Honolulu Board of Water Supply

Stakeholder Advisory Group Meeting 54

Thursday, April 17, 2025, 4:00 – 6:00 pm

Neal S. Blaisdell Center – Pikake Room

Meeting Notes

PURPOSE AND ORGANIZATION OF MEETING NOTES

The purpose of these notes is to provide an overview of the Board of Water Supply (BWS) Stakeholder Advisory Group meeting. They are not intended as a transcript or as minutes. Major points of the presentations are summarized herein, primarily for context. Copies of presentation materials were provided to all participants and are available on the BWS website. Participants made many comments and asked many questions during the meeting. These are paraphrased to be more concise.

ATTENDEES

This was an in-person meeting in which 15 stakeholders participated, in additionto BWS staff, consultants and members of the public. The stakeholders represent diverse interests and communities island wide.

The following Stakeholders Advisory Group members attended:

Alison Richardson	Coca-Cola Company
Bob Leinau	Resident of Council District 2
Brady Jencks	Resident of Council District 7
Cruz Vina, Jr.	Resident of Council District 8
Dana Okano	Hawaii Community Foundation
Guy Yamamoto	YHB Hawaii
Helen Nakano	Resident of Council District 5
Jicky Ferrer	AARP Hawaii
Kaleo Manuel	Kamehameha Schools
Mahealani Cypher	Resident of Council District 3
Mark Fox	Environmental
Pono Chong	Resident of Council District 7
Ryan Obrero	Honolulu Board of Realtors
Wayne Tanaka	Sierra Club
Bill Clark	Resident of Council District 6

WELCOME

Facilitator Dave Ebersold welcomed everyone to the 54th meeting of the BWS Stakeholder Advisory Group.

Meeting objectives were identified as:

- Provide BWS updates
- Review water quality regulatory updates
- Discuss condition assessment plan
- Learn more about wildfire mapping
- Accept notes from meeting #53

PUBLIC COMMENTS: None.

BWS UPDATES

Dave invited Kathleen Elliott-Pahinui, BWS Information Officer, to share BWS updates. Manager Ernest Lau was unavailable due to illness.

WATER QUALITY REGULATIONS

Dave introduced Jon Lowry, Water Resources Engineer with CDM Smith, to provide a review of water quality and regulatory updates.

Jon began his presentation on the regulatory landscape that guides drinking water safety in Hawaii. He opened by explaining that all drinking water regulations originate from the federal Safe Drinking Water Act. This legislation, passed in 1974 and amended in 1986 and 1996, established a national framework to protect public drinking water supplies throughout the United States. The US Environmental Protection Agency (EPA) is the lead federal authority responsible for developing and enforcing these regulations, though it delegates enforcement to states that meet EPA criteria for primacy. In Hawaii, this responsibility falls to the Department of Health's Safe Drinking Water Branch.

Jon emphasized that Hawaii generally adopts EPA standards but has, in certain cases, chosen to apply stricter thresholds. He noted this is particularly true for contaminants related to agricultural runoff from legacy pineapple cultivation, such as pesticides and herbicides. He then laid out the structure of his presentation, stating that while he would not cover every regulation, he would focus on those most relevant to Honolulu and Oahu, particularly the rules undergoing revision or those considered "emerging" concerns.

Jon discussed the Groundwater Rule and the Disinfection Byproducts Rules. The Groundwater Rule, which became effective in 2006, is focused on the identification and treatment of microbial pathogens in groundwater sources, especially E. coli. Its core requirement is that systems must assess the vulnerability of their sources and implement corrective actions where contamination is detected. In Hawaii, where groundwater is the primary source of drinking water, this rule is particularly significant.

The Disinfection Byproducts Rule (DBPR), which covers chemicals that can form when disinfectants like chlorine interact with organic material in water, complements the Groundwater Rule. While disinfecting water is critical to eliminating pathogens, the process can create unintended chemical byproducts that can pose long-term health risks, including cancer. The DBPR sets Maximum Contaminant Levels (MCLs) for these compounds. Jon noted that although these rules have not changed, BWS continues to monitor them closely and remains in full compliance.

He then discussed the revised Total Coliform Rule (TCR), which replaced the original Total Coliform Rule in 2016. Jon explained that the old rule focused broadly on the presence of total coliforms, a group of related bacteria that are not necessarily harmful themselves but can indicate pathways for contamination. The revised rule narrows its focus to E. coli, which is a more precise and dangerous indicator of fecal contamination. Under the TCR, water systems are no longer simply required to react

to the presence of coliforms but must develop a comprehensive monitoring strategy and implement corrective actions when contamination is detected. The rule also requires utilities to establish a sample siting plan, carefully identifying the locations most vulnerable to contamination, such as older pipes, dead-end mains, or low-pressure zones. Jon confirmed that BWS has completed its sample siting plan and is in full compliance with all TCR requirements.

