Port Gardner

Regional Background

Sampling and Analysis Plan

Technical Workshop

March 12, 2013

Goals For Today

- Provide context for why we're conducting sampling.
- Provide an overview of the SAP.
- Hear your feedback and issues you've identified.
- Discuss issues you've raised and your ideas for resolution.

Why is Ecology Determining Regional Background?

- **Sediment Management Standards Rule Provision:**
  - Revised rule adopted: February 22, 2013.
  - Adopted rule effective date: September 1, 2013.
  - WAC 173-204-505: Definition of regional background.
  - WAC 173-204-560(5): Criteria for establishing regional background.

- **Rule Advisory Group(s):** Members unanimously advised Ecology that it should be our responsibility to sample and establish Regional Background.

Regional Background: Establishing Cleanup Levels

Cleanup Screening Level
Highest of:

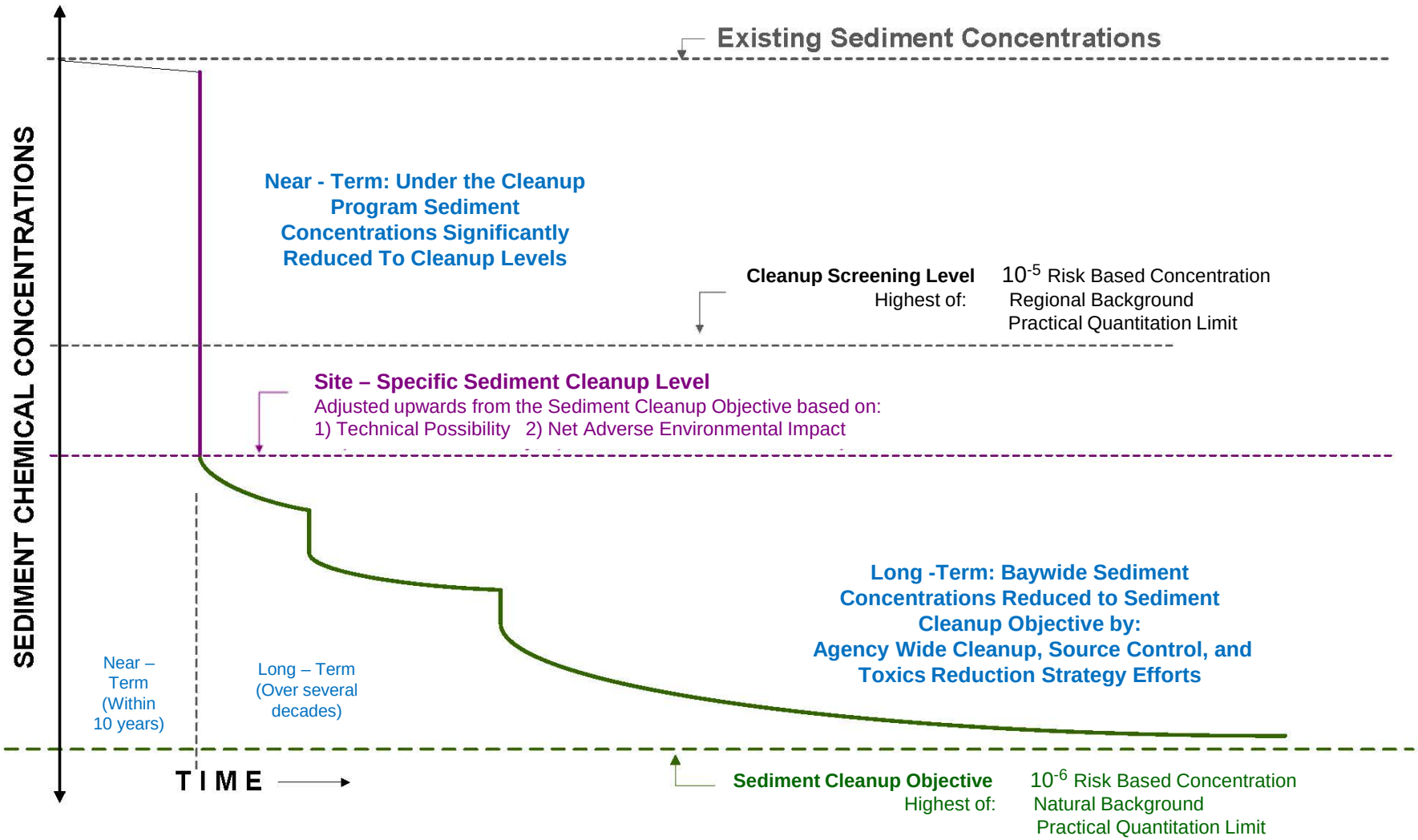
- Risk based criteria *Lowest of:*
  - Benthic Cleanup Screening Level
  - Human Health Risk 10^{-5}
  - Ecological Risk Narrative
  - ARARs
- PQL
- **Regional Background**

