



NAVFAC
Naval Facilities Engineering Systems Command

Hunters Point Naval Shipyard Climate Resilience Assessment

Hunters Point Shipyard Citizens Advisory Committee
Environmental & Reuse Subcommittee Meeting

April 22, 2024

Michael Pound – BRAC Environmental Coordinator
Wilson Doctor – Remedial Project Manager

Agenda

Topic
<ul style="list-style-type: none">• Introductions
<ul style="list-style-type: none">• Basis for Climate Resilience Assessment<ul style="list-style-type: none">◦ Federal guidance, HPNS Five Year Reviews
<ul style="list-style-type: none">• Overview of Navy Climate Resilience Assessment<ul style="list-style-type: none">◦ Best available science, methods for conducting the assessment, identification of potential impacts at HPNS
<ul style="list-style-type: none">• Climate Resilience Assessment Results<ul style="list-style-type: none">◦ Projections for sea level rise and groundwater level, anticipated effects on HPNS parcels, vulnerabilities, considerations for Parcel E-2 landfill
<ul style="list-style-type: none">• Next steps in assessing climate resilience at HPNS
<ul style="list-style-type: none">• How to learn more and upcoming meeting schedule
<ul style="list-style-type: none">• Contacts
<ul style="list-style-type: none">• Questions

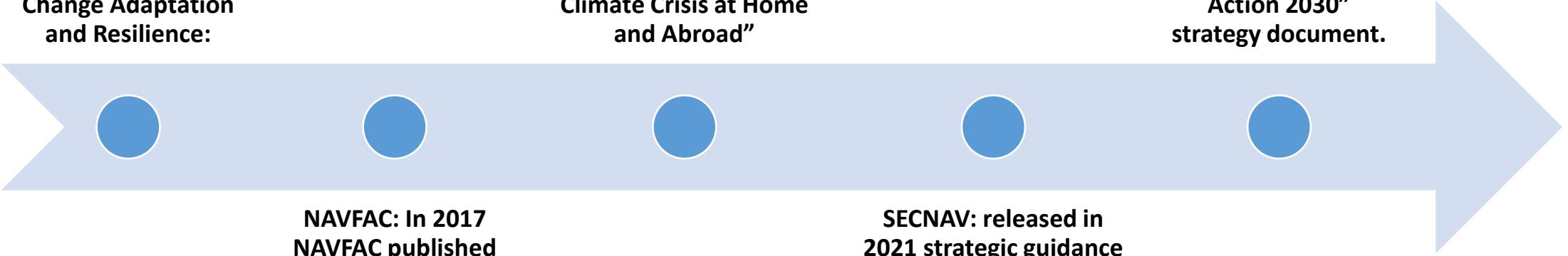
Why is the Navy assessing climate resilience?

- To support the Five-Year Review of environmental cleanup remedies at HPNS
- Evaluate short- and long-term protectiveness of Navy remedies
- Plan for and improve remedies based on new information and technologies

January 14th, 2016:
DoD Directive
4715.21 Climate
Change Adaptation
and Resilience:

January 27th, 2021:
President Biden issued
Executive Order (EO)
14008, “Tackling the
Climate Crisis at Home
and Abroad”

DON: In 2022 DON
published “Climate
Action 2030”
strategy document.



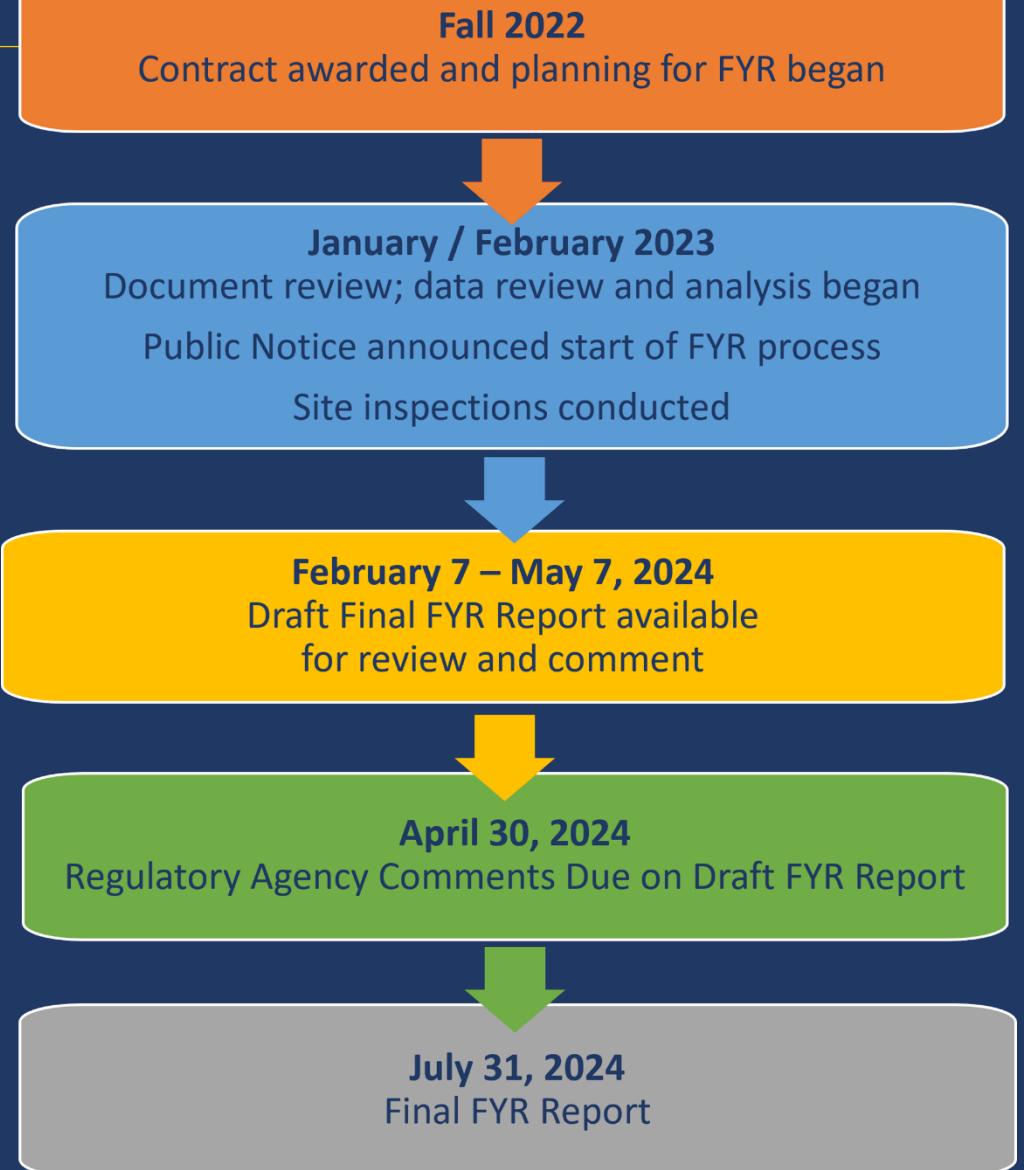
NAVFAC: In 2017
NAVFAC published
“Climate Change
Installation
Adaptation and
Resilience Planning
Handbook”

