HAWAII STATE DEPARTMENT OF HEALTH

PROPOSAL | JUNE 2019

PROCUREMENT OF
PROFESSIONAL SERVICES FOR

CESSPOOL CONVERSION FINANCE RESEARCH

SOLICITATION NO. WWB 19-02

carollo
Engineers...Working Wonders With Water®

PROPOSED SCOPE OF SERVICES

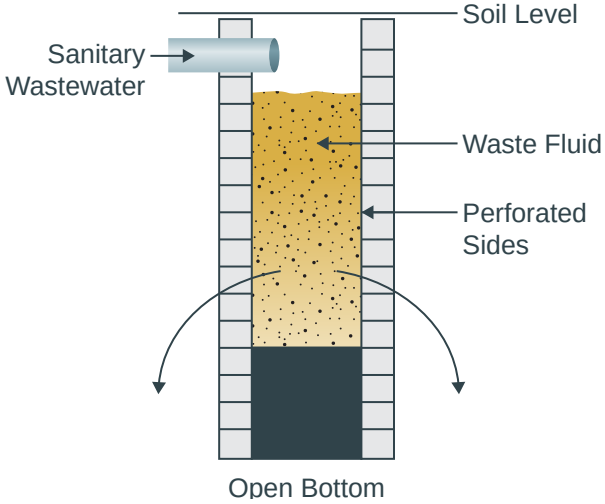
In 2017, the Hawai‘i State Legislature passed Act 125, which required the replacement of all cesspools by 2050. Subsequent legislation (Act 132) was passed in 2018 to form and fund the Cesspool Conversion Working Group (CCWG), and to set the CCWG’s objectives and timeline. This project is led by the Department of Health (DOH), Wastewater Branch (WWB) as an initial step of the CCWG to begin to form the financial framework to fund the cesspool conversions in the state.

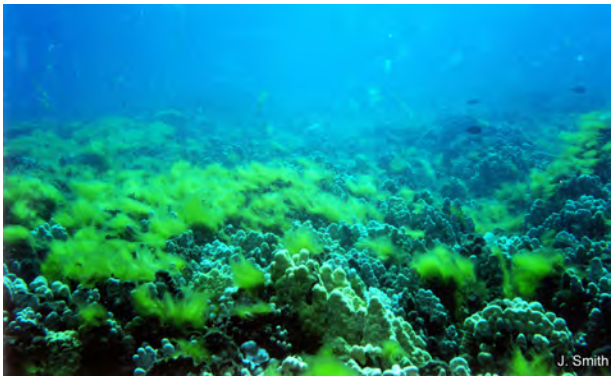
PROJECT UNDERSTANDING

Cesspools are an antiquated method of disposing of wastewater. Raw wastewater flows directly to cesspools or below ground holes with no lining. The raw wastewater leaches into the ground and solids collect within the cesspool bottom. There are approximately 88,000 cesspools in the State of Hawai‘i, with 50,000 located on the Big Island of Hawai‘i, 14,000 on Kaua‘i, 12,000 on Maui, 11,000 on O‘ahu, and 1,400 on Moloka‘i. The equivalent discharge of these cesspools is estimated to be about 53 million gallons per day of raw sewage into the ground. Cesspools have been shown to have a potential significant impact on drinking water quality, near shore and surface water quality as well as the health of sensitive coral reefs. While there are many contaminants of concern in domestic wastewater, the primary contaminant of interest in Hawai’i is nitrogen.

The State has already implemented a tax credit program for qualifying cesspools (Act 120). This legislation provides up to $10,000 of income tax credit for upgrade or conversion of qualifying systems. The tax credits started in tax year 2016 and are set to expire in 2020. The temporary credit applies to the cost of upgrading or converting a cesspool to a septic system or an aerobic treatment unit system, or connecting to a sewer system.

Typical Domestic Cesspool





Nutrients from cesspools can eventually flow to the ocean causing algae blooms, oxygen depletion, and damage to sensitive coral reefs in Maui.

Source: http://mauicounty.us/community/marine-coral-reef-recovery-team-to-address-council/

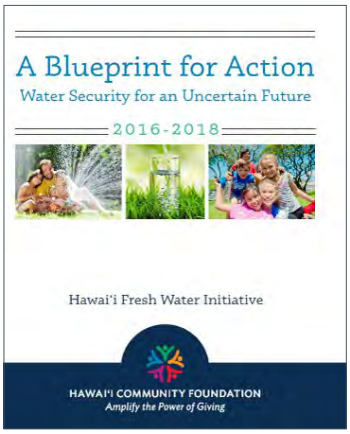
The credits provided by Act 120 help offset the costs for some residents with cesspools, but likely only covers a fraction of the full cost of cesspool conversion, depending upon the implemented solution. Act 120 requires certification of some cesspools by a licensed contractor or engineer (i.e. additional costs to be borne by homeowners). Also, Act 120 only addresses initial construction costs to convert cesspools and does not provide relief for ongoing maintenance and management of the new wastewater management system. Thus, additional funding tools and mechanisms are needed to effectively facilitate cesspool conversions.

Financial and Institutional Challenges and Considerations

Some of the key financial and institutional challenges to cesspool conversions are discussed below.

Developing flexible financial options for cesspool conversions.

There is not a "one-size-fits-all" solution to cesspool conversions when it comes to wastewater treatment technologies. As a result, flexible and long-term financial options need to be considered as well. The income tax credit created by Act 120 is a great start. However, key to the implementation of the overall program is the identification of other federal, state, and local financial options such as grants and low-interest loans for both the homeowners and the communities that provide flexibility to implement varying technical solutions.



Addressing long-term O&M, management, and other costs.

Besides the construction costs associated with the cesspool conversions, there will be ongoing operation and maintenance (O&M) efforts or costs that need to be addressed. Examples of O&M costs include servicing septic tank systems and onsite treatment systems, emptying of composting toilets, and O&M of decentralized and centralized treatment systems. In addition, there may be institutional or organizational systems that need governance to be established and funding mechanisms secured for day to day operations, such as new County service of assessment districts. Our team will identify reoccurring costs and institutional constraints relative to funding sources. However, most grant and low interest loan programs do not fund O&M costs. Our team can look at special assessments, state program oversight, and partnerships with existing agencies.

Defining and aiming to attain multiple benefits.

Besides the cesspool conversion issue, there are various, statewide initiatives and environmental goals, including:

- Attaining 100 percent renewable energy by 2045.
- Increasing recycled water use by 30 mgd by 2030.
- Doubling the local agriculture food production from 10 to 20 percent by 2030.
- Preparing for and mitigating the effects of climate change and sea level rise.
- Job creation.

It may be possible to leverage the multiple benefits aspect of proposed cesspool conversion plan to increase the chances of funding. Our team will consider technological solutions that achieve multiple benefits thereby increasing the available funding opportunities.

With a broad-reaching program such as the cesspool conversion plan, it may be possible to leverage multiple benefits such as recycled water use/water conservation, renewable energy production, or agricultural irrigation/ support to increase funding opportunities.

PROPOSED INTEGRATED APPROACH

Implementing a comprehensive program to convert all the cesspools across the state will be a challenge With a deadline of 2050, the CCWG is wisely proceeding with the development of a Long-Range Cesspool Conversion Plan which encompasses both the financial and technology frameworks and strategy development. This collective work will help to identify, research, and vet options.

We are proposing the same technical advisory and project leadership team for both the cesspool conversion finance and technology research projects because there are advantages to utilizing one, coordinated team:

- The treatment technologies and proposed technical solutions can impact the funding options and vice versa.
- Overall coordination and knowledge transfer of both the technology and finance research work will be integrated, efficient, and cost effective.
- Coordinated approach to public outreach.

We view the integration of the technology and finance research tasks as important and necessary for a comprehensive Cesspool Conversion Plan, and our approach has been developed assuming a level of coordination between the two assignments.

Whether or not the CCWG entrusts the Carollo team with both projects, the following section describes how we would coordinate the finance research with the technology research efforts.

We are proposing the same technical advisory and project leadership team for both the financial and technology cesspool research projects, providing continuity and coordination between the two, intertwined issues.

Cesspool Conversion Working Group

Principal-in-Charge
Gary Deis, PE

Project Manager
Cari Ishida, PE

Technical Advisors and Support
Roger Babcock, PE
Paavo Ogren
John Waddell
John Katahira, PE

Coordinate Financial Solutions with Technology Solutions

There are project management and knowledge sharing benefits to utilizing a consistent team for both the financial and technology research projects. Initially, while the technology team is identifying onsite treatment technologies, the financial research team can coordinate funding research efforts, such as:

- Research and identify existing federal, state and local grants, low interest loans, tax credits, rebates,and other funding mechanisms to understand funding capacity, funding timing, application processes, technical documentation, availability of planning versus construction funding.
- Research funding mechanisms successfully utilized by other communities facing similar issues (e.g. Rhode Island, New Jersey, and Florida).
- Identify potential approaches and mechanisms to equitably distribute funding to homeowners
- Identify initial list of potential factors inhibiting cesspool conversion based on experiences in Hawai'i and other states.

Based on the findings from the technology research, finance options may include potential federal, state, and local funding sources based on the proposed technology, project aspects, and/or the potential benefits of the cesspool conversions. In addition, considerations of other factors such as economies of scale for cluster or system technology solutions, potential provision of recycled water, green infrastructure, increased energy efficiency, or other community benefits of the proposed solutions may open doors for other potential funding opportunities.

Integrate Stakeholder Feedback to Develop Site-Specific Solutions

Given that cesspool conversion is a very localized and personal issue mainly affecting individual homeowners across the state, it is imperative to solicit and incorporate stakeholder feedback to ensure successful program implementation. Solutions that stakeholders may view as undesirable or do not garner regulatory support may not be worth further investigation.

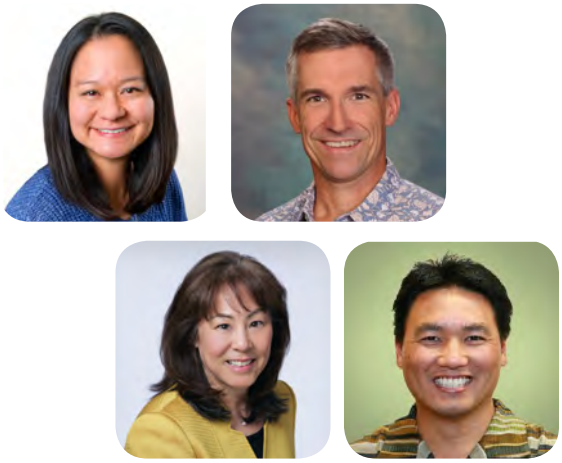
Given the varying locations of the cesspools (urban, rural, coastal, inland, etc.) across the Hawaiian Island chain and within different counties, site specific technical and financial solutions that are supported by the local and regulatory communities need to be identified. The Carollo team can implement outreach efforts to the extent desired to solicit stakeholder input on these variable considerations.

Leveraging Local Knowledge and National Expertise with an Integrated Team

Many unique aspects about Hawai‘i need to be considered in the development of the work effort.

Our team, includes team members with both local and national expertise in financial, funding, technical, and public outreach. Our project manager Cari Ishida, located in Honolulu, has over 14 years of diverse experience in long-range wastewater treatment and program planning, natural systems engineering, as well as water reuse and sustainability issues. She has worked on projects in Hawai‘i, California, Arizona, Nevada, Illinois, and Florida. Ann Hajnosz, a key financial advisor has worked with all 4 county water agencies in the State of Hawai’i, 2 of 4 county wastewater agencies; all 4 county solid waste agencies and 1 electric utility in the State. Dr. Roger Babcock of the University of Hawai‘i has been researching wastewater issues in Hawai‘i for over 25 years. He has recently completed a study regarding onsite wastewater treatment technologies for Upcountry Maui. John Katahira, our team’s community and public outreach lead has over 24 years of local experience and performed public outreach services for some of the largest and more challenging projects to implement in the state. Cari, Ann, Roger, and John are all deeply committed to helping the local communities in their home state of Hawai‘i.

Depending upon stakeholder influence and interest, our team can collectively strategize with the CCWG on the appropriate level of public outreach.



Our team includes members with both local and national expertise and deep commitments to helping the State of Hawai’i.

APPROACH TO CESSPOOL CONVERSION FINANCIAL RESEARCH

We will identify, research, and vet a wide range of funding options to facilitate future cesspool conversion outreach and marketing strategies. The following sections describe our approach to the cesspool conversion financial research.

Develop Cesspool Conversion Funding Matrix

Our team will develop a comprehensive matrix of feasibility funding mechanisms. The strategies used to identify funding mechanisms will be similar for local, state, federal government programs and non-governmental programs. Our approach to developing the matrix, includes:

- Define the Project Need/Driver and Overall Project(s): Successful funding efforts need to be built on and around a specific need or driver. Working with the technical research team, we will develop a thorough understanding of the project, its benefits, and project components to help identify funding opportunities.
- Develop a Funding Questionnaire: This will be used to solicit information from funding sources.
- Identify Potential Federal, State and Local Funding Sources: Leveraging our team's knowledge of funding programs and agency contacts, we will identify potential funding sources to determine eligibility, requirements, funding availability, documentation requirements, schedule, and resources required.
- Confirm that the Project Meets the Funding Criteria: It is important to assess if the project will meet the criteria set forth in the funding mechanism by each funding agency. The team will identify and prioritize funding programs based on the funding criteria and project competitiveness.

Carollo has successfully secured more than $600 million in SRF loans and over $140 million in grants for agencies over the last 10 years. Most recently, Carollo has developed a loan strategy to fund the City of San Jose's $1 billion wastewater capital program.

Defining Potential Revenue Sources

Our team will review the existing authority under the General Provisions of the Hawai'i State statutes for generating revenue that could be used to fund the cesspool conversions. This effort could include the following:

- Identify at what governmental level, either state, county, or local should the adoption of the cesspool conversion program take place;
- Review various financing mechanisms such as special assessment districts, community facilities districts, a general tax, user fees, or grant or loan programs;
- Should there not be a readily available financing mechanism, then determine what legislative remedies may be necessary;
- Evaluate multiple funding scenarios for different technical solutions, i.e. replacing cesspools with septic systems; use of innovative technologies, etc.
- Assess obstacles to adoption or implementation, including social equity issues;
- Highlight issues of public versus private ownership of cesspool conversions;
- Review options for the administration of the program – local, county, state, or privatized.