COMMENT: Dave Ebersold asked to clarify whether MCLs are always based on cancer risk. Jon responded that it depends on the contaminant. For microbial contaminants like coliforms, the MCLs are based on acute health risks such as gastrointestinal illness, not cancer. In contrast, MCLs for chemical contaminants like arsenic or benzene are indeed tied to long-term cancer risk or other chronic health effects.

Jon then discussed the Lead and Copper Rule (LCR), originally issued in 1991 and significantly revised in response to the Flint, Michigan water crisis. He explained that in Flint, a change in water source increased the corrosivity of the water, which led to the leaching of lead from aging service lines and household plumbing. The result was a widespread public health disaster and a loss of trust in the public water system. The revised rule, along with a more recent update called the Lead and Copper Rule Improvements, shifts the emphasis from corrosion control toward full removal of lead-bearing service lines.

Jon explained that the first major step in the new rule is a complete service line inventory. This includes identifying pipe materials on both the public side and the private side. BWS met the first inventory deadline of October 16, 2024, and has made the information available online through a searchable map tool. A revised baseline inventory is due by November 1, 2027, to address unknowns and confirm materials through field verification methods like potholing. By that same date, BWS must also submit a replacement plan, detailing how all known and suspected lead lines will be removed. Jon shared that BWS has not found any lead service lines in its public system so far, though some interior building plumbing may still contain lead components. Additionally, the revised rule places greater emphasis on protecting children by requiring testing and remediation in schools and child care facilities.

COMMENT: Dave Ebersold reflected on letting the water run for a full minute before using it, especially at public drinking fountains. This past practice was based on concerns about lead, illustrating how far regulations and water safety have come.

Jon continued with a discussion of emerging contaminants. First, he talked about hexavalent chromium, which is found naturally in soil and rock but is also released during various industrial processes. While the EPA currently only has a combined MCL for total chromium, which includes both trivalent and hexavalent forms, California has moved forward with a state-specific MCL for hexavalent chromium that took effect on October 1, 2024. Jon said that BWS is watching these developments carefully, as they may eventually lead to new national standards.

Jon addressed PFAS, a family of synthetic chemicals used in thousands of consumer products due to their resistance to heat, oil, and water. PFAS are found in items ranging from non-stick cookware to food packaging to firefighting foam. They are known to accumulate in the human body and persist in the environment, earning the nickname “forever chemicals.” Jon noted that PFAS has been detected nearly everywhere, including remote areas. Until recently, there were no enforceable federal standards, but in April 2024 the EPA finalized its first national PFAS regulation.

The compliance timeline for PFAS is, by April 2027, all water systems must complete initial PFAS monitoring, and by April 2029 they must comply with new MCLs for six specific PFAS compounds,

including PFOA and PFOS. He said BWS is already well on its way, having recently held meetings with testing laboratories. He emphasized the challenge posed by the extremely low detection thresholds and noted that some MCLs are close to the limits of what current testing technology can reliably measure.

He also explained that BWS has detected low levels of PFAS in some of its wells and is currently conducting a full study to determine the extent and possible treatment options.

Q: Bob Leinau asked how EPA could set standards for PFAS when there are hundreds or even thousands of different PFAS compounds with varying levels of harm.

A: Jon replied that the EPA had to start somewhere and that research is ongoing. States are free to set stricter standards based on their own studies. BWS Program Administrator for Water Resources, Barry Usagawa, added that BWS is already working with a consultant to study PFAS in their water sources. He said labs test for PFAS weekly and that trace amounts have been found at around eight sites. BWS is preparing a pilot treatment plant at Hoaeae Wells in Waipahu and is also working on a portable GAC treatment facility in Aiea. These will eventually become permanent systems. Barry said BWS is also pursuing federal funding to help cover costs.

Q: Bob Leinau asked how PFAS and nanoplastics are related.

A: Jon answered that nanoplastics are more of a physical risk because they can accumulate in the body. Some may contain PFAS but not all. There is some overlap but they are not the same thing.

Q: Bob Leinau also asked whether fluoride might be added to Hawaii's water supply under current leadership.

A: Jon said he doubted that would happen and believed the state would more likely avoid adding fluoride. Barry Usagawa explained that fluoride is helpful for dental health but most of the water people use does not get consumed. Since only about 10 percent of water is actually drunk by people it does not make financial sense to add fluoride. Military bases do fluoridate their water but BWS does not.

Q: Ryan Obrero asked about the efficacy level of PFAS treatment.

A: Barry said there are two main treatment options: carbon and ion exchange. BWS already uses carbon at 13 plants for other contaminants and the pilot will help determine which method works best for PFAS. He said the goal is to remove all of it but not every PFAS compound is removed by current treatments. BWS is also studying the sources of PFAS and how to prevent it from entering water supplies.