SECNAV: released in
2021 strategic guidance
that lists combating
climate change among
top four challenges
facing Department of
the Navy (DON)

Fifth Five Year Review (FYR)

Components of the FYR

1. Document review
2. Data review and analysis
3. Community notification
4. Site inspection
5. Site specialist interviews
6. Assessment of protectiveness; identify necessary changes



Use of Best Available Science through Document Review

- Implemented federal and state methodologies
 - California Department of Toxic Substances Control (DTSC): *Draft Sea Level Rise Guidance to DTSC Project Managers for Cleanup Activities* (2023)
 - USEPA: *Guidance on Climate Resilience in Superfund Planning* (2021)
 - US Department of Defense (DoD): *Climate Assessment Tool* (DCAT) (2021)
- Consulted climate projection reports and other resources
 - DoD Regional Sea Level Rise (DRSL) database (compiled 2015-2016)
 - DoD Strategic Environmental Research and Development Program
 - California Ocean Protection Council (2018, 2024)
 - Others: City of Alameda (2022), FEMA, NOAA, Cal-Adapt, CA Department of Forestry and Fire Protection, BPTCP, Journal of Hydrology

Scientific Methodology Used to Assess Climate Impacts at HPNS

Climate Hazard Identification and Prescreening

- Identified climate hazards in DCAT

Climate Impact Assessment

- Identified projected impact areas at HPNS for climate hazards

Climate Vulnerability Assessment

- Conceptualized any new potential exposure pathways attributable to climate change for further assessment

Climate Risk Assessment (FUTURE)

- Evaluate potential pathways to determine if there are potential future unacceptable CERCLA risks to human and ecological receptors

Note: Not all impacts lead to environmental cleanup program vulnerabilities

Sea Level Rise Projections at HPNS

- **Department of Defense Regional Sea Level (DRSL) database projections at HPNS**
 - Consistent with California Ocean Protection Council (2018) projections
 - Accounts for multiple global greenhouse gas (GHG) emissions scenarios
 - Simulated highest and lowest GHG scenarios

Sea Level Rise Comparisons (measured in feet)

	DRSL (Navy)		California Ocean Protection Council (OPC) 2018		California OPC 2024		DTSC 2023
Year	Lowest	Highest	Low	Med-High	Low	Int-High	
2030			0.5	0.8	0.3	0.4	
2035	0.3	1					
2040			0.8	1.3	0.4	0.7	
2050							3.5*
2060			1.5	2.6	0.6	1.5	
2065	0.6	3.2					
2070			1.9	3.5	0.7	2.2	

* Based on OPC's California SLR Action Plan 2022

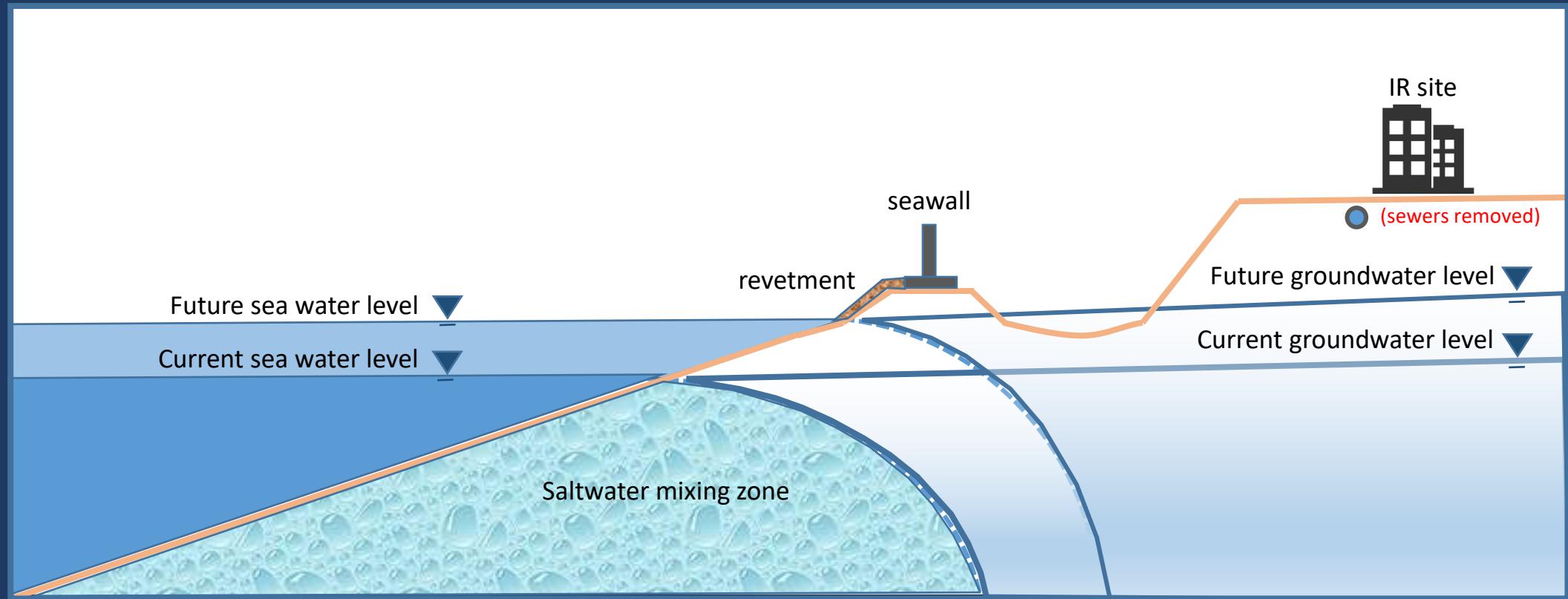
Methods Used to Identify Impacted Areas, Potential Effects at HPNS

Sea Level Rise Assessment	Groundwater Table Rise	Summary of Impacts	
<ul style="list-style-type: none">Digital elevation model (DEM) used to represent topographyGeographical information system (GIS) used to compare sea level rise projections with topography	<ul style="list-style-type: none">Highest historical groundwater table level in past 20 years identifiedAssumption applied: water table rise in future years at a 1:1 ratio with sea level rise at all locations <p><i>Same method used by the City of Alameda in 2022</i></p>	1. Coastal flooding?	<ul style="list-style-type: none">No permanent seawater inundationSome groundwater table emergence
		2. Extreme weather?	Yes: storm surges, rainfall
		3. Riverine flooding?	No
		4. Drought?	Yes
		5. Wildfires?	Yes
		6. Energy demand?	Yes: power supply interruptions possible
		7. Heat?	No
		8. Land degradation?	No

Not all impacts lead to environmental cleanup program vulnerabilities.