The table below is an example, abbreviated funding matrix. A detailed matrix will be developed by the Carollo team, including additional funding sources.

FINANCING MECHANISM	TERMS	PROS	CONS
Special Improvement/ Community Facility Districts	Funding in the form of a tax-exempt bond with maturities of up to 30 years.	▪ Funds for cesspool conversion available as soon as district is formed and bonds are issued. ▪ Can be used in combination with other federal financing sources.	▪ Counties would be responsible for forming Special Improvement District. ▪ Fee on property.
PACE Financing	Funded through private lending or the issuance of municipal bonds with maturities from 5 to 30 years.	▪ Since funding is through private lending or municipal bonds, no liability upon WWB. ▪ WWB/CCWG can design and implement program to match internal goals. ▪ May be used in combination with other financing sources.	▪ Internal approval/credit process with private lenders may inhibit low-income participation.
HGIA	While this solar system related program has unique benefits, the WWB can learn from the overall program structure.	▪ GEM$ On-Bill Program offers fixed interest rate of 5.5% over 20 years with no individual loan amount.	▪ HGIA was funding through State taxable bond; WWB must find funding source. ▪ WWB must create in-house administration of program or perhaps partner with HGIA.
Federal/State/Local Loans and Grants and Wastewater Tax Credits	Federal loan and state tax credit programs are available for cesspool remediation, such as EPA WIFIA, state CWSRF, HUD CDBG, USDA, and USBR programs.	▪ Provides grants or low interest financing towards cesspool remediation with varying loan terms. ▪ Some programs allow the WWB to provide funds to low income households.	▪ Most funding programs do not cover the entire project cost and require complimentary funding. ▪ The State's control of the cesspool conversions may be subject to Federal restrictions.

Researching Financing Options

We will also research potential financing options, such as:

- **Special Assessment or Community Facilities District (CFD)** – A special assessment district or CFD may be formed to finance authorized public improvements such as cesspool conversions. A special assessment district is typically formed to provide funding for public infrastructure in connection with new development, but may also be formed to finance improvements pertaining to developed properties. Once a district is formed, special taxes or assessments may be levied upon properties within the district to directly pay for facilities, and in certain cases, services. Special taxes or assessments may also be levied to repay bonds issued to finance public improvements, such as cesspool conversions. Section 46-80, Hawai'i Revised Statues, was recently amended to allow counties to create improvement districts and CFDs to finance special improvements. We believe that the WWB can work with the counties directly to allow them to form districts which would allow funding of the cesspool conversions to occur directly at the local level.

- **PACE Financing –** Property Assessed Clean Energy (PACE) is another type of financing vehicle used to provide funds for various types of needs. While legislation covering PACE varies state-by-state, this type of financing can be used in some areas to finance energy efficiency improvements such as water efficiency products, seismic retrofits, and hurricane preparedness measures. Loans are repaid over a selected term, typically between 5 to 25 years. We believe the PACE Financing can be a viable option for the CCWG to consider as it allows a property owner to pay back the costs of the improvements over time at an agreed upon interest rate. Funding occurs through private lenders or the issuance of municipal bonds depending on enabling state legislation.
- **Hawai'i Green Infrastructure Authority (HGIA) –** Created by the Hawai'i Legislature to make renewable energy investments accessible and affordable to Hawai'i's consumers, HGIA was capitalized with the Green Energy Market Securitization ("GEM$") Bond, an innovative market-driven financing mechanism, to advance the Hawai'i's goal of achieving 100% renewable portfolio standard in the electricity sector by 2045. Our team has experience with HGIA in its formation, as well as with the issuance of the GEM$ Bond, and the on-going administration of the GEM$ funds. We believe some of the programmatic areas of this project can be used for the cesspool conversion plan as HGIA offers an on-bill program called the GEM$, providing an innovative financing program for homeowners.
- **Short- and Long-Term Debt Financing** – Often municipalities and public agencies borrow money through short- and long-term funding mechanisms that are repaid through user fees, tax revenues, or special assessments. Long-term debt financing options, which have repayment terms ranging from 15 to 40 years, include general obligation (GO) bonds (e.g. limited and unlimited tax general obligations), revenue bonds, and improvement district bonds (e.g. local improvement district [LID]). Short-term debt financing, which can be used to cover temporary cash flows deficits and provide interim methods of financing until long-term borrowing is secured, includes interest-bearing warrants, tax or bond anticipation notes, and lines of credit.
- **Private Equity and Public-Private Partnerships** – There has been increasing interest from the private sector to design, construct, operate and finance public water and wastewater improvement projects, including small and localized systems. Such partnerships between the public and private sectors have led to the proliferation of public-private partnership (P3) models, which includes short- and long-term financing through a combination of private equity, private loans/bonds, and public debt/funds. The well-publicized example of Prince George's County, Maryland's Clean Water Partnership (CWP), a community-based P3 (known as CBP3), demonstrates both public and private sector alliance in the implementation and maintenance of discrete and localized water management improvements through a combination of private and community involvement. In addition, there are currently several private equity interests in the Western U.S. looking for investments in similar partnership models to address small, rural, and localized wastewater management needs. Because of the lack of a centralized management entity and/or coordination of such systems and improvements, several state agencies are evaluating P3 models as a potential solution to address small-system management and financing gaps.
- **Other Federal/State/Local Grants and Special Loans** – Local, state, and federal grant and loan funding sources are available for the planning, design and construction of water/wastewater projects. Grants and low interest loans funding programs, which are highly competitive, often require projects to meet as many objectives as possible, including: regional partnerships; integrated project benefits; water conservation; and renewable energy improvements. The larger funding programs such as EPA's Water Innovation Finance and Innovation Act (WIFIA)

program, the State of Hawai'i Clean Water State Revolving Fund (SRF) program, and the US Department of Agriculture provide some of the best opportunities to obtain larger sources of low interest loan funding. Programs administered by the U.S. Bureau of Reclamation, U.S. Army Corps of Engineers Continuing Authority Program, HUD's Community Development Block Grants, U.S. Economic Development programs also can provide relatively large sources of grant funding. With the passage of AWIA 2018, the EPA anticipates funding and/or creating up to 30 new programs targeted at water/wastewater projects which may provide potential sources of funding for the project.

Other Considerations in Decision Process

Governance Structure/Jurisdictional Control – As discussed in the information previously presented, we believe there are governance structure and jurisdictional control issues to be considered. For example, what type of program would be in the best interest of WWB, CCWG, and the state of Hawai'i? Also, what organization or institution is needed to apply for various funding types? Based on a review of other state programs, some states, like Delaware and Washington funded their programs through their state revolving fund programs or SRF. This involved issuing state bonded debt, which then allows the various loan programs to be offered directly to the homeowners. The terms and interest rates all varied based on income.

Other states offered a more decentralized approach, offering the funding to local communities and preferring those communities to manage their own programs with varying financing terms. Some states worked with local banks, having them arrive at the credit criteria for the loan program.

Low Income Programs – In order for the WWB and CCWG to have a successful program which also serves the low-income population, a more centralized approach may be needed where the WWB and CCWG are highly involved in setting the goals and mission of the cesspool conversions. For example, with rural and low-income populations on all islands being affected, how will those populations that are experiencing economic hardship be served? How will low-income exemptions be determined?

Other utility affordability program models are in place throughout the state, e.g. HECO and the Honolulu Board of Water Supply. Models from other states will also be considered. The affordability program elements would be developed to identify not only the funding for the cost/subsidy of the financial assistance, but also determining the eligibility of the participants.

SCOPE OF WORK

The following sections describe the proposed scope of work.

Task 1 – Project Kickoff Meeting

In our experience in coordinating large, complex programs, we find it very beneficial to conduct a project kickoff meeting with key staff to set the course for the project. We will coordinate with the WWB project manager to determine the appropriate attendees and content for the meeting. For example, it may be helpful to engage the CCWG members early on in the project to hear their input and understand expectations. This task will be led by Carollo in coordination with WWB and supported by other team members.

Task 1 Deliverables:

- Project Kickoff Meeting Agenda
- Project Kickoff Meeting Minutes

Task 2 - Develop a detailed matrix of funding mechanisms available for cesspool conversions.

This task is to address Task A described in the Request for Proposal (RFP) and is divided into subtasks with the end goal of developing a detailed matrix of funding mechanisms available for cesspool conversions. The matrix will include eligibility, requirements, funding amount available, timeline, challenges, and benefits for each mechanism.

Subtask 2.1 – Research grants, loans, tax credits, rebates, and other funding

We will research applicable grants, loans, tax credits, rebates, and other funding options that may support the cesspool conversions. These efforts will be coordinated with the cesspool technology research work. This task will be jointly performed by Carollo and Harris.

Subtask 2.2 – Research funding mechanisms in other states

Our team will also research funding mechanisms used in other states for cesspool or septic tank conversions, or other types of projects, as appropriate. We will annotate where the funding sources have been used previously, and identify similar programs in Hawai‘i that have been effective, such as the Solar Tax Credit Program. This task will be jointly performed by Carollo and Harris.

Subtask 2.3 – Develop funding options summary

We will compile the research from the previous subtasks in a DRAFT Cesspool Conversion Funding Options Matrix. The matrix will focus on the most feasible funding options, including what mechanisms already exist, and what may be created. Policy changes and resources that may be needed to implement the funding program will be described.

The Matrix can be reviewed and discussed in a workshop setting with WWB and the CCWG, if desired.

Review comments will be incorporated into the FINAL matrix. This task will be led by Carollo with support provided by other team members.

Task 2 Deliverables:

- DRAFT Cesspool Conversion Funding Options Summary Matrix
- Cesspool Conversion Funding Options Summary Workshop
- FINAL Cesspool Conversion Funding Options Summary Matrix

Task 3 - Provide a list of potential avenues for equitably distributing funds to homeowners.

This task is to address Task B in the RFP. We will provide a list of potential avenues for equitably distributing funds to homeowners. Considerations may include cesspool priority levels, amount of wastewater flow or water use, residential vs. non-residential use, proposed technology, etc. We will include details, challenges, benefits, etc. as appropriate for each option reviewed. We will consider equity and affordability and provide recommendations on how to provide financial assistance to lower income families. We will also research what other states who have faced similar wastewater challenges have done. This task will be led by Carollo with support provided by other team members.

Task 3 Deliverables:

- List of potential avenues for equitably distributing funds to homeowners

Task 4 - Research other factors inhibiting cesspools conversions.

This task is to address Task C in the RFP. We will research other factors inhibiting cesspool conversions. The work completed in this task will be coordinated with the cesspool technology research team. We will create a write-up of any other factors (besides financial) that might be inhibiting cesspool conversions in Hawai’i. This will be based on local knowledge, but will also include factors that other states have had to overcome. We will also describe marketing techniques for overcoming these barriers. This task will be led by The Limtiaco Consulting Group (TLCG) and supported by Carollo and others. The write-up for this task will be included in the DRAFT and FINAL Report described in task 5.

Task 5 - Reporting

We will summarize the results of Tasks 1-4 in a DRAFT Cesspool Financial Research Report (Report) and review the DRAFT Report findings with the CCWG. The team will subsequently incorporate review comments received and produce a FINAL Report to the WWB.

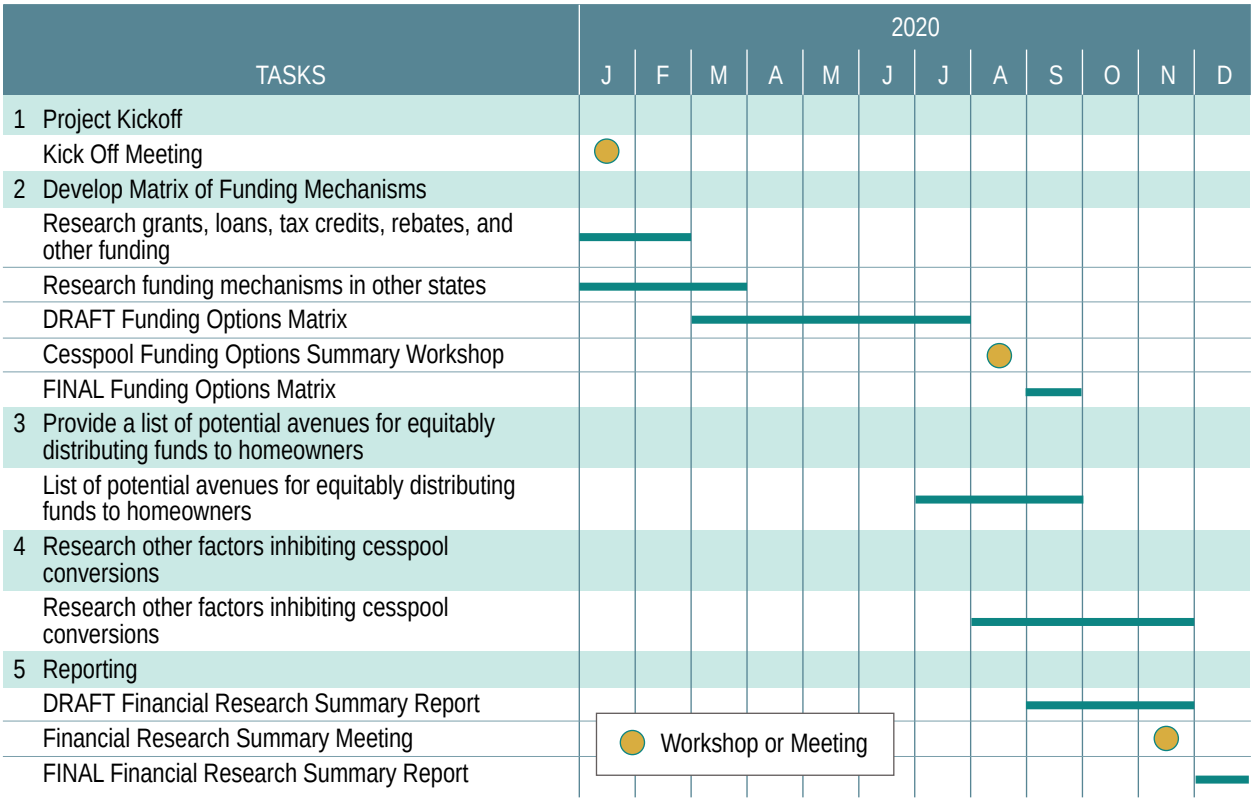
An additional deliverable within the DRAFT and FINAL Reports is a Preliminary Work Flow Chart that will be coordinated for the cesspool technology and financial research. The Preliminary Work Flow Chart will show key milestones, tasks, decisions, and potential organizational formations along with the treatment technology and financial options researched.

