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**Agency or Organization Representing:**

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**Describe the location:**

The Santa Venetia neighborhood of San Rafael is in Marin County, wedged between the Gallinas Creek estuary and the scenic uplands of San Pedro Mountain and China Camp State Park. The neighborhood of 1,600 households was built on tidal marshland that was drained and filled in 1914. Nine hundred households sit in a FEMA designated flood zone. These are protected by two miles of levees, six pump stations, and a drainage system—all of which are not adequate to protect the community from the projected sea level rise.

**Link to Google Map with Location:**

<https://www.google.co.in/maps/place/Santa+Venetia,+CA,+USA/@38.0041914,-122.4956167,13.96z/data=!4m5!3m4!1s0x808599a0afcfb5b9:0xd37a6cc82edf364b!8m2!3d37.9985338!4d-122.5252541>

**What would make this site a good fit for the design challenge (250 words max, 245):**

Much of the community of Santa Venetia lies below sea level, on the tidewater of San Pablo Bay. At risk are private homes protected by an outdated system of earthen levees and pump stations. This community has more affordable homes than is typical of the rest of the County, given the history of flooding and the location of many homes that are below sea level. There are two apartment complexes serving low income and/or section 8 tenants. The site is a good fit for the design challenge due to its isolation on the front lines of sea level rise and because of its need for upgraded infrastructure.

The site is also ripe for the design challenge due to its vulnerable ecological systems. The Gallinas Creek estuary has significant natural habitat for wildlife, including endangered species. This offers a unique design opportunity to safeguard a threatened neighborhood by combining cutting-edge engineering and modern watershed science to improve the estuary's natural mechanisms. Protecting the neighborhood by bolstering the creek's natural habitat will promote an ideal symbiosis and could serve as a model for a broader paradigm shift of working with nature as opposed to constraining nature.

After the numerous events of combined high tides and above average rainfall during the 2016/2017 winter season, Santa Venetia has an immediate need to improve its levees. The greater watershed of Las Gallinas Creek is ripe for a rethinking of its biological and geomorphic functions, and its interactions with the human infrastructure.

**What are the potential physical vulnerabilities that threaten this site (250 word max, 237):**

The earthen levee height varies due to settlement and erosion. The initial levees were built around 1915. Redwood box flood walls were built on top of the existing levees in 1982/83. The levee system protects a sizable residential community sited in low-lying elevation. The market rate residences and multi-family units servicing low income tenants, seniors, and people with disabilities, are and will continue to be threatened by increased flooding over time.

The community relies on a system of storm drains, street drainage, and pumping stations to move water through the low-lying areas and into the creek.

Overtopping from runoff and sea level rise, compounded with high tides and more atmospheric river events, are the major threats. During a major earthquake on one of the nearby faults, strong to very strong ground shaking is expected to occur in Santa Venetia. Based on a geotechnical investigation at the site, there is a strong potential for liquefaction to occur within the levee fill, landside fill, and alluvium underlying Young Bay Mud where loose saturated granular deposits exist.

The upper stretches of the Gallinas Creek Watershed are dramatically altered by development and impermeable concrete ditches. The lower watershed includes the Las Gallinas Valley Sanitary District, the McInnis Marsh, a private airport, and a community of low-income residents of a trailer park [in addition to the residents of Santa Venetia](#). These historic tidelands and diked baylands would provide an important natural step toward sea level rise resilience and habitat restoration.

**What are the social vulnerabilities? (250 word max, 157)**

A breach of the levee system could displace the residents from over 900 households and impact the greater community of 1,600 single family homes, low-income housing complexes, and a complex for low income seniors and people with disabilities. With or without a breach of the levees, the residents of Santa Venetia risk permanent displacement if sea level rise is not addressed and mitigated. The Las Gallinas Valley Sanitary District wastewater treatment ponds (currently serving 30,000 people and 2.9 million gallons of water) would also be at risk from a levee failure in the lower watershed, which could result in an untreated discharge of wastewater into the bay and a disruption of sewage treatment service. The tracks of the regional SMART train are also vulnerable to sea level rise through this area.

Furthermore, Marin County faces a housing shortage on all fronts. The potential of having Santa Venetia reclaimed by the sea from a combination of wet winters and high tides, and sea level rise, would severely impact the County's already limited housing supply. Additionally, flooding could impede access to China Camp State park, due to a low lying road.

**Who owns or controls this site? (200 word max, 143)**

Area ownership is a combination of the County of Marin, Marin County Parks, with extensive private property, including a private airport (San Rafael Airport LLC) located across Gallinas Creek from the homes in Santa Venetia. The tidewater areas have overlapping jurisdictions with the Army Corp of Engineers, San Francisco Bay Conservation and Development Commission, and the San Francisco Bay Regional Water Quality Board.

The County is in the process of purchasing “Buck’s Landing,” which is an area of transitional wetlands, tidal marshland, lying at the eastern terminus of the residential community, at the mouth of Gallinas Creek into the San Pablo Bay, and just to the north of China Camp State Park.

**What is threatened at this site? (200 word max, 200)**

The Santa Venetia neighborhood is a thriving community within San Rafael. It’s situated along North San Pedro Road, between the iconic Marin County Civic Center and the heavily visited China Camp State Park. The area supports businesses, provides crucial market-rate housing, and provides low income housing for families, seniors, and the disabled.

