICT OF INTEREST

We know there is potential for a conflict of interest when a firm works with a number of clients. And because we work with a lot of public agencies, the possibility of working with two agencies simultaneously that have conflicting interests does exist.

We are not aware of any projects or relationships that would cause a conflict-of-interest on this project. We have a strong set of protocols and guidelines in place to handle possible conflicts of interest. The following four points are keys to our Policy for Conflict of Interest Resolution:

EDUCATION

We educate employees on the principles of conflict-of-interest prevention. Employees are provided with a written policy outlining Engineering Business without Conflict.

DISCLOSURE

We fully disclose to each client any relationships, contracts, or teaming agreements that might present a conflict of interest or provide an unfair business advantage. Each person working on a project is responsible to disclose any circumstances that could present a conflict of interest.

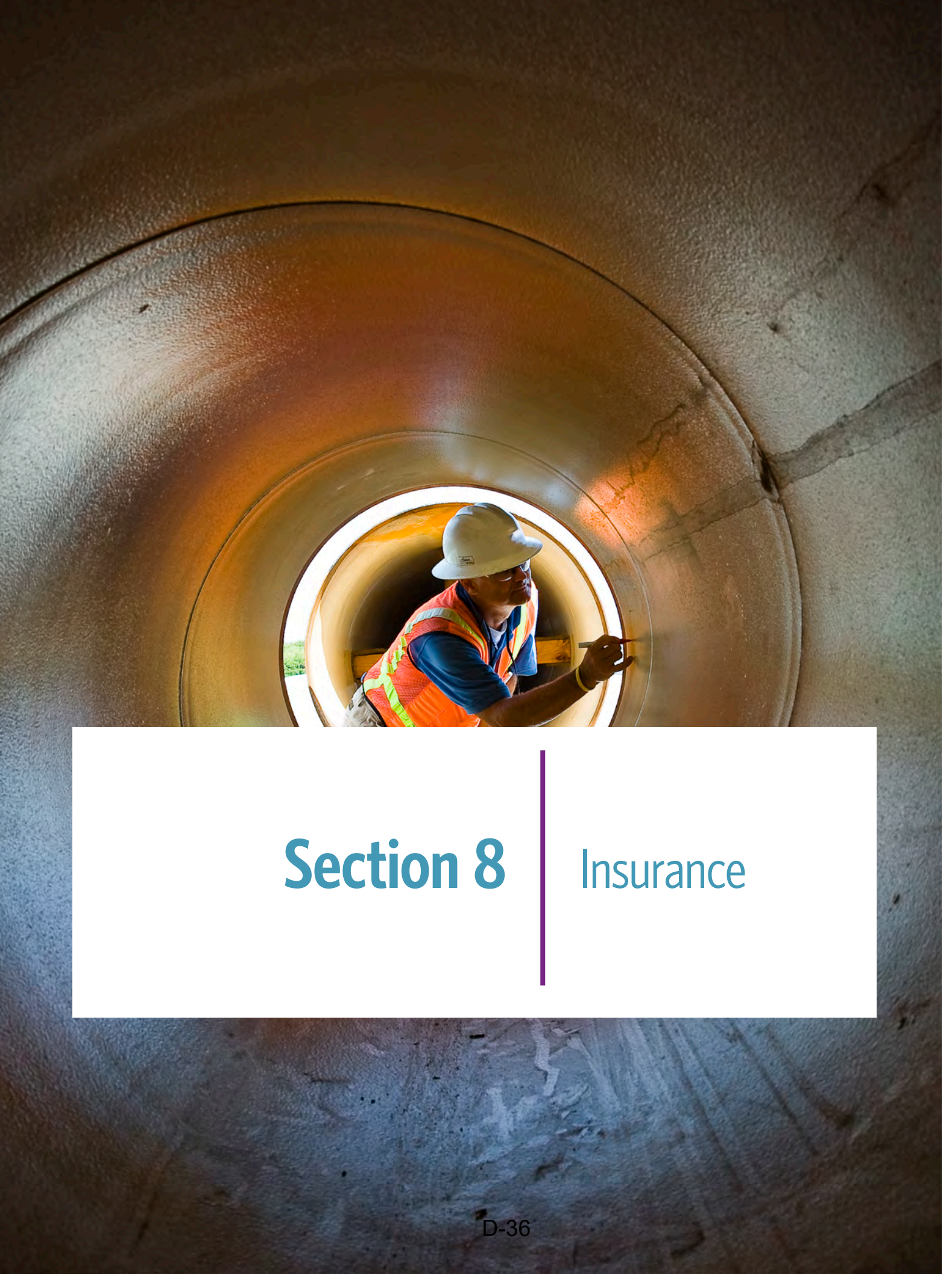
DELINEATION

We structure teams and assign personnel in ways that avoid inappropriate sharing or crossover of confidential or sensitive information. When necessary due to project circumstances, individuals who are positioned on teams where information-sharing would present a conflict are reassigned to maintain clear separation between project teams.

DOCUMENTATION

We require formal commitment from our personnel with regard to avoiding conflict of interest. When necessary due to project circumstances, we require employees to sign a "Firewall Agreement Form" tailored to the client/project in question to formalize their commitment to maintaining separation between internal teams and/or sources of information that could give rise to a conflict of interest or unfair business advantage.

It is our understanding that HDR does not have any existing conflicts of interest prohibited by law to submit for the Water Supply Evaluation Update.



Section 8 | Insurance

INSURANCE

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 06/16/2021

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER Willis Towers Watson Midwest, Inc. c/o 26 Century Blvd P.O. Box 305191 Nashville, TN 372305191 USA	CONTACT NAME: Willis Towers Watson Certificate Center PHONE (A/C, No, Ext): 1-877-945-7378 FAX (A/C, No): 1-888-467-2378 E-MAIL ADDRESS: certificates@willis.com
INSURED HDR Engineering, Inc. 1917 South 67th Street Omaha, NE 68106	INSURER(S) AFFORDING COVERAGE — NAIC # INSURER A : Liberty Mutual Fire Insurance Company — 23035 INSURER B : Ohio Casualty Insurance Company — 24074 INSURER C : Liberty Insurance Corporation — 42404 INSURER D : INSURER E : INSURER F :

COVERAGES **CERTIFICATE NUMBER:** W21262337 **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	[X] COMMERCIAL GENERAL LIABILITY [ ] CLAIMS-MADE [X] OCCUR [X] Contractual Liability [X] Deductible: $100,000 GEN'L AGGREGATE LIMIT APPLIES PER: [ ] POLICY [X] PRO-JECT [X] LOC [ ] OTHER:	Y	Y	TB2-641-444950-031	06/01/2021	06/01/2022	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG $	$ 2,000,000 $ 1,000,000 $ 10,000 $ 2,000,000 $ 4,000,000 $ 4,000,000 $
A	AUTOMOBILE LIABILITY [X] ANY AUTO [ ] OWNED AUTOS ONLY [ ] SCHEDULED AUTOS [ ] HIRED AUTOS ONLY [ ] NON-OWNED AUTOS ONLY [X] Comp/Coll [X] Ded. $1,000	Y	Y	AS2-641-444950-041	06/01/2021	06/01/2022	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident) $	$ 2,000,000 $ $ $ $
B	[ ] UMBRELLA LIAB [X] OCCUR [X] EXCESS LIAB [ ] CLAIMS-MADE [ ] DED [X] RETENTION $ 0	Y	Y	EUO(22)57919363	06/01/2021	06/01/2022	EACH OCCURRENCE AGGREGATE $	$ 10,000,000 $ 10,000,000 $
C	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY Y / N ANYPROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? No (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	N / A	Y	WA7-64D-444950-011	06/01/2021	06/01/2022	[X] PER STATUTE [ ] OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	 $ 1,000,000 $ 1,000,000 $ 1,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

Workers Compensation Deductible - $250,000

Certificate Holder is named as Additional Insured on General Liability, Automobile Liability and Umbrella/Excess Liability on a Primary, Non-contributory basis where required by written contract. Waiver of Subrogation applies on General Liability, Automobile Liability, Umbrella/Excess Liability and Workers Compensation where required by written contract. Umbrella/Excess policy is Follows Form over General Liability, Auto Liability and Employers Liability.

CERTIFICATE HOLDER	CANCELLATION
Sample	SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS. AUTHORIZED REPRESENTATIVE Alicia J. Pivelko

ACORD 25 (2016/03) The ACORD name and logo are registered marks of ACORD

SR ID: 21227135 BATCH: 2132293

Section 9 | Contract

CONTRACT

We have no modifications to the standard terms and conditions.

Appendix

Staff Resumes

Leanne Hammond, PE, ENV SP

Project Manager | Report Development | Scenario Planning & Workshop Facilitation

Leanne is an experienced Project Manager with more than two decades of experience in San Diego and the Southern California market working on water and wastewater projects for clients in both the public and private sectors. Leanne is well-versed in engineering and project management duties, including resource allocation, team performance, coordination with clients and subconsultants, and technical oversight so that quality goals are met, and budgets and schedule are maintained and achieved. Technical project work includes potable, recycled water, and wastewater master plans and hydraulic model development, urban water management plans (UWMPs), water and sewer technical studies for public and private clients, and task order support on as-needed engineering contracts.

EDUCATION
BS Environmental Engineering, California Polytechnic State University, San Luis Obispo (Cal Poly), 2000

REGISTRATIONS
Professional Engineer - Civil, Arizona, No. 73622

Professional Engineer - Civil, California, No. 68344

Envision Sustainability Professional

INDUSTRY TENURE
21 years

HDR TENURE
2 years

RELEVANT EXPERIENCE

West Basin Municipal Water District, Recycled Water Master Plan Update, Los Angeles, CA
Deputy Project Manager. Recycled Water Master Plan: Assess the conditions of the existing recycled water system, evaluate new opportunities to expand recycled water service, and develop an updated master plan document that outlines the District's improvement projects for the next 20 years. WBMWD Water Recycling Facilities include Hyperion Secondary Effluent Pump Station, Edward C. Little Recycling Facilities; Satellite Pants include: Torrance Refinery Water Recycling Plant, Juanita Milender-McDonald Carson Regional Water Recycling Plant, and Chevron Milender-Nitrification Treatment Plant; Distribution Facilities include: Hyperion Secondary Effluent Pipeline, Title 22 Recycled Water Distribution System, and West Coasst Barrier Distribution System.

Vallecitos Water District, Urban Water Management Plan (UWMP), San Marcos, CA
HDR prepared the 2020 Urban Water Management Plan (UWMP) update for Vallecitos Water District. As part of the 2020 UWMP update, HDR reviewed the 2015 UWMP, developed a water supply (based on obtained data from water purveyors) and water demand analysis to verify water supplies would adequately meet the projected water demand, confirmed the SBx7-7 water use target baseline methodology and verified that the District was meeting the 2020 per capita targets. The District's demand and supply documentation was also coordinated with San Diego County Water Authority's (SDCWA) demand and population projections for their member agencies. A Water Shortage Contingency Plan was created for the 2020 UWMP and both plans were presented at public hearings and Board meetings for comments and adoption.

City of San Diego MWWD, Recycled Water System Condition Assessment and Optimization Plan, San Diego, CA
HDR completed the San Diego Recycled Water Condition Assessment and Optimization Plan in 2020, which included tasks similar to the IMP project. We performed a market assessment for expansion of the nonpotable system, hydraulic modeling and optimization of the distribution system operations, condition assessment of the 20 year old infrastructure, prioritization of asset improvements, conducted life cycle analyses, prepared business case evaluations for recommended projects, and developed a CIP schedule.

Padre Dam Municipal Water District, Task Carlton Oaks Water Study, Santee, CA
HDR prepared a water study and hydraulic analysis using the District InfoWater hydraulic model to analyze the onsite and offsite facilities needed to serve the 160 single-family residential unit and 53-room resort facility with onsite restaurant project and provide improvement recommendations. The water study was executed as a task order authorization under the District As-Needed Civil Engineering Services contract with HDR.

Long Beach Water Department, Water System Optimization and Supply Management Study, Long Beach, CA
HDR prepared a Water System Optimization and Supply Management Report (Report), which will be a planning, level document discussing water system improvements, alternatives, constraints, and should address a comprehensive management approach of water production and conveyance in the City. The Report will be the roadmap to accomplish LBWD's long and short-term water resources strategy. Additionally, this Report will be utilized by LBWD to support development of near and long-term capital improvement projects.

