Effects of Toxics on the Sound: Sampling Proposal for Upcoming Proviso Report

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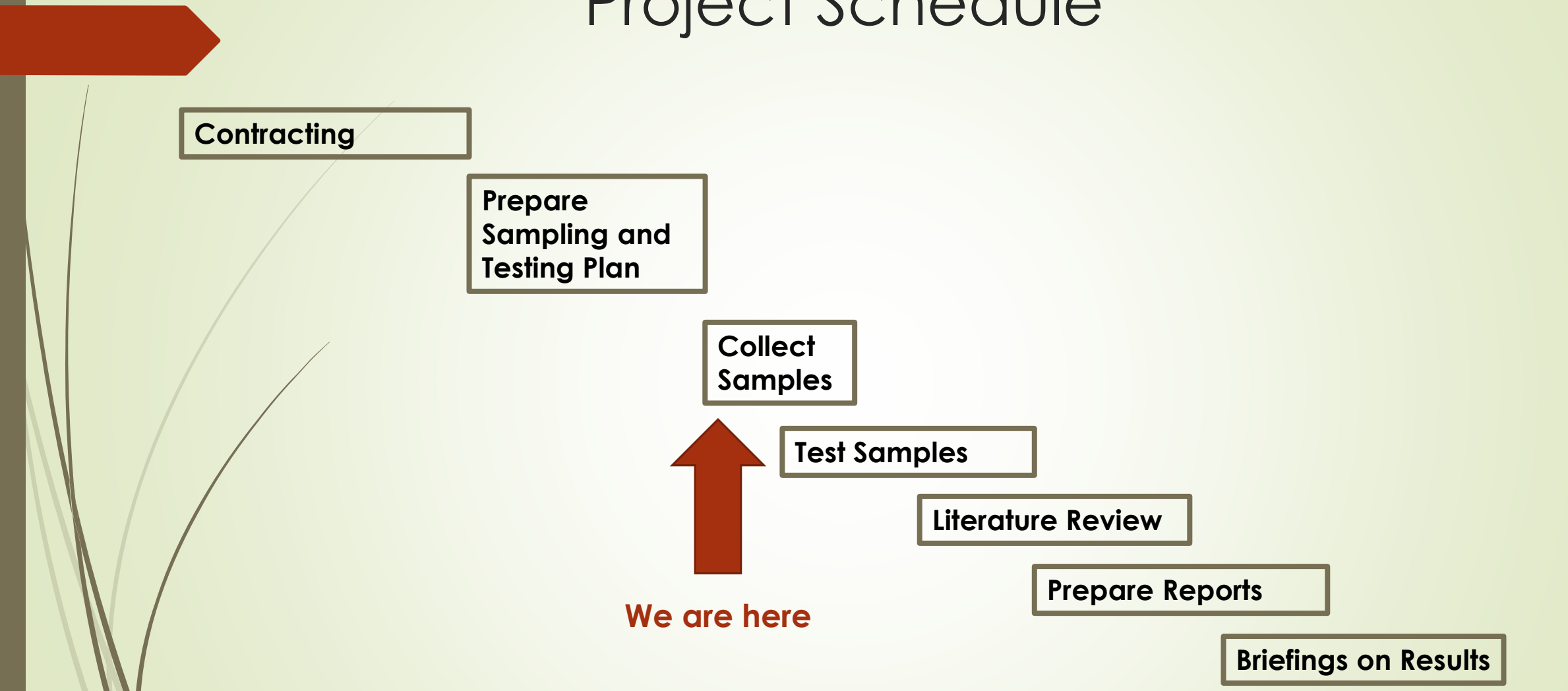
Project Background

- Included in King County Council budget adopted November 2018
- Independent research study
- To the degree possible, within $400K contract
  - Analyze toxic chemicals, including contaminants of emerging concern (CECs) not typically tested, in treated wastewater effluent and Puget Sound
  - Assess potential impacts on Orcas and Chinook
  - Assess potential treatment options

Project Schedule



Project Team

- Independent researchers
  - Washington State University - Puyallup
  - National Oceanic and Atmospheric Administration (NOAA) - Seattle
  - University of Washington – Tacoma
  - SGS Axys Laboratory
- King County support
  - King County Environmental Lab
  - Water and Land Resources Division Science Section
  - Wastewater Treatment Division

Samples to Collect

- Treated wastewater effluent samples
  - Once during high flow (winter/spring)
  - Once during low flow (spring/summer)
  - Brightwater, West Point, South Plant
- Puget Sound
  - Once during spring/summer only
  - Near surface and at depth
  - Near West Point and South Plant outfalls
  - Remote area near north end of Colvos Passage

Chemical Testing of Effluent and Water

- Limited number of samples to be analyzed
- Intended to provide preliminary information on topic
- Over 600 different chemicals targeted for analysis
  - Pharmaceuticals
  - Personal care products
  - Pesticides
  - Industrial chemicals
- Additional chemical test that can tentatively identify thousands of different chemicals

Chinook Salmon Lab Studies

- Expose juvenile Chinook to low-flow South Plant effluent
- After exposure test fish for
  - Endocrine function as measured by vitellogenin
  - Brain chemistry marker as an indicator of behavior affects
  - Blood cortisol levels as a marker of stress
  - Blood plasma chemistry to assess overall metabolism and health
  - Liver chemistry for hundreds of chemical metabolites to assess potential immune, growth, metabolism, and other responses

Modeling and Assessments

- Model bioaccumulation in Chinook
- Assess potential health impacts on Chinook
- Assess potential indirect effects on Orcas
- Effort begins after testing complete

Literature Review

- Led by Wastewater Treatment Division
- Focus on chemicals identified by independent researchers as potentially posing risks to Chinook
- Assess treatment options
- Effort begins after testing is complete

Next Steps

- Re-evaluate schedule due to COVID-19 pandemic
- Collect high-flow effluent samples at three treatment plants and begin chemistry tests
- Prepare to collect low-flow effluent and Puget Sound samples for chemistry and Chinook lab studies

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