Task 5 Deliverables:

- DRAFT Report
- Financial Research Summary Meeting Agenda
- Financial Research Summary Meeting Minutes
- FINAL Report
- Preliminary Work Flow Chart

PROJECT SCHEDULE

Our schedule is focused on delivering all scope of work items within a 12 month period as listed in the RFP assuming a two week comment period on all deliverables.



SPECIAL QUALIFICATIONS AND EXPERIENCE

Carollo has provided wastewater expertise to clients nation-wide for 86 years, solving some of the most complex challenges in our industry. This background combined with our commitment to the local Hawai'i community is assurance that the Carollo Team will effectively assist the CCWP in the development of a long-range, comprehensive plan for statewide cesspool conversion by 2050.

GENERAL INFORMATION

The information presented herein has been prepared to summarize the qualifications of Carollo Engineers and our subconsultants to provide services to the Hawai'i State Department of Health, specifically related to general wastewater engineering and finance research services required for the long-term cesspool conversion plan. This section includes the following topics as required in the RFP:

- Principal Office and Point of Contact Information
- Firm Overview and Qualifications
- Project Organization and Key Personnel
- Relevant Experience and Project References
- Subconsultant Qualifications

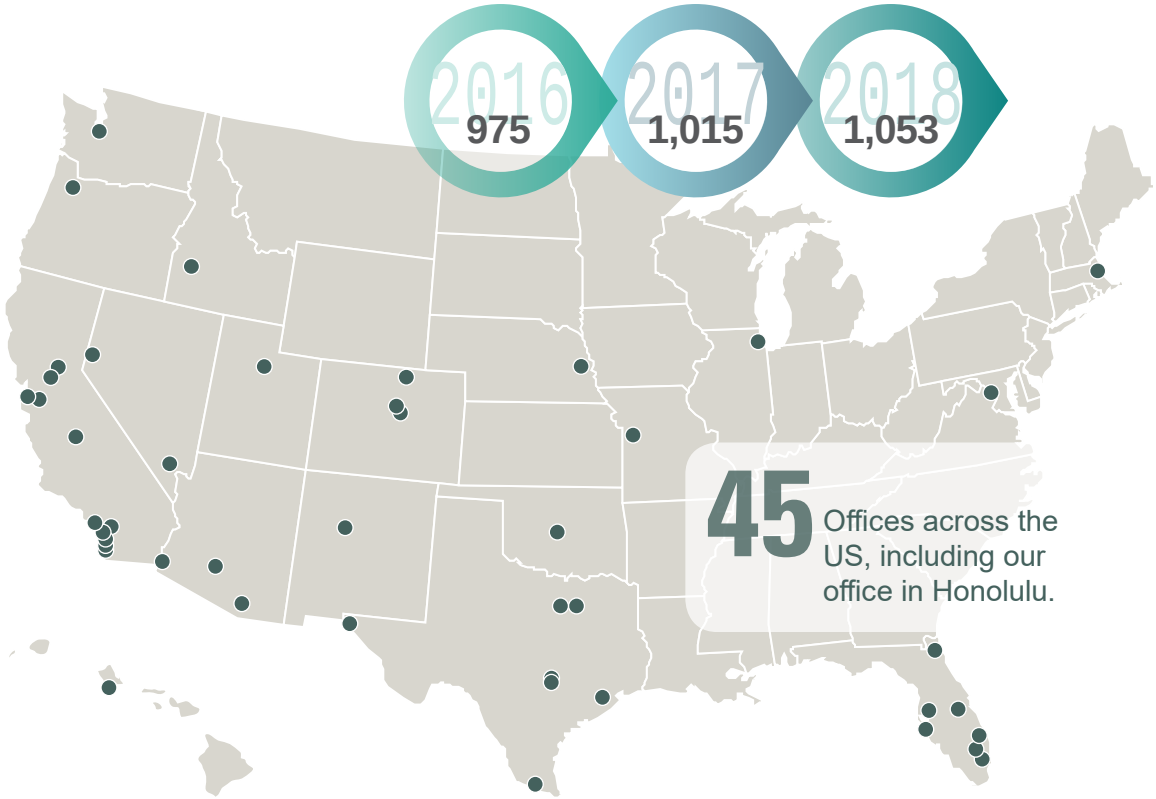
Principal Place of Business and Point of Contact

Carollo Engineers, Inc.
1003 Bishop Street, Suite 2700
Honolulu, HI 96813

Age of Firm: 86 years

Primary Point of Contact for Proposal and Project:
Cari Ishida, PhD, PE, ENV SP
T: 808.524.0869
E: cishida@carollo.com

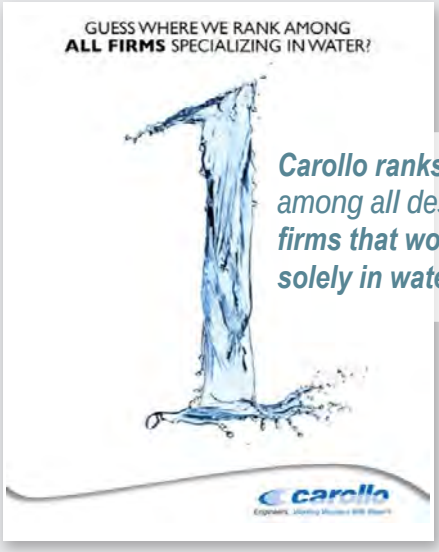
Number of Employees Over Last Three Years



FIRM OVERVIEW

Water and Wastewater...It's All We Do

Carollo Engineers is the largest engineering firm in the United States focused solely on water and wastewater. For more than 86 years, we have specialized in the research, planning, design, and construction of water, wastewater, and water reuse treatment and infrastructure systems. With this singular focus, we attract the best and brightest technical staff with a passion for this industry, offering you the top experts with the skills and knowledge to deliver any project.



Carollo ranks first** among all design **firms that work solely in water.

Within our industry we are sought after to deliver some of the largest and most complex wastewater conveyance and treatment systems, ranging small-scale service areas to populations exceeding 6 million citizens. These work efforts often involve complex technical, institutional, financial, and public outreach efforts to address aging infrastructure, capacity demands, water quality concerns, and new regulations. Our experience provides many lessons learned about how to meet our clients' long-term service needs while balancing the realities that come with high-profile projects. Consistently striking this balance is why so many of our client relationships are measured in decades.

Carollo has provided planning and design services for wastewater treatment facilities with a combined treatment capacity of over 3 billion gallons per day.

Our specific wastewater experience is inclusive of the design of more than two million linear feet of wastewater pipelines, 500 wastewater pump stations, and hundreds of treatment facilities ranging in size from less than one to greater than 450 million gallons per day (mgd). We are experts in water reuse, and serve as a regulatory panelist for the National Water Research Institute, currently developing national regulatory guidance on potable water reuse.

Cesspool and Septic Tank Conversions

Our experience with the conversion of cesspool and septic tank systems spans more than 30 years. This expertise is inclusive of evaluation and demonstration testing of onsite treatment units, gray water systems, decentralized treatment and reuse, as well as centralized collection (conventional gravity, STEP/STEG, vacuum, and low pressure systems) and treatment using a wide-range of technologies.

Representative Cesspool and Septic Tank Conversions

CLIENT/AGENCY	CESSPOOL/SEPTIC TANK SERVICE AREA POPULATION	SERVICES PROVIDED				
		Planning	Design	Construction	Public Outreach	Project Funding
Elsinore Valley Municipal Water District, CA	30,000	✓				
City of Chico, CA	29,000	✓				
Hi-Desert Water District, CA	24,000	✓	✓	✓	✓	✓
San Luis Obispo County, CA (Los Osos)	14,000	✓	✓	✓	✓	✓
City of Modesto, CA	10,000	✓				
Washoe County, NV	9,400	✓				
Templeton Community Services District, CA	7,700	✓	✓	✓	✓	✓
Lost Hills Sanitary District, CA	2,400	✓	✓	✓	✓	✓
City of Redding, CA	1,500	✓				✓
Tulare County, CA (Delft Colony)	460	✓	✓	✓	✓	✓
Tulare County, CA (Tooleville)	390	✓	✓	✓	✓	✓
Tulare County, CA (Tonyville)	330	✓	✓	✓	✓	✓

Financial Services

Carollo's financial services expertise includes revenue program analyses, rate and connection fee studies, cost allocations, project financing, and general financial planning services for water and wastewater clients. We integrate the financial and engineering disciplines to give our clients an advantage in planning for its capital and operational needs. We can develop revenue requirement forecasts designed to meet a variety of cash flow, earnings, and bond coverage objectives. Carollo has developed project specific funding mechanisms for agencies of all sizes and complexities. A utility must identify appropriate capital financing and set connection fees and rates not only to meet revenue needs, but also to equitably distribute costs among its customers. Adopted financial structures should reflect both policy objectives and community values. Carollo's engineering perspective allows us to provide our clients with detailed, supportable cost allocations based on the functional design of the utility system. This approach ultimately provides equity and defensibility.

Carollo has been involved in many financial studies around the nation that address similar challenges and concerns of those the WWB is facing. Below is a representative table that illustrates some of our experience followed by more detail on specific project examples.

	Capital Planning	Capital Funding Strategy	Cost-of-Service Rate Structure Analysis	Revenue Requirements	Fiscal Policy Review	Connection/ Impact Fees	Financial Modeling	Bond Coverage Evaluation	Stakeholder Involvement/ Public Outreach
City of Carlsbad, CA	●	●	●	●	●	●	●	●	●
City of Chula Vista, CA	●	●	●	●	●		●	●	●
City of Del Mar, CA	●	●	●	●	●	●	●	●	●
City and County of Honolulu, HI	●	●		●	●		●	●	●
City of King City, CA	●	●	●	●	●	●	●	●	●
City of Las Vegas, NV	●	●	●	●	●	●	●	●	●
City of Modesto, CA	●	●	●	●	●	●	●	●	●
City of Oceanside, CA	●	●	●	●	●	●	●	●	●
City of Omaha, NE	●	●		●	●	●	●	●	●
City of Portland, OR	●	●	●	●	●	●	●	●	●
City of Riverside, CA	●	●	●	●	●	●	●	●	●
City of Sacramento, CA	●	●	●	●	●	●	●	●	●
City of San José, CA	●	●			●	●	●		●
City of Scottsdale, AZ	●	●	●	●	●	●	●	●	●
City of Seattle, WA	●	●		●	●	●	●	●	●
City of Simi Valley, CA	●	●	●	●	●	●	●		
Clean Water Service, OR	●	●	●	●	●	●	●	●	
Delta Diablo Sanitation District, CA	●	●		●	●	●	●		
El Paso Water Utilities Public Service Board, TX	●	●	●	●	●	●	●	●	●
El Toro Water District, CA			●	●			●		
Inland Empire Utilities Agency, CA	●	●	●	●	●	●	●	●	●
Irvine Ranch Water District, CA	●		●			●	●		
King County, WA	●	●	●	●	●	●	●	●	●
Marina Coast Water District, CA	●	●	●	●	●	●	●	●	●
Orange County Sanitation District, CA	●	●	●	●	●	●	●	●	●
Palmdale Water District, CA	●	●	●	●	●	●	●	●	●
Rodeo Sanitation District, CA	●	●		●	●		●	●	●
Sacramento County Department of Water Resources, CA	●	●	●	●	●		●	●	●
Sacramento Regional County Sanitation District, CA	●	●	●	●	●	●	●	●	●
San Diego County Water Authority, CA			●	●	●	●	●	●	●
San Francisco Public Utility Commission, CA	●	●	●	●	●	●	●	●	●
Santa Ana Watershed Project Authority, CA	●	●	●	●	●	●	●	●	●
Santa Margarita Water District, CA	●	●	●	●	●	●	●	●	●
Washoe County, NV	●	●	●	●	●	●	●	●	●
West County Sanitation District, CA	●	●	●	●	●	●	●	●	
Western Riverside County Regional Wastewater Authority, CA	●	●	●	●	●	●	●		●

Funding Support Experience

An integral part of doing water-related engineering is helping clients identify financing for their projects. Carollo has worked with clients across the U.S. in the research, identification and recommendation of potential federal, state and local funding mechanisms for water and wastewater projects. We provide financial planning and assistance with SRF loans, WIFIA loans, Title XVI grants, USBR Grants (Drought, Research, Title XVI Reclamation and Basin Study), and various state programs (California Department of Water Resources IRWM, Proposition 1, Desalination and other grants). In the last 10 years, Carollo has assisted clients in securing more than $600 million in grants and loans. Our team has successfully supported clients with large programs/projects in developing strategies to optimize grant and low-interest loan financing to keep projects on schedule. The following table provides an overview of some of our relevant funding assistance experience. Specific project examples are highlighted on the following pages.