Eastern Municipal Water District, As-Needed Sewer and Water Modeling Support Services
Perris, CA
Leanne provided as-needed sewer and water modeling support services to assist Eastern Municipal Water District staff resources with expediting tasks to meet their Capital Plan schedule. Services included coordination and development of future demand/flow projections for the potable water and wastewater systems, developing a streamlined process for importing demands/flows into the District's InfoWater and InfoSewer hydraulic models, updating the potable water, recycled water, and wastewater hydraulic models for use in the master plan updates, and developing various supply analyses for the District's service areas. As part of the hydraulic model updates, Leanne reviewed CIP projects from previous District master plans for digitization into the hydraulic model and updated model components based on District GIS databases, as well as incorporated special study areas into hydraulic model scenarios.

City of San Diego, As-Needed Comprehensive Groundwater Consultant Services, San Diego, CA
Through the 3-year As-Needed contract, which executed over 20 separate task orders, Leanne provided comprehensive services to complete various monitoring plans and the development of strategic groundwater projects, while meeting the challenge of cost-efficiently managing schedule and budget compliance and regulatory coordination. As Deputy Program Manager, Ms. Hammond assisted with overseeing schedule and budget of the various authorized task orders, reviewed monthly invoice packages and progress reports, prepared for and attended weekly status meetings with City staff, and coordinated with task managers to successfully deliver project submittals.

City of Carlsbad, 2018 Water and Recycled Water Master Plan Update, Carlsbad, CA
The City of Carlsbad (Carlsbad) last updated its Water, Recycled Water, and Sewer Master Plans in 2012 based on data through 2010.
As part of the master plan updates, Leanne provided an evaluation for significantly reduced potable and recycled water demands from the economic recession, combined with a multi-year drought. H2OMap hydraulic models were converted to InfoWater models, with current and forecasted demands being refined and loaded into the models for existing and future modeling scenarios. The models will be used to revise and update the resulting capital improvement programs (CIPs) to guide Carlsbad in spending precious funds in the most cost-effective manner.

Sweetwater Authority, Water Supply Feasibility Study, Chula Vista, CA
As a subconsultant to Gillingham Water, HDR is participating in a Water Supply Feasibility Study for Sweetwater Authority (SWA) in South San Diego County. SWA serves potable water to a population of approximately 190,000 in the City of National City, the unincorporated area of Bonita, and the western portion of the City of Chula Vista. Water is sourced from Sweetwater Reservoir, water wells (fresh and brackish) located in numerous locations within the SWA service area, and imported water purchased from the San Diego County Water Authority.

San Dieguito Water District, Water Master Plan & Water Capacity Fee Study, San Diego, CA
The San Dieguito Water District (District) provides potable water service to approximately 37,000 residents in the Western Half of the City of Encinitas. The District's 2010 water master plan projected a 17% increase in potable water demands by the year 2030. The District, as with many water municipalities across the nation, have experienced a decrease in overall water demands and per capita water consumption, even with rising population. This can be attributed to a number of factors, including economic downturns, conservation, and the increased use of recycled water to offset potable demands. This reduction in demands have created reduced tank turn overs and associated water quality issues resulting in a need for frequent flushing practices in portions of the District's system.

EDUCATION
MS Environmental Engineering (Civil Engineering with Environmental Emphasis), University of Miami, 2006

BS Chemistry (Chemistry and Environmental Health Science), University of Miami, 2004

REGISTRATIONS
Professional Engineer - Civil, California, No. 76824

LEED Accredited Professional, United States National Registration, No. 10328834

INDUSTRY TENURE
18 years

HDR TENURE
15 years

Amy Omae, PE, LEED AP

Principal in Charge

Amy is a proven senior engineer with extensive experience in water and wastewater master planning, design, and engineering services during construction projects throughout Southern California. Her expertise is in the design of treatment plant processes, mechanical pumping systems, pilot testing and research, alternative technology evaluations, mass balance and financial model development, pipeline alignments, data analysis for technically based local limits, quality assurance, and field engineering services during construction. She has worked with the District on many important projects, some of which include the Michelson WRP Phase II Expansion and Tertiary Filter Rehabilitation projects, the Sewage Treatment Master Plan, as well as the Cienega Selenium Treatment Facility.

RELEVANT EXPERIENCE

Irvine Ranch Water District, 2016 Water Reliability Study, Irvine, CA
Project Engineer. Provided modeling and evaluation of local and imported water supply reliability under a variety of emergency scenarios based on a rigorous and transparent probability of risk analysis. Recent climate change research and projected reliability of imported water resources were incorporated into the analysis. Level of service expectations were established and mitigation strategies developed.

Irvine Ranch Water District, Michelson WRP Tertiary Filters Improvements, Irvine, CA
Project Manager. IRWD contracted HDR to perform the preliminary and final design for the rehabilitation of the tertiary filtration system (originally constructed in 1978) and consists of the tertiary filters, backwash supply, spent backwash, air scour blower, and air compressor. An investigation into the poor performance of Filter No. 7 and a condition assessment of the concrete backwash supply and spent backwash tanks were also performed to better inform the extent of the rehab design and make modifications to potentially improve filter performance.

Irvine Ranch Water District, Sewage Treatment Master Plan, Irvine, CA
Basis of Planning Task Lead. HDR assisted with preparation of master plan, which characterized sewage for such constituents as organic content and nutrients, determined future sewage conveyance requirements to each of the recycling plants, identified future treatment processes and their associated capacities at both the 28 mgd Michelson Water Recycling Plant and 7.8 mgd Los Alisos Water Recycling Plant, identified beneficial uses of sewage, minimized diversion of sewage to Orange County Sanitation District, and identified ways of managing the sewage collection and treatment systems in the most cost-effective manner while balancing the projected sewage flows with projected recycled water demands. The master plan identified capital improvement projects necessary to implement the recommendations and a corresponding implementation program for those improvements. Changes that were addressed in the master plan included the new biosolids and energy recovery facilities at the Michelson plant, potable reuse program, sewer flows from the Irvine Business Complex, increased loading concentrations, water conservation and increased developments, Michelson plant diversion to San Diego Creek, and Orange County Water District's Green Acres Project. The project included update of the existing sewer collection model to generate options for sewage conveyance to better optimize the management of flows throughout the collection system and their ultimate end use.

Irvine Ranch Water District, Recycled Water Salt Management Plan, Irvine, CA
Deputy Project Manager and Project Engineer. Assisted the management of project work, schedule, and team. Identified and assigned tasks to the project team, coordinated and collaborated with Irvine Ranch Water District (IRWD), other utility agencies and subconsultants, performed data collection and analysis, provided direction to develop the model and resolve data gaps, evaluated alternative mitigation strategies, and wrote reports. To better understand the contributing sources of salt in IRWD's recycled water product, IRWD selected HDR to prepare a Salt Management Plan that contains a comprehensive historic, present day and future salt balance analysis, quantifies salt concentration limits for recycled water customers and identifies costs and benefits of mitigation strategies to control salts in the recycled water product. Solutions from both the potable water and wastewater perspective were evaluated to determine the most cost-effective approach to reducing salinity.

Irvine Ranch Water District, Cienega Selenium Treatment Facility, Irvine, CA
Deputy Project Manager and Project Engineer. Responsible for managing the project work, budget, schedule, and team. Ms. Omae coordinated with Irvine Ranch Water District (IRWD), regulatory and permitting agencies, vendors, and subconsultants, performed civil and process design, evaluated alternatives, and participated in the pilot testing. HDR performed an evaluation to identify and recommend the technology treatment alternatives to remove selenium from Peters Canyon Wash in Irvine, California. HDR pilot tested the the Advanced Biological Metals Removal (ABMet) system, completed a 60% design of a 3-cfs Cienega Selenium Treatment Facility (Cienega) and the 100% design of the infiltration gallery and discharge systems for the facility.

Irvine Ranch Water District, Filter Pump No. 2 Discharge Header Replacement, Irvine, CA
Project Manager. Amy was responsible for coordinating and collaborating with Irvine Ranch Water District (IRWD), managing the project work, schedule, and team. HDR was selected to develop the design to replace the corroded discharge header for the Michelson Water Recycling Plant (MWRP) Filter Pump Station No. 2 (FPS-2) and incorporate cathodic protection measures on the new header. FPS-2 is part of the MWRP conventional treatment train to convey up to 22 mgd of secondary effluent to the tertiary filters, high-rate clarifier, or long-term storage. HDR is currently providing engineering services during construction for submittal reviews and RFIs.

Irvine Ranch Water District, Biosolids/Energy Management Plan, Irvine, CA
Staff Engineer. Prepared a biosolids handling preliminary design report for the Michelson Water Recycling Plant (MWRP), as well as an energy efficiency master plan for MWRP and Los Alisos Water Reclamation Plant. HDR evaluated several solids handling alternatives. The resulting preliminary design included centrifugal thickening of primary and waste activated sludge, acid-phased anaerobic digestion, centrifugal dewatering, treatment of dewatering centrate, and solids drying to 95 percent. The biogas will be cleaned and utilized in a fuel cell to produce 1.4 megawatts of electricity and to partially fuel the dryer.

Irvine Ranch Water District, Michelson WRP Phase II Expansion, Design and Engineering Services During Construction, Irvine, CA
Project Engineer and Staff Engineer. Responsible for developing the design of the agitation aeration distribution system for the influent junction structure, headworks, primary splitter box, and primary distribution channel, managing and performing QA/QC review of submittal reviews and requests for information (RFIs), change orders, civil site grading design, and field engineering. HDR performed the conceptual design, preliminary design, and final design, and provided engineering services during construction of the Michelson Water Reclamation Plant Phase 2 expansion to 33 mgd.

Irvine Ranch Water District, Baker WTP Construction Management Services, Irvine, CA
Task Lead. HDR was retained by Irvine Ranch Water District to provide improved water supply and water system reliability to the service areas of IRWD and four other local water agencies including El Toro Water District Moulton Niguel Water District Santa Margarita Water District and Trabuco Canyon Water District.

Irvine Ranch Water District, Salt Model Phase I Refresh, Irvine, CA
Task Lead. This project is Phase 1 of the refresh to Irvine Ranch Water District's Salt Balance Model (originally developed by HDR in 2015) that identifies the impact of changing potable water sources, wastewater discharges (residential, commercial, industrial), and treatment plant processes on the total dissolved solids (TDS), chloride (Cl), and boron (B) in their recycled water product. The Salt Model Update will be organized into two phases with Phase 1 being a refresh of historical data that serves as the basis of the model, recalibration, and incorporate planned future facilities consistent with IRWD's Sewage Treatment Master Plan, and provide additional model enhancements.

Gregorio Estrada, PE, LEED AP

QA/QC

Gregorio has extensive experience in the planning, design, construction, and management of wastewater and water projects in Southern California. He has served as a trusted advisor to the District for over 12 years and understands your systems, processes, and procedures. His specialization is in wastewater treatment processes with a particular interest in advanced treatment including: nutrient removal, filtration, membranes, and disinfection. Project experience includes the design of utility and infrastructure facilities, and systems economic evaluations, regulatory compliance, negotiations with regulatory agencies, investigation and design of wastewater collection, and distribution facilities, wastewater treatment plant design, open-channel and closed conduit flow, parameter monitoring systems, wastewater pumping stations, and collection and conveyance infrastructure.

EDUCATION
BS Civil Engineering, Stanford University, 2001

REGISTRATIONS
Professional Engineer, Civil, CA, No. 67066

LEED Accredited Professional

INDUSTRY TENURE
21 years

HDR TENURE
16 years

RELEVANT EXPERIENCE

Irvine Ranch Water District, Michelson Water Recycling Plant Phase 2 Expansion, Irvine, CA
Project Manager/Task Leader/Construction Manager. This award-winning $87.5 million project expanded capacity of the Michelson Water Recycling Plant to 33 mgd. Improvements included influent sewers, new headworks, expansion of the primary sedimentation tanks, new primary effluent pumping station and flow control, modified flow equalization basins, secondary treatment expansion with new membrane bioreactor (MBR) facility, new high-rate clarifier to treat filter backwash, new ultraviolet (UV) disinfection system, reclaimed water pumping, modifications to chlorine contact basins, chemical feed systems, new pumping and other ancillary facilities, and electrical modifications.

Irvine Ranch Water District, Michelson WRP Tertiary Filters Improvements, Irvine, CA
Task Lead. HDR is performing the preliminary and final design for the rehabilitation of the tertiary filtration system (originally constructed in 1978) which consists of the tertiary filters, backwash supply, spent backwash, air scour blower, and air compressor. An investigation into the poor performance of Filter No. 7 and a condition assessment of the concrete backwash supply and spent backwash tanks were also performed to better inform the extent of the rehab design and make modifications to potentially improve filter performance.