Groundwater Rise in Response to Sea Level Rise

- A conservative assumption is that **groundwater rises everywhere by the same amount as the sea**
 - More detailed modeling is necessary to determine how close this worst-case scenario is to actual levels

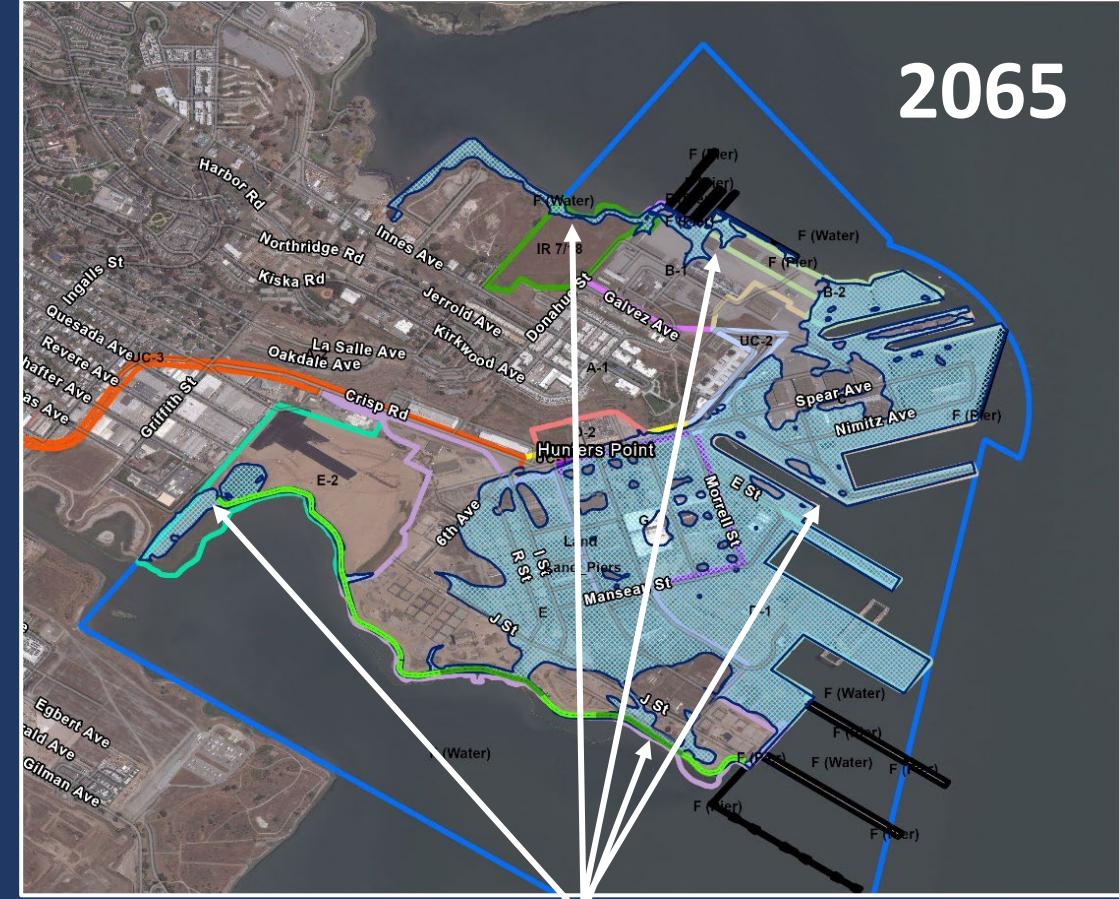
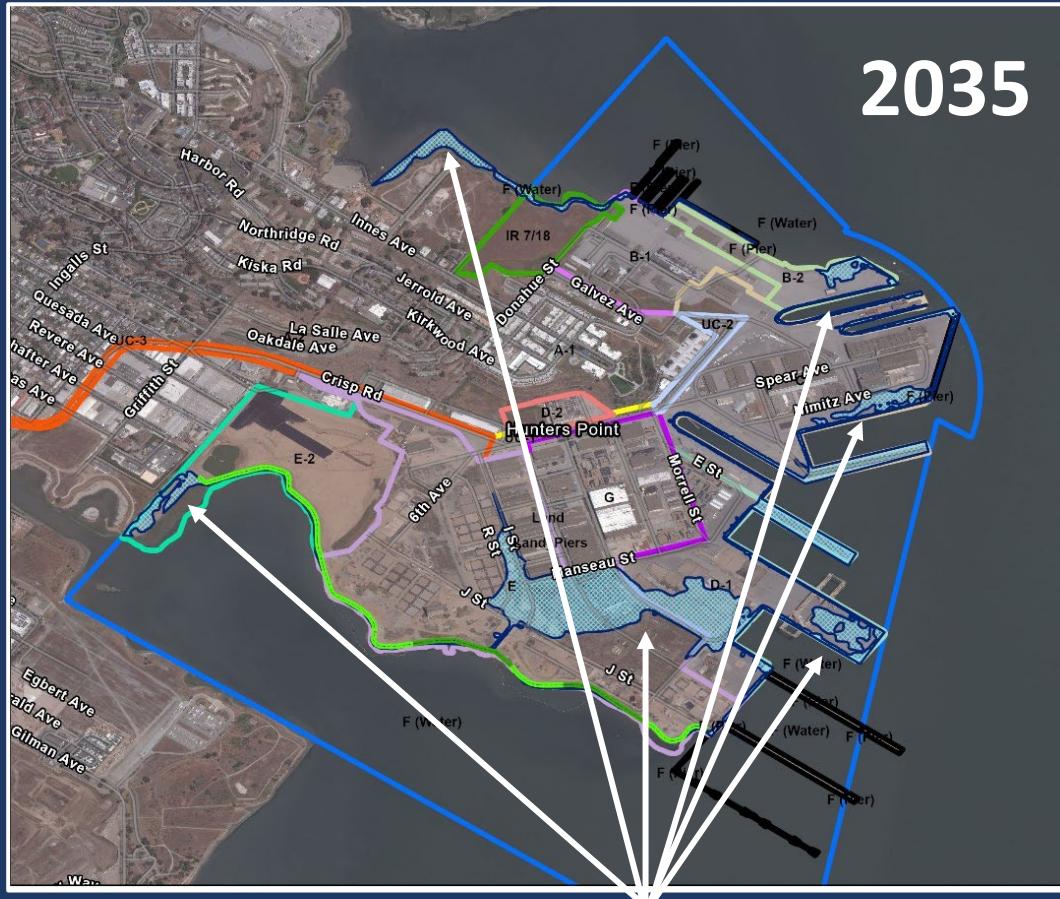


Projected Permanent Seawater Flooding at HPNS (No Mitigation)



Permanent seawater inundation – only projected at Parcel F pier structures

Projected Temporary Flooding from 100-Year Storm at HPNS (No Mitigation)