PROJECT	LOCATION	FUNDING SOURCE	AMOUNT
Septic and Sewer Conversion Project	Hi-Desert	CWSRF	$140,000,000 (Loan)
Regional Wastewater Facility CIP Program	San Jose	CWSRF	$1,000,000,000 (SRF Loan Strategy)
WWTP Critical Improvements and Sanitary Sewer Wet Weather Improvements	City of Richmond	CWSRF	$46,000,000 (Loan)
Brackish Water Desalination Project	City of Antioch	DWSRF CA DWR Desalination Grant WIFIA	$55,000,000 (Loan) $10,000,000 (Grant) $32,000,000 (Loan)
Blue River WWTP Biosolids Facility Project	Kansas City, MO	WIFIA	$49,000,000 (Loan)
South Santa Clara County Recycled Water Project	Santa Clara Valley Water District	Title XVI	$6,200,000 (Grant)
San Luis Obispo County Integrated Regional Water Management 2015 Implementation Grant Proposal	San Luis Obispo County Flood Control and Water Management District	Proposition 84 2015 IRWM Implementation Grants Solicitation	$6,300,000 (Grant)
Salinas and Carmel River Basin Study	MRWPCA, San Luis Obispo County, Monterey Peninsula Water Management District, MCWRA	U.S. Department of Interior (USBR)	$1,200,000 (Grant)
Delta Water Supply Project	City of Stockton	Proposition 84	$13,000,000 (Grant)
Alternative Intake Project	Contra Costa Water District	Proposition 84	$29,000,000 (Grant)
Recycled Water Project	City of Ukiah	CWSRF Proposition 1	$10,000,000 (Loan) $10,000,000 (Grant)
Southeast Surface Water Treatment Facility	City of Fresno	DWSRF	$195,000,000 (Loan)
Cater Water Treatment Plant Advanced Treatment Solutions Project / Ortega Groundwater Treatment Plant Rehabilitation Project	City of Santa Barbara	DWSRF	$30,000,000 (Loan)
Ellis Creek Water Reclamation Facility	City of Petaluma	Coastal Conservancy and Sonoma County Preservation and Open Space District	$4,000,000 (Grant) $125,000,000 (SRF Loan)

YUCCA VALLEY SEPTIC TANK CONVERSION PROJECT

Hi-Desert Water District, California

Carollo has been providing Owner's Advisor services for Hi-Desert Water District for the past eight years. Our services are being provided to assist the District with implementation of a septic to sewer conversion program that includes 77 miles of new sewer collection system conveyance piping, three pump stations, and a new centralized wastewater reclamation facility. As part of our Owner's Advisor services, we have served in a number of different financial assistance roles including:

Completion of the general, technical, and financial applications for the main SRF loan to fund the project, including development of the technical report and cash flow projections.

- Acted as main point of contact with the State for questions during the application process and coordinated with the District to provide or develop additional information, as required.
- Conducted meetings with various State staff to identify strategies for securing the loan.
- Reviewed the design engineer's specifications for compliance with SRF requirements.
- Developed and submitted the Final Budget Approval (FBA) package for the first construction package and will provide the same services for subsequent construction packages (4 remain).
- Develop SRF quarterly report for review by the District and submit final to the State.
- Worked with the State and District to identify the steps required for a Progressive Design Build project. The FBA package is currently being compiled.
- In the process of completing an SRF Expanded Use Loan application for use in paying for homeowner's on-lot connections to the new sewer system.

Our team compiled the Technical Report, assisted with the development of the financial package and cash flow coordination, responded to SRF questions during and after the application process, reviewed consultant bid documents for compliance and provided comments, developed the FBA package, reviews the quarterly reports developed, and is preparing the applications for the Expanded Use Loan. The District successfully obtained a loan in the amount of $152 million. The Expanded Use Loan they are currently pursuing is in the amount of $44 million and they are expecting to receive $8 million in loan forgiveness due to their status as a disadvantaged community.

HIGHLIGHTS

- Funding amount: $152M
- Funding support, including non-point source pollution loan funding options.
- Procurement and project management support.
- Low income program.
- Engineering support for collection system design.
- Established trust, familiarity, and working history with District, District Board, local consultants, regulators, SRF loan representatives, and Town staff.

BRACKISH WATER DESALINATION PROJECT

City of Antioch, California

The City of Antioch is implementing its Brackish Water Desalination Project to improve the City's water supply reliability and operational flexibility. The project, which includes the construction of a new intake, conveyance piping, reverse osmosis facilities, and a brine discharge, will produce up to 6 mgd of desalinated water to offset the use of purchased water. It also provides operational flexibility by allowing the City to continue to withdraw water from its existing intake at times of high salinity. Carollo was retained to develop a grant application for the State of California Department of Water Resources (DWR) Water Desalination Grant Program Round 4 for desalination of brackish or seawater. The grant package, with 21 attachments, had to meet specific requirements as laid out by DWR and was scored according to a multitude of factors including economic and non-economic benefits of the project. The project was awarded $10M in construction funding from this highly competitive program. Carollo also assisted the City in pursuing low interest loans from state and federal agencies. Carollo developed and successfully secured a $1M Drinking Water State Revolving Fund (DWSRF) Planning loan from the State Water Resources Control Board, Division of Financial Assistance (SWRCB DFA). Carollo also developed and submitted a $55M DWSRF Construction loan package to the SWRCB. Carollo is currently working with the state to process the loan package and is on target to secure project financing. We also supported the City in pursuing loan financing from EPA's Water Infrastructure Finance and Innovation Act (WIFIA) program for its FY 2018 solicitation round. We developed the Letter of Interest which resulted in the successful invitation to apply to secure $32 M in loan financing from the EPA.

HIGHLIGHTS

- Funding amount: $11M secured; $55M pending.
- Multiple funding alternatives.
- Complex and competitive application process.

RECYCLED WATER FEASIBILITY STUDY

Los Carneros Water District, California

Carollo provided comprehensive services for the Los Carneros Water District (LCWD) Recycled Water Pipeline project from the initial Feasibility Study through construction management. The project included 9 miles of recycled water pipeline and 107 customer turnouts. As part of our services, Carollo performed the following financing-related activities during the project:

- Completed and submitted the general, technical, environmental and financial applications.
- Assisted with technical information required for the successful formation of an Assessment District to secure the SRF loan.
- Provided coordination between the State, LCWD, Napa Sanitation District, and Napa County staff to provide clarification or additional information where requested by the State.
- Coordinated with the environmental consultant for additional environmental documentation required due to the State's environmental review and changes during the design of the project.
- Coordinated with the State and LCWD to secure Proposition 1 grant money for the project just before start of construction. Which resulted in approximately 40 percent of the overall project cost being funded by grants.
- Developed and submitted the final budget approval package for the project after project bid.
- Submitted an American Iron and Steel (AIS) waiver during construction for long lead time valves and coordinated with the State and EPA to have air release valves covered by a de minimis waiver.
- Ensured contractor compliance during construction.
- Provided updates, as necessary, during construction to assist with development of monthly and quarterly reports.

Carollo served as point of contact with the State in developing the applications, coordinating with the environmental subconsultant, developing project costs. Carollo also led the development of the final budget approval package, development of the SRF compliant front end documents, and the development of the AIS waiver.

HIGHLIGHTS

- Funding amount: $20M
- Assessment district formation.
- Multiple agency coordination.
- Combination of grant and loan financing.
- Preparation of complete application package.

BLUE RIVER WWTP BIOSOLIDS FACILITY PROJECT

City of Kansas City, Missouri

As Owner's advisor, the Carollo team is providing project management, funding, site investigation, conceptual design, preliminary design, sustainability assessment, public outreach, risk management, Building Information Modeling (BIM), project delivery analysis, P3 partnership opportunity evaluations, and project cost estimating services. The Carollo team is also providing design build procurement assistance, construction phase management support, and commissioning oversight on behalf of the City's Water Services Department.

The Blue River WWTP Biosolids Facility Project is a $100 Million+ design build project that will replace and rehabilitate aging infrastructure, and upgrade biosolids treatment processes to reliably produce Class A biosolids through the addition of a Thermal Hydrolysis Process (THP), maximize the effectiveness of the existing anaerobic digesters, and increase digester produced methane gas as a sustainable fuel source. This project is intended to provide the regional capacity and reliability necessary to comply with solids management regulatory requirements through 2035, and meet the City's sustainability goals for the project.

In 2018, Carollo supported the City in pursuing loan financing from EPA's Water Infrastructure Finance and Innovation Act (WIFIA) program for its FY 2018 solicitation round. Carollo developed the Letter of Interest which resulted in the successful invitation to apply to secure $49 M (the maximum WIIFA loan amount) in loan financing from the EPA. The City of Kansas City is currently working with the State SRF program to secure the complementary funding. Carollo is currently supporting the City in the development of the second phase of the WIFIA process in the development of the application package.

HIGHLIGHTS

- WIFIA Loan amount: $49M
- Funding through EPAs Water Infrastructure Finance and Innovation Act (WIFIA).
- Detailed application development.
- Combination of funding sources.

REGIONAL WASTEWATER FACILITY CIP PROGRAM

City of San Jose-Santa Clara Regional Wastewater Facility, California

Carollo is part of the Program Management team for the City of San Jose's Regional Wastewater Facility Capital Improvement Program (CIP). As part of the program, Carollo was contracted to develop an SRF Loan funding strategy for its 10 year CIP (consisting of 22 projects) to help offset the costs of its program. Activities to date have included:

- Coordination with various State Water Resources Control Board staff to understand the current status of the CWSRF Program and to identify potential funding strategies to pursue.
- Developed a CWSRF Funding Strategy for the City's 10 year CIP program. Approach included review of entire program including project and document status, discussions with SWRCB and other multi project agency applicants, evaluation of various approaches and applicability to the City's CIP program, and the recommendation of 3 proposed approaches. Developed a bundled application strategy to identify packages of CIP projects with which to apply to the SRF program based on project readiness, environmental/design documentation, construction start, etc.
- Review of SRF application packages developed by City of San Jose CIP project managers. Coordination of SRF application packages to optimize resources and ensure consistency amongst applications.
- Identification of new requirements including the Climate Change Worksheet, and Fiscal Sustainability Plan.
- Developed comment letters to the SWRCB as requested, as well as provided for review of City developed documents.
- Provided training to CIP project staff on the development of SRF packages and provided support to City staff on submitted SRF packages.

HIGHLIGHTS

- Capital Improvement Program funding amount: $100M CIP Funding Strategy (low interest loan and grants)
- Funding support, including non-point source pollution loan funding options.
- Procurement and project management support.
- Multi-agency coordination.
- Bundled application strategy.

SOUTH SANTA CLARA COUNTY RECYCLED WATER PROJECT

Santa Clara Valley Water District, California

Carollo was retained by the Santa Clara Valley Water District (District) to develop a grant strategy, for its Expedited Recycled Water Project and to support the District in identifying and applying for grants and low interest loans to help offset the costs of the program. The recycled water project supports the District in expanding its recycled water program by 35,000 AFY and consisted of four main projects. In addition, the District was continuing to implement other non-potable reuse projects which were also evaluated for potential funding. As part of the effort to implement the program, the District Board directed staff to work on acquiring grant funding including USBR Title XVI and SRF funding. As part of our services, Carollo has conducted the following activities to date:

- Project Visioning activities including a visioning workshop and development of a grant visioning document which supported the District in determining project priorities and project groupings to provide the greatest financial value.
- Development of the South Bay Water Recycling Grant Funding Vision Technical Memorandum which identified and prioritized which grants/low interest loans to pursue for specific projects.
- Developed two USBR WaterSMART Title XVI Water Reclamation and Reuse Program Grant Application Packages (FY 2016 and FY 2017), for the South Santa Clara County Recycled Water Project, which resulted in the securement of $5.2 million in grant funding. Provide support to the District in responding the USBR review questions, as well as in review of financial agreement.
- Developed and submitted a Proposition 1/SRF Application Package.

HIGHLIGHTS

- Amount: $5.7M (USBR Grant)
- Developed overall Expedited Water Program Grant Funding Strategy and Visioning Approach.
- Identified potential low interest loan and grant funding opportunities
- Developed state SRF Application including required packages, attachments.
- Coordinated with district and state staff on the SRF Loan.
- Worked with the District and state to evaluate public and private partnerships and the impacts of various governance structure on funding opportunities.

REFERENCES

We encourage you to contact the following references as they will attest to the quality of service and responsiveness that Carollo brings to each project.

CLIENT REFERENCES

Mr. Jason Nikaido, Acting Chief, Collection System Maintenance*
City and County of Honolulu Department of Environmental Services
P: 808.768.7220 | E: jnikaido@honolulu.gov

Mr. Wesley Yokoyama, Assistant Chief, DDC Wastewater*
City and County of Honolulu Department of Design and Construction
P: 808.768.8790 | E: wyokoyama@honolulu.gov

Mr. Scott Parker, Utility Asset Manager
City of Kansas City, Missouri Water Services
P: 816.513.0260 | E: Scottg.Parker@kcmo.org

Mr. Jon Blank, Public Works Director/City Engineer
City of Antioch, California
P: 925.779.6953 | jblank@ci.antioch.ca.us

**Services have been provided to these clients within the last year.*

PROJECT ORGANIZATION AND KEY PERSONNEL

Cesspool Conversion Working Group

Principal-in-Charge
Gary Deis, PE

Technical Advisors
Roger Babcock, PE[2]
Paavo Ogren[4]
John Waddell[5]

Project Manager
Cari Ishida, PE

Task 2 Detailed Funding Matrix Development

Local Research Lead and National Support
Ann Hajnosz[1]

Funding Research Support
Seema Chavan
Kevin Tice
Kim Lightner

Task 3 Equitable Distribution of Funds
Jen Ivey

Task 4 Other Factors

Task and Community Outreach Lead
John Katahira, PE[3]

1. Harris and Associates
2. University of Hawaii
3. The Limtiaco Consulting Group
4. Former Public Works Director, San Luis Obispo County, CA
5. Construction Division Manager, San Luis Obispo County, CA

KEY PERSONNEL

We are proposing the same technical advisory and project leadership team for both the financial and technology cesspool research projects, providing continuity and coordination between the two, intertwined issues. Our finance team also provide local and national financial expertise.

GARY DEIS, PE

Principal-in-Charge

EDUCATION:

MS Sanitary Engineering, UC Berkeley; BS CalState Fresno

Gary is a senior vice president with Carollo. He has 44 years of experience in a wide range of complex wastewater projects and programs throughout the U.S., including projects for major utilities such as the Metro Wastewater Reclamation District, CO; East Bay Municipal Utility District, CA; and Sacramento Regional County Sanitation District, CA. He currently serves as project director for the evaluation of 20 wastewater pump stations and the construction management of the Pearl City Wastewater Pump Station Upgrade for the City and County of Honolulu. Gary has been responsible for the preparation of numerous wastewater rate studies and funding analyses, including projects for the East Bay Municipal Utility District, Orange County Sanitation District, and City of Sunnyvale, CA. He also served as project manager for the septic tank conversion project for several small communities in Tulare County, CA.

