

EXECUTIVE SUMMARY

DESIGN CONSIDERATIONS FOR RESIDENTIAL LEAK DETECTION & REPAIR CERTIFICATION TRAINING

DECEMBER 2022

EXECUTIVE SUMMARY

In early 2022, the California Water Efficiency Partnership (CalWEP), with funding from Valley Water and the Bay Area Water Supply and Conservation Agency (BAWSCA), conducted research to help assess the need for, and feasibility of developing, a **customer-side leak detection and repair certification training program** for plumbers and landscape professionals. Those who successfully complete training would be placed on a directory provided to residential customers considering contracting with a professional to locate and fix leaks. The directory would serve as a timely resource to help respond to an ever-increasing number of identifiable customer-side leaks thanks to technologies such as Automated Metering Infrastructure (AMI) and smart flow sensors. Overall, the benefits of such a training are threefold: 1) it would help generate a skilled workforce focused on improving water-use efficiency, 2) it would produce an objective list of certified professionals to help customers repair leaks, and 3) it would improve agency customer support. A professional directory is also intended to expedite customer corrective action and as a result, reduce water waste.

While Valley Water and BAWSCA have sponsored this research to help inform the development of individual indoor and outdoor leak detection and repair certification training programs for their respective regions, ultimately, they would like to see the training expand across the state of California with a centralized directory of all certified professionals. To

this end, CalWEP surveyed several agencies within geographically distinct regions, interviewed industry experts, and conducted online research. Through this outreach and research, CalWEP sought to identify common trends in customer-side leaks and assess collective barriers and successes related to leak mitigation to help design trainings that will be easily adaptable for other interested parties.

In addition to the research efforts cited above, CalWEP conducted focus groups with plumbers and irrigation experts. In total, 22 professionals participated, evenly split between trades, and representing various regions across the state. A detailed summary of insights obtained from the focus groups is provided within a separate report¹. And while the insights were often anecdotal or shared by a small majority of participants, a number were also expressed by agency staff and/or industry professionals during surveys and interviews. CalWEP also received samples of agency leak detection data generated by AMI or collected manually via leak programs. This data helped validate some of the trends observed by agency staff during home water audits or while fielding customer calls.

The following *general insights* were extracted from CalWEP's efforts and deserve consideration during the development of the leak training frameworks.

¹ California Water Efficiency Partnership Focus Group Research, March 2022. Prepared by Public Values Research.

General Insights

1. All agencies surveyed expressed support for training that addresses indoor and outdoor leaks, citing annual water waste from leaks that account for millions of gallons or tens to hundreds of acre feet (where 1 acre-foot is approximately 326,000 gallons).
2. All agencies surveyed believed a directory of trained professionals could help reduce leak repair times and improve customer support.
3. Often multiple leak notifications are issued before customers attempt corrective action, indicating that additional agency interventions or programs are needed to reduce leak repair times.
4. Committing agency resources to help customers address leaks below AMI continuous leak thresholds (typically 7.48 – 10 gallon per hour) are generally not cost-effective for the supplier.
5. In addition to customer support, a directory of trained professionals could benefit agencies looking to source contractors for leak program services.
6. Anecdotal information provided during interviews and limited data samples revealed that toilet and irrigation leaks are the most reported by residential customers.
7. Some continuous irrigation leaks monitored by agencies were found to be the most wasteful, even in comparison to toilet leaks.
8. Property managers have observed increased interest in water use efficiency by their clients; sometimes this interest is prompted by a leak notification from an agency.
9. Home Owners Associations (HOAs) typically prioritize low-cost service contracts, therefore, education is needed to highlight the economic benefits of retaining leak-trained professionals despite the latter's higher labor rates.
10. Existing training modules to investigate include: IAPMO Green Plumbers, Qualified Water Efficient Landscaper, National Association of Landscape Professionals' Landscape Industry Certified, and Leaktronics' Plumbing and Irrigation Leak Detection Trainings.
11. In-person, virtual, and hybrid training options are all formats worth exploring.

Additional research insights and findings have been organized below in a series of tables. Each table addresses a particular topic including: 1) Attitudes and Behaviors, 2) Training Design, and 3) Training Administration; where:

- “Attitudes and Behaviors” relates to professionals’ motivations and barriers towards training participation;
- “Training Design” refers to design considerations to help optimize training value and outcomes; and
- “Training Administration” refers to marketing and operation considerations for training program practitioners.

Further, the four rightmost table columns indicate if the insight or finding relates to an indoor or outdoor training program, or both, and whether they were shared during our research surveys and interviews (denoted “Research”) or during any one of the focus groups (denoted as “Focus Group”). In addition, since water agencies funded this work and are looking to sponsor future leak detection and repair trainings, insights related to Training Administration are framed to support agency staff with program management responsibilities.

Note

The information in the tables has been summarized based on CalWEP’s collective research and does not represent direct quotes from any single stakeholder. Additional context related to information in the tables can be found in the full report² that accompanies this executive summary. The report also provides details on related trainings, including The International Association of Plumbing and Mechanical Officials (IAPMO) Green Plumbers and Qualified Water Efficient Landscaper (QWEL) trainings, as well as example agency leak programs.