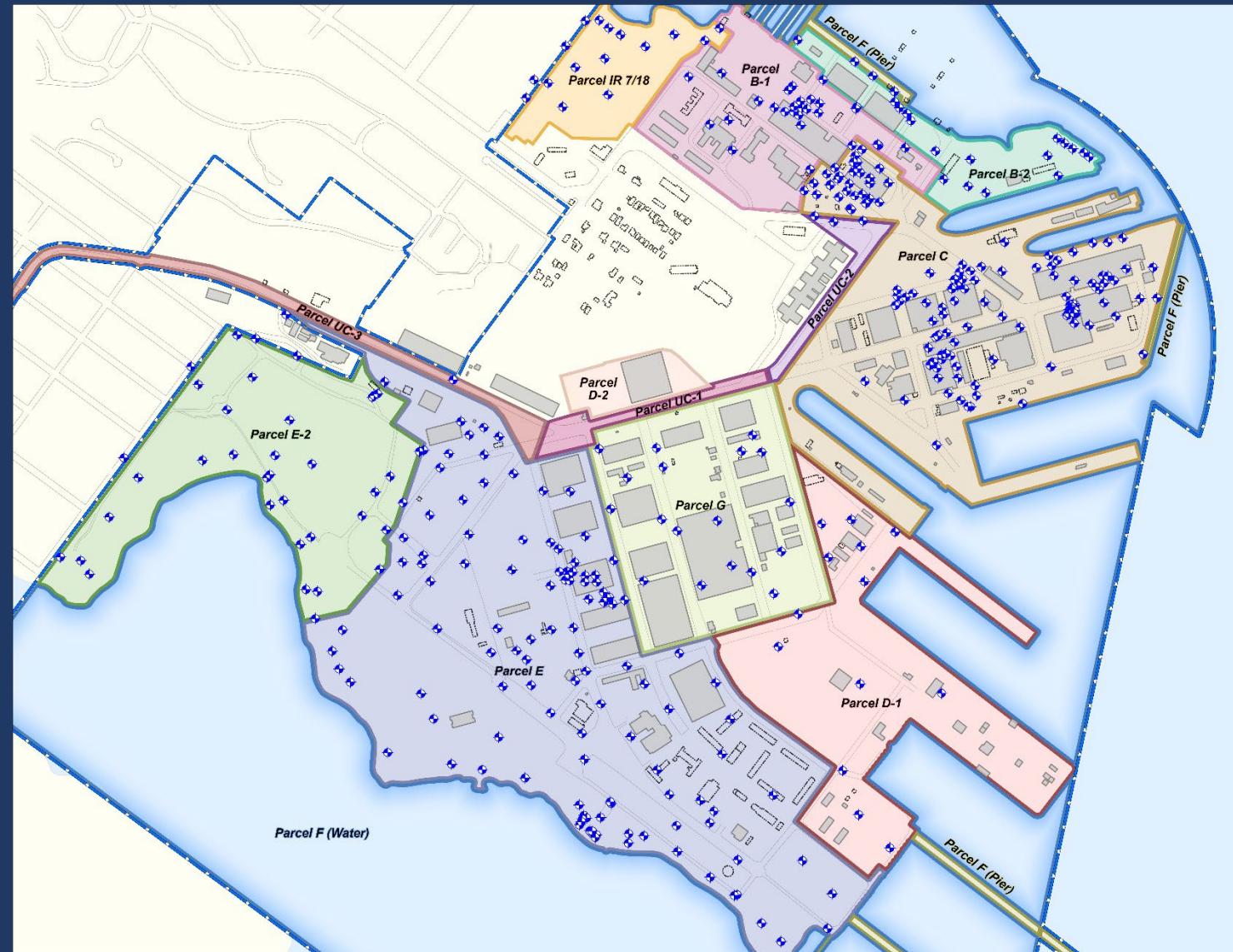


Temporary seawater flooding – limited in 2035 and projected to occur in more areas in 2065

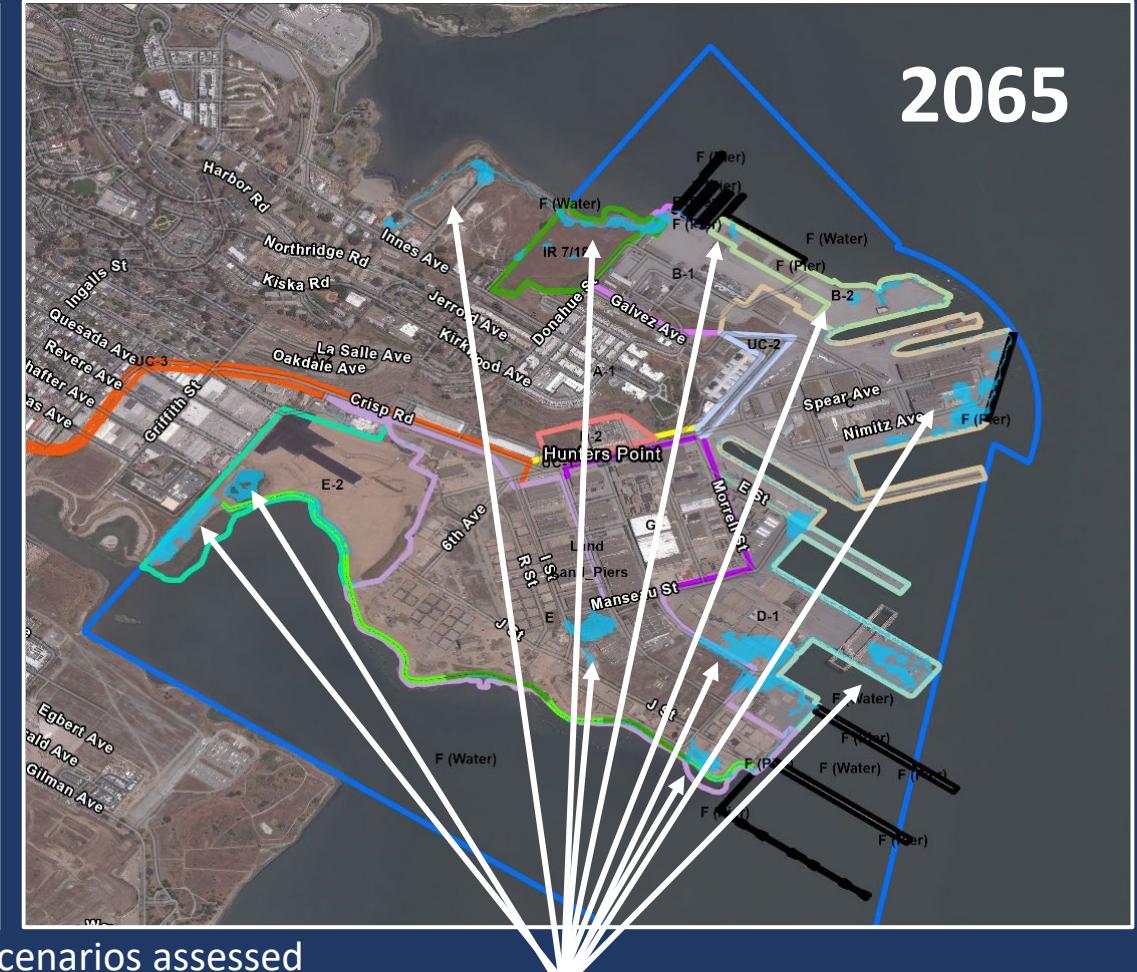
Existing Groundwater Monitoring System

The Navy monitors upper-aquifer groundwater under the HPNS Basewide Groundwater Monitoring Program

- 195 A-aquifer groundwater wells
- Monitored semiannually
- Monitored since 2004



