

PROJECT TITLE: **Climate Change Vulnerability and Resilience Plan**

PROJECT LOCATION: **Honolulu, Hawaii**

PROJECT OWNER: **City and County of Honolulu
Department of Environmental Services**

ENTRANT FIRM: **Carollo Engineers, Inc.**



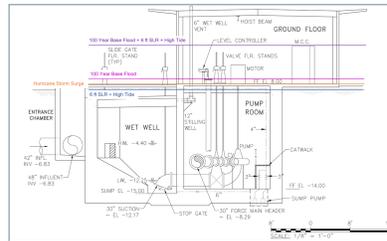
Sea level rise threat to the Sand Island Wastewater Treatment Plant

Together with the City and County of Honolulu, Department of Environmental Services, Carollo completed the Climate Change Vulnerability Assessment and Resilience Plan for the Sand Island Sewer Basin (SISB) in January 2021. The purpose of the study was to perform a vulnerability assessment of the SISB wastewater facilities. The flooding threats and climate change impacts included coastal erosion, tsunamis, storm surge (related to hurricanes), and 100-year flood events. In addition, this analysis considered how predicted sea level rise (SLR) may enhance these threats.

The City owns and operates the largest wastewater system in the State of Hawaii, including nine wastewater treatment plants (WWTPs) and approximately 70 wastewater pump stations (WWPSs). The largest sewer basin within the system is the SISB which stretches from Kuliouou to Aliamanu. The Basin is served by the Sand Island WWTP, and a collection system composed of 580 miles of gravity pipes and force mains, 17 city-owned WWPSs, and one Army owned WWPS (Fort Shafter).

Being an island state, Hawaii is arguably one of the most vulnerable states to the impacts of climate change. Also, Honolulu includes critical services and businesses that are the most significant economic drivers for the State. Thus, protecting critical assets, such as wastewater infrastructure within the City is essential.

The City will leverage the findings and recommendations included in this assessment to further plan and prepare for climate change impacts. In addition, the approach and evaluation methods can be applied to other City agencies and assets to prepare for climate change.



Potential flooding levels for the Kamehameha WWPS

Kamehameha Highway WWPS: Worst-Case Inundation



- For future, chronic flooding:
 - Install watertight doors
 - Elevate exterior equipment
 - Install flood barrier for site
 - Install flood wall for building
 - Elevate access road
 - Elevate site grade
 - Reinforce/seal manholes
 - Restore/expand coastline
 - Relocate or abandon facility



“Carollo successfully delivered a comprehensive evaluation of the Sand Island Basin wastewater facilities to help the Department of Environmental Services understand its risks due to climate change. This study included a variety of present day and far reaching future threats that the City must consider to protect and enhance resilience of our infrastructure. The result of the work includes the identification of adaptive management strategies and a proposed capital improvement plan. The consideration of basin-wide and regional climate change-related impacts is critical as the City works through its long-term integrated planning and One Water efforts.”

– Roger Babcock, Director
Department of Environmental Services

