

# Mosquitoes and Utility Vaults

## What's the Connection?

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Ever wondered which animal causes the most deaths worldwide? Surprisingly, one of the smallest—the mosquito—is the deadliest.

Mosquitoes can transmit debilitating and deadly diseases such as West Nile virus, which has caused more than 7,000 reported illnesses and more than 300 deaths in California since 2003, according to the state's public health department.

Invasive *Aedes* mosquitoes, which have spread throughout the state, are aggressive daytime biters and can transmit exotic viruses such as dengue, chikungunya and Zika, posing a significant public health threat.

Are you wondering what mosquitoes and municipal utilities have in common? Turns out, it is a lot.

Utility vaults are an ideal habitat for mosquito production because there can be stagnant water inside vaults. In some regions, a high water table causes seepage into vaults. In other regions, landscape irrigation or rain may contribute to stagnant water in vaults.

Female mosquitoes can detect this stagnant water and will deposit their eggs in the vault. Offspring can develop into adults within a few days. Shade inside the vault provides protection from evaporation and limits access by predators. This creates ideal habitat for continual mosquito development and a location for them to rest.

Mosquitoes can develop in tiny sources of stagnant water—even a water-filled bottle cap—which means control programs require identification and treatment of many different water sources. Underground sources often go undetected until more obvious ones are eliminated.

Utility vaults provide a particular challenge due to restricted access and designs that allow adult mosquitoes to emerge.

Mosquito production in utility vaults has been increasingly reported in areas where invasive *Aedes* mosquitoes have become established. As mosquito and vector control districts increased their focus on residential areas, mosquito activity continued even after neighborhoods were intensively inspected and homeowner sources eliminated. Water retained in utility vaults was ultimately identified as a major source of these mosquitoes.

When mosquito production is detected in utility vaults, there are a few potential remedial actions:

- Pump or remove stagnant water that has accumulated in the vault.
- Modify the vault so it excludes mosquitoes.
- Apply a pesticide.

A long-term solution is to provide adequate drainage or prevent water flow into the vaults so stagnant water does not persist for several days. Sealing or properly screening vaults can help prevent access by egg-laying mosquitoes.

Very small amounts of water can be problematic, so a combination of these modifications is ideal.

Mosquito and vector control districts are tasked with providing surveillance and control of disease vectors throughout the state under the California Health and Safety Code. Partnerships that work together to protect public health are vital. CMUA and its members can play an important role in facilitating collaboration.

One successful partnership is between Northwest Mosquito and Vector Control District and the City of Riverside Public Utilities Department. Staff at a hotel in downtown Riverside had been hosing off the sidewalk, and the water drained into an underground utility vault. This water was the source of significant mosquito production. The nearby convention center, restaurants and hotels



A worker from the Consolidated Mosquito Abatement District in Fresno County treats a utility vault to eliminate breeding areas.

were impacted as visitors and residents complained of mosquito bites.

Northwest MVCD and Riverside PUD worked together to determine the best way to eliminate mosquitoes. The solution was to add small panels of screening to the vault. Since making this modification, there has been no detection of mosquitoes in the vault.

By working together, utility providers and mosquito control professionals can establish a standardized protocol so mosquito and vector control districts can identify, access and remediate problem sources. This will help reduce costs, protect utility workers from mosquito bites, improve quality of life for residents and, ultimately, protect public health for all Californians. **CWP**

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