Q: Jicky Ferrer asked whether E. coli testing is done through AI automation or manually.

A: Jon explained that it is done through physical sampling.

Q: Jicky followed up by asking how many wells BWS has and whether there are enough people to monitor them regularly. He also asked how long BWS has to respond to contamination and who investigates the source of E coli. He referenced a specific E.coli-related issue on Ala Mahamoe Street near Tripler.

A: Barry commented that BWS tests frequently and now chlorinates all water sources. In the past only 60 percent were chlorinated but better testing showed it was safer to treat everything. When E. coli is found, BWS staff check the source and chlorination equipment. If a second positive result is found additional steps are required. Barry said staffing is limited but highly focused on compliance. He said he was not familiar with the specific case near Tripler but would follow up. Jon added that BWS uses a detailed site sampling plan to look at all possible contamination sources and can provide more information.

Q: Bob Leinau commented that E coli is very common and asked if better indicators exist.

A: Jon said newer tests can trace E coli more specifically and distinguish its source.

Q: Mahealani Cypher asked about the disposal of spent carbon used to treat PFAS and how often water tanks are cleaned to prevent coliform buildup.

A: Jon said tank maintenance is being reviewed as part of the Water Master Plan and will be discussed in a future meeting. He also said that disposal of PFAS-contaminated carbon is being studied as part of residuals management. Barry added that BWS now runs about 30,000 tests a year and this number is increasing with PFAS monitoring. All water is chlorinated at the pump station and again in the tanks.

Q: Pono Chong asked whether the move to full chlorination reflected declining water quality or a cultural shift.

A: Dave explained that chlorinating public water systems is one of the most important public health measures ever adopted. Before chlorination, waterborne diseases were a major cause of death. Choosing not to chlorinate would be irresponsible now.

Q: Pono also asked how PFAS exposure from drinking water compares to other sources like cookware or food and whether policy decisions are being made based on science or fear.

A: Jon acknowledged this is still being studied and that the goal is to reduce exposure where it can be controlled. He said PFAS has been removed from many products but the focus now is on water because everyone drinks it.

Q: Pono noted the inconsistency in not adding fluoride due to low consumption but treating PFAS in all water.

A: Jon said PFAS accumulates in the body and even small reductions in exposure can be helpful. Pono agreed but said zero exposure is unrealistic in an industrial society. Dave further explained that EPA sets rules based on health risk studies and peer review and that utilities are required to comply. While people may argue about how best to use resources the regulatory process does not allow flexibility once a rule is in place. Barry said the best solution would be to stop manufacturing products with PFAS altogether but that is not something BWS can control. Jon added that BWS is developing a strategy for PFAS response including island-wide risk assessments and searching for federal funds. He also discussed the EPA's Contaminant Candidate List which tracks potential future regulated substances. This list is updated every five years and informs additional monitoring rules.

Q: Bob Leinau asked if the State Department of Health can set stricter standards than the EPA.

A: Jon confirmed they can and sometimes do. They just cannot set less strict standards.

Q: Jicky Ferrer asked if any research is being done into remote or AI-based testing methods and whether all islands receive equal testing.

A: Jon said some contaminants can be monitored remotely but E. coli still requires manual testing. He said BWS studies what other leading utilities are doing especially in California. Each island has its own water system but all follow the same EPA rules. Dave confirmed that all systems must meet the same standards.

Q: Mark Fox asked if the current administration is trying to weaken Clean Water Act standards or stop states from setting stricter rules.

A: Jon said he had seen efforts to delay compliance with federal rules but states have so far been able to resist. He said the current administration claims to support state-level decision making so he does not expect them to block stricter standards at the state level.

Q: Jicky Ferrer asked if BWS is reviewing historical pesticide use from sugar and pineapple farming to see how these chemicals are moving toward the aquifer.

A: Jon said this was studied as part of the Source Water Protection Plan and confirmed that the issue is actively being monitored.

Q: Jicky Ferrer asked about heptachlor contamination from the 1980s and whether it might become a problem again.

A: Jon said that these chemicals are no longer applied but are still being tracked. Barry added that BWS is not currently finding heptachlor in its water. He said some chemicals like TCP are very stable and have not decreased even after 45 years of treatment. Kathleen Elliott-Pahinui informed Jicky that BWS operates 13 GAC centers to filter chemicals left behind by past sugar and pineapple farming.

CONDITION ASSESSMENT PLAN

Dave introduced Carl Lundin, Environmental Engineer with CDM Smith, to provide an overview of the condition assessment portion of the Water Master Plan.

