Adapting to Rising Tides

Wastewater Vulnerability and Risk Profile

The wastewater management system consists of multiple components including treatment plants, pump stations, dechlorination and discharge facilities, and ancillary facilities such as oxidation ponds, sludge drying beds, and wet weather facilities. There are two wastewater service areas in the ART project area: East Bay Municipal Utility District (EBMUD) and East Bay Dischargers Association (EBDA). EBDA is made up of several member agencies, including Oro Loma Sanitary District (OLSD), Union Sanitary District (USD), and the cities of San Leandro and Hayward, which operate and maintain their own wastewater infrastructure as well as the EBDA conveyance and pump system.

Key Issues

Wastewater treatment plants may be able to cope with minor, infrequent flooding using sandbags and on-site pumping, but they are very sensitive to frequent or long duration flooding. There is little to no duplication of their function, meaning that the communities they serve face consequences to public and environmental health if treatment plants are affected by flooding. Systems are also not linked to one another - that is, wastewater cannot be routed to another treatment plant if one is compromised by flooding. Other components of the wastewater treatment system, such as pump stations and dechlorination facilities, rely on electricity, which may be shut off during flooding, and are sensitive to flooding because salt water can damage electrical components. Ancillary facilities may be unable to perform their primary function of storing wastewater if flooded, resulting in environmental and public health consequences. By mid century one pump station in the subregion will be exposed to high tide inundation, and several wastewater treatment plants, pump stations, discharge, and ancillary facilities are exposed to flooding in storm events. By end of century, over half of the wastewater facilities are exposed to the high tide, and all facilities are at least partially exposed to storm events.

Vulnerabilities

Timing

- Many wastewater assets will be exposed to storm event flooding by mid-century. Half will be exposed to the high tide by end of century, and all will be exposed to storm event flooding by end of century.

Physical and Functional Qualities

- Pump stations and dechlorination facilities are sensitive because they rely on electricity, which may be shut off during flooding and could jeopardize function if sufficient backup fuel is unavailable.
- Electrical and computerized components cannot function when wet, and are susceptible to further damage by salt water.
- Ancillary facilities such as oxidation ponds, wet weather facilities, sludge drying beds, and channels are at grade, are not enclosed or protected from flooding, and are highly erodible.
- Larger pump stations are vulnerable because portable pumps are unlikely to have sufficient capacity to handle flows.
- Wastewater treatment plants are large, expensive, and complex, and there is no redundancy within each system, nor across systems through interconnections.
- Wastewater systems are sensitive to groundwater rise, which could infiltrate into storage and conveyance facilities and reduce functionality, and also increase risk of liquefaction.

Consequences

Scale

- Adjoining properties and neighborhoods
- Each wastewater system's service area will suffer consequences if major components of the system are affected.
- Regional, if untreated wastewater is released into Bay

Ecosystem Services

- Wastewater infrastructure, particularly dechlorination facilities, protect Bay ecology; if they are compromised, the Bay could be polluted with partially chlorinated water and/or raw sewage.

People

- If untreated sewage backs up into homes, neighborhoods, and / or the Bay, it could pose a public health risk.

Economy

- Sewage overflows into the Bay can cause losses for tourism, fishing, and other Bay-dependent industries.

Vulnerabilities **Management Control** ● Different entities manage different parts of each wastewater system (e.g., flow conveyance and treatment/discharge), adding complexity to issues such as managing wet weather flows. ● Existing maintenance & operations for some facilities is insufficient, for example in reducing and handling wet weather flows.	