

2. SEWER AUTHORITY MID-COASTSIDE WASTEWATER TREATMENT PLANT

Operated by Sewer Authority Mid-Coastside

VULNERABILITY SUMMARY

The Sewer Authority Mid-Coastside Wastewater Treatment Plant (SAM Plant) is **highly vulnerable** to the impacts of sea level rise. The facility's essential power distribution system is very sensitive to inundation, and would cause a loss of service at the plant if flooded. Adaptive capacity is low as there are no other plants to treat wastewater from this service area, and the power system redundancies are also low-lying. Exposure to coastal flooding is low; however, overall exposure is moderate as the plant is presently subject to groundwater intrusion, and can be vulnerable to creek backup caused by heavy rainfall that coincides with high tides.

SENSITIVITY
High

EXPOSURE
Moderate

ADAPTIVE CAPACITY
Low

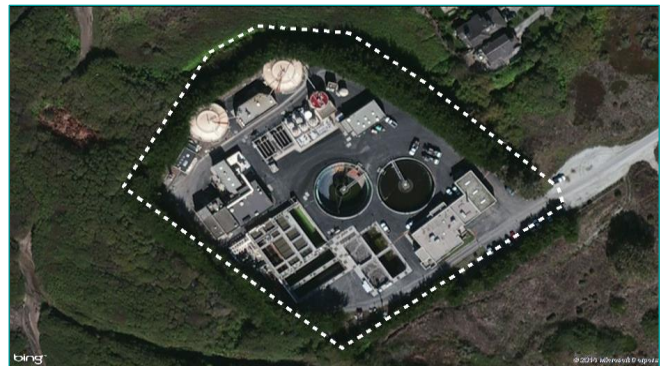
CONSEQUENCES
High

ASSET CHARACTERISTICS

Bev Cunha's Country Road | Half Moon Bay

Asset Description and Function:

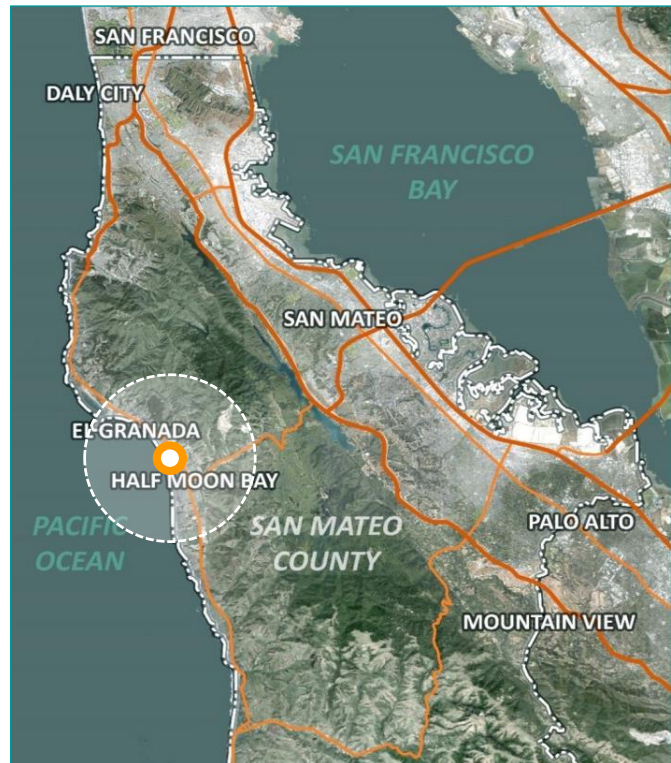
The SAM Plant is operated by a Joint Powers Authority of Half Moon Bay, Granada Community Services District, and the Montara Water and Sanitary District and serves 25,000 customers in those communities. It collects sewage and pumps up to the Portola lift station, where wastewater is conveyed through a gravity-fed force main to the treatment plant. The SAM Plant provides primary and secondary treatment, and then discharges effluent to the Pacific Ocean through an outfall.



Asset Type	Wastewater Treatment Plant
Asset Risk Class	3
Size	4.3 acres
Year of Construction	1978
Elevation	18 feet
Level of Use (Dry Weather)	1.2 million gallons/day
Annual O&M Cost	\$2,125,000
Special Flood Hazard Area	Asset is not in SFHA
Physical Condition	Fair
Landowner	City Of Half Moon Bay
Underground Facilities	Pipe galleries and a generator are underground.