CARI ISHIDA, PHD, PE, ENV SP

Project Manager

EDUCATION:

PhD Civil and Environmental Engineering, Northwestern University; MS Environmental Engineering, Northwestern University; BS Environmental Engineering, University of Southern California

Cari has more than 14 years of experience in water and wastewater system planning and design. She has returned to her roots in Honolulu to expand Carollo's operations to Hawai'i. She was the project manager for several, long-range wastewater master plans, and has worked closely with agencies to develop financial and technology solutions. Cari also has expertise in natural systems treatment, including wetland systems, sustainability, and water reuse. Most recently, Cari was the project manager for the DuPage County Wastewater Master Plan and the Metropolitan Water Reclamation District of Greater Chicago's phosphorus removal feasibility studies. She also served as project manager for the Sand Island Wastewater Treatment Plant Primary Expansion, Phase 2 – Reconstruction Project. Cari is a registered Hawai'i Professional Engineer. **Cari is located in Carollo's Honolulu office and will be the primary point of contact for WWB regarding this RFP and project.**

ROGER BABCOCK, PhD, PE

Technical Advisor

EDUCATION:

PhD Civil Engineering, UCLA; MS Civil Engineering, California Polytechnic State University; BS Civil Engineering, UC Davis

Dr. Babcock is one of the preeminent experts in the State on Onsite Sewage Disposal Systems (OSDS) in Hawai‘i, studying them since 1998. Most recently in 2018-2019, Dr. Babcock and his team of researchers have been working on the Investigation of cesspool upgrade alternatives for Upcountry Maui funded by Department of Health, Safe Drinking Water Branch. This investigation includes an evaluation of OSDS replacement alternatives, their site-specific costs, their environmental benefits, a cost/benefit decision-making analyses, and stakeholder engagement. This study will be completed in July 2019. In 2012, Dr. Babcock completed the Condition Assessment Survey of Onsite Sewage Disposal Systems (OSDS) in Hawai‘i, which included an on-the-ground survey and assessment and sampling of OSDSs in Kaua‘i, O‘ahu, Moloka‘i, Maui, and the Big Island of Hawai‘i. This study found that 80% of the 181 OSDSs surveyed were not receiving basic maintenance, and 70% of effluent samples exceeded expected (EPA) values for total nitrogen and phosphorus. Roger’s research team continues to study OSDSs including a current laboratory investigation of passive denitrifying absorption beds using sawdust and plans to conduct pilot testing of membrane bioreactor aerated treatment units, and field tests of various absorption bed materials. As a part of his research, Roger plans to delve into issues of local conditions, locally sourced materials, low versus high technology options, operational costs versus reliability, and inspection/maintenance needs.

PAAVO OGREN

Technical Advisor

EDUCATION:

BS Business Administration - Accounting, California Polytechnic State University, San Luis Obispo

Over the course of Paavo’s 35 year career, he has led numerous technical, financial, and policy development efforts focused on compliance with state and federal environmental legislation. One of his legacy accomplishments was directing the solution for the conversion of septic tanks to a community wastewater system for Los Osos, CA. His leadership was paramount in successful project implementation, overcoming years of controversy. He also led the Integrated Regional Water Management Program for San Luis Obispo County and was instrumental in the formation of two special service districts. Paavo’s work in capital project management has resulted in several state and national awards from the American Public Works Association and the American Society of Civil Engineers.

JOHN WADDELL

Technical Advisor

EDUCATION:

BS, Environmental Engineering, Cal Poly State University, San Luis Obispo

John helped to guide the Los Osos septic tank conversion program for San Luis Obispo County (County) over the last 20 years. As the agency project manager, he led a comprehensive public outreach program, including a dedicated community liaison, website, social media, and phone hotline system. He also managed the program funding and procurement process, including a mixture of federal and state grants and loans. John also oversaw design and construction teams for $130 million of new sewer infrastructure, including 50 miles of pipelines, lift stations, and a new 1.2 million gallon per day water recycling facility and recycled water distribution system. He currently leads a team of engineers and construction professionals in managing the County’s construction projects.

ANN HAJNOSZ

Financial Local Research Lead and National Support

MBA, Finance, Indiana University at Bloomington; BS, Civil Engineering, University of Hawai'i at Manoa

Ann has worked closely with water, wastewater, electric, and solid waste utilities for 33 years in the areas of best practices, utility performance, financial planning and rates. Since the early 2000's she has worked with all 4 county water agencies in the State of Hawai'i, 2 of 4 county wastewater agencies; all 4 county solid waste agencies and 1 electric utility in the State. Ann has also worked with numerous water and wastewater utilities, mostly in the Western US and with the territory of Guam. Ann's knowledge of local utility, economic, cultural, environmental and political issues in Hawai'i, combined with utility rates and finance expertise and broad strategic utility experience makes her uniquely qualified to support this critical cesspool conversion financing project. She is deeply committed to helping water utilities in her home state of Hawai'i.

JENNIFER IVEY

Task Lead – Equitable Distribution of Funds

EDUCATION:

MBA Finance, Southern Methodist University; BS Civil Engineering, University of Texas, Austin

Jennifer has 20 years of extensive experience in multi-year financial planning, impact fees, bond feasibility, and cost of service, rate, and charge studies throughout the U.S., as well as civil and environmental design projects. Her combined financial and engineering expertise crosses over to provide accurate financial results based on sound engineering and cost causation foundation. Jennifer is currently active in industry associations including the AWWA's National Rates and Charges Committee and was a contributing author for AWWA's updated Principles of Water Rates, Fees, and Charges M1 Rates Manual.

JOHN KATAHIRA, PE

Task and Community Outreach Lead

EDUCATION:

MS Civil Engineering, UH Manoa; MBA Business Administration, UH Manoa; BS Civil Engineering, UH Manoa

John Katahira specializes in the engineering of water, wastewater, recycled water and stormwater infrastructure. As president of The Limtiaco Consulting Group, Katahira's key responsibilities include business development, marketing, financial management, human resources, and information technology. He is the principal-in-charge for planning engineering and public outreach services. An active member of various nonprofit organizations, John served as president of the American Council of Engineering Companies of Hawai'i and Hawai'i Water Environment Association. He also served as president of the Boys and Girls Club of Hawai'i Alliance Board. He is currently a corporate board member and executive committee member of the Boys and Girls Club of Hawai'i and executive committee member of the UH Engineering Alumni Association.

SEEMA CHAVAN

Funding Research Support

EDUCATION:

MS Environmental Engineering, Northwestern University; BS Civil Engineering, UC Berkeley

Seema, a senior engineer with Carollo, brings more than 17 years of environmental engineering experience to the team. Her projects have focused on identifying and securing sources of local, state, and federal Loan/Grant funding, program management, coordination of environmental documentation/permitting, including agency coordination and permit acquisition.
Seema was instrumental as the SRF program coordinator for the City of San Jose-Santa Clara's Regional Wastewater Facility CIP Program by managing the identification and application for SRF funding for the design, engineering and construction of identified CIP projects. She also served as lead for evaluating funding assistance opportunities for the City of Modesto, CA.

SUBCONSULTANTS

SUBCONSULTANT	GENERAL SCOPE OF WORK	APPROXIMATE PERCENT OF TOTAL EFFORT	CONTACT INFORMATION
Harris and Associates 207 1/2 1st Avenue S Suite 250 Seattle, WA 98104	Task 2 Lead	25%	Ann Hajnosz ann.hajnosz@weareharris.com 206.455.8862
University of Hawai'i 2540 Dole Street Holmes Hall 383 Honolulu, HI 96822	Technical Advisor for Technology Research Coordination	20%	Dr. Roger Babcock rbabcock@hawaii.edu 808.956.7550
The Limtiaco Consulting Group, Inc. (TLCG) 1622 Kanakanui Street Honolulu, HI 96817	Task 4 Lead, Community Outreach, and Local Issues	10%	John Katahira johntlcghawaii.com 808.596.7790
Paavo Ogren 3625 Maricopa Road Atascadero, CA 93445	Technical Advisor	< 5%	Paavo Ogren paavo.ogren@gmail.com 805.540.0887
John Waddell 2429 Ladera Court San Luis Obispo, CA 93401	Technical Advisor	< 5%	John Waddell john.i.waddell@gmail.com 805.459.5034

Dr. Roger Babcock and his UH Team are currently conducting a laboratory investigation of passive denitrifying absorption beds for cesspool or septic tank effluent. He also plans to conduct pilot testing of membrane bioreactor aerated treatment units, and field tests of various absorption bed materials. As a part of his research, Roger will delve into issues of local conditions, locally sourced materials, low versus high technology options, operational costs versus reliability, and inspection/maintenance needs.

Attestation Letters from each subconsultant can be found in the following pages.

Harris & Associates

May 16, 2019

Cari Ishida, PhD, PE, ENV SP
Client Service & Project Manager | Associate
Carollo Engineers
1003 Bishop Street, Suite 2700
Honolulu, HI 96813

Subject: Attestation that the Subconsultant will Perform the Work as Indicated

Dear Ms. Ishida:

Harris & Associates, Inc. (Harris) is pleased to provide this documentation to you regarding utility finance support services to Carollo Engineers in regards to the Procurement of Professional Services for Cesspool Conversion Finance Research Solicitation No. WWB 19-02. Harris is prepared to provide Utility Finance Services in support of the above mentioned contract as part of the Carollo Engineers Team. Proposed tasks to be performed by Harris are described in the enclosed proposal. The final scope of work for Harris will be negotiated upon contract award.

This is an exclusive agreement and Harris agrees not to partner with another firm on this Solicitation.

Once again, Harris appreciates the opportunity to be included on the Carollo Engineers team for this upcoming contract.

Sincerely,

Harris & Associates, Inc.

Ann Hajnosz, PE*
Senior Director, Strategic Advisory Services
Phone: 425.503.3731
Email: Ann.Hajnosz@WeAreHarris.com
*WA

1401 Willow Pass Road, Suite 500, Concord, CA 94520 ■ p: 925.827.4900 ■ f: 866.356.0998 ■ WeAreHarris.com

UNIVERSITY OF HAWAI'I AT MĀNOA
Department of Civil and Environmental Engineering

May 22, 2019

Cari Ishida, PhD, PE, ENV SP
Client Service & Project Manager | Associate
Carollo Engineers, Inc.
1003 Bishop Street, Suite 2700
Honolulu, HI 96813

Dear Ms. Ishida:

Roger Babcock of the University of Hawaii at Manoa [UHM] is pleased to provide this documentation to you regarding engineering support services to Carollo Engineers, Inc. in regards to the Procurement of Professional Services for Cesspool Conversion Technology Research Solicitation No. WWB 19-01. UHM is prepared to provide technical advisory services in support of the above mentioned contract as part of the Carollo Engineers Team. Proposed tasks to be performed by UHM are described in the enclosed proposal. The final scope of work for UHM will be negotiated upon contract award.

This is an exclusive agreement and UHM agrees not to partner with another firm on any project listed in the RFQ.

Once again, UHM appreciates the opportunity to be included on the Carollo Engineers team for this upcoming contract.

Sincerely,

Roger Babcock

Roger Babcock, PhD, PE
Professor
(808) 956-7298
rbabcock@hawaii.edu

2540 Dole Street, Holmes Hall 383, Honolulu, Hawaii 96822-2382
Telephone: (808) 956-7480, Facsimile: (808) 956-5014
An Equal Opportunity/Affirmative Action Institution

THE LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

May 20, 2019

Cari Ishida, PhD, PE, ENV SP
Client Service & Project Manager | Associate
Carollo Engineers, Inc.
1003 Bishop Street, Suite 2700
Honolulu, HI 96813

Dear Ms. Ishida:

The Limtiaco Consulting Group is pleased to provide this documentation to you regarding engineering support services to Carollo Engineers, Inc. in regards to the Procurement of Professional Services for Cesspool Conversion Technology Research Solicitation No. WWB 19-01. The Limtiaco Consulting Group is prepared to provide technical advisory services in support of the above-mentioned contract as part of the Carollo Engineers Team. Proposed tasks to be performed by The Limtiaco Consulting Group are described in the enclosed proposal. The final scope of work for The Limtiaco Consulting Group will be negotiated upon contract award.

This is an exclusive agreement and The Limtiaco Consulting Group agrees not to partner with another firm on any project listed in the RFQ.

Once again, The Limtiaco Consulting Group appreciates the opportunity to be included on the Carollo Engineers team for this upcoming contract.

Sincerely,

John H. Katahira
President
(808) 687-8723
john@tlcghawaii.com

1622 Kanakanui Street • Honolulu, Hawaii 96817
(808) 596-7790 • tlcghawaii.com

May 30, 2019

Cari Ishida, PhD, PE, ENV SP
Client Service & Project Manager | Associate
Carollo Engineers, Inc.
1003 Bishop Street, Suite 2700
Honolulu, HI 96813

Dear Ms. Ishida:

I am pleased to provide this documentation to you regarding engineering support services to Carollo Engineers, Inc. in regards to the Procurement of Professional Services for Cesspool Conversion Technology Research Solicitation No. WWB 19-01 and the Cesspool Conversion Finance Research Solicitation No. WWB 19-02. I am prepared to provide technical advisory services in support of the above mentioned contract as part of the Carollo Engineers Team. Proposed tasks that I am to perform are described in the enclosed proposal. The final scope of my work will be negotiated upon contract award.

This is an exclusive agreement and I agree not to partner with another firm on any project listed in the RFQ.

Once again, I appreciate the opportunity to be included on the Carollo Engineers team for this upcoming contract.