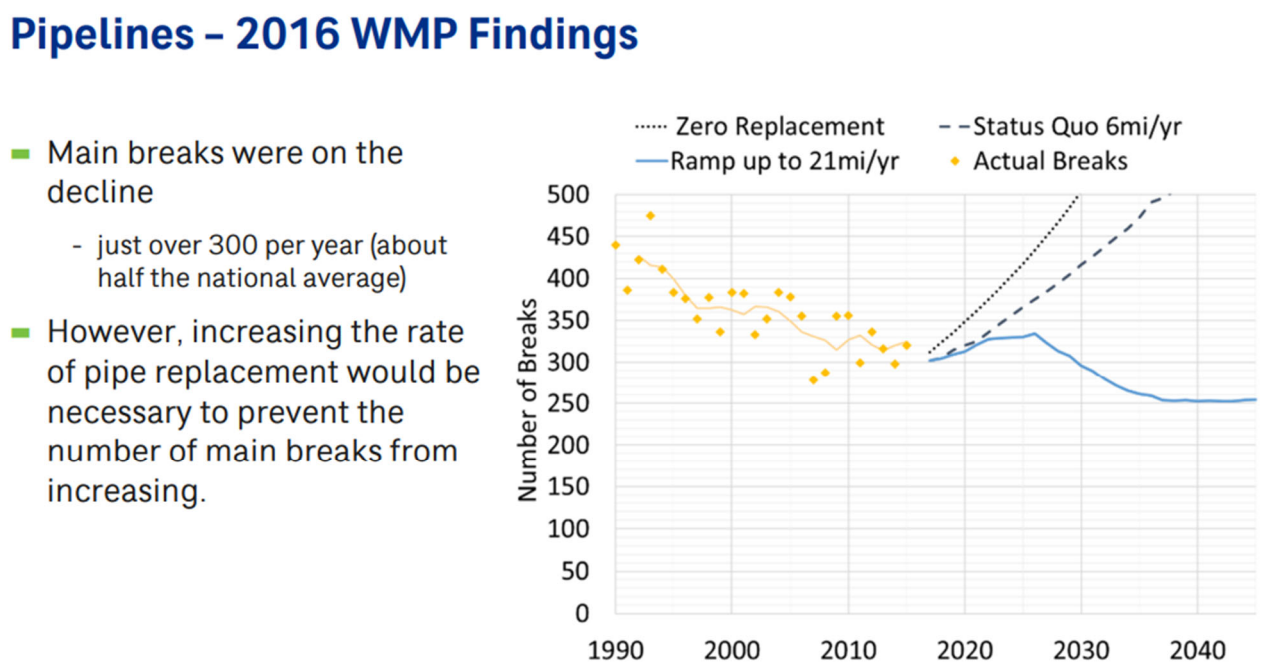
Carl began his presentation by reviewing the approach used for the 2016 Water Master Plan, with most condition assessment work having been conducted during 2014 and 2015. He explained that the goal of the updated assessment is to build on past findings, account for changes in technology and infrastructure, and prepare for challenges anticipated in the coming decades. The scope of the condition assessment includes the full range of BWS assets across the island: wells, pumps, treatment facilities, offices, base yards, potable water reservoirs, and pipelines.

Carl then described the methods used to assess each asset type. Wells, pumps, treatment facilities, and administrative facilities were evaluated through visual inspections. Reservoirs, of which there are 172 in the BWS system, received external physical inspections, and a subset received internal assessments. Pipeline infrastructure, which spans 2,100 miles, was analyzed using a combination of statistical modeling, forensic analysis, and physical inspection.

Carl delved first into pipeline assessments. Given the vast size of the network, it was not feasible to inspect each segment manually. Instead, statistical modeling was used to estimate the likelihood of failure across the system. This modeling relied heavily on historical main break data, which BWS has been collecting since the 1970s. By combining GIS data, pipe material records, installation dates, soil types, and break histories, the team was able to model failure probabilities and identify high-risk segments.

For forensic analysis, Carl explained that BWS examined pipe sections removed during unrelated construction or after breaks. These segments were sandblasted to expose corrosion patterns and verify the accuracy of the statistical models. Physical inspections were also conducted using advanced tools such as the Sahara tethered camera system and the SmartBall, a free-floating sensor encased in foam. Additionally, acoustical assessments were carried out using hydrophones to detect changes in sound waves along pipeline segments. However, Carl noted that these physical techniques were costly and used selectively.

He then presented a graph showing the number of annual main breaks and leaks over time. Yellow dots represented individual yearly counts, while a yellow line displayed a five-year running average. At the time of the 2016 analysis, main breaks averaged just over 300 per year. The statistical model predicted three scenarios: one with no pipe replacements (breaks would increase), one maintaining the status quo of six miles of pipe replacement per year (breaks would remain steady), and a third scenario involving a 10-year ramp-up to 21 miles per year (representing 1 percent of the system) which would lead to a reduction in breaks. The latter scenario was selected for programming into the CIP.