Projected Rise of Groundwater to Surface



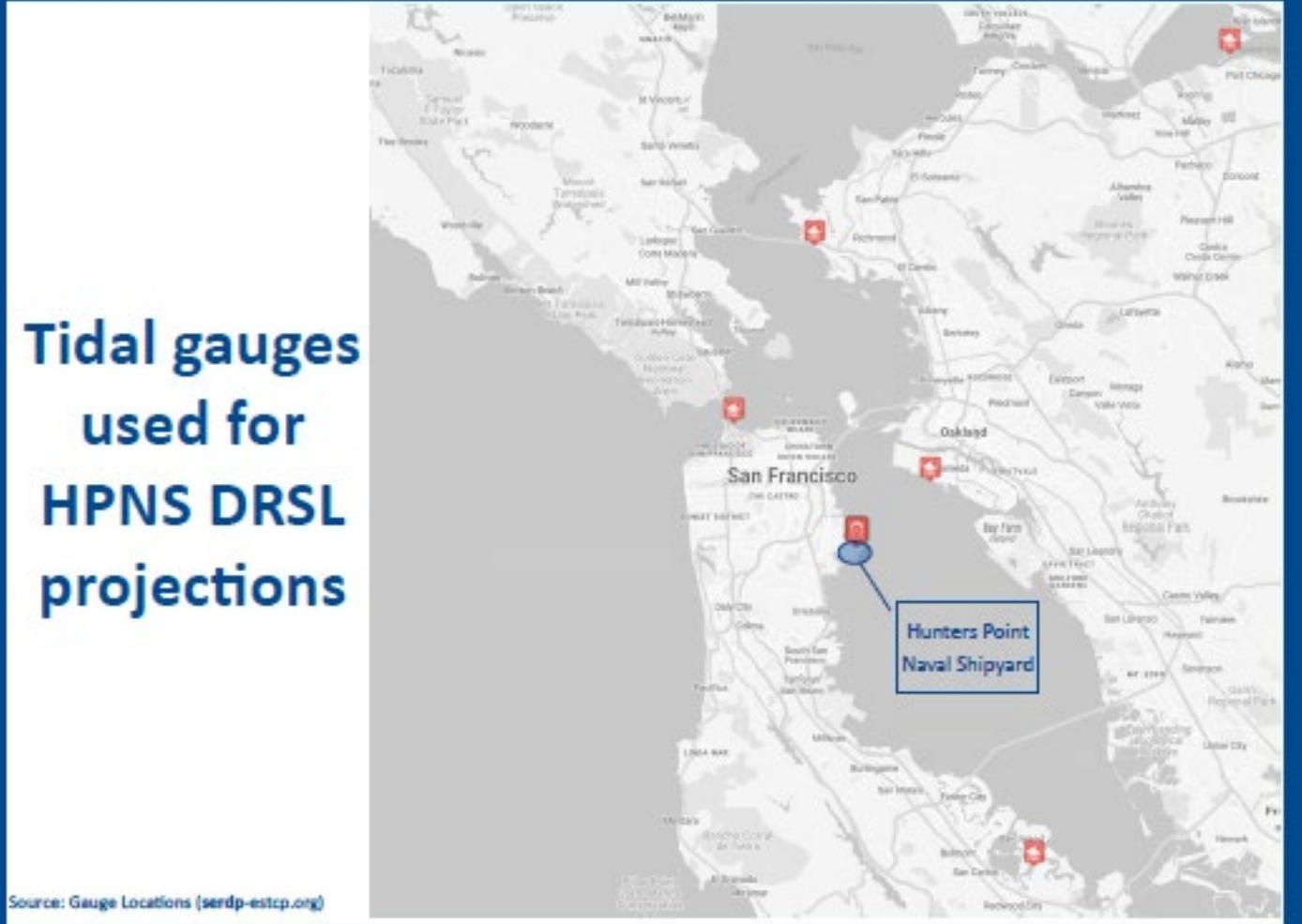
Projected groundwater emergence
limited to small areas in Parcel D-1 and Parcel E-2 wetlands in 2035; additional parcels in 2065

Comparison of Actual Sea Level Rise Measured in Nearby Tidal Gauges in San Francisco Bay