Environmental Considerations

The western snowy plover, northern coastal salt marsh, and the coast iris may be present, in addition to other species.



SEWER AUTHORITY MID-COASTSIDE WASTEWATER TREATMENT PLANT

ASSET SENSITIVITY

The SAM Plant is highly sensitive to inundation. The SAM Plant's most critical and essential component is Mechanical Building No. 1, which houses the plant's electrical equipment and its power distribution system, if damaged the plant cannot function. Mechanical Building No. 1 also contains the influent (untreated wastewater) pumping equipment, the headworks, and a generator. These components are extremely sensitive to a significant flood event or permanent inundation; if flooded, the SAM Plant would lose power and pumps would not work, causing untreated effluent to overflow on site.

The fuel tanks onsite are not sensitive to flood events because they're above ground and have secondary containment; they do not pose a threat if the site were inundated.

Pipe gallery, primary sludge pumps, and grit pumps.



SHORELINE VULNERABILITY

Erosion Extent

At this time, the best available data (2012) suggest that this site is not vulnerable to the erosion that would be expected by 2100 (and with 4.6 feet of sea level rise) as it lies well east of the easternmost extent of erosion.

Cross-Cutting Vulnerabilities

Loss of service could affect the SAM Plant and collection system. Additionally, pump or lift stations off site that are exposed to flooding or sea level rise would affect the conveyance system. Particularly, if saltwater were to enter the treatment equipment, it would cause a disruption of the biological treatment process. This could occur if saltwater were to enter pipes in the collection system, through which the lift station would pump this saltwater into the plant. Road access, though currently not threatened, is critical to maintain chemical truck access and allow staff to access the site.

Erosion Extent: Future coastal erosion does not reach asset.



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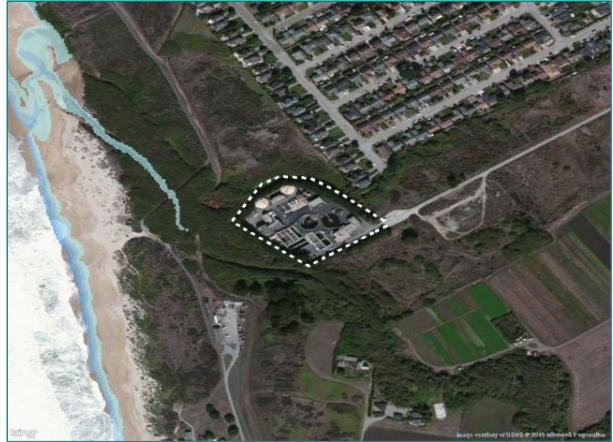
SEA LEVEL RISE EXPOSURE ANALYSIS

Exposure Discussion

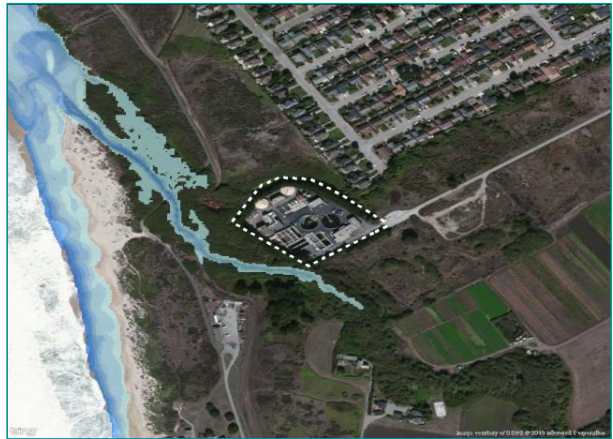
The SAM Plant is moderately exposed to sea level rise impacts. It has no prior experience with coastal flooding or erosion, though the plant's underground facilities, including a piping gallery, are already experiencing groundwater and saltwater intrusion. The SAM Plant is also exposed to creek flooding during storms, which could be worse with higher tides. Pilarcitos Creek runs south along the west side of the plant and cannot discharge during extremely high tides, causing creek floods. The plant is surrounded by non-engineered berms that prevent creek flooding on the property; however, creek backup has caused pooling adjacent to the treatment plant.

Sea level rise will increase the frequency with which the underground facilities are exposed to ground and saltwater intrusion, and a combination of future higher tides and rain events could force Pilarcitos Creek to back up enough to spill into the plant's property. Eventually, the plant may be directly exposed to coastal flooding in the high-end scenario (a 1% flood with 6.6 feet of sea level rise), though flooding from Pilarcitos Creek (posing a threat to back up, pond, and flood the plant) is more likely. Water that gets on the site would likely reach the plant's transformer and power distribution systems, and Mechanical Building No. 1, as they are low-lying or underground.