Irvine Ranch Water District, Sewage Treatment Master Plan, Irvine, CA
Project Manager, Treatment Plant Conceptual Design Task Lead. HDR assisted with preparation of master plan, which characterized sewage for such constituents as organic content and nutrients, determined future sewage conveyance requirements to each of the recycling plants, identified future treatment processes and their associated capacities at both the 28 mgd Michelson Water Recycling Plant and 7.8 mgd Los Alisos Water Recycling Plant, identified beneficial uses of sewage, minimized diversion of sewage to Orange County Sanitation District, and identified ways of managing the sewage collection and treatment systems in the most cost-effective manner while balancing the projected sewage flows with projected recycled water demands. The master plan identified capital improvement projects necessary to implement the recommendations and a corresponding implementation program for those improvements. Changes that were addressed in the master plan included the new biosolids and energy recovery facilities at the Michelson plant, potable reuse program, sewer flows from the Irvine Business Complex, increased loading concentrations, water conservation and increased developments, Michelson plant diversion to San Diego Creek, and Orange County Water District's Green Acres Project. The project included update of the existing sewer collection model to generate options for sewage conveyance to better optimize the management of flows throughout the collection system and their ultimate end use.

Irvine Ranch Water District, Biosolids/Energy Management Plan, Irvine, CA
Project Engineer. Prepared a biosolids handling preliminary design report for the Michelson Water Recycling Plant (MWRP), as well as an energy efficiency master plan for MWRP and Los Alisos Water Reclamation Plant. HDR evaluated several solids handling alternatives. The resulting preliminary design included centrifugal thickening of primary and waste activated sludge, acid-phased anaerobic digestion, centrifugal dewatering,

treatment of dewatering centrate, and solids drying to 95 percent. The biogas will be cleaned and utilized in a fuel cell to produce 1.4 megawatts of electricity and to partially fuel the dryer.

Irvine Ranch Water District, Recycled Water Salt Management Plan, Irvine, CA
Client Service Manager. HDR was selected to prepare a Salt Management Plan that contains a comprehensive historic present day and future salt balance analysis quantifies salt concentration limits for recycled water customers and identifies costs and benefits of mitigation strategies to control salts in the recycled water product. Solutions from both the potable water and wastewater perspective were evaluated to determine the most cost-effective approach to reducing salinity.

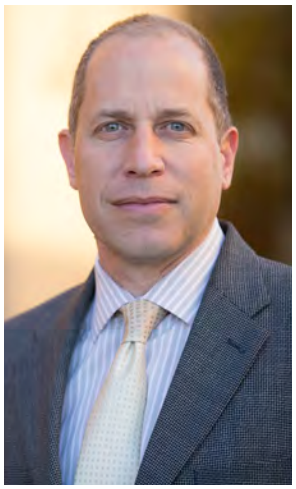
Irvine Ranch Water District, MWRP Filter Pump Station No. 2 Replacement Design, Irvine, CA
Task Lead. HDR was contracted to develop the construction documents on an expedited schedule to replace the corroded FPS-2 header, install new isolation valves and flow meter, and provide cathodic protection. HDR engaged with stakeholders to develop a detailed construction sequence, temporary bypass pumping implementation and testing plan, and startup plan for the FPS-2 pumps during the design phase. Following the completion of this design effort, IRWD contracted with HDR to provide Engineering Services During Construction.

Irvine Ranch Water District, Syphon Reservoir Owner's Engineer, Irvine, CA
Project Manager. IRWD is expanding its existing 500 acre-foot Syphon Reservoir to 5,000 acre-feet to provide storage capacity for its expanding recycled water program. The $90 million construction project includes removing the existing 59-foot high dam and the design and construction of a 130-foot-high embankment dam, a sloping intake and outlet works, a spillway, and on-site treatment facilities. The HDR team is acting as IRWD's Owner's Representative, and is helping IRWD navigate through the investigation, design, environmental documentation, permitting, public outreach, and agency approval process.

Irvine Ranch Water District, Replacement Planning Model Cost Assumption Update, Irvine, CA
Project Manager. The HDR team provided updates to the treatment facility cost assumptions in the District's replacement planning model.

Irvine Ranch Water District, Salt Model Phase I Refresh, Irvine, CA
Task Lead. This project is Phase 1 of the refresh to Irvine Ranch Water District's Salt Balance Model (originally developed by HDR in 2015) that identifies the impact of changing potable water sources, wastewater discharges (residential, commercial, industrial), and treatment plant processes on the total dissolved solids (TDS), chloride (Cl), and boron (B) in their recycled water product. The Salt Model Update will be organized into two phases with Phase 1 being a refresh of historical data that serves as the basis of the model, recalibration, and incorporate planned future facilities consistent with IRWD's Sewage Treatment Master Plan, and provide additional model enhancements.

South Orange County Wastewater Authority, JB Latham Treatment Plant - Aeration and Cogeneration Updates, Dana Point, CA
Project Manager. Led the project team responsible for the evaluation and design of aeration and cogeneration systems upgrades for the JB Latham Treatment Plant. The HDR team completed the final design and bid-phase services, and were selected to provide Engineering Services During Construction of the JBLTP Aeration and Cogeneration Project. Services included preliminary and final design, development of performance specifications, development of start-up and commissioning plans, bid phase services, construction phase services, preparation of conformed drawings, review and response to Submittals and Requests for Information, preparation of Change Order documentation, field visits, start-up services, and preparation of record drawings.



Steve Friedman, PE, PMP, BCEE

Demand & Supply Inputs | MWD/Groundwater Expert

Steve has over 27 years of experience in engineering planning and design of water, recycled water, industrial waste, and wastewater facilities. His background includes a variety of project types that consist of transmission and distribution system piping, wastewater treatment plant upgrades, pumping stations, pressure control stations, and water treatment. He has provided a wide range of services during construction including office engineering, observation and construction management. His project management skills have been honed through the successful delivery of multidiscipline infrastructure projects in southern California and across the US — he is one of HDR's most experienced project managers. He will provide consistent guidance to HDR project teams, and manage the overall contract to deliver on the scope objectives while maintaining schedule and budget.

EDUCATION

MS Civil Engineering, University of California at Berkeley, 1994

BS Civil Engineering, University of California at Berkeley, 1993

REGISTRATIONS

Professional Engineer - Civil, CA, No. 055566

Project Management Professional, California, No. 293170

American Academy of Environmental Engineers, CA No. BCEE / 7337470

Risk Assessment Methodology for Water, CA

INDUSTRY TENURE

29 years

HDR TENURE

28 years

RELEVANT EXPERIENCE

Irvine Ranch Water District, SOCWA Pumping Station, Irvine, CA

Project Manager. Responsible for day-to-day project management mechanical and civil design oversight of electrical and instrumentation and controls design and services during construction. HDR prepared contract documents for a new 7.5-MGD pumping station to divert a combination of plant effluent and 1.5 MGD of brine from the District's desalter project to the existing ocean outfall. Components of this project included a new electrical building to contain facilities for new and future equipment wet well and two 40-HP and three 125-HP pumps.

Irvine Ranch Water District, Recycled Water Salt Management Plan, Irvine, CA

Task Lead. HDR was selected to prepare a Salt Management Plan that contains a comprehensive historic present day and future salt balance analysis quantifies salt concentration limits for recycled water customers and identifies costs and benefits of mitigation strategies to control salts in the recycled water product. Solutions from both the potable water and wastewater perspective were evaluated to determine the most cost-effective approach to reducing salinity.

Irvine Ranch Water District, Michelson WRP Phase II Expansion, Irvine, CA

Task Lead. HDR designed the MWRP Phase 2 Capacity Expansion to handle projected flows in the year 2025. Project tasks included project management permitting and public involvement assistance site investigation special studies preliminary design report final design and construction assistance. The final design included new influent sewers and headworks expanded primary sedimentation a new primary effluent pumping station modified flow equalization basins secondary treatment expansion with membrane bioreactors a new high-rate clarifier to treat filter backwash a new ultraviolet disinfection system chemical facilities a new floodwall new pumping and other ancillary facilities and electrical modifications.

Metropolitan Water District, Task: Delta Conveyance, Sites Reservoir, and Other Bay-Delta Matters, Los Angeles, CA

Project Manager. HDR is providing technical support for Delta Conveyance, Sites Reservoir planning, Metropolitan's Delta Islands pilot projects, and other Bay-Delta matters. The Delta Conveyance project will modernize the State Water Project infrastructure in the Sacramento-San Joaquin Delta that diverts fresh water to consumers in the Bay Area, the San Joaquin Valley, along the central coast, and to Southern California. The Conveyance Project adds diversions on the Sacramento to improve the State Water Project resilience, reliability and to minimize risk due to climate change and future seismic events. The project includes infrastructure such as levees, canals, pumping plants, reservoirs, river intakes, sedimentation basins, power transmission, power distribution systems and substations and large diameter tunnels. The Sites Reservoir is an off-river reservoir that will capture excess water from major storms and save it for drier periods, helping California's communities to supply reliable water when other sources are low. Also Sites stores and release water for environmental protection. The Sites facilities include pipelines, pumping plants, canals and dams.

Eastern Municipal Water District, San Jacinto Valley Raw Water Conveyance Facilities Design, San Jacinto, CA
Project Manager. The project is comprised of over 7 miles 66-inch pressure pipeline, a 100 CFS booster pumping station and a new service connection to the Metropolitan Water District's 144-inch diameter Inland Feeder. Special features of the design include tunneling beneath busy intersections and a Railroad right of way and stringent permit requirements necessary to advance the project from preliminary to final design. Due to the pipeline and booster station space requirements, significant property and easement acquisitions were necessary. Careful hydraulic evaluation is necessary due to the range of hydraulic grades anticipated within the Inland Feeder. Alternative configurations were considered to defer pumping and determine the range of options where recharge basins could be fed by gravity.

Metropolitan Water District, Water Treatment and Pipeline On-Call Services, Los Angeles, CA
Contract/Project Manager. Steve has managed this on-call contract for Metropolitan since the end of 2013. Since that time, he has selected the appropriate project team and managed the contract for four different task orders. He is currently the project manager for one task order; providing UPS replacement at all five Colorado River Aqueduct Pumping Stations.

Metropolitan Water District, Sepulveda Prestressed Concrete Cylinder Pipe (PCCP) Rehabilitation, Los Angeles, CA
Project Manager. HDR is providing engineering design services to perform preliminary design for the Prestressed Concrete Cylinder Pipe (PCCP) Rehabilitation of the Sepulveda Feeder, a 40- mile pipeline in urban Los Angeles. Pipeline size ranges from 84-inches to 150-inches. Services consist of preliminary design and the preparation of design reports.

Metropolitan Water District, Service Connections Administrative Code Update Recommendations, Riverside, CA
Project Manager. One relevant project included providing technical support to Metropolitan regarding updates to the agency's administrative code pertaining to metering requirements in "non-standard" service connections (i.e., those with low turndown ratios and/or shorter than required upstream/downstream pipe lengths from the meter). HDR's work has included: industry research regarding large meter types and their accuracy requirements, installation limitations, and costs; development of options for approaches to evaluate non-standard service connection modification requests that Metropolitan receives from its member agencies; a limited survey of other large utilities in the US regarding their large revenue meter programs; support at a series of Meter Workgroup workshops involving Metropolitan and member agency staff; and, preparation of a report containing program recommendations that are envisioned to ultimately inform updates to the MWD's administrative code.

Metropolitan Water District, Task: Rialto Feeder Hydraulic Feasibility Study, Los Angeles, CA
Project Manager. Determine the hydraulic feasibility of this emergency drought response and identify required construction work and components to implement the concept.

Metropolitan Water District, Lake Mathews Forebay Bypass Study, Riverside, CA
Project Manager. This study evaluated several alternatives to replace pressure reduction (Howell-Bunger) valves from the existing 2,000 cfs facility that distributes Colorado River raw water from Lake Mathews to the Upper and Lower feeders. Alternatives considered ranged from a simple pressure reduction valve replacement to complete facility replacement. Power generation options were also considered for each option. Facilities considered for these alternatives include multi-orifice plates, sleeve-valves, adjustable weirs and bypass pipelines as large as 14-feet in diameter. Isolation valves and connection to the existing 22 feet diameter inlet tunnel and emergency spillway concepts were key considerations for all alternatives.

Joel Engleson

Hydraulic Modeling

Joel has 19 years of experience providing numerical and computational support services, including more than 12 years of experience in utility management consulting services. His primary focus is hydraulic analysis and master planning of water, recycled water, and sewer systems. He specializes in using the latest modeling software technology to developed innovative solutions related to the operation, planning, and design of water distribution systems. He has served in the capacity of project engineer and modeler on a variety of District projects. He has provided hydraulic modeling support for the District on the Sewage Treatment Master Plan, the 2016 Water Supply Evaluation Study, the Recycled Water Salt Management Plan, the 2014 Embedded Energy Audit, and the Zone A Hydraulic Model.