Since 2016, additional data points have validated this modeling. Although the 21-mile-per-year target has not yet been achieved, the rate of replacement has improved, and break trends are within predicted ranges. Carl acknowledged that while progress in pipeline replacement has been slower than planned due to various challenges, significant advances have been made. He also highlighted the adoption of satellite leak detection as a new technology that allows BWS to locate leaks before they become full breaks, helping to prevent costly emergency repairs.

Q: Jicky Ferrer asked whether there is a geographical pattern to main breaks, particularly in areas impacted by above-ground transportation construction like the rail project. He also asked who is financially responsible when construction-related damage occurs.
A: Carl responded that the statistical modeling included geographic and environmental variables such as soil conditions, pipe age, and chloride exposure. While no single area consistently sees the most breaks, certain conditions increase risk. Pipes near the coastline, for example, are more vulnerable due to saltwater corrosion. Kathleen Elliott-Pahinui added that while there may be localized spikes, such as on the Windward side or the North Shore, there is no single area that consistently experiences the most breaks. Denser areas like Honolulu may have slightly higher break rates due to older infrastructure. Regarding rail construction, Kathleen noted that some breaks have occurred due to contractor error, particularly along the Dillingham corridor. These incidents are not caused by the rail infrastructure itself but rather from incorrect digging due to outdated or inaccurate utility maps. In such cases, contractors are responsible for repairs, not BWS or its ratepayers.

Q: Mahealani Cypher asked whether the current condition assessment incorporates updated technologies to prevent or minimize breaks.

A: Carl said yes, and that satellite leak detection is a key tool being used. He noted that while some physical pipe inspections are still conducted, they have proven to be of limited use compared to the benefits of leak detection. As for reducing the likelihood of breaks, he explained that improvements in operational practices, such as reducing pump cycling and system pressure spikes, have significantly lowered break rates since the 1970s.

Q: Mahealani then asked about pipes in Mapunapuna, an area frequently inundated with saltwater.

A: Carl explained that pipes already in the ground cannot easily be moved, but future planning includes corrosion-resistant materials and coordination with other agencies for street and utility elevation. This forward-looking effort accounts for climate change and sea level rise, which are expected to further compromise infrastructure in areas like Mapunapuna and Iwilei. Barry Usagawa added that BWS has updated its standards since the last Master Plan to require cathodic protection on ductile iron pipes. Epoxy coatings are now mandatory for cast iron, though they increase costs. Barry also mentioned that BWS is working with the City's One Water Honolulu initiative to coordinate the timing of pipe replacements with street elevation projects, ensuring new infrastructure is not buried too deep to access.

Carl continued his presentation by discussing reservoir assessments. In 2016, BWS visually inspected nearly all of its 168 tanks. For each tank, staff conducted non-destructive testing including sounding techniques to detect voids behind the concrete. They inspected seals, hatches, locks, and external conditions. For 30 tanks, BWS deployed remotely operated vehicles equipped with cameras to inspect the interior. Structural analyses were performed based on roughly a dozen tank design types. These analyses assessed how each design would perform under modern seismic and wind load standards.

The findings showed that 94 percent of tanks required no or only minor repairs. Seven tanks were identified as high priority and were added to the CIP. Common repair needs included failed foundation seals, concrete spalling, and minor leakage.

Q: Mahealani Cypher asked whether the tanks were assessed for sediment buildup, which could contribute to coliform bacteria growth and reduce water quality. She also questioned whether routine tank cleaning might be more cost-effective than relying on increased chlorination.

A: Carl confirmed that tank inspections typically occur every three years and cleaning often coincides with these inspections. Most tanks include a silt ring to keep sediment away from the outlet. He explained that both cleaning and maintaining chlorine residuals are necessary for public health, as tanks are vented and naturally allow some pathogens to enter with air movement.

Carl continued his presentation with updates on the seven high-priority tank repair projects identified in 2016. All have either been repaired or are currently under construction. Looking forward, one of the major goals is to better understand how fast tanks deteriorate. By comparing past and current inspections, such as a tank inspected in 2005 and revisited in 2014, BWS can now begin to calibrate the rate of decay and refine maintenance schedules.

He said the team is also evaluating the effectiveness of past repairs and looking at new inspection technologies. One example is the use of drones for visual inspections. Drones reduce the need for bucket trucks, improve safety, and allow for more frequent assessments. He said the plan is to correlate drone imagery with physical inspections to validate the technology's reliability. If successful, this could significantly improve efficiency and frequency of inspections.

Carl summarized the condition assessment process for other facilities like pump stations and treatment plants. These inspections were largely visual and aimed at identifying broken equipment, corrosion, and other maintenance needs. Most of the issues identified in 2016 have already been addressed through the CIP. However, this work is ongoing. In the current plan, BWS is also reviewing facility vulnerabilities to climate change and whether equipment needs to be relocated or upgraded.