Sediment Cleanup Level:
Adjusted upwards from Sediment Cleanup Objective based on technical possibility & net adverse environmental impacts

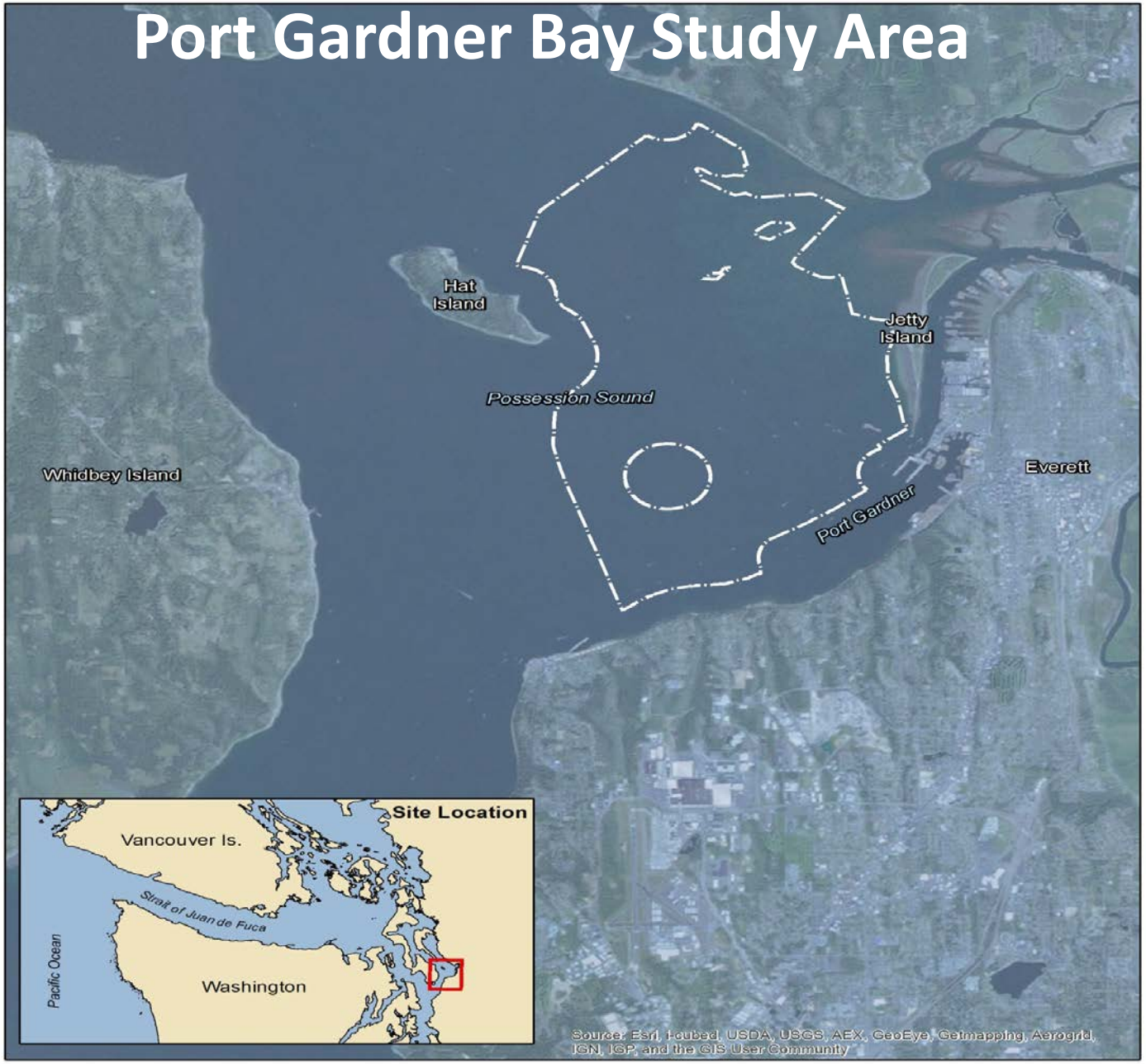
Sediment Cleanup Objective
Highest of:

- Risk based criteria *Lowest of:*
  - Benthic Sediment Cleanup Objective
  - Human Health Risk 10^{-6}
  - Ecological Risk Narrative
  - ARARs
- PQL
- Natural Background

How Regional Background fits with long term goals



Port Gardner Bay Study Area



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0 1 2 4 Miles

0 1 2 4 Kilometers

Figure 1. Port Gardner Bay Study Area

C:\GISprojects\Ecology\Background\PortGardner_Site.mxd

What was the process of SAP development?

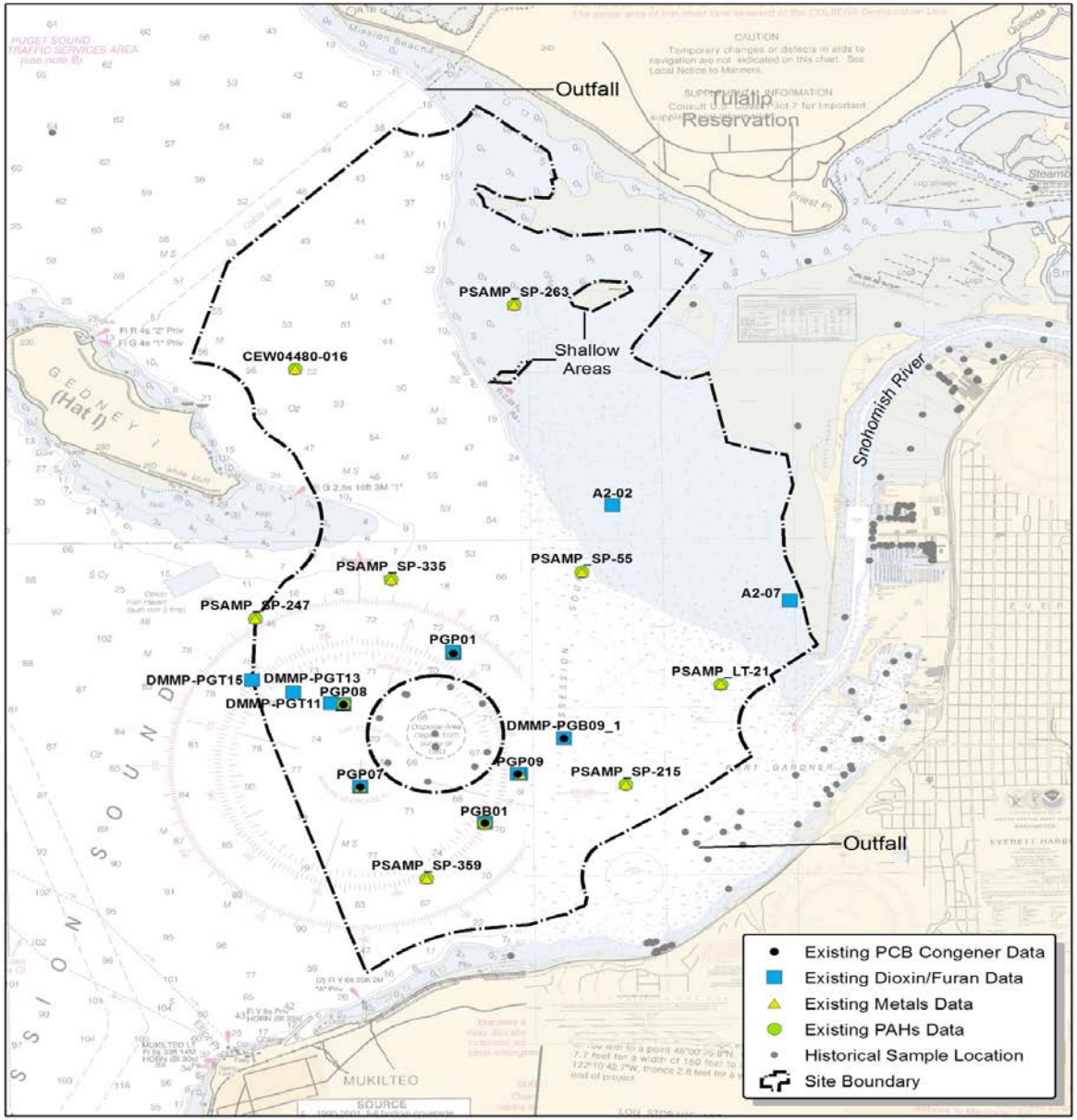
- Finalized definition of Regional Background in rule.
  - Incorporated feedback from rule advisory groups and public comments received on the proposed rule.
- Researched approaches for determining sampling stations.
- Identified sources and potential sources of contamination in the bay.
- Determined appropriate buffer between sources and sampling locations.