EDUCATION

PhD Civil Engineering, University of South Florida (USF Tampa), In-progress

ME Civil Engineering, Texas A&M University, College Station, 2005

BS Civil Engineering, Texas A&M University, College Station, 2003

INDUSTRY TENURE

19 years

HDR TENURE

14 years

RELEVANT EXPERIENCE

Irvine Ranch Water District, 2016 Water Reliability Study, Irvine, CA

Hydraulic Modeling. Provided modeling and evaluation of local and imported water supply reliability under a variety of emergency scenarios based on a rigorous and transparent probability of risk analysis. Recent climate change research and projected reliability of imported water resources were incorporated into the analysis. Level of service expectations were established and mitigation strategies developed.

Irvine Ranch Water District, Recycled Water Salt Management Plan, Irvine, CA

Hydraulic Modeling. HDR was selected to prepare a Salt Management Plan that contains a comprehensive historic present day and future salt balance analysis quantifies salt concentration limits for recycled water customers and identifies costs and benefits of mitigation strategies to control salts in the recycled water product. Solutions from both the potable water and wastewater perspective were evaluated to determine the most cost-effective approach to reducing salinity.

Irvine Ranch Water District, Embedded Energy Audit, Irvine, CA

Project Engineer. HDR, as a subconsultant to Navigant, developed a tool that will work the District's geographic information system (GIS) database to project embedded energy spatially for a variety for future alternatives.

Irvine Ranch Water District, Sewage Treatment Master Plan, Irvine, CA

Conveyance Hydraulic Modeling. HDR assisted with preparation of master plan, which characterized sewage for such constituents as organic content and nutrients, determined future sewage conveyance requirements to each of the recycling plants, identified future treatment processes and their associated capacities at both the 28 mgd Michelson Water Recycling Plant and 7.8 mgd Los Alisos Water Recycling Plant, identified beneficial uses of sewage, minimized diversion of sewage to Orange County Sanitation District, and identified ways of managing the sewage collection and treatment systems in the most cost-effective manner while balancing the projected sewage flows with projected recycled water demands. The master plan identified capital improvement projects necessary to implement the recommendations and a corresponding implementation program for those improvements. Changes that were addressed in the master plan included the new biosolids and energy recovery facilities at the Michelson plant, potable reuse program, sewer flows from the Irvine Business Complex, increased loading concentrations, water conservation and increased developments, Michelson plant diversion to San Diego Creek, and Orange County Water District's Green Acres Project. The project included update of the existing sewer collection model to generate options for sewage conveyance to better optimize the management of flows throughout the collection system and their ultimate end use.

Irvine Ranch Water District, Zone A Hydraulic Model, Irvine, CA
Hydraulic Modeling. Provided hydraulic modeling and analysis for the Zone A system using InfoWater. The district was experiencing high pressures in Zone A of their recycled water distribution system near the Michelson Water Recycling Plant. Used the hydraulic model to analyze the system for possible causes of the high pressures. Provided an explanation for the problem and proposed solution based on model analysis.

City of San Diego Municipal Wastewater District, Recycled Water System Condition Assessment & Optimization Plan, San Diego, CA
Hydraulic Modeling. HDR completed the San Diego Recycled Water Condition Assessment and Optimization Plan in 2020, which included tasks similar to the IMP project. We performed a market assessment for expansion of the nonpotable system, hydraulic modeling and optimization of the distribution system operations, condition assessment of the 20 year old infrastructure, prioritization of asset improvements, conducted life cycle analyses, prepared business case evaluations for recommended projects, and developed a CIP schedule.

City of Carlsbad, Water, Wastewater, and Recycled Water Master Plan, Carlsbad, CA
Hydraulic Modeling. HDR prepared water, sewer, and recycled water master plan update. The project included hydraulic modeling to assess development impacts on existing system infrastructure, fire flow analysis, water demand and sewer flow projection calculations, analysis to assess capacity of existing infrastructure to convey flows, and development of an asset management plan. Developed cost-effective opportunity condition assessment for water systems.

San Dieguito Water District, Water Master Plan and Water Capacity Fee Study, Encinitas, CA
Hydraulic Modeling. The San Dieguito Water District (District) provides potable water service to approximately 37,000 residents in the Western Half of the City of Encinitas. The District's 2010 water master plan projected a 17% increase in potable water demands by the year 2030. The District, as with many water municipalities across the nation, have experienced a decrease in overall water demands and per capita water consumption, even with rising population. This can be attributed to a number of factors, including economic downturns, conservation, and the increased use of recycled water to offset potable demands. This reduction in demands have created reduced tank turn overs and associated water quality issues resulting in a need for frequent flushing practices in portions of the District's system.

City of Vista, Comprehensive Sewer Management Plan, Vista, CA
Project manager for as needed services related to sewer model update and/or analysis, including adding/ updating model scenarios or other updates requested for the model. Worked performed included analyzing proposed flow transfers, analyzing proposed developments that are not considered in the current flow generation data, determining the effects of zoning changes proposed by developers, and updating the hydraulic model to include capital improvements and extensions to the system.

Jafar Faghih, PE

Demand & Supply Inputs

Jafar has 23 years of experience as a civil engineer specializing in water resources planning and management. He has served as Project Engineer or Project Manager on multiple water supply and infrastructure master plans, integrated regional water management plans, water supply assessments, and groundwater management plans for local, regional, state, and federal clients. His relevant experience includes development of water supply strategy on a local and regional level, estimation of future water demands and water supply reliability, and identification of water supply sources and facilities. With Jafar's expertise in integrated regional water management, he is particularly skilled at linking multiple planning studies, identifying emerging water supply and regional planning issues and opportunities, and addressing funding issues and challenges for fiscally responsible long-range utility planning.

EDUCATION

MS Civil Engineering, University of California, Los Angeles, 2000

BS Civil Engineering, University of California, Davis (UC Davis), 1999

REGISTRATIONS

Professional Engineer - Civil, CA, No. 63393

INDUSTRY TENURE

23 years

HDR TENURE

9 years

RELEVANT EXPERIENCE

City of Sunnyvale, Water Pollution Control Plant Master Plan and Primary Treatment Facility, Sunnyvale, CA

Project Engineer. HDR provided master planning, site planning, design standards, final design, and engineering services during construction for primary treatment renovation improvements for the city's 14 mgd water pollution control plant. Treatment processes were evaluated. Alternatives were develped for preliminary, primary, and secondary treatment; filtration; disinfection; solids thickening and dewatering; gas management, and; odor control systems.

RMC Water, Regional San Recycled Water Opportunities Update Assistance, Walnut Creek, CA

Project Engineer. Prepared planning-level cost estimates for delivering recycled water to five development areas via a centralized recycled water supply (versus satellite plants), which included Vineyard and West Jackson Centralized, East Rancho and Westborough and Cordova Hills Centralized, Aerojet and Folsom Plan Area Centralized, Natomas Vision and Sutter Pointe and North Precinct and Elverta Centralized, and Delta Shores Centralized. Unit costs were later updated and HDR assisted with developing future recycled water project ideas through a staff meeting and management workshop, and also provided conceptual design for a centralized recycled water system to the Folsom Plan area and agricultural customers in Grant Line area, which included sizing pipelines, pumping stations, and storage tanks.

Sacramento Central Groundwater Authority, Utility Rate Work, Sacramento, CA

Project Engineer. s the project engineer, Jafar is currently supporting SCGA to conduct a rate study. The study will include reviewing current conditions, identifying customers, summarizing customer concerns and preferences in developing a new rate model, and developing the cost allocation methodology and approach, as well as technical analysis and development of rates. The new rate structure has been requested by SCGA to make sure that they maintain funding through the implementation of various implementation activities needed to comply with the Sustainable Groundwater Management Act.

Nevada Irrigation District, Task 1: Raw Water Master Plan Update, Nevada County, CA

Project Engineer. Nevada Irrigation District (NID) is in need of an update for the District's Raw Water Master Plan (RWMP). The last update to the plan was in 2011. The 2011 RWMP analysis was based on projected 2032 water management practices at the time, which did not include future, projected Federal Energy Regulatory Commission (FERC) license conditions or climate change. To support the water supply decisions in current and future years, an updated plan is needed. The update will include a 50 year projection of demands and capital improvements.

Yolo County, Small Communities Flood Risk Reduction Feasibility Studies, Yolo, CA
Project Manager. Jafar is HDR's project manager for 12 Small Communities Flood Risk Reduction Feasibility Studies. Each study will recommend a project to help each community achieve 100-year level of flood protection, while also achieving multi-benefits as required by DWR. HDR is supporting different aspects of each study, including the environmental constraints analysis, geotechnical analysis, nonstructural measures formulation, stakeholder engagement, and/or plan formulation. Jafar is leading a team of over 20 scientists and engineers to support county staff to develop projects that can be recommended for design and implementation.

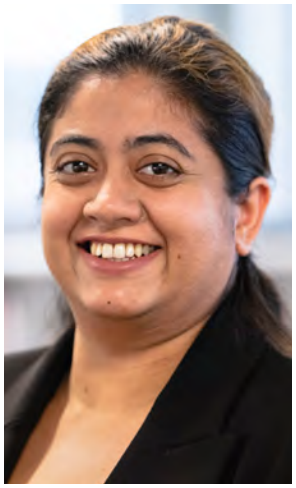
USACE San Francisco District, Task 16: San Francisco Bay Long Term Management Strategy, San Francisco, CA
The San Francisco Bay LTMS is a multiagency, multi-stakeholder group tasked with facilitating aspects of dredged sediment management in the San Francisco Bay area; the intent is to get needed dredging done expeditiously and cost-effectively while complying with various laws, regulations, and policies, protecting the environment, and maximizing beneficial used of dredged material to the extent practicable. The USACE, San Francisco and Sacramento Districts, and other agencies are concerned about the dearth of scientific knowledge pertaining to the entrainment of delta smelt and longfin smelt during dredging operations. The intent of this project is to increase the knowledge regarding entrainment rates including making more accurate estimates. The likely means of doing so is by HDR reviewing existing work, proposing a prioritized list of technical studies (including lab and field studies), conferencing with stakeholders, carrying out one such technical study, and producing a technical report and peer-reviewed technical publication.

California Department of Water Resources, Value Engineering, Yolo, CA
Project Engineer. HDR is providing value engineering (VE) and related services to augment the planning process and assist DWR in determining a plan for addressing the subsidence issues associated with a segment of the State Water Project aqueduct. The work consists of a series of value engineering and related workshops at key points in the planning processes. These workshops are to assist the DWR planning team and project related stakeholders in expediting the identification of alternatives for feasibility analysis, optimizing the preferred alternative, and the selection of a plan to advance into the design process.

Three Rivers Levee Improvement Authority, Western Pacific Interceptor Canal West Levee Construction Management, Yuba, CA
Project Engineer. The State of California Department of Water Resources provided engineering criteria for a 200-year flood event, called the Urban Levee Design Criteria. It was determined that 2.1 miles of the Western Pacific Interceptor Canal West Levee did not meet the Urban Levee Design Criteria for geotechnical purposes. Provided construction management and inspection services for the recommended improvements, which included cutoff walls, ditch backfill, drain berm, stability berm, and landside toe low area fill.

Modesto Irrigation District, Modesto Reservoir Watershed Sanitary Survey, Modesto, CA
Project Engineer. HDR provided an update to the 2014 Modesto Reservoir Watershed Sanitary Survey that HDR Prepared. The Modesto Irrigation District (District) is interested in partnering with Stanislaus Regional Water Authority (SRWA) to develop a comprehensive watershed sanitary survey for both the Modesto Regional Water Treatment Plant (MRWTP) and the SWRA Regional Surface Water Treatment Plant (WTP). MRWTP treats surface water received from the Modesto Reservoir, and the WTP treats surface water received from the Tuolumne River.

County of Sacramento, Groundwater Sustainability Phase I, Sacramento County, CA
Project Manager. Jafar is HDR's project manager and local liaison to support Sacramento County in developing a fee that will fund the actions required of Sustainable Groundwater Management Act. HDR is helping to review the management of groundwater basins in the county, identify customer classes, and develop potential rate structures.