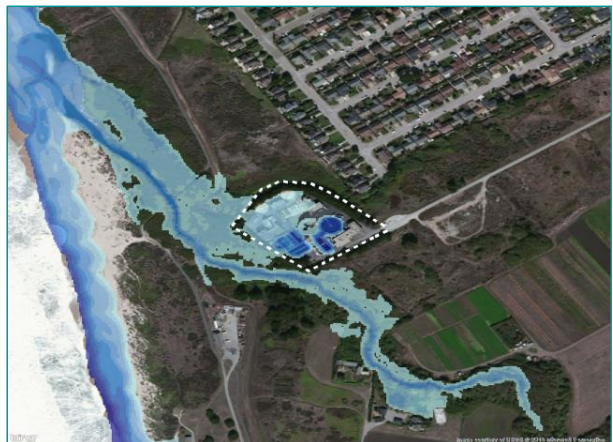
Baseline Scenario: Asset not yet inundated.



Mid-Level Scenario: Asset not yet inundated.



High-End Scenario: Asset under 0-15 feet of water.



Exposure Analysis Results

Potential Inundation Depth (feet)		
Scenario	Minimum	Maximum
First Significant Impacts	Area Not Included in Overtopping Analysis	
Baseline 1% Flood	0	0
Mid-Level 1% + 3.3 feet	0	0
High-End 1% + 6.6 feet	0	15

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ADAPTIVE CAPACITY, CONSEQUENCES, AND POTENTIAL ADAPTATION

Adaptive Capacity

The SAM Plant has low adaptive capacity, as there is no alternate treatment facility to perform the same service, though it could minimize effects from temporary or minor inundation. Small interventions could be made to improve the overall resilience of the plant, like protecting the electrical system, but these would not be a long-term solution. Though the underground wastewater pumps are sensitive to water, sump pumps are in place to keep equipment dry. Electrical conduits were built to tolerate marine environments, so they should not be affected by minor flooding. Backup generators are available in case of power outage, but they are only usable if the power distribution system remains dry. The SAM Plant has an emergency response plan, but if it were to lose service completely, the pumps at the Montara and Portola lift stations could divert sewage into temporary storage for over half a day assuming normal wastewater inflow.

Consequences

The consequences of inundation at the SAM Plant are high. The scale of impacts from sea level rise could be both local and county-wide, as direct damages to the SAM Plant may require repairs to various components, but loss of wastewater treatment service could affect the plant's conveyance system as a whole (including lift and pump stations), and the customers (up to roughly 25,000) in the region. Temporary flooding of the SAM Plant could damage any number of plant components that would then have to be replaced. If Mechanical Building No. 1 were subject to a major event, and if the generators flooded, then the SAM Plant could lose service altogether. If the SAM Plant lost service, there would be overflow in the southern half of San Pablo lift station, as the plant operators have temporary storage at the Montara and Portola Lift stations for over half a day assuming normal wastewater flow. The full economic damages have not been quantified, and full replacement cost of the facility is unknown.

Additional Important Information

The SAM Plant is part of an interdependent system called the Intertie Pipeline System (IPS), which includes 8 miles of forcemain and gravity interceptors and three pumping stations. The satellite collection systems - Montara Water and Sanitary District, the Granada Community Services District, and the City of Half Moon Bay - own, operate, and maintain the collection systems in their respective areas.

Asset-Specific Adaptation

Adaptation could include measures in the plant itself such as elevating water- or salt-sensitive equipment like the lower electrical systems above water levels or floodproofing individual critical structures like Mechanical Building No. 1. Outside the plant, a long-term adaptation measure would be to enhance the existing berms on the west and south sides of the plant, and build a berm on the east and north sides to fully protect the perimeter.

Vulnerable Wastewater Treatment Plants

There are Asset Vulnerability Profiles on the following vulnerable wastewater treatment plants: Silicon Valley Clean Water (AVP #14) and SSF-SB WQCP (AVP #23). The vulnerability assessment analysis shows that there are seven vulnerable wastewater treatment plants in the project area, including those in the City of Millbrae, the City of San Mateo, the City of Burlingame and at SF International Airport.

Digester control room.



Chemical tank facility.