Sincerely,

Paavo Ogren
Technical Advisor - Finance
805-540-0887
paavo.ogren@gmail.com

3625 Maricopa Road
Atascadero, CA 93422

May 31, 2019

Cari Ishida, PhD, PE, ENV SP
Client Service & Project Manager | Associate
Carollo Engineers, Inc.
1003 Bishop Street, Suite 2700
Honolulu, HI 96813

Dear Ms. Ishida:

I am pleased to provide this documentation to you regarding engineering support services to Carollo Engineers, Inc. in regard to the Procurement of Professional Services for Cesspool Conversion Technology Research Solicitation No. WWB 19-01 and the Cesspool Conversion Finance Research Solicitation No. WWB 19-02. As an independent contractor, I am prepared to provide technical advisory services in support of the above mentioned contracts as part of the Carollo Engineers team.

The tasks are expected to generally include any of the following, with the final scope of work depending on Carollo Engineers' negotiated agreement with the Hawai'i Department of Public Health.

- Provide input and guidance on the evaluation and screening of treatment technology alternatives
- Review and comment on draft reports, presentations, and other deliverables
- Participate in presentations and public meetings

This is an exclusive agreement and I agree to not partner with another firm on any project listed in the RFQ.

Once again, I appreciate the opportunity to be included on the Carollo Engineers team for this upcoming contract. I am looking forward to using my experience and background to help communities in Hawai'i improve their water quality.

Sincerely,

John Waddell

JOHN WADDELL, PE

Phone: (805) 459-5034
Email: john.i.waddell@gmail.com

JOHN WADDELL, PE
2429 LADERA COURT
SAN LUIS OBISPO, CA 93401

LABOR CATEGORY, PROFESSIONAL LEVEL, RATE SCHEDULE, AND PRICE LIST

The following section provides our team's labor categories, professional levels, and rate schedules.

CAROLLO ENGINEERS, INC.

POSITION	RATE*
Principal Engineer	$287.00
Technical Advisor	$287.00
Project Manager	$262.00
Senior Engineer	$222.00
Project Engineer	$197.00
Staff Engineer	$142.00
Admin/Document Processing/ Graphics	$112.00

OTHER DIRECT EXPENSES	
Travel and Subsistence	at cost
Mileage at IRS Reimbursement Rate	
Subconsultant	cost + 10%

HARRIS AND ASSOCIATES

POSITION	RATE*
Vice President	$275.00
Senior Director	$250.00
Senior Engineer	$195.00
Project Engineer	$165.00
Staff Engineer/Analyst	$150.00

THE LIMTIACO CONSULTING GROUP (TLCG)

POSITION	RATE*
Principal Engineer	$200.00
Project Manager	$170.00
Project Engineer	$150.00
Senior Staff Engineer	$125.00
Staff Engineer	$110.00
Senior Env Planner	$170.00
Env Planner	$150.00
Staff Env Planner	$110.00
CAD/Graphics	$110.00
Admin	$75.00

UNIVERSITY OF HAWAI'I (UH)

POSITION	RATE*
Technical Advisor/ Principal Investigator	$128.00
Research Associate	$35.00

OTHER

POSITION	RATE*
Technical Advisor	$175.00

**Note: All rates exclude Hawai'i State General Excise Tax of 4.712%*

The table below presents a summary of the estimated lump sum costs by tasks for the proposed scope of work. Tasks are broken out separately. The costs summarized below include our estimated labor, other direct costs, and State General Excise Tax of 4.712%. The Carollo team is negotiable on the estimated costs and scope of work should you choose to entrust us to support you on this important project.

TASK AND DESCRIPTION	PROPOSED BUDGET
Task 1 - Project Kickoff & PM	$30,700
Task 2 - Develop a detailed matrix of funding mechanisms available for cesspool conversions	$100,200
Task 3 - Provide a list of potential avenues for equitably distributing funds to homeowners	$36,200
Task 4 - Research other factors inhibiting cesspool conversions	$17,100
Task 5 - Reporting	$60,100
Total	$244,300

CERTIFICATE OF VENDOR COMPLIANCE

STATE OF HAWAII
STATE PROCUREMENT OFFICE

CERTIFICATE OF VENDOR COMPLIANCE

This document presents the compliance status of the vendor identified below on the issue date with respect to certificates required from the Hawaii Department of Taxation (DOTAX), the Internal Revenue Service, the Hawaii Department of Labor and Industrial Relations (DLIR), and the Hawaii Department of Commerce and Consumer Affairs

Vendor Name: **CAROLLO ENGINEERS, INC.**

DBA/Trade Name: **CAROLLO ENGINEERS, INC.**

Issue Date: **02/12/2019**

Status: **Compliant**

Hawaii Tax#:	W20173130-01
New Hawaii Tax#:	GE198576537601
FEIN/SSN#:	XX-XXX9222
UI#:	XXXXXX2422
DCCA FILE#:	42560

Status of Compliance for this Vendor on issue date:

Form	Department(s)	Status
A-6	Hawaii Department of Taxation	Compliant
	Internal Revenue Service (Compliant for Gov. Contract)	Compliant
COGS	Hawaii Department of Commerce & Consumer Affairs	Compliant
LIR27	Hawaii Department of Labor & Industrial Relations	Compliant

Status Legend:

Status	Description
Exempt	The entity is exempt from this requirement
Compliant	The entity is compliant with this requirement or the entity is in agreement with agency and actively working towards compliance
Pending	The entity is compliant with DLIR requirement
Submitted	The entity has applied for the certificate but it is awaiting approval
Not Compliant	The entity is not in compliance with the requirement and should contact the issuing agency for more information

STATE OF HAWAII
STATE PROCUREMENT OFFICE

CERTIFICATE OF VENDOR COMPLIANCE

This document presents the compliance status of the vendor identified below on the issue date with respect to certificates required from the Hawaii Department of Taxation (DOTAX), the Internal Revenue Service, the Hawaii Department of Labor and Industrial Relations (DLIR), and the Hawaii Department of Commerce and Consumer Affairs

Vendor Name: **Harris & Associates, Inc.**

Issue Date: **05/17/2019**

Status: **Compliant**

Hawaii Tax#:
New Hawaii Tax#:
FEIN/SSN#: XX-XXX5238
UI#: No record
DCCA FILE#:

Status of Compliance for this Vendor on issue date:

Form	Department(s)	Status
A-6	Hawaii Department of Taxation	Compliant
	Internal Revenue Service (Compliant for Gov. Contract)	Compliant
COGS	Hawaii Department of Commerce & Consumer Affairs	Exempt
LIR27	Hawaii Department of Labor & Industrial Relations	Compliant

Status Legend:

Status	Description
Exempt	The entity is exempt from this requirement
Compliant	The entity is compliant with this requirement or the entity is in agreement with agency and actively working towards compliance
Pending	The entity is compliant with DLIR requirement
Submitted	The entity has applied for the certificate but it is awaiting approval
Not Compliant	The entity is not in compliance with the requirement and should contact the issuing agency for more information

STATE OF HAWAII
STATE PROCUREMENT OFFICE

CERTIFICATE OF VENDOR COMPLIANCE

This document presents the compliance status of the vendor identified below on the issue date with respect to certificates required from the Hawaii Department of Taxation (DOTAX), the Internal Revenue Service, the Hawaii Department of Labor and Industrial Relations (DLIR), and the Hawaii Department of Commerce and Consumer Affairs

Vendor Name: **THE LIMTIACO CONSULTING GROUP, INC.**

DBA/Trade Name: **THE LIMTIACO CONSULTING GROUP, INC.**

Issue Date: **05/20/2019**

Status: **Compliant**

Hawaii Tax#: W20473670-01
New Hawaii Tax#: GE009674342401
FEIN/SSN#: XX-XXX8608
UI#: XXXXXX5070
DCCA FILE#: 93694

Status of Compliance for this Vendor on issue date:

Form	Department(s)	Status
A-6	Hawaii Department of Taxation	Compliant
	Internal Revenue Service (Compliant for Gov. Contract)	Compliant
COGS	Hawaii Department of Commerce & Consumer Affairs	Compliant
LIR27	Hawaii Department of Labor & Industrial Relations	Compliant

Status Legend:

Status	Description
Exempt	The entity is exempt from this requirement
Compliant	The entity is compliant with this requirement or the entity is in agreement with agency and actively working towards compliance
Pending	The entity is compliant with DLIR requirement
Submitted	The entity has applied for the certificate but it is awaiting approval
Not Compliant	The entity is not in compliance with the requirement and should contact the issuing agency for more information

Gary C. Deis, P.E.

Gary Deis is a senior vice president with Carollo. He has 44 years of experience in a wide range of complex water and wastewater projects and programs throughout the U.S. His experience includes financial studies, master planning, design, and project delivery via conventional design-bid-build and alternative design-build concepts.

Education

MS Sanitary Engineering, University of California, Berkeley, 1975

BS Civil Engineering, California State University, Fresno, 1974

Licenses

Civil Engineer, California, Kansas, Alaska, Michigan, Utah, Oregon, Illinois, Colorado, Missouri, Nevada, Washington, North Carolina, Arkansas, Arizona, Idaho

Professional Engineer, Texas, Hawaii

Professional Affiliations

American Water Works Association

California Water Environment Association

Water Environment Federation

Relevant Experience

→ Project manager for the planning, design, and construction management of the septic tank and conversion project for three small rural communities in Tulare County, California. The project resulted in the construction of community sewage collection systems and small, decentralized wastewater treatment and disposal facilities.

→ Principal-in-Charge for comprehensive wastewater collection and treatment master plans for the City of Modesto, California. Planning efforts considered sewerage of areas currently served by onsite systems and the construction of decentralized wastewater treatment and disposal facilities.

→ Responsible for preparation of 12 wastewater rate studies and funding analyses, including projects for the East Bay Municipal District, City of Sunnyvale, Delta Diablo Sanitation District, and Orange County Sanitation District, California.

→ Project director for the evaluation of 20 wastewater pump stations for the City and County of Honolulu, Hawai'i. The project will assess compliance with National Fire Protection Agency requirements. All required improvements will be implemented via a design-build contract.

→ Project director for the construction management services for upgrade of the 36-mgd Pearl City pump station for the City and County of Honolulu, Hawai'i. The project involves the replacement of existing pumps and associated suction and discharge piping, surge tanks, as well as HVAC and EI&C improvements.

→ Project director for the Sacramento Regional County Sanitation District, California, EchoWater Project Tertiary Treatment Facilities, Nitrifying Sidestream Treatment, Return Activated Sludge Pumping, and Flow Equalization projects. Total construction value in excess of $550 million.

→ Principal-in-charge for the Metro Wastewater Reclamation District, Colorado, PAR 942 North Secondary Complex Treatment Improvements. This $65 million project involved modifications to the main influent channel to the plant while maintaining plant operations. Secondary improvements included modification to the BNR aeration basin layout, and secondary clarifiers to meet more stringent effluent nitrate and ammonia requirements while providing increased secondary treatment capacity.

→ Principal-in-charge for the Metro Wastewater Reclamation District, Colorado, PAR 1085 South Secondary Complex Treatment Improvements. This $139 million project includes final design of a new 114-mgd secondary treatment complex.

→ Principal-in-charge for the City of Modesto, California, 15-mgd BNR/Tertiary Treatment Facilities. This $120 million project involved final design of a primary effluent pump station, membrane bioreactors, membrane feed/WAS pump station, and UV disinfection to produce a high-quality tertiary effluent for reuse.

→ Principal-in-charge for design of the Napa Sanitation District, California, Soscol Water Recycling Facility. This project included a new headworks, primary clarifiers, and activated sludge processes. A tertiary filter complex treats wastewater to California Title 22 standards for unrestricted reuse.

→ Principal-in-charge for the North Valley Regional Recycled Water Program, California. Highlights of the $80 million project include design of a retrofitted 30-mgd recycled water pump station with three - 1,000 horsepower pumps, 12 miles of 42-inch-diameter pipeline that includes more than 2,800 feet of horizontal directionally drilled construction beneath the San Joaquin River.

Cari K. Ishida, Ph.D., P.E., ENV SP

Dr. Cari Ishida has 14 years of experience in wastewater master planning and design, model development, treatment wetlands and nutrients removal strategies from surface water quality, and treatability studies. Recent projects include:

Education

PhD Civil and Environmental Engineering, Northwestern University, 2005

MS Environmental Engineering, Northwestern University, 2001

BS Environmental Engineering, University of Southern California, 2000

Licenses

Professional Engineer, Illinois, Hawaii

Civil Engineer, California

Certification

Certified, Envision™ Sustainability Professional, Institute for Sustainable Infrastructure, 2016

Professional Affiliations

Water Environment Federation

American Water Works Association

Relevant Experience

→ Project manager for the Sand Island Wastewater Treatment Plant (SIWWTP) Primary Expansion, Phase 2 – Reconstruction Project in Honolulu, Hawaii. The SIWWTP is a 90 mgd capacity primary treatment and disinfection facility, and is the largest plant in Hawaii. She oversaw the design and bidding process for this large primary expansion and rehabilitation project with a construction budget of $67 million.

→ Project manager for the SIWWTP Secondary Treatment Membrane Bioreactor (MBR) Procurement, 3rd party review in Honolulu, Hawaii. Phase I of SIWWTP secondary treatment will include 20 mgd of MBR equipment. The project scope includes providing technical review of the MBR equipment procurement documents and process.

→ Project manager for the Windward Facilities Condition Assessments of various pump stations in Hawaii.

→ Project manager for the planning and design phases of the Heeia Wastewater Pump Station Improvements in Kaneohe, Hawaii. The pump station was over 40 years old and required extensive upgrades to improve reliability, reduce maintenance, and improve overall pump station performance.

→ Deputy project manager for the Metropolitan Water Reclamation District of Greater Chicago Phosphorus Removal Feasibility Studies for Kirie and Egan Water Reclamation Plants. Developing the capital improvement plan recommendations to meet 1.0, 0.5, and 0.1 mg/L total phosphorus effluent limits.

→ Project manager for the DuPage County Public Works (DCPW) Wastewater Master Plan (Master Plan). The Master Plan serves as a road map for DCPW, providing the capital improvement projects for the next 20 years. Major drivers for the Master Plan are planning for phosphorus removal, addressing aging infrastructure, and financial sustainability.