Kanchan Joshi

Hydraulic Modeling

Kanchan has five years of experience providing hydraulic analysis and planning support of water and sewer systems. She has used various hydraulic modeling software to provide solutions related to planning, mitigating urban flooding and optimization of capital improvement projects. She has also supported asset management teams in developing risk models for proposing rehabilitation of sewer systems, Survey123 forms development, data management and automation. Kanchan has provided hydraulic modeling support for the City of Atlanta for 4 years and in the year she has spent in California she has provided hydraulic modeling support to several So-Cal utilities.

EDUCATION

MS Environmental Engineering, Georgia Institute of Technology, 2017

BS Civil Engineering, Sardar Patel College of Engineering, 2016

INDUSTRY TENURE

7 years

HDR TENURE

1 year

RELEVANT EXPERIENCE

Irvine Ranch Water District, Pump Stations Condition Assessment, Irvine, CA
Hydraulic Modeling. HDR is providing condition assessment services for the District's booster pump stations, as well as recommendations for rehabilitation or replacement as necessary.

Long Beach Water Department, Water System Optimization and Supply Management Study, Long Beach, CA
Hydraulic Modeling. HDR prepared a Water System Optimization and Supply Management Report (Report), which will be a planning, level document discussing water system improvements, alternatives, constraints, and should address a comprehensive management approach of water production and conveyance in the City. The Report will be the roadmap to accomplish LBWD's long and short-term water resources strategy. Additionally, this Report will be utilized by LBWD to support development of near and long-term capital improvement projects.

Contra Costa Water District, 2021 Treated Water Master Plan, Concord, CA
Hydraulic Modeling. Developed a comprehensive, integrated treated water master plan that identifies capital improvements needed to meet current demands and expand the distribution system to accommodate future growth. The treated water distribution system consists of approximately 820 miles of pipeline, 40 water storage reservoirs with a total treated water storage capacity of approximately 72 million gallons, 31 pumping stations, and eight pressure zones. Updated water demand projects for existing and buildout conditions. Updated the hydraulic model. Identified and developed capital improvements needed to address system deficiencies for existing, intermediate, and buildout conditions.

Padre Dam Municipal Water District, Potable Water Pipeline Condition Assessment, Santee, CA
Hydraulic Modeling. HDR is completing Potable Water Pipeline Condition Assessment for the District which includes utilizing risk assessment results to identify high risk pipelines for condition assessment, performing condition assessment and identifying capital improvement projects and timing. Capital improvement project development includes alternative analysis of different methods to extend asset remaining life. These solutions include a comparison of cathodic protection retrofits (based on Water Research Foundation Study 4618 developed by HDR staff), repairs, rehabilitation through lining, and replacement which will result in optimized low cost solutions that extend asset life.

South Coast Water District, Lift Station 13 Study, Laguna Beach, CA
Hydraulic Modeling. HDR is providing (1) an evaluation of existing coastal hazards and (2) explore short and long-term solutions to protecting, relocating or bypassing the lift station.

Sweetwater Authority Water Distribution System Master Plan and Urban Water Management Plan, Chula Vista, CA
Hydraulic Modeling. The project includes development of an Urban Water Management Plan and Water Distribution System Master Plan. Desktop pipeline infrastructure condition assessment with main break forecasting and risk model development are included in the Water Distribution System Master Plan. The hydraulic model is used to quantify consequence of failure for pipelines and valves in terms of customer impacts to support improved decision making.

Sweetwater Authority, Fire Flow Analysis, Chula Vista, CA
Hydraulic Modeling. ,HDR is conducting a fire flow analysis on the Authority's potable water distribution system and to perform a technical peer review for the Chula Vista Bayfront Redevelopment.

West Basin Municipal Water District, Recycled Water Master Plan Update, Los Angeles, CA
Hydraulic Modeling. The recycled water master planning efforts include a comprehensive analysis of West Basin's recycled water facilities (treatment and distribution), and identification of capital improvement projects through the year 2040.

City of Vista, Hydraulic Model Update, Vista, CA
Hydraulic Modeling. HDR is providing miscellaneous updates to collection system hydraulic model based on recent/near-term improvement projects.

Padre Dam Municipal Water District, Task: Carlton Oaks Water Study, Vista, CA
Hydraulic Modeling. HDR prepared a water study and hydraulic analysis using the District InfoWater hydraulic model to analyze the onsite and offsite facilities needed to serve the 160 single-family residential unit and 53-room resort facility with onsite restaurant project and provide improvement recommendations. The water study was executed as a task order authorization under the District As-Needed Civil Engineering Services contract with HDR.

Jeff Hansen, PE

Water Conservation

Jeff's work includes regional water resources planning, water and sewer system analysis and design, water reuse planning, hydraulic modeling, and watershed assessment. He is experienced in all disciplines related to water and wastewater comprehensive planning, including water demand forecasting, water system modeling, facility assessments, water quality analyses, conservation planning, service area policy development, and financial planning. He has served as the project manager or lead engineer on numerous water system planning and design efforts over the course of his career in Washington. Jeff has a strong background in water reuse planning, pre-design, and design. He has conducted reuse marketing studies for the Cities of Olympia and Cheney, and King County, Washington, involving identification of potential water reuse customers and their associated reuse demands.

EDUCATION

MS Civil Engineering, University of Washington (UW), 1999

BS Civil Engineering, Missouri University of Science and Technology (Missouri S&T), 1998

REGISTRATIONS

Professional Engineer, Civil, WA, No. 39861

LEED Accredited Professional

INDUSTRY TENURE

24 years

HDR TENURE

22 years

RELEVANT EXPERIENCE

Tacoma Public Utilities, Water System Plan, Tacoma, WA

Project Advisor/QC. Jeff served as a project advisor and QC reviewer for the preparation of Tacoma Water's 2018 WSP update. The update describes recent improvements in the utility's water facilities and programs. It forecasts water needs and documents the utility's CIP and financial health. A key aspect of this project was the utility's interest in developing a streamlined, user-friendly document as an improvement over its prior WSP.

City of Moscow, Comprehensive Water System Plan, Moscow, ID

Project Manager. Jeff oversaw a team of planners and engineers during the development of the 2012 Moscow Comprehensive Water System Plan. He directed the system analysis, hydraulic modeling, and capital improvement program development. Jeff served as the primary point of contact with City staff and provided briefing to the City Council during the review and approval process. Water Utility On-call, City of Moscow, ID (2012–2017) Project Manager. After serving as PM for the development of their Comprehensive Water System Plan, the City retained Jeff and his team for on-call services related primarily to water utility planning and engineering services. Services have included use of the hydraulic model to examine distribution system modifications and optimization, predesign support for waterline extensions and new booster pump station facilities, siting and sizing of a new reservoir, and assistance in securing state loan funding for groundwater well and fire suppression improvements.

LOTT Clean Water Alliance, Conservation Coordination Plan, Research and Support Services, King County, WA

Conservation Task Lead. HDR worked in collaboration with LOTT and its Water Conservation Coordination Committee to develop a Water Conservation Coordination Plan. The efforts were focused on areas where outside perspectives experience and research could provide the greatest value towards achieving LOTT's flow reduction objectives. HDR performed a series of tasks including program management data collection optimization analysis technical memorandum and plan review.

City of Stockton Municipal Utilities, Feasibility Report and Cost-Benefit Analysis for Implementation of Advanced Metering Infrastructure for Water Metering, Stockton, CA

Conservation Task Lead. Assessed current meter reading practices and investigated feasibility of converting from the touch-read and manual read system to a mobile drive-by and fixed network (remote) metering system. Cost-benefit analysis consisted of capital cost estimates operating cost estimates and cost model development to compare implementation or continuation of the current and proposed meter reading systems. Proposed an implementation schedule and determined computability with the city's computer hardware and billing software/procedures. Discussed advantages of various methods of water metering with respect to water conservation.

City of Redmond, Water System Plan, Redmond, WA
Project Manager. HDR assisted the City of Redmond in updating its 2021 WSP for submittal to DOH. Jeff developed the framework for the hydraulic modeling analysis (defining scenarios and the format of output to be communicated to the City), led development of the CIP, facilitated discussions with City staff on system analysis results and CIP development, and was the primary author of the engineering-related sections of the WSP. Jeff has served as the project development manager and engineer, guiding the team's efforts and serving as the client liaison.

City of Cheney, Cheney Water System Plan Update, Cheney, WA
Jeff served as the primary analyst and author during preparation of the City's 2010 Water System Plan. He developed the demand forecast and source of supply analysis. Using findings from the hydraulic modeling analysis, he prepared a capital improvement program and associated schedule of costs. Jeff also assisted with the review of materials primarily produced by the City, including the operations and maintenance volume of the water system plan, and construction specifications and standard details. Jeff led briefings to the City Council and Council committees regarding the plan and associated water conservation plann ing, and also aided the City during the State regulatory review process.

City of Pullman, Water System Plan, Pullman, WA
Jeff served as the lead QC reviewer for the most recent updates to the City's water system plan. He reviewed and refined the demographic forecasts and water demand projections, as well as the source and storage capacity analyses. He also coordinated review of the hydraulic modeling and capital improvement program.

Oregon Resources Department, Statewide Conservation Inventory, OR
Task Lead. The project involves developing a database of planned/future water conservation projects or activities from the municipal and agricultural water use sectors. The database will provide OWRD with a basis to identify trends and prioritize resources for funding water conservation projects. Significant stakeholder outreach will be used for the data collection effort.

San Benito County Water District, North County Groundwater Facilities Feasibility Study, San Benito, CA
Task Lead. Completed a feasibility study to update and refine the Draft North County Groundwater Facilities Plan based on the water quality sampling results being collected under a separate contract, and recommend one alternative for implementation. The Draft North County Groundwater Facilities Plan identified facilities (new wells, pipelines, treatment, a storage tank, and booster pump station) required to produce an estimated 1,000 acre-feet/year (AFY) of new high quality water supply to the northerly part of the combined City of Hollister and Sunnyslope County Water District water distribution system as Phase I of the water supply program. Worked with the district's groundwater modeling consultant to identify wells suitable for water quality sampling based on the options identified in the facility plan by reviewing the sampling plan prepared. Based on the results of the water quality from the sampling program and proposed test wells, evaluated the need for treatment processes to meet the district's water quality goals. The Pellet Softening Treatment Process and Ion Exchange Treatment Process were evaluated. The most suitable, effective and costeffective technology meeting the district's water quality goals was recommended, if needed. The life-cycle cost estimate developed in the facility plan was updated. Design criteria was updated for the recommended treatment process.

Kristi Shaw, PE, ENV SP

Water Banking

Kristi is a professional associate and water resources engineer with over 25 years of experience in water supply planning. Her experience is in strategic water supply development, with emphasis on regional water planning, conjunctive use management for supply sustainability and reliability, water conservation, aquifer storage and recovery, groundwater protection and modeling, and groundwater and surface water interaction. She enjoys concept-to-completion projects the most, with her design experience ranging from off-channel reservoirs to 180+ well field systems. She has conducted numerous groundwater supply analyses both domestically and internationally.

EDUCATION

MS Civil Engineering, University of Texas at Austin, 2001

BS Environmental Sciences/ Studies, Texas A&M University, College Station, 1996

REGISTRATIONS

Professional Engineer, Civil, TX, No. 93962

ISI Envision Sustainability Professional

INDUSTRY TENURE

26 years

HDR TENURE

20 years

RELEVANT EXPERIENCE

Irvine Ranch Water District, Water Reliability Study, Irvine, CA

Task Lead. Provided modeling and evaluation of local and imported water supply reliability under a variety of emergency scenarios based on a rigorous and transparent probability of risk analysis. Recent climate change research and projected reliability of imported water resources were incorporated into the analysis. Level of service expectations were established and mitigation strategies developed.

Long Beach Water Department, Water System Optimization and Supply Management Study, Long Beach, CA

Groundwater Task Lead. HDR prepared a Water System Optimization and Supply Management Report (Report), which will be a planning, level document discussing water system improvements, alternatives, constraints, and should address a comprehensive management approach of water production and conveyance in the City. The Report will be the roadmap to accomplish LBWD's long and short-term water resources strategy. Additionally, this Report will be utilized by LBWD to support development of near and long-term capital improvement projects.

City of North Las Vegas, Well rehabilitation - Elstner Estates, Sun Valley, and Silver Mesa, North Las Vegas, NV

Design Lead. Kristi served as the well design lead for a project to replace three - 1000 ft deep, 2600 gpm public water supply wells for the City of North Las Vegas at three access constrained, residential sites. Her work included leading a well design team to develop well specs, special variance requests to accommodate site needs, bidding package, and client work plan that outlined the work to be performed by the Contractor under a constrained schedule.