The Gallinas watershed is a historic feeding ground for ~~Steelhead-steelhead~~ and Chinook salmon. Steelhead are extirpated due to human modifications to the watershed. In the record El Nino water year of 1982/83, a twelve-inch ~~Steelhead-steelhead~~ was recorded in the upper stretches of the watershed, in the Los Ranchitos neighborhood. Modern watershed science has shown that watershed restoration can increase native fish populations.

What remains of the Santa Venetia Marsh is a fragile saltwater marsh ecosystem. It is situated in a habitat migration corridor frequented by California Ridgeway’s Rail (known as “Clapper Rail”), Blue Herons, Egrets, various birds of prey, and other avian species too multiple to list. It is home to the largest known Ridgeway’s Rail population in San Pablo Bay. The ~~Salt-salt~~ ~~mMarsh~~ ~~hHarvest~~ ~~mMouse~~, raccoons, river otters, muskrat, black and striped bass also inhabit the marsh, and white sturgeon frequent the creek mouth near Buck’s ~~Landing~~.

**Comment [cc1]:** Bird names are capitalized, but other common names of mammals, fish, etc. are not because someone decided long ago that it would be that way.

**What local partners would need to be involved for it to be successful; what has their involvement been to date? (150 word max, 141)**

The Santa Venetia Valley Neighborhood Association is an incredibly active and strong advocate for the needs of the community. Its involvement will be crucial to a successful project. The Association is organized, publishes a bi-monthly newsletter, and holds regular community meetings which will be instrumental in engaging the community and stakeholders.

The County of Marin, including Marin County Parks and Open Space and Department of Public Works, Marin County Flood Control and Water Conservation District, Flood Zone #7, Community Service Area #6 (dredging), and McInnis Park.

Sonoma Marin Area Rail Transit (SMART) - tracks in watershed (not in Santa Venetia)

California Department of Fish and Wildlife

Las Gallinas Valley Sanitary District

USACE (Army Corps)

Los Gamos Cooperative Association (apartments, Barry Taranto)

City of San Rafael.

San Rafael City School District.

San Francisco Bay Regional Water Quality Board.

Romberg Tiburon Center for Environmental Studies.

Santa Margarita Neighborhood Association- upstream.

Terra Linda Homeowners Association- upstream.

Marin Lagoon Homeowners Association.

**What local plans exist or are underway in this area (150 words max—150)**

- Marin Bay Shoreline Sea Level Rise Vulnerability Assessment (BayWAVE), by Marin County, 2017. Identifies risk from sea level rise, flooding and storms. A county-wide adaptation plan is contemplated.
- Marin County Parks is advancing the McInnis Marsh Restoration Project with a \$550,000 grant from the California Department of Fish and Wildlife. 180 acres of wetlands north of Santa Venetia. Site report, feasibility study, and alternatives.
- “Climate Adaptation- Sea Level Rise”. San Rafael, Department of Community Development. — Identifies problems in Gallinas Basin, suggested adaptation measures.
- Las Gallinas Creek Levee Evaluation, Marin County and the US Army Corps. 1/29/14.
- Las Gallinas Levee Geotechnical Data Report, Kleinfelder, 7/2013 and 1/2014.
- Las Gallinas Sediment Studies.

- Geomorphic dredge analysis.
- Santa Venetia Storm Hydraulic Study, Jan 2015.
- Gallinas Creek Restoration Feasibility Study and Conceptual Design Report, 2004. (Army Corps, Coastal Conservancy, Friends of Gallinas Creek, Bay Institute, MCSTOPPP). By Kamman Hydrology.
- Upper Gallinas Creek Restoration Opportunities, 12/7/2016.

**Is there any additional information that you would like to add about this site? (300 words max, ~~193281~~)**

Santa Venetia is an excellent choice for the Resilient By Design challenge because the geographical size is small enough to have a Design implemented with real impact. The site characteristics are repeated around the Bay Area, and a Design at this location would be replicable for other low lying areas around the Bay and the world where homes are protected by inadequate levees, and where sea level rise is an immediate threat.

The County of Marin has a dedicated sea level rise program (BayWAVE) with staff from the Community Development Agency and the Department of Public Works to assist with planning and project implementation. The next phase of BayWAVE will support implementation actions such as guidance for general plan updates and capital improvement projects, demonstration projects built to test innovative approaches to flood impacts, and education to support the use of the vulnerability assessment. The Resilient by Design challenge would complement the County's efforts and could be supported by staff.

The Gallinas Creek watershed is 5.6 square miles. A majority of the land that drains into the Santa Venetia community is steep, forested hills, much of which is designated open space and preserves, locally known as San Pedro Mountain. The upper stretches of the Gallinas watershed are dramatically altered by development and impermeable surfaces. The Kamman study (2004) evaluates the feasibility of restoring Gallinas creek upstream of Santa Venetia. Marin County began implementation of a County-wide Watershed Program in 2008 to integrate flood protection and environmental restoration, viable options for the entire watershed were identified in a 2016 report. In short, there is a desire and momentum for a whole watershed evaluation of Gallinas, the Santa Venetia levees being the terminus.