How Were Sources Identified?

- Used historical data to identify sources.
  - Cleanup site data.
  - Baywide sediment investigation data.

- Used best professional judgment to identify potential sources of contamination in the bay:
  - Stormwater outfalls.
  - Highly urbanized areas draining to the bay.

Existing Sediment Chemistry Data



0 2,000 4,000 8,000 Feet

0 500 1,000 2,000 Meters

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Figure 2. Existing Sediment Chemistry Data in Port Gardner Bay

Proposed Baseline Sampling Locations

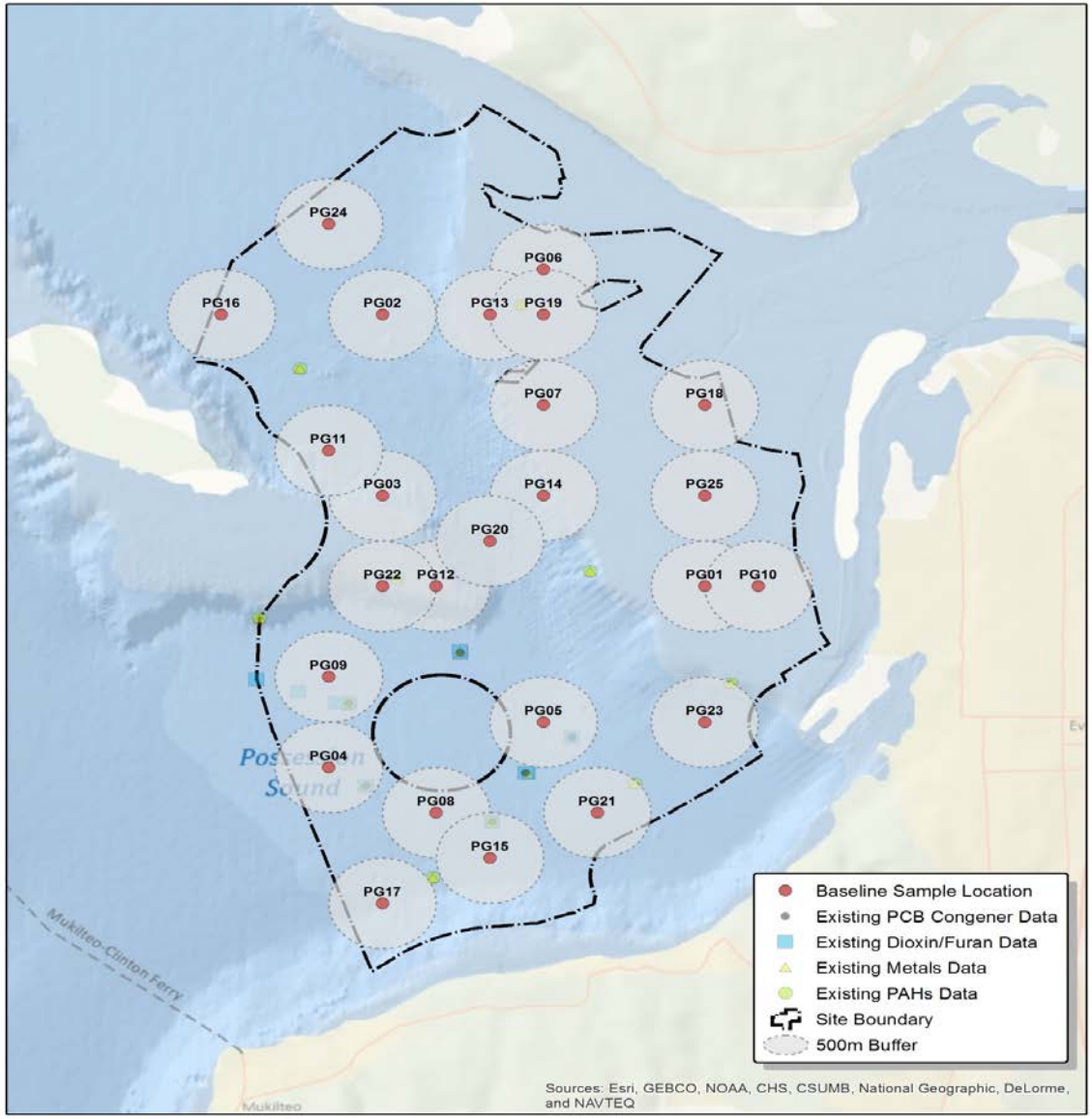

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Figure 3. Proposed Baseline Sediment Sampling Locations in Port Gardner Bay