Q: Bob Leinau asked whether generator systems were part of the assessment and whether there was sufficient redundancy to maintain service during outages.

A: Carl responded that three sites were identified in 2016 as needing permanent generators, which have since been installed. BWS still relies on a number of portable generators and will update the assessment to ensure overall reliability remains strong. He said redundancy does exist and the system can produce enough water on emergency power to meet indoor use needs. While not all customers would receive full service during a major outage, the system would still support core drinking water requirements.

Q: Jicky Ferrer asked whether photovoltaic (PV) panels or wind turbines were being considered to reduce energy costs and power pumps, particularly given the open space above some tanks and the windy conditions at elevated tank sites.

A: BWS Assistant Program Administrator for Water Resources, Marc Chun, explained that BWS launched an Energy Savings Performance Contract in 2016, inviting private companies to design cost-saving strategies. These companies were given broad discretion and implemented a range of upgrades including LED lighting, AC system replacements, new pump controls, and some well pump upgrades. PV systems were installed at multiple sites including on reservoir rooftops, on the ground, and over parking areas at the Beretania facility. However, he said that while PV offsets energy usage, it cannot generate enough electricity to power the pumps, which have very high energy demands. BWS does benefit financially from feeding excess electricity back into the grid during low usage times. There are currently no new PV projects in the pipeline, but the performance contract guarantees energy savings for 17 years, during which time BWS will continue to evaluate additional opportunities. Wind energy is not currently being pursued due to logistical challenges, but BWS remains open to exploring new technologies.

WILDFIRE EMERGENCY PLANNING

Dave introduced Mike Cubas, Water Resources Engineer with CDM Smith, to provide an overview of the wildfire emergency planning for the Water Master Plan.

Mike began his presentation by discussing the scale of wildfires BWS is planning for. These are not routine brush fires but large, destructive incidents like the Lahaina fire in 2023, which destroyed more than 2,000 structures and caused over 100 fatalities. Winds during the Lahaina fire reached 70 miles per hour, a condition that drove the rapid spread of embers far ahead of the flames. Mike also referenced recent Los Angeles fires, where drought conditions broke nine-month dryness records and simultaneous large-scale blazes, which led to the destruction of 16,000 structures and 25 deaths.

Dave Ebersold described how the California fires moved from burned wildlands into developed urban areas, leaving patches of green vegetation and some homes intact while completely destroying buildings along the beach. This was not the result of flames touching every structure but rather embers carried by wind, which ignited new fires in advance of the main burn front. Dave emphasized that embers carried by high winds leading to building-to-building ignition was key to understanding what makes these events so dangerous.

Mike confirmed that this is known as "urban conflagration," which is defined as building-to-building fire spread via windborne embers. Mike shared testimonies from firefighters and water system operators during recent fire responses. One key challenge is that most urban water systems, including BWS's, were not designed to support firefighting in wildland-urban scenarios. Systems are built to handle isolated house fires or standard urban fire flow demands, not broad-scale emergencies across multiple properties.

Mike highlighted the logistical challenges faced by firefighters. In wind-driven fires, aerial support is often grounded due to turbulence and unsafe flying conditions. This leaves ground crews to respond alone. When hydrants run dry, crews rely on water tankers, which can be delayed or obstructed by vehicles abandoned during evacuations. This was observed during the Palisades fire, where a narrow exit road was blocked by residents fleeing and firefighters attempting to enter, causing chaos and slowing the emergency response.

Mike emphasized that these examples are meant to set the context. They reflect extreme and increasingly common events. Standard firefighting demands: a single fire hose typically uses 150 gallons per minute, while a standard water tanker holds around 3,000 gallons. For a single-family home, fire flow requirements are typically 1,000 gallons per minute for an hour, equivalent to 20 tankers or six to seven hoses. For multifamily or commercial buildings, the numbers increase dramatically.

Mike then described physical infrastructure currently in place to support wildland firefighting. BWS maintains emergency fill pads and connections for portable dip tanks. These tanks are filled from BWS water sources and used by helicopters to transport water to fire zones. While effective in standard wildland fires, Mike cautioned that extreme wind events typically ground aircraft, limiting the usefulness of aerial support in such scenarios. BWS is currently working with Honolulu Fire Department (HFD) to identify additional sites where emergency water supply infrastructure might be needed.

Q: Jicky Ferrer asked whether drone technology could be used in place of helicopters to reduce risk to pilots and residents, particularly referencing the Mililani Mauka fires in November 2023 where large helicopters flew near homes and schools.

