APPENDIX D: EXAMPLE PLANNING TABLE USED TO ASSIST WITH THE DEVELOPMENT OF THE CONCEPTUAL SITE MODEL REFINEMENT IN STEP 3
SUMMARY OF ASSESSMENT ENDPOINTS, RISK QUESTIONS AND MEASUREMENTS ENDPOINTS.
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Receptor Class and Specific Receptors	Assessment Endpoint	Risk Questions	Surrogate Species or Community	Measurement Endpoints	Uncertainties	Notes
1º PRODUCERS V. Phytoplankton and algae Unicellular plants	1) Survival and reproduction 2) Maintain a similar zooplankton community to that in similar habitat in SF Bay	1) Are surface water chemicals related to Navy activities present at concentrations acutely or chronically toxic to the phytoplankton community? 2) Are Navy-related chemical concentrations in water high enough to cause adverse impacts to the structure of the phytoplankton community?	*Lassiosira* or *Skeletonema* Phytoplankton Community	1) Laboratory test for toxicity 2) Abundance of phytoplankton (e.g. chlorophyll a?) 3) Compare biodiversity index to SF Bay reference sites	1) Lab test may not reflect field conditions. 2) May be infeasible to determine acceptable reference site 3) Many confounding factors to evaluating results. 4) Influx due to tide may confound results. 5) Biodiversity index may not be feasible in the SF Bay	1) The plankton community would be inferred to be healthy, if the BMI community and their predators are healthy. This trophic path is adequately evaluated through analysis of other pathways. **PROPOSE NOT TO EVALUATE THIS ENDPOINT**.
1º CONSUMERS VI. Zooplankton Copepods, rotifers, larval shellfish	1) A similar zooplankton community to that in similar habitats in the SF Bay	1) Are surface water chemicals related to navy activities present at concentrations acutely or chronically toxic to the zooplankton community? 2) Are Navy-related chemical concentrations in water high enough to cause adverse impacts to the structure of the zooplankton community?	*Mysidopsis, or Mytilus* larvae *Ampelisca abdita* Zooplankton Community	1) Laboratory test for toxicity 2) Abundance of zooplankton in field 3) Compare biodiversity index to SF Bay reference sites	1) Lab test may not reflect field conditions. 2) Many confounding factors to evaluating results. 3) Biodiversity index may not be feasible in the SF Bay	1) The plankton community would be inferred to be healthy, if the BMI community and their predators are healthy. This trophic path is adequately evaluated through analysis of other pathways. **PROPOSE NOT TO EVALUATE THIS ENDPOINT.**
1º CONSUMERS VII. Benthic Macroinvertebrates (BMI) Amphipods, bivalves, polychaete worms, and crabs	1) Acute or chronic toxicity to BMI 2) *In situ* toxicity to BMI compared to SFBAY? 3) Maintain populations of diverse species that represents a stable healthy benthic community	1) Are chemicals in Seaplane Lagoon adversely affecting benthic organisms? 2) Is the toxicity of Alameda Point sediments similar to sites in the Bay considered to be generally unaffected by point discharges? 3) Is the benthic community diversity in Seaplane Lagoon lower than reference areas in the Bay?	*Eohaustorius sp, Neanthes sp.,* --or- *Strongylocentrotus sp.* Benthic community	1) Compare concentration of COPECs in sediment to levels reported in the scientific literature to be harmful. 2) Compare site-specific sediment toxicity tests to SF Bay reference stations, including analysis of covariance with sediment chemical concentrations. 3) Conduct community analyses in concert with analysis of covariance with sediment chemical concentrations.	1) Actual conditions of exposure in SF Bay may not be represented. 2) May be infeasible to determine acceptable reference site 3) Effects of salinity, temperature and organic content may confound toxicity tests, organic material or other characteristics unrelated to chemicals. 4) Community analyses may have large uncertainty in the Bay.	1) This step is already accomplished through the COPEC screening process. 2) Toxicity test results need to be scrutinized to determine that percentage of organic carbon, grain size, salinity and other physical characteristics of the comparison tests are similar to those at Alameda Point. 3) Benthic community analyses have not been demonstrated to be useful in SF Bay. The high proportion of introduced species, the wide temporal variation in populations and the high variability in physical conditions such as salinity, temperature, grain size, and organic material content can confound the interpretation of community analysis results.