Tidal gauges used for HPNS DRSL projections



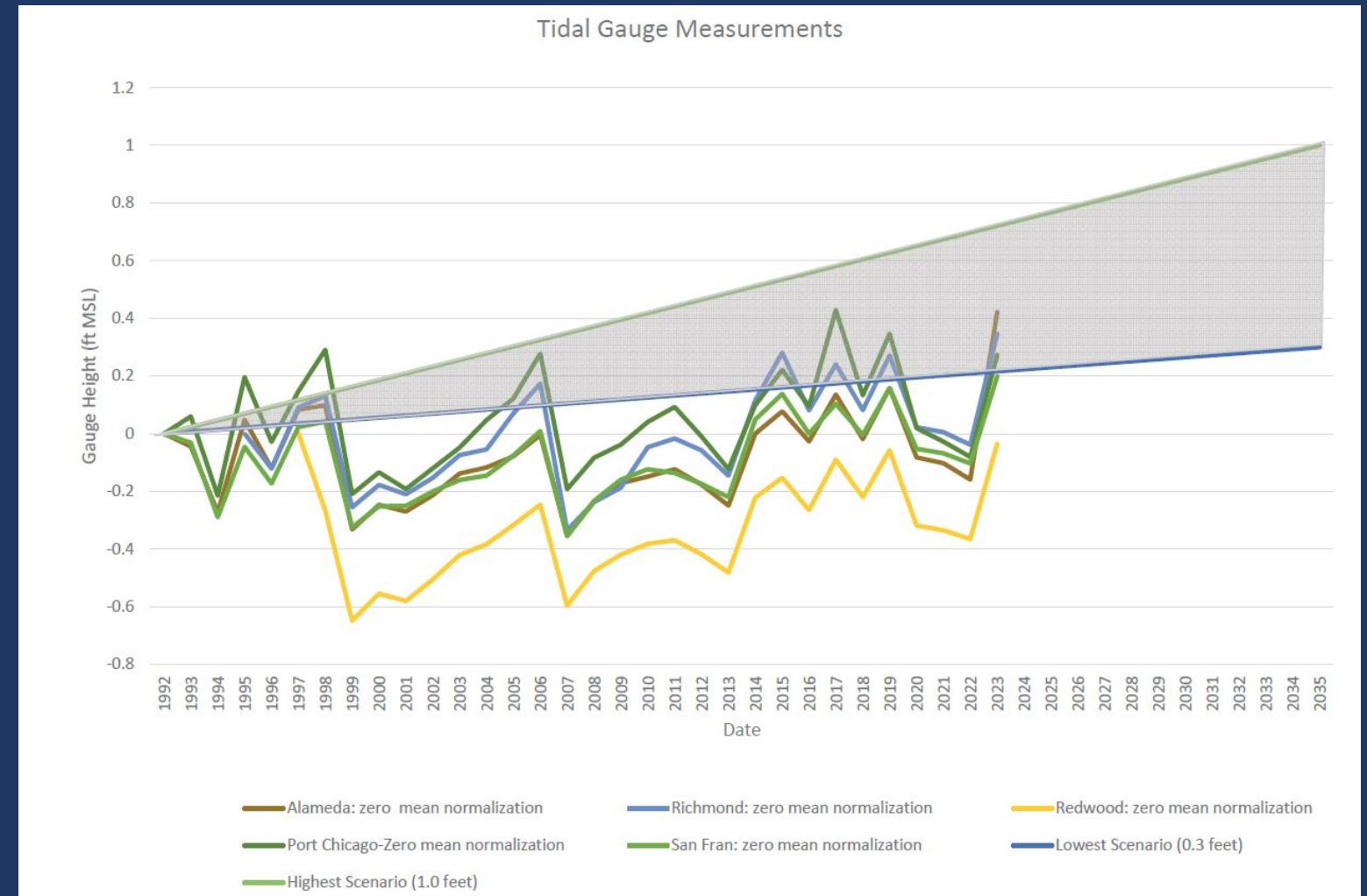
example of tidal gauge



Comparison of Actual Sea Level Rise Measured in Nearby Tidal Gauges in San Francisco Bay, over the last 30 years vs. Projections

Comparison to DRSL range of sea level rise projections (gray area), baseline year 1992

Note: Actual sea level rise in the last 30 years has been trending near the lower part of the projected range



Source of tidal gauge data: <https://tidesandcurrents.noaa.gov>

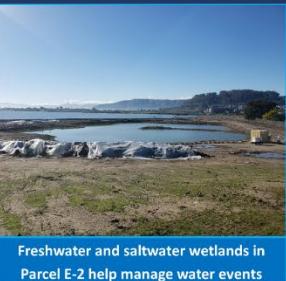
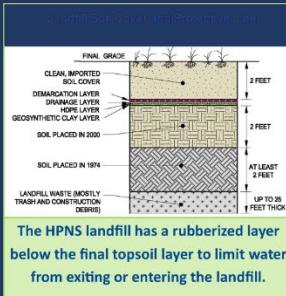
Vulnerabilities Identified for Further Risk Assessment

- **2035: permanent groundwater rise to the surface in limited areas**
 - Small portions of Parcel D-1
 - Small portions of E-2 wetland areas
 - Groundwater emergence is limited, evaluation of mobilization of contaminants of concern needs to be conducted to determine potential unacceptable risks
- **2065: permanent groundwater rise to the surface in additional areas**
 - Parcels B-1 (including IR 07/18), B-2, C, D-1, E, and E-2 wetlands
 - Potential pathway to above-ground human receptors and ecological receptors in San Francisco Bay



Rock revetments and sea walls are important parts of the Navy's proactive efforts to plan for the impacts of climate change

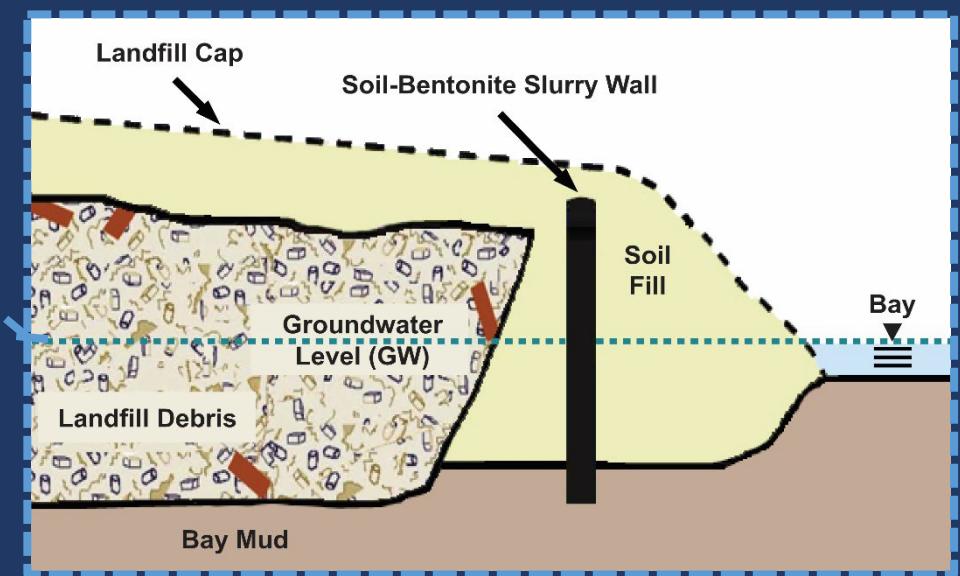
Measures to Address Sea Level Rise at HPNS



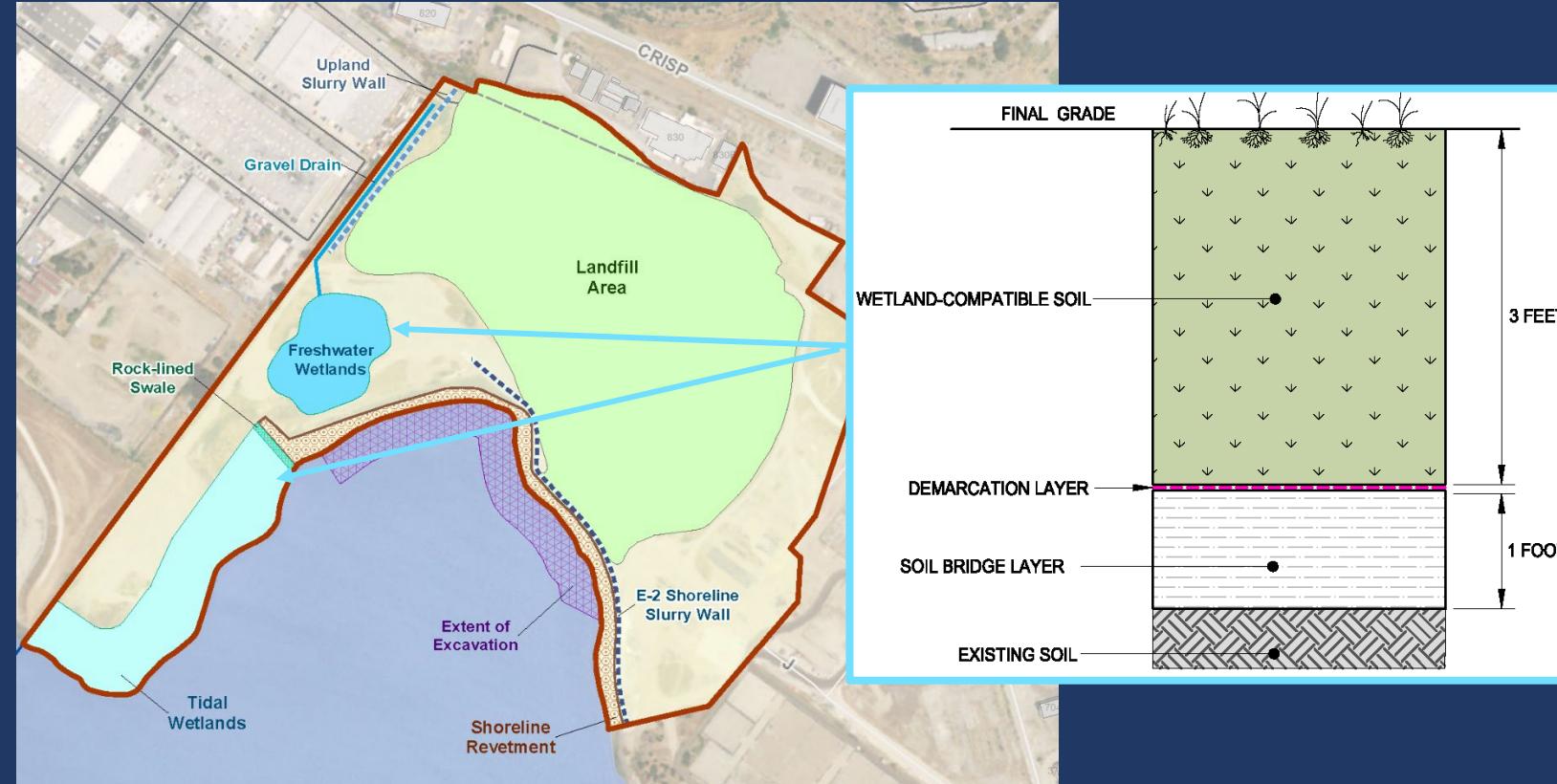
Parcel E-2: Measures to Manage Groundwater – Slurry Walls