A: Kathleen Elliott-Pahinui responded that BWS does use drones through contracted companies for certain operations, but not for firefighting. She noted that HFD has its own drone program and that the idea of drones carrying water is interesting but challenging. Dave Ebersold reinforced this point and added that in the kind of high wind events where helicopters are grounded, drones would be similarly affected and unable to fly safely or effectively. Kathleen added that emerging technology, such as tethered weather balloons equipped with cameras and real-time data links, is being explored. These could allow ground crews to monitor fire spread and create fire breaks even when aerial vehicles cannot be deployed.

Q: Jicky followed up by suggesting that drone technology could still be used in outer zones to prevent fires from encroaching into populated areas. He also suggested that lessons from the Mililani Mauka fire, where firefighters initially filled water barrels near a school and later moved them to a remote location, could inform future emergency water site planning for places like Pacific Palisades or Haleiwa.

A: Barry Usagawa said BWS is already working with HFD to identify and install new dip tank sites, focusing on high-risk, elevated locations to shorten flight times and increase efficiency. Sites have been completed or are in progress in Makakilo, Makaha, Waianae, Lualualei, Nanakuli, and Koa Ridge. Barry confirmed that discussions with HFD are ongoing to add more sites in strategic areas.

Q: Bob Leinau asked whether BWS or HFD could use seawater in fire response, given Hawaii's location in the middle of the Pacific Ocean. He also asked what the minimum safe distance would be for freshwater ponds near the coast to avoid saltwater contamination.

A: Mike said BWS would raise the question in its upcoming meeting with HFD. He acknowledged the idea has been discussed before and will be revisited.

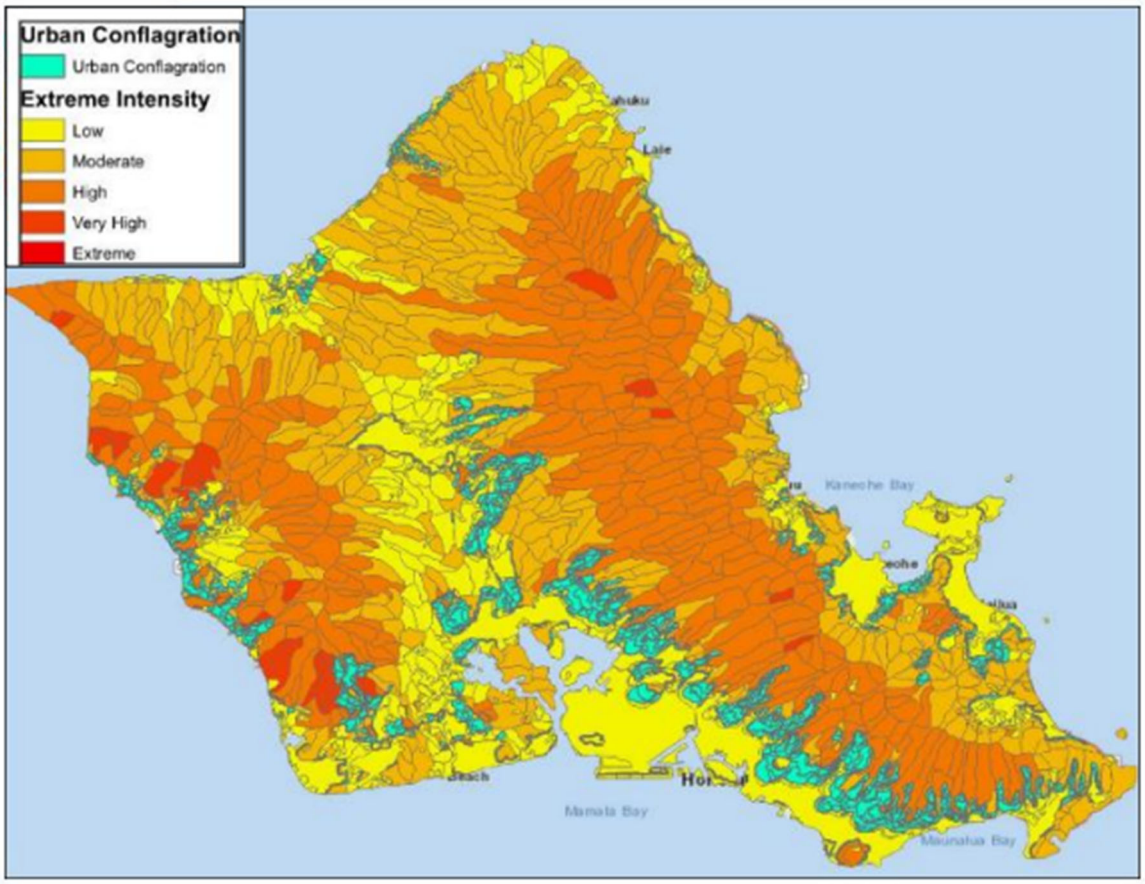
Mike resumed his presentation and discussed wildfire modeling efforts that BWS is undertaking as part of its Risk and Resilience Assessment. Two models were developed: a baseline model using typical wind and drought conditions and an extreme model simulating high-wind, low-humidity conditions similar to those seen in Lahaina and Los Angeles. Both models incorporate wildfire frequency, surrounding infrastructure, potential structural damage, and mitigation features such as proximity to fire hydrants and stations.