→ Project engineer for the San Jose/Santa Clara, California Wastewater Master Plan. She coordinated directly with the client to develop standby/design criteria for future wastewater treatment processes, and subsequently performed capacity-rating analyses based on process data for existing facilities.

→ Conducted full-scale experiments in constructed wetlands as part of her thesis dissertation research at Northwestern University in Evanston, Illinois. The site of research was part of a wetlands mitigation bank supervised by The Wetlands Initiative.

→ Co-project manager for an advanced water treatment study of endocrine disrupting compounds (EDCs) and pharmaceuticals and personal care products (PPCPs) removal from California Delta source waters.

→ Project engineer for a research project that resulted in the validation of a specific ozone dissolution technology for wastewater reuse in California.

→ Project engineer for the Title 22 validation testing of Calgon Carbon's UV Disinfection Reactor. Completed a detailed testing protocol in order to achieve approval from the California Department of Health for reclaimed water use.

→ Project engineer for the commissioning of two UV disinfection systems at Los Angeles County Sanitation Districts in California. Developed a testing protocol for a flow/UVT, and sensor-based approaches.

Roger Babcock Jr.
Professor - Department of Civil Engineering and Water Resources Research Center
University of Hawaii at Manoa
2540 Dole Street - Holmes Hall 346
Honolulu, Hawaii 96822 (808) 956-7298, rbabcock@hawaii.edu

Degrees
B.S., Civil Engineering, University of California, Davis, 1987
M.S., Civil Engineering, California Polytechnic State University, San Luis Obispo, 1989
Ph.D., Civil & Environmental Engineering, University of California, Los Angeles, 1991

Experience
24 Years at current position (Professor = instructor, researcher, mentor, advisor, consultant)
1992-93 Project Engineer, John Carollo Engineers, Walnut Creek, California

Registration: California, P.E. in Civil Engineering, No. 51325, Hawaii No. 12133

Research Group:
4,500sf Environmental Engineering Laboratory and 800sf Water Quality Analytical Laboratory enable bench-scale wet lab process experimentation and analyses of all conventional and trace contaminants in water, sludge and soil. Research areas include biological wastewater treatment, on-site wastewater treatment, water recycling, membrane bioreactors, bioremediation, stormwater runoff management, and green roofs. Currently supports three PhD students, four MS students, two visiting international MS students and three BS students. Since 1995, a total of 4 PhD and 69 MS students have been advised to degree completion after conducting research in this group.

Research Funding
56 grants from agencies including NSF, USGS, EPA, DOD - Army COE, DOD-ESTCP, U.S. Dept. of Agriculture, Hawaii Department of Health, Hawaii DOT, Hawaii DBED, Honolulu Board of Water Supply, Honolulu Environmental Services, County of Maui, County of Kauai, County of Hawaii, WateReuse Foundation, National Fish & Wildlife Foundation, Hawaii Sea Grant, and private companies including Reynold's Metal Company, URS Greiner Woodward Clyde, Best Industries USA Inc., Brown and Caldwell Inc., AECOM, R.M. Towill Corp., Environet Inc., Yogi Kwong Engineers, Kennedy Jenks, and International Wastewater Technologies. Total Funding: $3,500,000.

Selected Related Publications
1. Babcock. R.W.Jr. (March, 2001) Experimental evaluation of on-site treatment and reuse of domestic wastewater. Presented at the 23rd Annual Hawaii Water Environment Association Conference, Honolulu, Hawaii.
2. Babcock R.W.Jr., McNair, D., Edling, L., and Nagato, H. (October, 2001) Potential for decentralized residential treatment and reuse of domestic wastewater in Hawaii. Proceedings of the 74th annual conference of the Water Environment Federation (WEFTEC), Atlanta, Georgia.
3. Babcock. R.W.Jr. and Engineering Solutions Inc. (2008) Onsite wastewater treatment survey and assessment. University of Hawaii, Water Resources Research Center Report, 135 pp. Available at Hawaii State Department of Health website: https://health.hawaii.gov/wastewater/home/forms/
4. Ogata, S., and Babcock. R.W.Jr. (2009) Development of a Permitting, Maintenance, and Inspection Program for Onsite Sewage Disposal Systems in Hawaii. University of Hawaii, Water Resources Research Center Report No. WRRC-2010-02, 109 pp.
5. Babcock, R.W.Jr. and Shoji, S. (March 2010) Design for graywater reuse in Hawaii: The new DOH guidelines. Presented at the 32nd Annual Hawaii Water Environment Association Conference, Honolulu, Hawaii.
6. Babcock, R.W.Jr. (October 2010) Comprehensive efforts to facilitate safe decentralized residential wastewater treatment and recycling in Hawaii. Proceedings of the 83rd annual conference of the Water Environment Federation (WEFTEC), New Orleans, Louisiana.
7. Chan T and Babcock, R.W.Jr. (May 2013) Master of Civil Engineering, Plan B. Major research report: "Diagnostic method to select onsite treatment and disposal systems," 25pp.
8. Babcock R W Jr, Lamichhane K M, Cummings M J, and Cheong G H (2014) Condition Assessment Survey of Onsite Sewage Disposal Systems (OSDS) in Hawaii. Water Science & Technology Journal 70 (6): 1083-1089. Source report/thesis available at Hawaii State Department of Health website: https://health.hawaii.gov/wastewater/home/forms/
9. Spirandelli D, Dean T, Babcock R W Jr and Braich E (2018) Policy gap analysis of decentralized wastewater management on a developed pacific island. Journal Environ Plan & Mgmt, doi: 10.1080/096640568.2019.1565817.
10. Babcock, R.W.Jr. (August 2018) Onsite wastewater treatment and disposal. Presented at the 2018 Hawaii Department of Health Joint Government Water Conference, Wailuku and Hilo, Hawaii.

Past Directly Related Projects

Each of these projects were conducted by graduate students with faculty mentoring.

1. Hawaii Source Water Assessment and Protection Plan – Supplement Onsite Sewage Disposal Inspection Study, funded by Hawaii Department of Health, Safe Drinking Water Branch, $85,000, 2010-12. This project aimed to find the distribution of existing OSDS conditions statewide, to obtain better transport model inputs, to feed inspection findings into risk analyses, and to help develop the OSDS management program. Masters student Michael Cummings asked homeowners for voluntary OSDS inspections statewide. We provided free inspections usimng the protocols and sheets developed previously, we collected water samples, we distributed homeowner education fact sheets, we described maintenance requirements. Approximately 200 systems were inspected and evaluated/scored on five islands. The study found that 80% of OSDSs are not receiving basic maintenance, 2/3 are rated as passing, 1/6 are in need of service and could fail, and 1/6 are failing. The study also found that the existing "honor system" is not effective and a more managed program is needed. Additional results can be found in the final report which is available on-line at the HDOH-WWB website: "Condition Assessment Survey of Onsite Sewage Disposal Systems (OSDS) in Hawaii."

2. Diagnostic Method to Select Onsite Treatment and Disposal Systems, unfunded MSCE study, 2012-13. The aim of this study was to develop a step-by-step process tool for selecting an OSDS system in Hawaii for engineers and for homeowners to understand the process. Masters student Terry Chan documented a four-step process including preliminary site analysis, site condition assessment/measurements, wastewater characterization, and estimation of costs. Tables were created for applicability/constraints, for costs, and examples were provided.

3. Certification Testing of Four Hawaii-Manufactured Aerobic Treatment Units (ATUs). Four different manufacturers provided grant funding and treatment units for testing from 1998-99, 2004-05, 2013-14, and 2015-16. The City & County of Honolulu provided sites and wastewater at Sand Island WWTP and Honouliuli WWTP to conduct the testing. A large number of graduate and undergraduate students collected and analyzed composite and grab samples five-days-per-week over the years. The ATUs were tested according to the NSF Standard 40 protocol (for BOD and TSS) and later the NSF Standard 245 protocol (for N-removal). This testing takes approximately 10 months for each unit. ATU systems tested and subsequently certified by HDOH-WWB for use in Hawaii include: Best OESIS 400 (1998-99), International Wastewater Technologies CBT 800 (2004-05), Envirocycle ECR 600 (2013-14), and WaiponoPure 800 (2015-16).

Current Directly Related Projects

1. Investigation of cesspool upgrade alternatives for Upcountry Maui. This project is funded by Hawaii DOH SDWB, June 1, 2018 to July 31, 2019, $99,609. This study is guided in part by a 28-member Upcountry Maui Stakeholder Group that includes State regulators, water/wastewater utilities, ranchers, farmers, large landowners, environmental groups, and elected officials. We have held 5 interactive webinars during this project with this group. The overall objective of the project is to determine costs and environmental benefits of various potential on-site treatment and disposal upgrade options for the 7,000 cesspools in Upcountry Maui. Conventional technologies, available but less common technologies, and emerging technologies are all being considered. A previously developed groundwater flow and transport model designed to simulate the movement of nitrate from various sources to receptor well locations was calibrated to predict actual measured data. An initial task of our project, was to refine that model with better estimates of inputs. This project involves determining the total installed costs (equipment, installation, sitework, design, permitting, etc) for six treatment options and eleven disposal options for each of the 7,000 properties. The site constraints (slope, soil permeability, available area, setbacks, etc) were used to screen for feasible alternatives at each property. Other options such as installing sewers and WWTPs and wellhead treatment of contaminated water are also considered. Operation and maintenance costs were determined and 60-year life cycle costs with replacements were determined. The flow and transport model was then used with the reduced nitrate inputs (due to upgraded treatment options) to simulate the reductions in groundwater nitrate concentrations (benefits) that would be achieved. A cost-benefit decision science model is being used to analyze a set of 36 alternative scenarios designed to meet one or more objective functions such as minimize cost, minimize aquifer nitrate, maximize cost-effectiveness, maximize fundability, minimize risk, meet existing design criteria, etc. The draft report will be issued on May 30, 2019 and the community presentation will be held on June 26, 2019.

2. Passive nitrogen removal (PNR) via denitrifying leachfield laboratory study. We are currently operating a set of experimental columns simulating a denitrifying leachfield. There are This study was begun by a CE undergraduate as a Research Award from Hawaii Water Environment Association for 2019 and is continuing as a summer internship project for a visiting Masters student from France. We are operating a set of fourteen 4-inch diameter columns containing different media (gravel, coral sand, basalt sand) to simulate an 18-inch deep absorption bed, followed by either a saturated or unsaturated bed of 4-in or 8-in depth containing a mixture of sand and sawdust. Influent is raw wastewater. Unpublished results indicate that all absorption beds achieve nitrification and that both saturated and unsaturated sawdust layers are feasible and highly effective for denitrification. Work is ongoing to determine loading rate ranges and potential design guidelines.

Ann Miyahira Hajnosz

PROJECT MANAGER

Ann has worked closely with water, wastewater, electric, and solid waste utilities for 33 years in the areas of best practices, utility performance, financial planning and rates. Since the early 2000's she has worked with all 4 county water agencies in the State of Hawaii, 2 of 4 county wastewater agencies; all 4 county solid waste agencies and 1 electric utility in the State. Ann has also worked with numerous water and wastewater utilities, mostly in the Western US and with the territory of Guam. Ann's knowledge of local utility, economic, cultural, environmental and political issues in Hawaii, combined with utility rates and finance expertise and broad strategic utility experience makes her uniquely qualified to support this critical cesspool conversion financing project. She is deeply committed to helping water utilities in her home state of Hawaii.

RELEVANT EXPERIENCE

- **Strategic Plan Phase 1, County of Maui, Department of Water Supply, Wailuku, Hawaii. Project Manager**. Ann is leading this effort to develop the first Strategic Plan for the Department of Water Supply. The first phase of the plan will address 11 Key Issues previously identified by DWS staff including Sustainable Water Supply, Dependable Water Infrastructure Services, Operational Efficiency, Financial Stability, Efficient Facilities Management, High Customer Service Standards, Effective Workforce Development, Adequate Technology and Innovation, Workforce Health and Personal/Professional Growth, Environmental Consciousness and Transparency and Social Responsibility.
- **Honolulu Board of Water Supply**, *Peer Review of Water Rate Study in Support of Water Master Plan; Process Optimization and Rates Development; Financial and Rates Studies; Capital Plan Reviews; Audit Response to Rate Issues*. Project Manager. Ann is currently working with senior leadership at the BWS in peer reviewing rate analyses and public materials to support the development of the BWS' Master Plan and Rate Study.

  Wastewater Rate Study and Impact Fee Update, County of Kauai, Department of Public Works, Wastewater Division, Lihue, Hawaii. Project Manager. Ann led a wastewater and impact fee study including a revenue requirements analysis, cost of service analysis, needs assessment and rate design for the Division's wastewater rates and impact fees.
- **Water and Wastewater Utility Merger Review Study, County of Kauai, Department of Water, Lihue, Kauai, Hawaii.** Senior Financial Analyst. Responsible for developing a financial model to assess the impact on the DOW of a potential merger between the DOW and the County Division of Wastewater Management.
- **Consulting Engineer's Report, Guam Waterworks Authority, Hagatna, Guam. Financial Task Leader.** Ann completed work on two Consulting Engineer's Report for a $173 million bond sale and a $143.3 million bond sale in 2014 and 2016, respectively, the proceeds of which will be used to finance water and wastewater system improvements required by a U.S. Environmental Protection Agency court order.
- **County of Hawaii, Department of Water Supply**, *Personnel Needs Assessment to Support Master Plan, Strategic Plan, Financial Plan and Rate Study*. Task Lead. Ann has worked with the DWS since the mid-1990s preparing rate studies to support the DWS' long term goals.