- The shoreline slurry wall limits groundwater migration from Parcel E-2 to the Bay
- The upland slurry wall limits groundwater flow into the landfill and will provide a natural water source for the new freshwater wetlands



Parcel E-2 Landfill: Measures to Manage Groundwater and Bay Waters - Wetlands

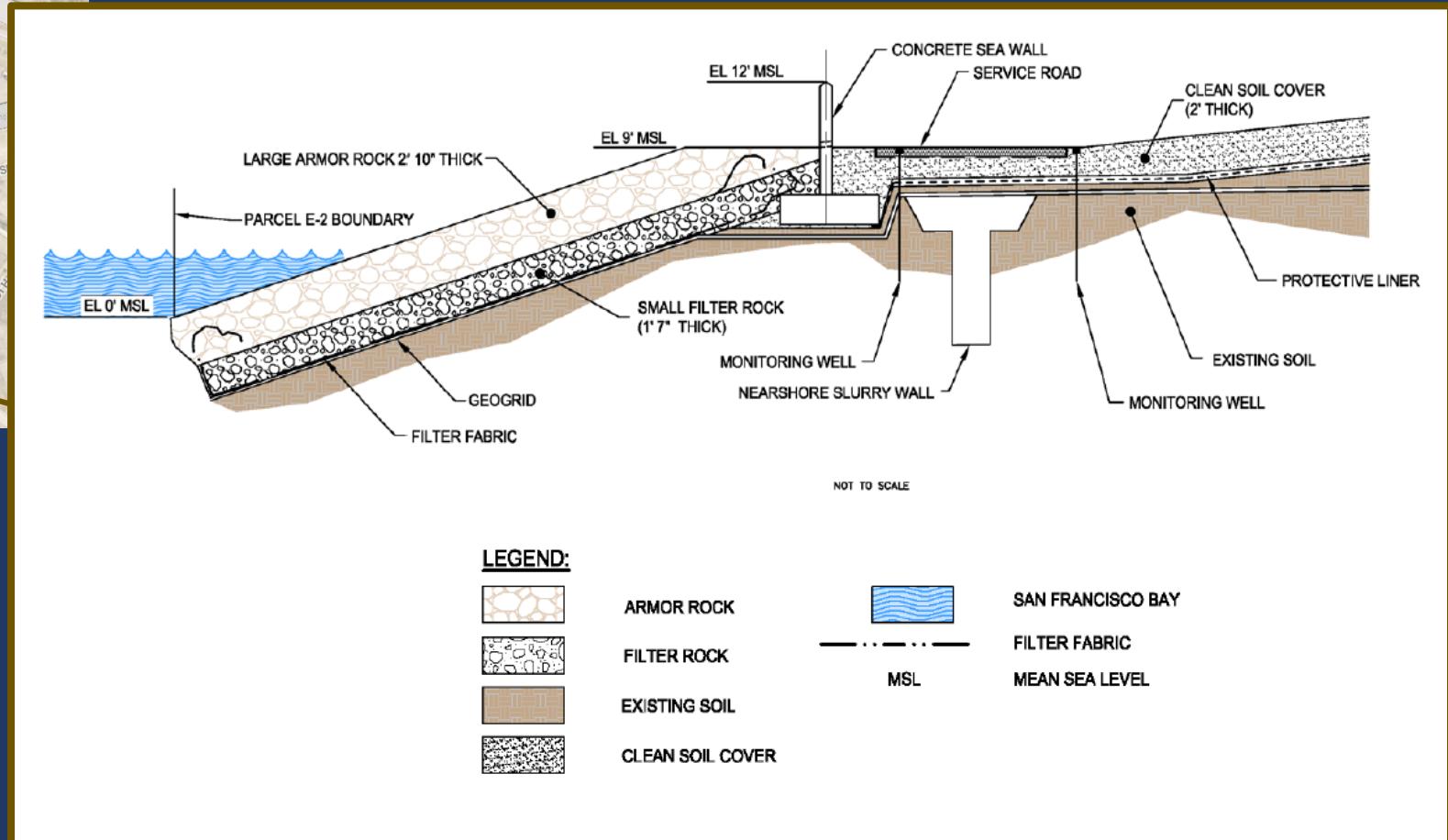


- The freshwater wetland includes a pond that will be fed by the nearby slurry wall to limit groundwater from entering the landfill area
- The tidal wetland lies on the shoreline and helps manage Bay waters on Parcel E-2 from entering the landfill area

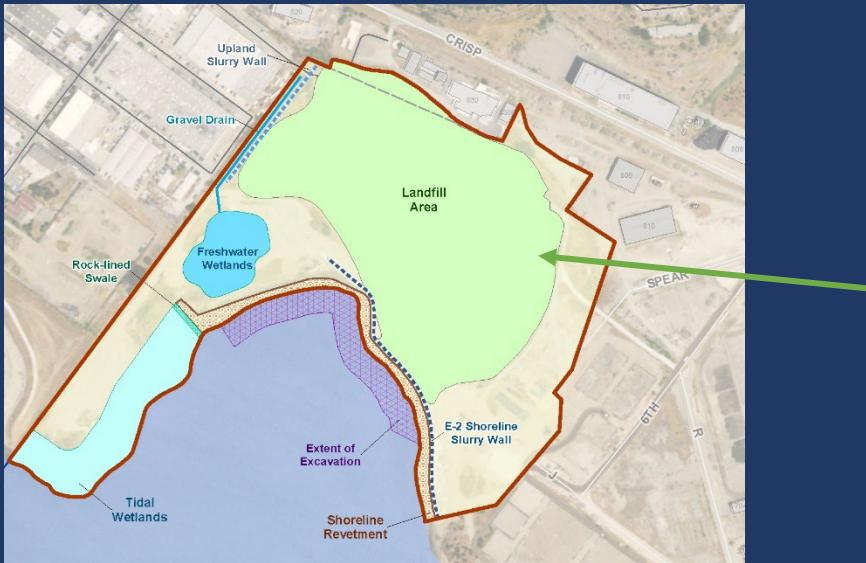
Parcel E-2 Landfill: Measures to Limit Sea Water onto Parcel E-2