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2º CONSUMERS VIII. Planktonivorous Fish Herring, topsmelt, and anchovy	1) Maintain a healthy, self-sustaining population in a balanced community by protecting the planktonivorous fish from the cumulative effects of chemicals in their food. 2) Fish egg development	1) Will the consumption of Navy-related chemicals in prey items be acutely or chronically toxic to fish? 2) Will the consumption of Navy related chemicals in prey items adversely affect larval survival of planktonivorous fish? 3) Is the planktonivorous fish community composition altered from the toxic effects of Navy-related chemicals in prey items?	Pacific herring Topsmelt embryo-larval development	1) Measure concentration of chemicals that have bioaccumulated from sediment or food chain in prey items and compare them to fish TRVs. 2) Topsmelt embryo sediment-water interface toxicity test	1) Limited information from which to generate fish TRVs. Identifying an appropriate reference site. 2) Toxicity to embryos does not evaluate whether adults can spawn. 3) Community analysis not feasible. 4) Planktonivorous fish feed in the water column and would have limited contact with contaminated sediments.	1) The planktonivorous fish community would be inferred to be healthy, if the higher trophic level piscivorous fish and their predators are healthy. This trophic path is adequately evaluated through analysis of other pathways. **PROPOSE NOT TO EVALUATE THIS ENDPOINT.**
2º CONSUMERS IX. Benthic-Feeding Fish Starry flounder, English sole, goby, sturgeon, and plainfin midshipman	1) Maintain a healthy, self-sustaining population in a balanced community by protecting the benthic-feeding fish from the bioaccumulative effects of chemicals in their food and in consumed sediments.	1) Will the consumption of Navy-related chemicals in prey items, **in addition to incidental sediment ingestion,** be acutely or chronically toxic to fish (including growth and reproduction)? 2) Is the benthic-feeding fish community structure from the toxic effects of Navy-related chemicals in prey items?	White croaker Fish community	1) Measure concentration of chemicals in prey items and compare to fish TRVs 2) Perform toxicity tests using field-collected prey items sediment and water or *in-situ* testing methods 3) Community analysis using biodiversity or dominance	1) Limited information from which to generate fish TRVs 2) Toxicity tests using field prey may not be feasible. 3) May not be feasible to assess predator communities in SF Bay	1) Very high degree of uncertainty in calculating abiotic to biotic accumulation phase. 2) Very high degree of uncertainty in calculating abiotic to biotic accumulation phase.
3º CONSUMERS X. Piscivorous Fish California Halibut, striped bass	1) Maintain a healthy, self-sustaining population in a balanced community by protecting the piscivorous fish from the bioaccumulative effects of chemicals in their food.	1) Will the consumption of Navy-related chemicals in prey items be acutely or chronically toxic to fish (including effects on growth or reproduction)? 2) Is the piscivorous fish community composition altered from the toxic effects of Navy-related chemicals in prey items?	California halibut Fish community	1) Model potential concentrations of chemicals in prey items, by applying a bioaccumulation factor potentially derived from literature and compare to TRV 2) Measure concentration of chemicals in prey items and compare to fish TRVs 3) Perform toxicity tests using field-collected prey items and water or *in-situ* testing methods 4) Community analysis using biodiversity or dominance	1) Bioaccumulation factor may be best estimate based on limited data. 2) California halibut, a common large piscivore, has wide range as adult. Young probably are present in SL for < 2 years 3) Young California halibut are substantially plankton and larval fish feeders, only becoming piscivorous at larger size. 4) Identifying an appropriate reference site probably not possible 5) May not be feasible to assess predator communities in SF Bay.	1) Use bioaccumulation factors calculated from OU-2 collected fish. Potentially need to collect additional BA data from other sites at OU-4 2) Very high degree of uncertainty in calculating abiotic to biotic accumulation phase