San Benito County Water District, 2022 Water Supply Master Plan Update, San Benito, CA

Task Lead. Updated the 2017 master plan to confirm water demand forecasts, identify the preferred long-term water supply option, and incorporate San Juan Bautista into the urban water supply program.

San Benito County Water District, Evaluation of Water Supply and Storage Alternatives, San Benito, CA

Task Lead. Conducted a study to provide the district with storage capacity and yield of the storage or supply alternatives, perform feasibility analysis, and provide a planning-level cost estimate to screen alternatives for further detailed evaluation. Water supply alternatives that were evaluated included expanding the existing San Justo Reservoir, expanding the existing Paicines Reservoir, a new reservoir at the existing Hawkins Reservoir site, and a new offstream reservoir at Lone Tree Way. The study also included evaluation of percolation ponds and aquifer storage and recovery (ASR) injection wells for aquifer storage, as well as evaluation of groundwater supply alternatives, including new Phase 2 groundwater wells in the North Area, in lieu water banking strategy, and groundwater demineralization of existing wells that supply municipal and industrial customers. The summary report included screening criteria that included consideration of capital cost per acre-feet of storage and yield available, preliminary siting and layouts, cost estimate, and conclusions and recommendations for further evaluation.

Antelope Valley Water Storage LLC, AVWB Groundwater Model Development, Kern County, CA
Groundwater Task Lead and Modeler. Kristi evaluated groundwater storage bank expansion opportunities up to 1,000,000 acre-feet at recharge rates up to 250,000 acre-feet per year. MODFLOW/ Groundwater Vistas was used to refine the regional USGS model for the project area which was revised and re-calibrate using site specific aquifer data. Multiple operational scenarios were considered to optimize recharge and pumping operations to control mounding conditions to within acceptable thresholds below land surface and avoid substantial aquifer dewatering during bank withdrawal.

Broken Arrow Municipal Authority, Long Range Water Supply Plan Update, Broken Arrow, OK
Task Lead. HDR conducted the Grand River Water Supply study to evaluate alternatives for delivery of Grand River water as a secondary raw water source to the existing Verdigris River WTP. The study included existing pipeline condition assessment, water treatability, detailed alternative evaluation, and presentation of the results to city leadership.

Hampton Roads Sanitation District, James River Treatment Plant Advanced Nutrient Reduction Improvements Design-Build, Virginia Beach, VA
Task Lead. Designed advanced nutrient reduction improvements for the James River Treatment Plant, which included administration building, maintenance building, electrical building, main power distribution equipment and facilities, generator and fuel storage facilities, wastewater chemical storage and feed equipment facilities, integrated fixed film activated sludge (IFAS) effluent channel, secondary clarifier equipment and facilities, moving bed bioreactor equipment and facilities, hydraulic connection to existing chlorine contact facilities, main distributed control system programming and equipment, and site work, including stormwater management.

San Antonio Water System, Water Supply Management Model, San Antonio, TX
Modeling Task Lead. Revised initial water levels of each grid cell in the GWSIM4 Edwards Aquifer Model based on a relationship to index wells and designated springs using regression equations developed municipal pumpage cutbacks according to usage patterns and precipitation trends and performed quality control of multi-sourced user friendly model to ensure accuracy of model output.

San Antonio Water System, Potential Use of Quarries for Supplemental Recharge to the Edwards Aquifer, San Antonio, TX
Task Manager. Kristi evaluated the use of a quarry for additional water supply and ecosystem benefits; developed a strategy for anticipating droughts and simulating the quarry in the Edwards Aquifer groundwater model; recommended project improvements which resulted in a more effective strategy for protecting springflow while providing maximum water supply benefit; and performed multiple model runs to optimize quarry location size and pumping pattern. She managed project tasks and the budgets and scheduling presented interim progress reports to the client and prepared a technical report.

San Antonio Water System, Critical Period Management Evaluation, San Antonio, TX
Task Manager. Kristi performed an analysis of critical period levels and pumping by using the GWSIM4 Edwards Aquifer Model to run simulations with new pumping caps CPM trigger levels and the use of Aquifer Storage Recharge (ASR) to provide a technical assessment of the benefits and impacts to index well levels and springflow. She also developed input files for the model executed multiple simulations responded to client requests for additional model simulations and prepared and presented the results of the assessment(s).

Yu Jung Chang, PHD

Water Quality Vulnerability

Yu Jung has more than 37 years of experience practicing water and wastewater treatment facility design, process optimization, troubleshooting, technology evaluation/verification, and applied research for both municipal and industrial clients. He has a wealth of experience in a variety of advanced treatment technologies with emphasis in emerging contaminants treatment, membrane filtration, BWRO & SWRO desalination, zero liquid discharge (ZLD), high rate clarification, disinfection practices, disinfection by-product (DBP) control, taste & odor mitigation, inorganic containment removal (selenium, arsenic, selenium, copper, radium, lead, strontium, iron manganese, chromium, nitrate, fluoride, etc.), advanced oxidation, UV disinfection processes, UV/H2O2 AOP, GAC adsorption, biological filtration, and trace organic contaminant removal (such as TCP and 1,4 Dioxin).

EDUCATION

PhD Civil and Environmental Engineering, University of Washington, 1996

MS Civil Engineering, Environmental Engineering, University of Washington, 1991

INDUSTRY TENURE

38 years

HDR TENURE

15 years

RELEVANT EXPERIENCE

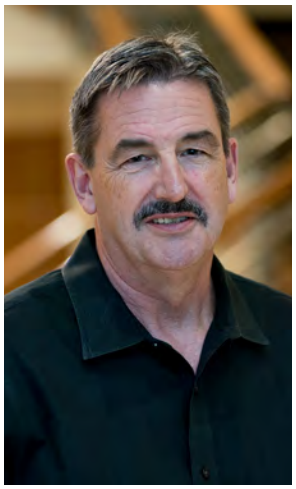
Central Coast Water Authority, Tank 5 & 7 Disinfection Improvements, Buellton, CA
Task Lead. Evaluated alternative for improving disinfection at Tanks 5 and 7, which included chemical storage/feed locations, tank/chemical feed system configurations, and electrical service locations.

City of Riverside Public Utilities Department, PFAS Treatment Planning Study, Riverside, CA
Task Lead. Conducted a study to develop a cost effective and optimized long-term approach to treat and maximize the reduction of Per- and Polyfluoroalkyl Substances (PFAS) in water produced by City of Riverside Public Utilities Department's drinking water wells. Conducted water quality analysis, evaluated treatment plant location site alternatives for the recommended treatment approach for long-term treatment and operation, evaluated optimum long-term operating approaches and feasible treatment technology alternatives (including granular activated carbon [GAC] and ion exchange [IX], provided blend modeling, performed an engineering evaluation/cost analysis comparison, and prepared a summary report.

City of Greensboro, Advanced Treatment for Emerging Contaminants at Mitchell WTP, Greensboro, NC
Task Lead. HDR is assisting the City of Greensboro (COG) with an evaluation of advanced treatment technologies for the treatment of emerging contaminants, including PFAS, 1,4-dioxane, manganese, TOC, DBPs, and HABs, at their Mitchell WTP. Bench-scale testing of GAC, IX, a novel sorbent, and UV/AOP was performed. RSSCT was conducted using GAC, IX, and a novel sorbent to understand expected breakthrough patterns of PFAS and TOC and select media for future pilot testing. UV/AOP testing identified treatment scenarios for the removal of 1,4-dioxane. GAC, IX, and the novel sorbent technologies, along with NF, are currently being studied at the pilot-scale level.

City of Kennewick, WTP Capacity Improvements, San Benito, CA
Task Lead. The project tasks include the following items: replacement of membranes and coat membrane filtration basins; replacement of leaking sodium Hypochlorite Tanks (4); replacement of aging chemical systems and feed pumps; replacement of existing surge tank, and; upgrade of aging sludge collection system.

Harris Group, Inc., University of Washington Medical Center - Water Disinfection System Improvements, Seattle, WA
Task Lead. HDR, as a subconsultant, is assisting the University of Washington Medical Center (UWMC) improve the microbial disinfection of the water system, especially with regard to Legionella, at its flagship Montlake Campus. Specifically, HDR is helping compile the engineering design reports required to gain approval from the State's Office of Drinking Water and the Hospital Review Services Program. The project involves the addition of onsite hypochlorite generators to re-chlorinate the cold water, and copper/silver ionization systems to disinfect the hot water system. The re-treated water supplies the campus's Pacific and Cascade Towers, each nine-stories in height. In a parallel effort, HDR is preparing the documentation for UWMC to become a regulated building water system. The documentation includes preparation of the sampling, monitoring, and report plans to assess plumbing system compliance with the Lead and Copper Rule, Disinfection/Disinfection Byproducts Rule, and the Revised Total Coliform Rule.



Les Harder, PHD, PE, GE

Bay Delta Vulnerability

Dr. Harder is a senior technical advisor whose primary duties include managing and providing technical support for the planning and design of water resources and environmental restoration projects. These projects include hydrology and hydraulic analyses, flood hazard assessments, flood damage reduction plans, reconnaissance and feasibility level planning studies, and final designs and construction. Prior to joining HDR, Dr. Harder was the Deputy Director for Public Safety for the California Department of Water Resources (DWR). During his 30-year tenure with DWR, he successfully completed numerous projects, including the complex geotechnical reevaluations and designs of major dams and embankments on the State Water Project.

EDUCATION

PhD Civil Engineering, University of California, Berkeley, 1988

MS Civil Engineering, University of California, Davis, 1977

REGISTRATIONS

Professional Engineer, Civil, CA, No. C 30472

Professional Engineer - Geotechnical, CA No. GE 000378

INDUSTRY TENURE

47 years

HDR TENURE

14 years

RELEVANT EXPERIENCE

California Department of Water Resources, DWR Task 14N Oroville Field Division-SUP-01, Oroville, CA

Technical Advisor. HDR is performing engineering evaluations and inspections for dam safety urgent activities at DWR, SWP facilities within Oroville Field Division. This project provides for urgent responses to immediate dam safety needs arising within Oroville Field Division for which the development of an individual Task Order would not meet the urgency of the need. The dam safety needs typically include site reconnaissance, inspections, paper studies, data compilation and review, analyses, and reporting for dams, aqueducts, appurtenant water conveyance structures, hydropower plants, pumping plants, penstocks, discharge lines, tunnels, access shafts, spillways, inlet and outlet structures, instrumentation, embankments and liners, check structures, Tainter gates, slide gates, and valves.

California Department of Water Resources, Oroville-Thermalito Inspections, Oroville, CA

Technical Advisor. HDR will provide engineering and specialized inspection services to DWR for completion of detailed inspections of Oroville-Thermalito Complex features. The Task Order will culminate in the submittal of Structural Inspection Reports for each inspection.

California Department of Water Resources, Project 2426 - Southern Field Division Dams - Ongoing Inspections and Evaluations, Yolo County, CA

With Les as a senior technical advisor, HDR is inspecting and performing evaluations for dam safety projects at DWR Southern Field Division facilities. The safety projects typically include site reconnaissance, inspections, paper studies, data compilation and review, analyses, and reporting. Services will be related to some of the California SWP dams, aqueducts, and reservoirs. It will also include water conveyance structures appurtenant to the dams and reservoirs, including but not limited to hydropower plants, pumping plants, penstocks and discharge lines, tunnels, access shafts, spillways, inlet and outlet structures, instrumentation, embankments and liners, check structures, tainter gates, slide gates, valves, and turn-outs.

California Department of Water Resources, Task Order 29 - P2426-PFMA Support, Yolo County, CA

Technical Advisor. HDR is providing facilitators, recorders, and selected Subject Matter Experts (SMEs) to participate in Potential Failure Mode Analysis (PFMA) workshops for DWR's Quail Dam, Cedar Springs Dam, Devil Canyon 1st and 2nd Afterbay Dams and L.A. Department Water and Power's (LADWP) Elderberry Forebay Dam and their associated powerplants (respectively Warne, Mojave, Devil Canyon, and Castaic) and their appurtenances, and to participate in a semi-quantitative risk analysis (SQRA) workshop for Pyramid Dam and its associated appurtenances.

California Department of Water Resources, TO 32 Design-Basis Threshold Levels for SWP Facility: Bidwell Bar Canyon Saddle Dam and Parish Camp Saddle Dam, Yolo County, CA

Technical Advisor. HDR will provide engineering services to DWR for the purpose of reviewing and developing new Design-Based Threshold Levels for performance monitoring instrumentation at Bidwell Bar Canyon Saddle Dam and Parish Camp Saddle Dam and its associated appurtenances within FERC Project 2100 (P-2100).