Proposed Secondary Sampling Locations

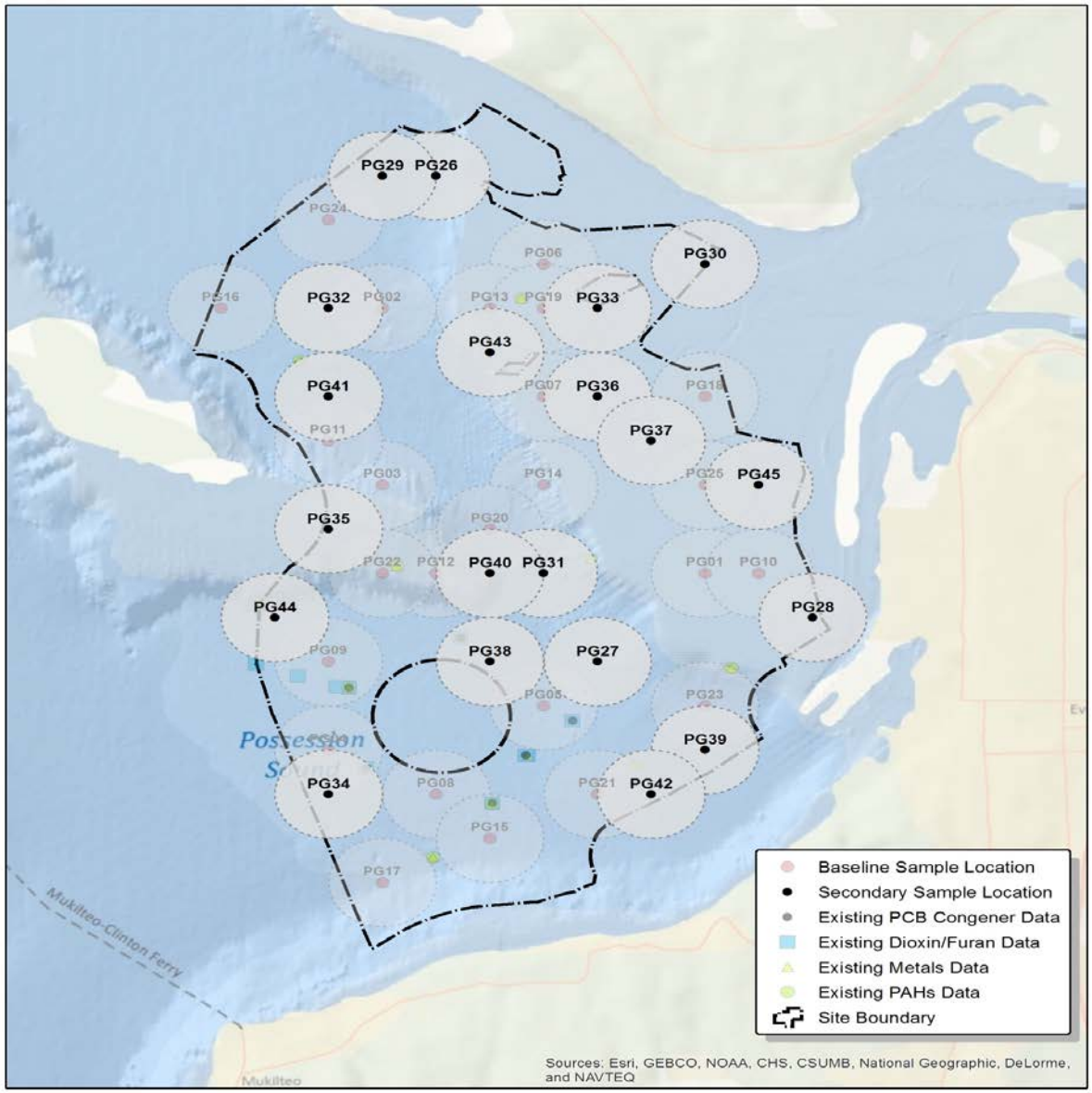

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Figure 4. Proposed Secondary Sediment Sampling Locations in Port Gardner Bay