The key difference between the models is suppression capacity. In the baseline model, fire response is assumed to be adequate. In the extreme model, suppression efforts are overwhelmed. Mike explained that in extreme conditions, hoses may become ineffective as flames shift rapidly, and embers can cause unpredictable ignitions. The models were developed to better understand the spread and intensity of fires under different conditions and to inform emergency planning.

Mike continued by comparing model predictions with the actual Lahaina fire damage. The baseline model underestimated the impact, showing low to moderate fire intensity surrounding Lahaina but not within it. The extreme model, however, closely matched the actual burn area, identifying the same zone as vulnerable to urban conflagration.

Mike then discussed model predictions for Oahu and shared model outputs showing predicted fire intensity across the island. While extreme fire risk appeared highest in the Waianae region, the model assumes a fire could start in any fire shed and uses land cover and vegetation to predict behavior. The key takeaway, he said, is that wildfires can start anywhere on the island, and the right conditions could

lead to severe damage in nearly any location.



To address this risk, BWS is developing a wildfire emergency response plan in coordination with HFD and the City's Department of Emergency Management. The plan will identify response actions across three stages: before an event, during the event, and after. Specific planning will also be done for HECO's Public Safety Power Shutoff (PSPS) scenarios and full-scale urban conflagration events.

Q: Ryan Obrero asked whether these wildfire readiness efforts had any effect on property insurance rates or underwriting decisions, given the recent spike in insurance costs. He wondered if BWS's actions were being considered by insurance companies or the insurance commissioner.

A: Mike said he could not speak directly to how insurers make decisions but believed that rising premiums were linked to the increased frequency and severity of wildfires seen in the same models.

Q: Ryan followed up, asking whether BWS has ever been consulted by insurers or the insurance commissioner.

A: Kathleen Elliot-Pahinui said they have not. She agreed that it would be beneficial for state insurance authorities to consider such efforts and thanked Ryan for the suggestion. Barry Usagawa added that if insurers recognized the fire mitigation efforts being done in partnership with other agencies, it might help prevent insurance withdrawals like those seen in California.

Q: Bob Leinau asked whether health risks faced by firefighters, such as those observed after the

Lahaina fires, were being considered in BWS's planning.

A: Mike said that while BWS supports responder safety, the wildfire plan specifically focuses on how the water system can assist in fighting fires. Kathleen added that health and welfare were a strong part of the conversation during the PSPS coordination in 2023. BWS, alongside state and nonprofit partners, conducted outreach to senior and medically fragile residents in vulnerable areas like Waianae and Nanakuli. Planning included strategies for relocating residents requiring dialysis or with mobility concerns.

Barry Usagawa explained that wildfire response planning must also consider post-event actions. Once structures burn and pipes are compromised, backflow and contamination can occur, depressurizing the system and introducing pollutants. This happened in Lahaina and required detailed testing by the Department of Health before water was deemed safe to drink. BWS is studying how to prevent similar issues and how to quickly test and restore service. He noted that HECO is also involved in mitigation planning, including hardening circuits in high-risk areas like Makaha, Waianae, Lualualei, Nanakuli, and Kahe by installing insulated wiring, anti-spark switches, and potentially moving their lines underground.

Q: Pono Chong asked whether BWS is considering its responsibilities as a landowner, particularly in managing fuels on its properties.

A: Barry responded that BWS is working on vegetative fire breaks in Makaha and Waianae in partnership with the State Department of Forestry. He also shared that Kaala Farms is developing a sheep grazing area to manage grasslands across the street from a BWS facility, and BWS is assisting by installing a water meter. Barry emphasized that fire prevention is a shared responsibility requiring coordination among landowners, agencies, and community groups. Building codes, fire-resistant materials, and fuel management all need to be part of the strategy. He concluded by noting that the timing of the wildfire response plan aligns perfectly with the Water Master Plan update, ensuring that future infrastructure, operational training, and interagency collaboration are designed to meet the challenges of climate-driven wildfire risk.

ACCEPTING MEETING 53 NOTES

Meeting 53 notes were approved.

NEXT STEPS

Dave reminded the group of the next stakeholder advisory group meetings on Thursday, July 17, 2025 and Thursday, October 23, 2025. The October meeting date was pushed back one week to avoid conflict with an upcoming Hawaii Water Works Association conference

Dave thanked the attendees for their attention and participation and concluded the meeting.