California Department of Water Resources, Task Order 32 – Pyramid Dam Spillway Phase 2 Evaluation, Yolo County, CA
Technical Advisor. HDR is providing engineering, detailed analysis, specialized inspection services, and construction support to DWR for the repairs and analysis at Pyramid Dam (PYO) facilities of the State Water Project (SWP).

California Department of Water Resources, Task Order 33 – Pyramid Dam Project Management Support, Yolo County, CA
Technical Advisor. HDR will provide program management and engineering support, and contractor services support to the Department of Water Resources (DWR) for Pyramid Dam (PYD) projects under the Pyramid Dam Modernization Program of the State Water Project (SWP).

California Department of Water Resources, Task Order 40, Oroville Dam, Emergency Response, Yolo County, CA
Les has been serving as a senior technical advisor, providing on-going engineering support, monitoring, evaluation, inspection, and design services in response to the Oroville Dam spillway failure and recovery efforts.

California Department of Water Resources, Task Order 31 Design-Basis Threshold Levels for SWP Facility: Thermalito Diversion Dam and Feather River Fish Barrier Dam, Yolo County, CA
Technical Advisor. HDR will provide engineering services to DWR for the purpose of reviewing and developing new Design-Based Threshold Levels for performance monitoring instrumentation at Thermalito Diversion Dam and Feather River Fish Barrier Dam and their associated appurtenances within FERC Project 2100 (P-2100).

Imperial Irrigation District, East Highline Reservoir, Imperial, CA
Technical Advisor. Provided alternatives analysis, preliminary design, and final design of a new off-line reservoir that will provide approximately 3,600 acre-feet of total storage. The earthen reservoir will receive water by gravity flow from the All-American Canal in a conveyance canal that will be sized to deliver approximately 1,500 cubic feet per second (cfs). Water delivered out of the reservoir will also be conveyed by gravity flow through a conveyance canal designed for 1,500 cfs of flow capacity and delivered into the East Highline Canal. The project included tie-in to All-American Canal, crossing of State Highway 98, crossings of two existing drains – All American Drains No. 2A and No 2, sedimentation basin at the headworks of the conveyance canal, canal inlet structure at the end of the sedimentation basin, conveyance canal extending from the canal inlet structure to the reservoir. tie-in/inlet to the reservoir, new storage reservoir, outlet structure from the reservoir connected to the East Highline Canal, wasteway structure off of the canal, and modifications to the Mesa Drain. The reservoir bottom is lined with geomembrane with 2 feet of soil cover, while the reservoir side slope is lined with geomembrane and geonet composite with unreinforced concrete lining.

Grant County Public Utility District, On-Call Services, Portland, OR
Technical Advisor. Currently, Les serves on independent BOC for the seismic reevaluation, risk analyses, and retrofit design of Wanapum and Priest Rapids Dams. Duties include independent expert review of geotechnical investigations, site characterizations, seismic response and deformation analyses, risk analyses, and review of seismic retrofit designs for Priest Rapids Dam. He was the lead participant in Senior Seismic Hazard Analysis Technical Team Level 3 for Wanapum Dam.

Chris Behr, LEED AP

Risk Assessment & Statistical Analysis

Chris is an economist and engineer who specializes in evaluating system risk and reliability and economic consequences to improve client decision making. His diverse set of analytical skills (involving financial, cost-benefit, cost-risk analyses, environmental valuation and statistics) has been applied on a wide range of infrastructure including transportation (seaports/railroads/highway), water/wastewater, energy (production and transport) and buildings in the U.S. and overseas. Often, his projects include workshops in which he facilitates discussions on topics such as technical engineering solutions and economic forecasts.

EDUCATION

MS Civil Engineering, University of Texas at Austin, 2001

BS Environmental Sciences/ Studies, Texas A&M University, College Station, 1996

REGISTRATIONS

LEED Accredited Professional

INDUSTRY TENURE

28 years

HDR TENURE

14 years

RELEVANT EXPERIENCE

Irvine Ranch Water District, Water Reliability Study, Irvine, CA

Risk Assessment & Statistical Analysis. Provided modeling and evaluation of local and imported water supply reliability under a variety of emergency scenarios based on a rigorous and transparent probability of risk analysis. Recent climate change research and projected reliability of imported water resources were incorporated into the analysis. Level of service expectations were established and mitigation strategies developed.

Metropolitan Water District, Risk Analysis and Management, Los Angeles, CA

Principal Economist. Led a team of economists to conduct a market and risk analysis of a new water supply. The new canal would divert water from the Sacramento River to the State Water Project (SWP) and Central Valley Project (CVP). The canal would provide a more secure water source for SWP/CVP and is estimated to cost in the billions of dollars. The analysis combines (a) an assessment of escalation of key construction components; and (b) cost and schedule risk assessment. The risk assessment included (1) two workshops to elicit quantitative information about risks; and (2) modeling risks with a project schedule.

California Department of Water Resources, Task Order 28 - HQ Support, Yolo County, CA

Economist. Chris is leading the economics analysis of recovery and rehabilitation elements of a long-range program for addressing subsidence in key sections along the canal. The analysis will investigate a range of program value dimensions, including water supply, energy use, operational flexibility, and resiliency, as well as job impacts. He is work closely with Program leaders to develop strategic guidance.

California Department of Water Resources, Value Engineering, Yolo County, CA

Economist. Chris is serving as the lead economist for the HDR team currently supporting the DWR CASP management and project delivery team within the Division of Engineering to conduct risk-informed long-term planning studies for how to address potential future impacts to the California Aqueduct from future subsidence. Chris is responsible to provide economic analyses of a wide range of impact scenarios to help the CASP Core Team meet their program goals.

Santa Clara Valley Water District, Expedited Recycled and Purified Water Program, Amendment 2, Santa Clara, CA

Principal Economist. Provided program management services as the district implement its first potable reuse project in response to the extended drought, declining groundwater levels, and the long-term water resources strategy, the district implemented its. This potable reuse project will produce highly purified water that will be conveyed to groundwater recharge ponds and/or injection wells. Based on preliminary engineering work, a Phase 1 Project for the program was recommended that involve construction of an up to 24,000 acre-feet per year (AFY) purification facility adjacent to the existing Silicon Valley Advanced Water Purification Center as well as a purified water conveyance pipeline to the Los Gatos Recharge Ponds for indirect potable reuse. Amendment 2 involved supporting the district's program implementation through the project's P3 procurement phase, and encompassed, in parallel, negotiation of necessary agreements with the City of San Jose for source wastewater, land for the new purification facility and pumping station,

management of RO concentrate, and completion of the California Environmental Quality Act (CEQA)/ National Environmental Policy Act (NEPA) and permitting process for this first project. Work also included providing information on RO concentrate management alternatives to be considered, establishing assumptions that serve as the basis of the proposals by P3 entities, and providing technical support documents defining the pipeline portion of the project in terms of district design standards and preferences.

City of Tacoma Water Utility, Regulatory Risk Analysis, Tacoma, WA
Principal Economist. Performed a statistical analysis of Fecal Coliform concentrations in water supply for the City of Tacoma. Developed a hierarchical statistical model that included multiple regression of water contamination levels. Model was used to estimate the risk of a water quality violation. The results were used to inform a decision on which treatment system would be best for the city.

Confidential Client, Reliability Analysis, Palm Beach, FL
Lead Analyst/Project Manager. Developed framework and model for quantifying risks and reliability of water supply of an energy facility. The model tracked water losses through stock and flow elements in the system. Risks were modeled using Monte Carlo and sensitivity analysis to help the client adopt risk minimizing features.

Confidential Client, Reliability Analysis, Corpus Christie, TX
Project Manager/Principal Economist. Provided a Stage 1 analysis of the risks of failure to a series of levees that served as impoundment lots for an industrial by-product. Held a risk workshop and discussed types of failure modes types of consequences and valuation of consequences were they to occur. Comprehensive modeling of failure modes consequences and valuation will occur in Phase 2 analysis.

New York City Department of Environmental Protection, Risk Analysis and Management for Water Supply Projects, New York City, NY
Project Manager/Principal Economist. Project 1: Developed an approach and model to identify the best projects to provide dependable water supplies for NYC. Risk factors included (a) the risk of a tunnel collapse (b) the quantity of a water shortfall (accounting for current supplies and projected rainfall) (c) the value of lost water and (d) the type and cost of a series of construction projects to supplement water. Project 2: Performed cost risk analyses of a new 2 400 mgd ultraviolet water treatment facility, designed as one of the largest of such facilities.

NYCEDC, Hunts Point Peninsula Resiliency Study, New York, NY
Principal Economist. Chris let a risk and vulnerability assessment of critical infrastructure systems to identify community vulnerability to climate change and extreme weather events. The project team developed and tested an assessment process that applies Risk Informed Decision Making (RIDM) and Potential Failure Mode Analysis (PFMA) techniques to Hunts Point critical systems in order to identify community vulnerabilities and develop specific resiliency improvements.

City of Hillsboro, Water Demand Projections Update, Hillsborough, WA
Principal Economist. City of Hillsboro Water Department has asked HDR to update the City's water demand projections, which includes development of scenarios to assist in analyzing demand sensitivities to water rates, growth rates, urban reserve boundary changes, economic changes, and climate impacts. HDR is using an econometric water demand forecasting method with risk analysis. Contingency tasks also include evaluating price elasticity, support for financial planning.

Michael McMahon, ENV SP

Climate Change

Mike has extensive experience, focusing on understanding and communicating the interactions of the land-water-atmosphere nexus. His projects and research include climate change impact analysis, quantification, adaptation, flood warning, monitoring, response and outreach, hydrologic and hydraulic (H&H), and GIS mapping for water system adaptation strategies. He has specific expertise in the communication of risk as it pertains to the social, environmental, and economic aspects of our ecosystems. He has an active role in the climate science community as part of the AWWA M71 panel for water infrastructure resilience, the Florida Climate Institute, the National Institute of Standards, and Technology Water Infrastructure Resilience Panel.

EDUCATION
BS Meteorology, San Jose State University (SJSU), 1985

REGISTRATIONS
Envision Sustainability Professional

INDUSTRY TENURE
37 years

HDR TENURE
15 years

RELEVANT EXPERIENCE

Irvine Ranch Water District, Water Reliability Study, Irvine, CA
Climate Change/Drought Management Task Lead. Mike supported the climate change research and reliability projections of imported water sources to help the District reassess its risk and level of service expectations to develop improved mitigation strategies.

Orange County Sanitation District, Collection Capacity Evaluation Study (Project PS15-08), Fountain Valley, CA
Climate Science Task Lead. OCSD is undertaking a comprehensive update to its collection system hydraulic model and capacity evaluation. This project, the PS15-08 Collection System Capacity Evaluation Study, refreshes the hydraulic model with an updated sewer flow assessment and wet weather analysis, as well as consideration of larger issues that affect long-term planning for any agency. As a sub to RMC, HDR was responsible for documenting comparative design storm methodologies, developing and recommending a design storm approach, summarizing relevant climate change literature, developing future flow projections by reaching out to member agencies, assisting with hydraulic model updates, and developed CIP recommendations for pipelines and pump stations of approximately $50 million.

California Department of Water Resources, Bay Delta Conservation Plan (BDCP) Climate Change, Sacramento, CA
Climate Change Task Lead. The BDCP is a habitat conservation planning and environmental permitting process with the co-equal objectives to restore habitat for Sacramento-San Joaquin Delta fisheries and provide reliable water supplies to thousands of acres of agriculture and millions of Californians. Responsible for providing climate change quantification to this study utilizing the latest output from Global Climate Models (GCM) and an analysis of cyclical trends in natural climate variability. These quantifications for changes in temperature precipitation flooding and drought snowpack snowmelt timing evapotranspiration and other parameters were used to develop an impact analysis and climate change hydrology for potential changes in climate for the Sacramento-San Joaquin Delta system.

San Diego Association of Governments (SANDAG), San Elijo Lagoon Double Track, San Diego, CA
Climate Change Analysis Task Lead. The climate change impact analysis evaluated sea-level rise along the coastline. Mike facilitated regular stakeholder meetings to assist in understanding climate change science and enabling a cost-efficient, risk-tolerant solution for the infrastructure design.

Tucson Water, Plan 2100: Integrated Water Master Plan, Tucson, AZ
Climate Change Task Lead. The master plan is a task order under HDR's existing Planning On-Call Contract with the City of Tucson. The master planning effort is being executed by a team of consultants working in parallel on various aspects of the master plan. HDR's scope of work covers the task of key stakeholder engagement, smart metering, rainwater/stormwater capture, greenhouse gas inventory, and climate change tasks.