EDUCATION

MBA, Finance, Indiana University at Bloomington

BS, Civil Engineering, University of Hawaii at Manoa

REGISTRATIONS

Professional Engineer, WA

RATES/FINANCE ASSIGNMENTS

- Honolulu Board of Water Supply, HI
- City & County of Honolulu Refuse Division, HI
- County of Maui, Department of Water Supply, HI
- County of Hawaii Department of Water Supply, HI
- County of Hawaii Department of Environmental Management, HI
- County of Kauai Department of Water, HI
- County of Kauai Wastewater Division
- Kauai Electric (KIUC), HI
- County of Kauai Solid Waste Division, HI
- Guam Water Authority, Hagatña, Guam
- Tacoma Water, WA
- Snohomish PUD, WA
- Renton, WA
- Federal Way, WA
- Eugene Water & Electric Board, OR
- Portland Water Bureau, OR
- Parish of St. Tammany, LA
- Tucson Water, AZ
- Central Arizona Project, AZ
- Gonzales, CA
- Soledad, CA
- Santa Clarita, CA

Paavo Ogren

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Objective

To provide technical advice on the Cesspool Conversion Technology and Finance Research for the State of Hawaii Department of Health Wastewater Branch – Solicitation No, WWB 19-02

Education

BACHELOR OF SCIENCE, BUSINESS ADMINISTRATION – ACCOUNTING - 1984
CALIFORNIA POLYTECHNIC STATE UNIVERSITY, SAN LUIS OBISPO

- Other Major Coursework: Math & Physics (Freshman); City & Regional Planning (Sophomore)
- Economics (Junior); Business Administration – Accounting (Junior & Senior)

Skills & Abilities

LEADERSHIP
Over the course of my 35 year career, I have been provided numerous opportunities to lead technical financial efforts, policy development, management, project management, and local efforts associated with state and federal legislation. Leading the solution, after decades of controversy, for the conversion of septic tanks to a community wastewater system for Los Osos, California, is a legacy accomplishment directly applicable to the Cesspool Conversion provisions established in Act 125 of July 2017.

MANAGEMENT & PROJECT DEVELOPMENT

- Managed a staff of approximately 200 including engineers, construction managers, surveyors, environmental specialist, fiscal and administrative staff.
- Led efforts resulting in approval for an environmental division within county public works, which has markedly improved its environmental stewardship.
- My experience in private industry included project and program management and developed my understanding of consultant and contractor business models.
- Managed teams on federal and state funding, including the largest funding program approved by the United States Department of Agriculture's Rural Development Program for the conversion of septic tanks to a community wastewater system in Los Osos, CA.
- Managed teams that obtained funding from private bond markets, and state and federal programs including the US EPA SRF program, the USDA Rural Development program, Community Development Block Grants and other state and federal programs.
- I have been actively engaged in diverse management capacities involving capital projects totaling approximately $1 billion.

Professional Development

CALIFORNIA CERTIFIED PUBLIC ACCOUNTANT #48914 (INACTIVE STATUS)

CREDENTIALED SENIOR EXECUTIVE – CALIFORNIA STATE ASSOCIATION OF COUNTIES

CALIFORNIA STATE CUCCAC COMMISSIONER – PUBLIC CONTRACT CODE 22010

CONFERENCE SPEAKER & PANEL MEMBER:

- Plenary speaker on California's drought – NOAA's Coastal Forum Conference, Charleston SC (2016)
- Pre-legislative conferences leading to the Sustainable Groundwater Management Act (CA) (2013/2014)
- International Conference – American Public Works Association – Boston, MA – (2010)
- Extensive public presentations, public hearings and meetings with legislators, county and local agency elected officials, community groups, business and property owners, and residents

John Waddell, PE

Construction Manager/Project Manager/Civil Engineer

Education

- BS, Environmental Engineering, Cal Poly State University, San Luis Obispo

Certifications

- Registered Civil Engineer, CA No. 66846
- California OES - Safety Assessment Program Evaluator

Associations

- Construction Management Association of America
- American Public Works Association
- American Society of Civil Engineers

Contact Information

Phone:
805.459.5043

Email:
john.i.waddell@gmail.com

Professional Experience

Construction Management – Public Infrastructure and Facilities

Leads a team of engineers and construction professionals in managing more than $15 million per year of public construction projects. Projects include roadway improvements, bridge replacement and retrofit, water and wastewater utilities, correctional facilities, and other public facilities.

Project Management – Los Osos Wastewater Project

Project manager and project engineer for the implementation of a large septic-to-sewer project. Responsible for project planning, permitting, funding, design and construction phases.

- Agency project manager for design and construction teams for $130 million of new infrastructure, including 50 miles of pipelines, lift stations, 1.2 MGD water recycling facility and recycled water distribution.
- Planned and led a comprehensive public outreach program for the project construction phase which included a dedicated community liaison, project website, social media, and phone hotline system. The program resulted in over 6,000 direct contacts and responses to individual members of the public.
- Managed procurement and performance of consultant planning, design, and construction management teams through $28 million in consulting contracts.
- Managed the application process to secure more than $173 million in Federal and State funding, including more than $20 million in grants for the project.
- As the agency's representative, planned and held large community meetings, managed technical advisory committees, and presented at public hearings which resulted in approval of the environmental documents and permits.

Technical and Peer Review Panels

- Morro Bay, CA Water Reclamation Facility project alternatives peer review panel – evaluated treatment facility and water reclamation master plans for a new treatment and water reclamation facility.
- High Desert Water District, CA Wastewater Project construction alternatives review panel – evaluated new collection system contracting alternatives for septic-to-sewer project.

Professional Papers and Conference Presentations

- APWA National Congress 2012: Presented and participated in panel discussion for education session titled "How Did Selecting a Project Delivery Method Get So Complicated?"
- Water Environment Federation (WEF) Collection Systems 2013 Conference: Presented paper titled "Septic to Sewer Finally Becoming Reality."
- Construction Management Association of America Capital Project Symposium 2015: Presented paper "How GIS and Project Management Data Improves Project Control and Provides a Better Deliverable to the Client."
- California Water Environment Association Annual Conference 2015: Presented paper titled "Los Osos Wastewater Project Septic to 100% Reuse."

Jennifer R. Ivey

Jennifer Ivey is a vice president with Carollo with over 20 years of extensive experience in multi-year financial planning, impact fee, bond feasibility, and cost of service, rate, and charge studies. She is currently active in the American Water Works Association (AWWA) Rates and Charges Committee and was a contributing author for AWWA's updated *Principles of Water Rates, Fees, and Charges M1 Rates Manual*.

Education

MBA Finance, Southern Methodist University, 2003

BS Civil Engineering, University of Texas, Austin, 1998

Licenses

Professional Engineer, Texas

Professional Affiliations

American Water Works Association (AWWA)

Water Environment Association, Texas (WEAT)

Water Environment Federation (WEF)

Chi Epsilon National Civil Engineering Honor Society

Relevant Experience

→ Project manager for the Water and Wastewater Facilities Land Use Assumptions Plan, Capital Improvements Plan, and Maximum Impact Fees Study, San Antonio Water System, Texas. The team is calculating the maximum impact fees, including financing charges, as well as a rate credit, which will be subtracted from the calculated impact fees to ensure customers do not double-pay.

→ Project manager for the Water and Wastewater Cost of Service Rate Design and Associated Financial Planning Services, Oklahoma City Water Utilities Trust, Oklahoma. She managed the study to develop cost of service rates and system development charges. She and her team analyzed customer billing and financial data to determine revenue requirements, allocated revenue requirements to functional categories and rate components to determine class cost of service.

→ Technical advisor for the Northwest Water Commission (NWC) and Northwest Suburban Municipal Joint Action Water Agency (NSMJAWA) Water System Redundancy Investigation, Illinois. Jennifer updated an analysis to compare various alternatives for developing a new water supply system to serve the NWC and the NSMJAWA. Analysis determined cash flows for both agencies based on projected capital, operating, and financing costs.

→ Project manager for the Utility Cost of Service and Rate Study, San Francisco Public Utilities Commission, California. Carollo developed the SFPUC 2014 comprehensive connection fee and cost of service rate study for the Water, Wastewater, and Stormwater to define customer equity and comply with Proposition 218 in accordance with California Government Code §66013.

→ Principal-in-charge for the Water and Wastewater Rate Structure Study, City of Sacramento, California. Project Lead and Quality Consultant for study to identify alternative rate structures for water and wastewater utilities and develop recommended rates using preferred rate structures.

→ Project manager for the Revenue Stability Fee Study, City of Austin, Texas. She collaborated with the City staff and Joint Committee on the City's Financial Plan to develop rate and fee structure to improve the City's revenue stability while continuing to encourage water conservation.

→ Project manager for the Funding Requirements Assessment, Brazos River Authority, Waco, Texas. She managed study to assess dams, intake structures, pump stations, pipelines, treatment facilities, and offices of the Authority to determine repair and replacement projects needed and develop 5-year capital improvements program.

→ Project manager for the Wastewater Surcharge Customer Class Study, Dallas Water Utilities, Texas. Gathered customer data from multiple City department databases and consolidated into one single database. Performed study to determine appropriate customer classes for extra strength wastewater surcharges and typical BOD and TSS strengths for each class.

→ Financial technical lead for the System Development Charge Allocation Study, Clean Water Services, Portland, Oregon. Developing approach for allocating full wastewater system costs to flow and loadings, including BOD, TSS, Phosphorus, Ammonia, and Temperature. Study will consider existing assets and future CIP in calculation of SDCs.

THE LIMTIACO CONSULTING GROUP

John Katahira, PE
President

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Honolulu, Hawaii 96817
john@tlcghawaii.com

Formal Education:

- MBA, Business Administration, University of Hawaii at Manoa (1999)
- MS, Civil Engineering, University of Hawaii at Manoa (1995)
- BS, Civil Engineering, University of Hawaii at Manoa (1993)
- University High School (1988)

Business:

- The Limtiaco Consulting Group, Inc., President and Majority Owner (2001-current)
- TLCG Ventures LLC, Co-Founder and Managing Member (2013-current)
- TLCG Energy LLC, Co-Founder and Managing Member (2013-current)
- Katahira Properties LLC, Co-Founder and Managing Member (2001-current)
- Aloha Niseko Properties Kabushiki Kaisha, Co-Founder and Director (2017-current)
- Underground Services, Inc., Co-Founder and Vice President (2006-2009)
- Contractors Choice LLC, Co-Founder and Managing Member (2007-2011)

Professional Affiliation:

- American Council of Engineering Companies of Hawaii, President (2010) and National Director (2012-2013)
- WEF/Hawaii Water Environment Association, President (2008)
- American Water Works Association/Hawaii Section, Legislative Committee Chair (2005-2006)

Community and Civic Involvement:

- Boys and Girls Club of Hawaii, Executive Committee (2017-current), Safety Committee Chair (2017-current), Corporate Board (2011-current)
- Engineering Alumni Association University of Hawaii College of Engineering, Director (2010-current), Treasurer (current)
- Maemae Elementary School PTSA, Treasurer (2014-2017)
- Maemae Elementary School PTSA Summer School, Founder (2016-2017)
- Ka Makani Anu O Ke Akua Athletic Club Hawaii, Board of Director (2017)
- Boys and Girls Club of Hawaii Alliance Board, Co-Founder, President (2002-2006)
- ASCE Hawaii Section Young Members Forum, Co-Founder (1995)
- ASCE Pacific Southwest Conference, Chair (1994)
- UH ASCE Student Chapter, President (1993)

Seema Bhimani Chavan

Seema Chavan is a senior engineer with over 17 years of experience in environmental engineering. Her projects have focused on identifying and securing sources of local, state, and federal Loan/Grant funding, program management, coordination of environmental documentation/permitting (including agency coordination and permit acquisition), water quality/watershed issues, and public involvement.

Education

MS Environmental Engineering, Northwestern University, 1997

BS Civil Engineering, University of California, Berkeley, 1993

Licenses

Civil Engineer, California (61867)

Professional Affiliations

American Academy of Environmental Engineers

Water Environment Federation

California Water Environment Association

Relevant Experience

→ SRF program coordinator for the City of San Jose-Santa Clara Regional Wastewater Facility CIP Program to support the identification and application for SRF funding for the design/ engineering and construction of identified CIP projects.

→ SRF application coordinator for the City of South San Francisco, California, Water Quality Control Plant CWSRF Loan Assistance and CEQA Documentation. Project tasks include: Preparation of CWSRF loan application for $53,400,000 for two CIP projects - wet weather improvements and digester rehabilitation project.

→ Project engineer responsible for the development of the overall Funding Strategy document for the Santa Clara Valley Water District, California, Expedited Program. Tasks included development of an understanding of the District's half billion dollar program; identification of each project within the program including schedule, project type, document readiness; and review and identification of potential local, state and federal sources of funding for planning, design and construction.

→ Project lead for evaluating and identifying grant and funding assistance opportunities for the City of Modesto, California. Tasks included review and identification of potential grant and loan funding opportunities for the implementation of planning, design, and construction activities.

→ Project manager for the development of the Proposition 1 Pilot Study Grant Application Package for the City of Modesto, California.

→ Project lead for evaluating and identifying grant and funding assistance opportunities for the Cities of Cedar City and South Jordan, Utah. Tasks included review and identification of potential grant and loan funding opportunities for the implementation of planning, design, and construction activities associated with a proposed reuse and DPR demonstration facility.

→ Project task lead responsible for identifying a combined state loan and grant opportunity for the City of Willmar, Minnesota, Northeast Water Treatment Plant Improvements for WWTF Salty Discharge Compliance. Tasks included review and identification of potential local, state, and federal grant/loan funding opportunities for the implementation of planning, design, and construction activities.

→ Project manager responsible for the 2018 WIFIA Letter of Interest Package for City of Kansas City, Missouri (KCMO), Blue River WWTP Biosolids Facility Project and the 2017 WIFIA Letter of Intent submittal for the City of South San Francisco, California, WQCP Wet Weather Improvements Project.

→ Project manager for the 2016 Santa Clara Valley Water District, California, Clean Water Proposition 1 Grant and Start Revolving Fund application.

→ Project manager for the 2016 and 2017 Santa Clara Valley Water District, California, US Bureau of Reclamation WaterSMART Title XVI Grant Applications for the South County Recycled Water Project. The project was awarded the maximum $4M grant in 2016 and an additional $1.7 million in 2017 for construction of Phases 1B/2A of the South County Recycled Water Project.

→ Project engineer for the 2017 and 2018 U.S. Bureau of Reclamation WaterSMART Title XVI Water Recycling Project Under WIIN Act Grant Application for the Pure Water Monterey Project and the City of San Buenaventura, California.