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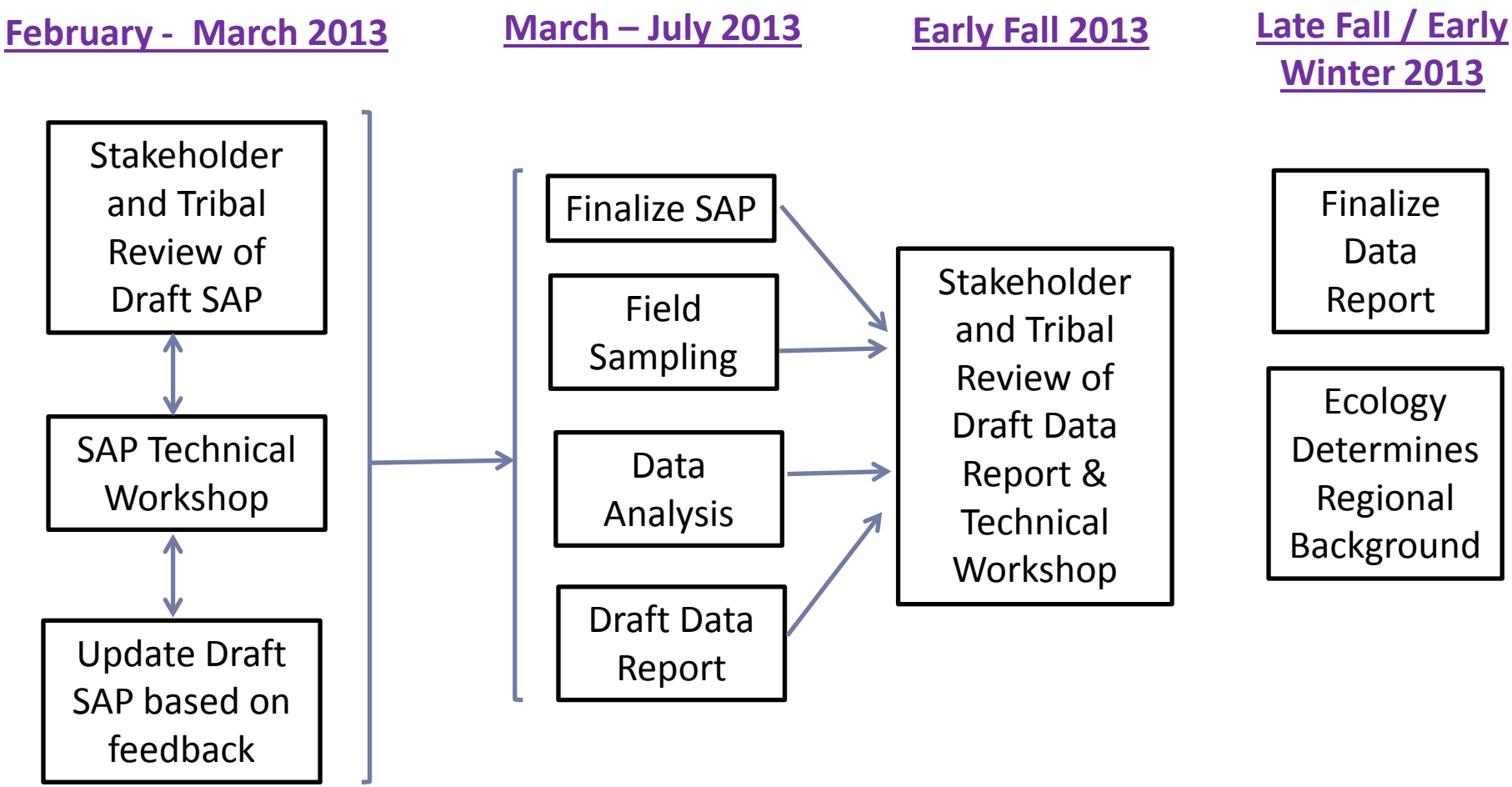
Process for Determining Sampling Locations

- Boundaries for the Background Area of Interest (AOI) were established to exclude:
  - Areas adjacent to known or suspected source areas
  - Shallow areas (above -6ft MLLW).
  - Natural background (Saratoga Passage).
- Within the AOI, used a spatially balanced random sampling design:
  - GIS algorithm was used to evenly distribute samples across the site (avoid sample clusters).
  - Minimum separation of 500m between samples for spatial independence.

Sample Sizes

- Baseline Sample Size (n=25)
  - Minimum sample size for describing distributional characteristics (shape, mean, variance)
- Secondary Archived Samples (up to 20)
  - All samples tested for Mercury (short holding times)
  - Number of archived samples tested for other analytes based on a target precision of the mean
    - Precision of the mean estimate improves with sample size
    - Target precision: 95UCL within 25% of the mean
    - Determined separately for each analyte

Regional Background Timeline & Next Steps



Next steps – Data Report Specifics

- Data Report Technical Workshop:
  - How would you like to be involved?
- Statistics and Calculating Values:
  - Feedback from you on suggested statistics.
- Data:
  - QA/QC issues
  - Practical quantitation limits
  - Method detection limits

Next steps – Context for Rule and Guidance

- Rule effective date September 1, 2013.
- Future Regional Background sampling:
  - Port Angeles: Field sampling scheduled for June 2013.
  - Elliott Bay/Lower Duwamish: Draft SAP for stakeholder review Late Summer 2013.
- Finalize guidance:
  - Considering a public comment period Summer 2013.
  - Finalize guidance Winter 2013.
  - Regional Background sampling as case studies in guidance.

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SMS Advisory Group Members

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