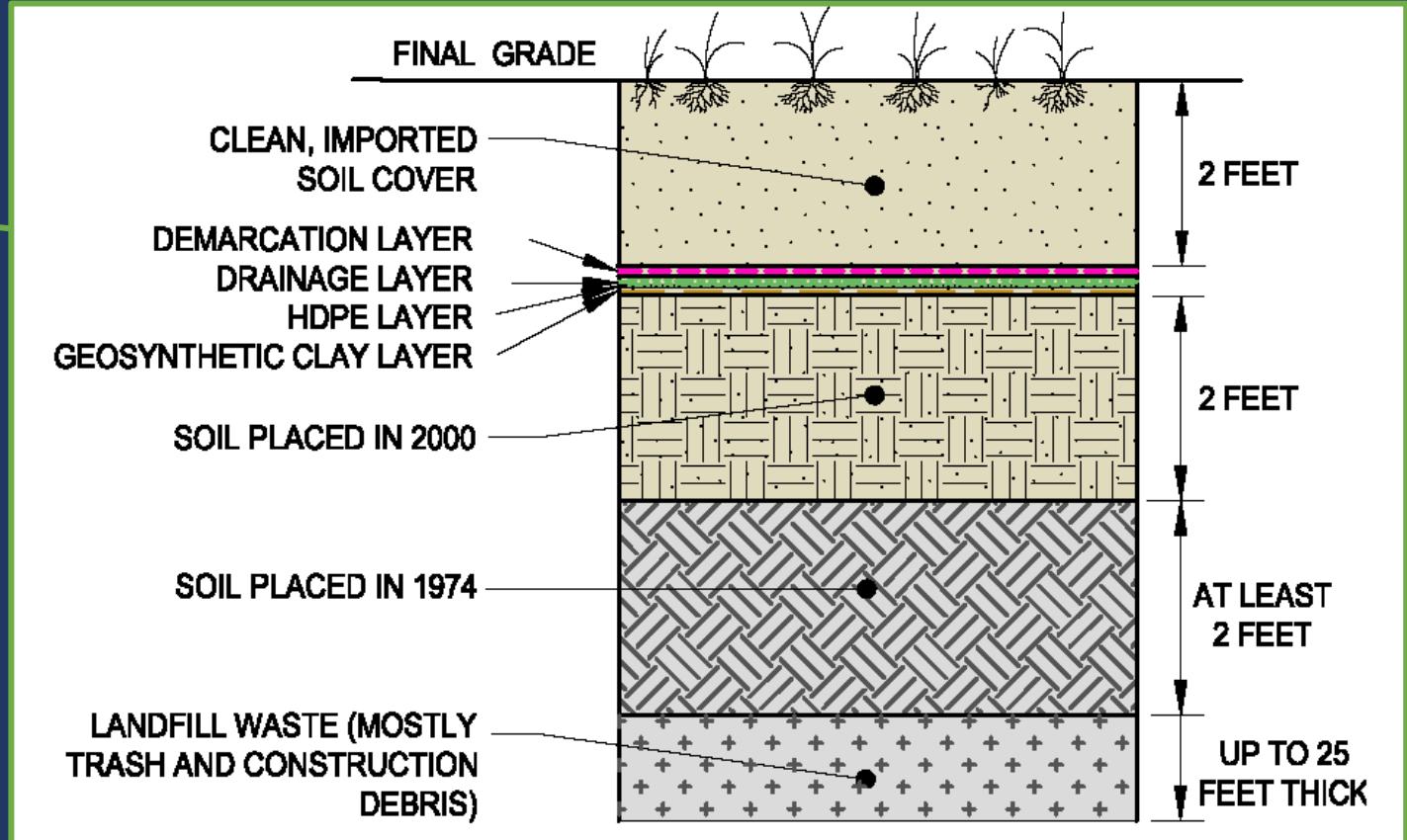
- A protective barrier of rocks (“revetment”) at the shoreline and the cement sea wall limit the impact of Bay waters onto the landfill area



Parcel E-2 Landfill: Measures to Limit Contaminant Migration



- The multilayer cap allows surface water to drain through the layers to limit standing water
- The remedy design provides for a pump-and-treat solution in the case of excessive flooding of the landfill area



Next Steps in Climate Resilience Assessment at HPNS



- **Conduct site-specific studies to evaluate climate vulnerabilities**
 - Parcel D-1 and wetland areas of E-2 remedies per 2035 projections
 - Parcels B-1 (including IR 07/18), B-2, C, D-1, E, and wetland areas of E-2 per 2065 projections
 - Additional studies as determined (e.g. horizontal groundwater flow)
- **Verify HPNS sea level rise projections**
- **Evaluate annual groundwater elevation data to determine how site-specific measurements compare to projections**
- **Expand Navy's assessment of sea level rise to 2100 projections in site specific assessments and in the Sixth Five-Year Review.**

Ways to Learn More and Provide Feedback on the HPNS Climate Resilience Assessment

- **Review the HPNS Draft Five-Year Review Report**
 - On the Documents page of the Navy's website: www.bracpmo.navy.mil/hpns
 - At the San Francisco Public Library, Main Branch, 100 Larkin Street, 5th Floor
- **In response to multiple requests, the Navy has extended the public review period to May 7, 2024**



Scan to go to the Documents page on the Navy's website

Email comments to: HPNS_FYR_Comments@us.navy.mil

Attend the Navy's Presentation on May 20, 2024 at 6:00 p.m.

HPS CAC E&R Subcommittee Meeting

- Presentation topic includes discussion of public comments received and the Navy's response



Resources for More Information

HPNS Program Management



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Navy BRAC PMO West
33000 Nixie Way, Bldg 50, Suite 207
San Diego, CA 92147
www.bracpmo.navy.mil/hpns

Regulatory Agencies

Andrew Bain, US Environmental Protection Agency
bain.andrew@epa.gov

Michael Howley, CA Dept. of Toxic Substances Control
michael.howley@dtsc.ca.gov

Mary Snow, San Francisco Reg'l Water Quality Control Board
mary.snow@waterboards.ca.gov

Other Resources



Community Technical Advisor
Dr. Kathryn Higley
(541) 737-7036
kathryn.higley@oregonstate.edu
www.ne.oregonstate.edu

HPNS Information Repository
San Francisco Public Library (Main Branch)
100 Larkin Street, 5th Floor, Gov't Information Center

Visit www.bracpmo.navy.mil/HPNS to link to the online HPNS Administrative Record (on the home page and documents page)

HPNS Community Outreach

Send an email or leave a message

- For program information
- To join the HPNS Mailing List
- To request language assistance



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