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3º CONSUMERS XI. Benthic-Feeding Birds Surf scoter, ruddy duck	1) Survival and reproduction of benthic-feeding birds? 2) Is the concentration of chemicals in prey at Seaplane Lagoon higher than the concentration elsewhere in the S.F. Bay?	1) Would the consumption of sediment-associated chemicals in benthic prey (such as snails and bivalves) and sediments cause either acute or chronic toxicity to benthic-feeding birds (particularly surf scoters)? 2) Would the consumption of sediment-associated chemicals in benthic prey and sediments cause adverse effects on reproductive capacity of benthic-feeding birds (particularly surf scoters)? 3) Are chemicals in prey at Seaplane Lagoon specific to the Navy, or general SF Bay conditions?	Surf scoter	1) Model potential concentrations of chemicals in prey items by applying bioaccumulation factors derived from literature sources and comparing these doses to bird TRVs. 2) Measure concentration of chemicals in prey items and comparing them to bird TRVs 3) Compare concentrations of chemicals in *Macoma nasuta* to reference locations in SF Bay	1 and 2) Area-use-factor for surf scoters and other surrogates are estimates. Uncertainty factors associated with bioaccumulation factors may over-or under-represent field conditions. TRVs developed for laboratory animals may not be accurate surrogates for wildlife. Sediment ingestion rates for surf scoters are uncertain. 3) Identifying a reference site controlled for other physical variables	
3º CONSUMERS XII. Piscivorous Mammals Harbor seal	1) To protect the reproductive ability of piscivorous mammals from bioaccumulating chemicals in their food sources.	1) Are sediment-associated chemicals in prey fish present at concentrations reproductively toxic to mammals (particularly harbor seals)?	Harbor seal	1) Model potential concentrations of chemicals in prey items by applying bioaccumulation factors derived from literature sources and comparing these doses to mammal TRVs 2) Measure concentration of chemicals in prey items and comparing them to mammal TRVs 3) Compare concentration of chemicals in prey fish in Seaplane Lagoon to reference sites in the SF Bay	1) Area-use-factor is less than 100%. Species ranges widely. 2) May be infeasible to determine acceptable reference site 3) TRVs were developed for laboratory animals, which may not be suitable surrogates for wildlife. 4) Sediment ingestion rate is uncertain	1) High degree of uncertainty with this species
3º CONSUMERS XIII. Piscivorous Birds Cormorant, pelican, and terns	1) Is the concentration of chemicals in prey items in Seaplane lagoon adversely affecting the health (either survival or reproduction) of piscivorous birds? 2) Is the concentration of chemicals in prey at Seaplane Lagoon higher than the concentration elsewhere in the S.F. Bay? 3) Population recruitment	1) Are sediment-associated chemicals in prey fish present at concentrations reproductively toxic to birds (particularly terns, cormorants or pelicans)? 2) Would the consumption of sediment-associated chemicals in fish cause adverse effects on reproductive capacity of piscivorous birds (particularly Least terns)? 3) Are chemicals in fish at Seaplane Lagoon specific to the Navy, or general SF Bay conditions? 4) Are chemicals in fish in Seaplane Lagoon causing lower recruitment in least terns?	Least tern	1) Model potential concentrations of chemicals in prey items by applying bioaccumulation factors derived from literature sources and comparing these doses to bird TRVs. 2) Measure concentration of chemicals in prey items and compare to bird TRVs. 3) Compare concentration of chemicals in prey fish in Seaplane Lagoon to reference sites in the SF Bay 4) Compare eggs/nest, fledglings-per-nest to reference sites.	1) Area-use-factor may be less than 100%. 2) TRVs were developed for laboratory animals, which may not be suitable surrogates for wildlife 3) Most sensitive endpoint (for example eggshell thinning) may not be sufficiently known. 4) Nest success depends on food supply, predation and other factors which may not be consistent across reference areas.	1) Need to determine which of least tern, double crested cormorant and brown pelican are most sensitive based on ingestion to weight ratio.