² Full Report: *Design Considerations for Residential Leak Detection & Repair Certification Training*. Published by CalWEP. December 2022.

Table 1: Potential industry professionals’ motivations and barriers towards participating in a leak detection and repair certification training

ATTITUDES & BEHAVIOR		INDOOR	OUTDOOR	RESEARCH	FOCUS GROUP
MOTIVATIONS					
1	Training might appeal to professionals looking to distinguish themselves from the status-quo.	●	●	●	●
2	Online training modules offer flexibility that could help increase attendance but should be coupled with a hands-on component to ensure implementation of skills in the field.	●	●	●	●
3	Referrals are one of the greatest motivations for professionals to undergo training and earn certification.	●	●		●
4	Irrigation professionals, some of whom provided drip irrigation systems for their customers, expressed more interest in a green certification than did general plumbing professionals.		●		●
5	Plumbers are more likely to participate in training if property owners find value in hiring a professional with a leak certification.	●			●
BARRIERS					
1	Training cost and time commitment can deter participation, especially if scheduling interferes with regular business.	●	●	●	●
2	Professionals are skeptical that a certification would garner enough business to offset the initial investment of time away from work.	●	●		●
3	Specialized outdoor leak detection training was not considered necessary for standard business, and investments in material costs are considered too high.		●	●	●
4	Lack of precision in pinpointing outdoor subsurface leaks deters professionals from fixing the leak, especially if the repair requires disturbing large areas of the landscape and is costly for the property owner.		●	●	
5	Lack of continuing education requirements for licensed plumbers weakens the value proposition of training.	●		●	

Table 2: Design consideration for the development of individual indoor and outdoor leak detection and repair certification trainings

TRAINING DESIGN		INDOOR	OUTDOOR	RESEARCH	FOCUS GROUP
1	The training price point should be relatively low to help increase participation. A range between \$150 and \$300 is considered affordable, would increase personal investment and signal value.	●	●	●	●
2	Training schedules should be designed with flexibility for the professional in mind and offer courses outside of normal business hours, such as weekday evenings.	●	●		●
3	Trainings between 4-8 hours could result in higher participation compared to trainings longer than one business day.	●	●		●
4	YouTube tutorials are a go-to resource for professionals looking to troubleshoot a leak-related problem, therefore leak training should be designed to compete with easy-to-access web content.	●	●		●
5	Certification courses with exams will likely attract fewer participants than more informal, brief trainings (e.g, lunch-and-learn, supply-house lectures), but will likely return professionals who are the most committed to implementing learned skills.	●	●		●
6	Curriculum must promote best practices based on local and state codes and ANSI ³ standards, where applicable, and be legally defensible.	●	●	●	
7	Training instruction should be provided by trusted equipment vendors/manufacturers and other experts with field experience.	●	●	●	
8	Broaden training to “water auditing” with leak detection and repair modules. A more holistic training could increase property owner interest, especially those who receive high-water use notifications.	●	●	●	
9	Curriculum should address continuous faucet, toilet, and irrigation valve leaks.	●	●	●	
10	“Digital branding” can serve as an authentication tool for agencies and customers to verify certification status of trained professionals and help to deter false advertising.	●	●	●	
11	Water agencies should explore partnering with plumbing unions and trade schools to both inform and help promote the trainings.	●			●
12	Curriculum should address how to replace and approach repairs of old and aging irrigation systems.		●	●	

³ The American National Standards Institute works in close collaboration with stakeholders from industry and government to identify and develop standards- and conform-based solutions to national and global priorities (<https://www.ansi.org/>).

Table 3: Marketing and operational consideration for the administration of individual indoor and outdoor leak detection and repair certification trainings by water agency staff

TRAINING ADMINISTRATION					
MARKETING		INDOOR	OUTDOOR	RESEARCH	FOCUS GROUP
1	Promotional materials should address drought to emphasize relevance, multiple benefits, and leverage social norming.	●	●	●	
2	Promotional materials should highlight the opportunity to be listed on a professional directory accessed by property owners.	●	●		●
3	Trainings sponsored by water agencies or other well-known government affiliated agencies are perceived as credible by property owners.	●	●		●
4	Target irrigation professionals who maintain multi-family/ HOA landscapes, where repairs are more likely to result in profits.		●	●	
5	Promotion and endorsements by unions could help increase participation.	●			●
OPERATIONS					
1	A directory of professionals should be provided with initial customer communications. For some agencies, this responsibility will fall to the billing and/or customer service departments.	●	●	●	
2	Include a link to the directory of professionals within auto-generated customer notifications via AMI customer portals.	●	●	●	
3	Offer subsidies, coupons, or direct install services to reduce economic burden to customers and increase leak repairs.	●	●	●	
4	The directory of certified professionals should be managed by an outside third party to limit staff burden and reduce liability concerns.	●	●	●	
5	Help increase demand for certified professionals by offering education to HOAs.	●	●	●	