Tacoma Public Utilities, Puget Sound Regional Water Supply Resiliency Project, Tacoma, WA
Climate Science Task Lead. Mike helped facilitate Forum adaptation strategies to water system risks to interact at all levels of governance. HDR served as the Forum's Project Management Consultant and provided technical expertise for the regional Resiliency Project. The project involves characterizing risks and vulnerabilities

that could potentially disrupt water supplies and delivery in the Puget Sound region, and evaluating cooperative, inter-jurisdictional options for enhancing regional water system resiliency. The specific topic areas evaluated included 1) earthquakes, 2) drought, 3) climate change, and 4) water quality. For each risk topic, a committee of Forum representatives and risk experts was formed to evaluate regional vulnerabilities and identify potential mitigation measures. Each topic area involves high-level characterization of risks; definition of multiple risk-event scenarios, review of existing mitigation and response techniques, and identification of further actions to be evaluated in order to improve supply resiliency.

EMPSI, Environmental Impact Statement (EIS) for Aamodt Tribal Water Settlement Supply, Albuquerque, NM
Climate change task leader during preparation of an EIS for the proposed design and construction of the Pojoaque Basin Regional Water System, which includes surface water diversion facilities at the Pueblo de San Ildefonso on the Rio Grande, and treatment, transmission, storage (including aquifer storage and recovery [ASR] wells), and distribution facilities and well fields that will supply up to 4,000 acre-feet annually to customers within the Pojoaque Basin.

City of Sarasota, Climate Change Vulnerability Assessment and Adaptation Plan, Sarasota, FL
Mike served as Climate Change Risk Analyst for this project to help better understand, assess, and adapt to the potential impacts of climate change on the City's infrastructure, community, and visitors. He helped identify risks as they pertained to social, environmental, and economic aspects of our built systems.

Kitsap County Stormwater Comprehensive Plan and SMAP Development, Kitsap County, WA
Climate Change Task Lead. HDR developed a Stormwater Comprehensive Plan for Kitsap County, including a new component that Washington State is requiring in such plans as part of NPDES requirements: a Stormwater Management Action Plan (SMAP). The SMAP identifies priority action area to address the impacts of stormwater runoff on the County's receiving waters. This includes impacts of local flooding, response to drainage issues, and NPDES municipal separate storm sewer system (MS4) permit update compliance needs. The SMAP includes an initial characterization of receiving water quality compared to possible SMAP subareas stormwater runoff water quality to identify a prioritize area for evaluation.

Systems Research & Applications Corporation, Bern Climate Change Storminess and Storm Surge EPA Vulnerability Study, Bern, NC
Project manager for technical assistance to assist with identifying sustainable community approaches that can help the City of New Bern reduce vulnerability to coastal and riverine flooding. Conducted a vulnerability assessment, at the direction of Environmental Protection Agency, that discussed, qualified, and quantified vulnerabilities of a neighborhood or a subset of structures or buildings as they apply to the stormwater, water supply, and wastewater infrastructure of New Bern created by heavy rainfall (i.e., local thunderstorms or synoptic scale tropical cyclones), storm surge (wind driven water), and sea level rise due to our changing climate. Analyzed extreme events as they apply to the objectives of city water-related infrastructure. An examination and prioritization of these extreme events and their impact on the critical functioning of this infrastructure and the potential impact to the city as a whole was determined.

Ed Winkler, PE

State Water Project Expert

Ed is a veteran of DWR, MWD, the Regional Water Authority, CH2M Hill and now HDR. As a senior consultant the past 14 years, Ed has served in various roles including program/project manager and strategic advisor overseeing teams involved with the successful delivery of several large water resources plans and projects. Recently Ed served as the project manager in support of DWR's $44 million Central Valley Flood Protection Plan (2017 Update). Prior to consulting, he served in public agency leadership positions, including seven years as executive director of the Regional Water Authority (RWA) and the Sacramento Groundwater Authority (SGA). Additional experience includes principal engineer with the Metropolitan Water District of Southern California, where Ed led MWD's Bay-Delta program, and 15 years with DWR where he managed water and power operations of the State Water Project (SWP) along with various other SWP-related engineering assignments.

EDUCATION

MS Civil Engineering, California State University, Sacramento

BS Civil Engineering, California State University, Sacramento

REGISTRATIONS

Professional Engineer - Civil, CA No. CE 35676

INDUSTRY TENURE

38 years

HDR TENURE

1 year

RELEVANT EXPERIENCE

DWR, Central Valley Flood Protection Plan (CVFPP), Sacramento, CA

Project Manager. Ed managed a consulting team of more than 80 in support of DWR's $44 million CVFPP 2017 Update. This effort included preparation of two Basin-wide Feasibility Studies (Sacramento and San Joaquin Basins); plan formulation for integrated, multi-objective projects and actions associated with the State Plan of Flood Control facilities; hydraulics and hydrology studies; ecosystem enhancements and extensive communications and engagement activities. This project (over 100 deliverables) was delivered on time and under budget and garnered five prestigious awards for DWR.

DWR, State Flood Management Planning (SFMP) Program, Sacramento, CA

Project Manager. Ed managed DWR's $22 million SFMP program. He managed the development of the report "California's Flood Future: Recommendations for Managing the State's Flood Risk," which was a joint effort by DWR and USACE. The report presents a comprehensive overview of statewide flooding challenges, along with policy recommendations for improving integrated flood management in California.

Delta WaterFix Program CA Department of Water Resources, Sacramento, CA

Principal Advisor to DWR on SWP and Sacramento/San Joaquin Delta water rights issues, and resolution of Sacramento River fish screen and environmental issues.

RWA and SGA, Organizational Management, California

Executive Director. Ed served as executive director of two public agencies (joint powers authorities): the 22-member RWA and the 16-member SGA. Collectively, RWA and SGA members—cities, water districts, and private water companies—supply water to more than 2 million people in Sacramento, Placer, El Dorado, and Yolo counties. Ed was responsible for fostering collaboration among diverse water interests; providing regional water leadership and vision; goal setting; policy development; public and legislative outreach; program development and implementation of all RWA and SGA activities and reports.

- **Implemented American River Basin Conjunctive Use (CU) Project.** Managed the development and implementation of a $44 million regional CU project involving coordination of seven local water utilities and 11 project elements—transmission pipelines, interconnections, treatment plant improvements, and aquifer storage and recovery (ASR) wells—to bolster regional drought reliability for several local water utilities. Successfully secured 50 percent funding ($22 million) for this project through a state grant.
- **Developed Integrated Regional Water Management Plan.** Managed the development and successful adoption of the American River Basin Integrated Regional Water Management Plan (IRWMP).

Bay-Delta Branch, MWD of Southern California, California
Project Manager. Ed managed a team of multidisciplinary staff, a $30 million budget, and several consultants on various projects, including Delta conveyance alternatives studies; Delta water quality improvements; SWP and Central Valley Project (CVP) operation studies; and alternative SWP water supply enhancement measures.

Operations Planning Branch (and other positions), California Department of Water Resources, California
Cheif Operator. Ed managed a branch of 22 professionals responsible for real-time SWP operations (water and power) scheduling; developed models and conducted water and power optimization studies; led daily coordination with the U.S. Bureau of Reclamation's CVP, and coordination with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service regarding compliance with Endangered Species Act biological opinions. Other DWR experience includes task leader on various SWP facility alternatives analyses including through-delta configurations, dual-conveyance alternatives, south-delta barriers, in-delta storage, new upstream reservoirs, and alternative regulatory scenarios. Served as Task leader over engineering and operation studies leading to execution of key north-south water transfers, including DWR's Drought Water Bank arrangements.

Blaine Dwyer, PE

Colorado River Expert

Mr. Dwyer is the Director of HDR's Water Supply Management program which includes the firm's water supply modeling, groundwater, water quality, irrigation and atmospheric sciences practices. He brings to IRWD more than 40 years experience in Colorado River basin water supply programs that have resulted strong understanding of the Law of the River including the Colorado River Compact, the 2007 Interim Guidelines, recent Drought Contingency Plans and current calls for large-scale reductions in river diversions. He has managed more than 30 studies in the basin using Reclamation's Colorado River Simulation System (CRSS) and other hydrology, water allocation and reservoir management models. Mr. Dwyer's experience in each of the seven basin states enables him to more fully understand the impacts of future hydrologic variability and water management strategies on the reliability of municipal water systems. Blaine is widely recognized for his ability to facilitate solutions among federal, state and local governments; all categories of water users and divergent special interests. The programs he has managed address long term water availability, water quality, watershed response and environmental effects.

EDUCATION

MS Civil Engineering, University of Colorado, Boulder, 1988

BS Civil Engineering, Colorado State University, 1980

REGISTRATIONS

Professional Engineer - Civil, CO No. 23794

Diplomat, American Academy of Water Resource Engineers

INDUSTRY TENURE

42 years

HDR TENURE

9 years

RELEVANT EXPERIENCE

Irvine Ranch Water District, Water Reliability Study, Irvine, CA

Workshop Facilitator and Technical Advisor. Blaine supported scenario planning processes to develop strategies to manage vulnerabilities including climate change and Colorado River and State Water Projects supply disruptions.

Colorado River Water Availability Study, CO, AZ, CA, NM, NV, UT, and WY

Project Manager. Led the study of water availability in the entire Colorado River Basin using historic, paleo, and climate change hydrologies. A hydrology model (VIC) was used to assess the effects of potential changes in temperature and precipitation on historic natural flows based on downscaled projections from global climate change models. The Colorado River Simulation System (CRSS) was then used to simulate effects altered hydrology on the operations of more than 60 million acre-feet of storage in the basin including Lake Powell and Lake Mead. The sudy's technical advisory teams were comprised of representatives of water supply agencies and federal agencies including the U.S. Bureau of Reclamation, NWS, NOAA, and NCAR.

Colorado River Basin Hydrology Study, Colorado

Project Manager. A collaborative effort among parties to potential litigation (Denver Water, the Colorado River Water Conservation District, the Northern Colorado Water Conservancy District, and several others) on the Colorado and Blue Rivers in western Colorado. Assessed the technical, economic, and water issues of developing new supplies to settle disagreements on current and future water management. Evaluated alternative project configurations to deliver additional Colorado River basin water to Front Range municipalities in the South Platte River basin. Alternatives included a large-scale pump-back system (up to 26 miles long with 1,100 feet of static pumping head) and construction of a new off-channel dam to impound a reservoir from 25,000 to 200,000 acre-feet. Long-term project operations were simulated using the Colorado River Decision Support System (CRDSS), StateMod, StateCU and Denver Water's PACSIM (BESTSM-based simulation model).

Colorado River Compact Compliance Study, Colorado River Basin States

Project Manager. Investigated methods to maintain compliance with the Colorado River Compact and to administer water in compliance with state water law in times of potential non-compliance.

Colorado River Decision Support System, Colorado River Basin

Principal-in-Charge and Technical Reviewer. Led the model enhancements for the StateMod water allocation computer model. Also reviewed enhancements to the models of the Yampa, Gunnison, and San Juan-Dolores River basins including the linkage of these models to represent nearly all river diversions and storage rights impounded by more than 300 dams in the basins.

Colorado River Return Reconnaissance Study, Colorado

Project Manager. Led the multi-attribute alignment study for a pipeline from the Utah state line to deliver Colorado River water to the Upper Colorado, South Platte, and Arkansas River Basins.

Gila River Adjudication, Arizona
Project Manager. Engineering assessments on a major, long-term water rights adjudication that included feasibility assessments of major new concrete gravity, concrete arch, and embankment dams with conventional and pumped-storage hydroelectric plants throughout the Salt and Gila River basins.

South Platte River Basin Implementation Plan, Colorado
Project Manager. Development of the long-term water supply plan for the basin including municipal, industrial, agricultural, environmental, and recreational water needs. With 80 percent of the State's projected additional M&I water needs through 2015, more than 80 percent of the State's current and projected population, more than 70 percent of the State's agricultural production and major existing and proposed trans-mountain diversions, the South Platte River basin plan is key element of Colorado's Water Plan.

Upper Chiquita Dam and Reservoir, California
Lead Technical Reviewer. Reviewed new off-channel 155-foot-high, zoned earthfill dam to store treated water. Project included fully lined reservoir, floating cover, spillway, inlet and outlet pipes and connection to the South Orange county pipeline.

Lake Hodges Dam Modifications, California
Design Lead for structural analysis and outlet piping modifications and valve replacements.

San Dieguito Dam Analysis, California
Technical Lead for structural and hydraulic assessments and reservoir operations and reliability studies.

Olivenhain Water Storage Project Dam Design, California
Lead Technical Reviewer for the Olivenhain District for a new 308-foot-high RCC dam.

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