

# Constituents of Emerging Concern Stakeholder Perspective

## Analytical Services

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# Profile

- Consulting, laboratory and field services
- Permit Compliance
- Ecological risk assessment
- Toxicity identification, control and remediation
- Staff actively working with CECs
- Recently completed fish and crab health studies—two outfalls in Vancouver, BC

# What Does Analytical Sector Provide??

- Data for regulatory compliance: “the number”
- Assurance that beneficial uses are being protected; or justification for additional measures are required
- Additional services related to achieving standard in event of exceedences
  - Need to know cause to set targets and implement appropriate control measures

# Objectives for Analytical Services

- Analytical Chemistry
  - “Provide a Number”
  - Has to be credible for regulatory use
    - Reproducible
    - Quantifiable interferences
    - Meaningful DL
    - Applicable in sediment, water and tissue matrices

# Objectives for Analytical Services

- Biological/Toxicological
  - Endpoints tied to meaningful effects
  - Endpoints tied to specific contaminants or biological process
  - Reproducible
  - Suitable for identifying cause
  - Suitable for setting targets for clean-up/remediation programs

# Emerging Contaminant Issues

- Identify a particular contaminant as a source of concern
- Identify associated mode of action and effects levels
- Identify threshold concentrations in water, sediment and tissues
- Develop appropriate analytical methodologies for different matrices

# Alternative Approach

- Identify potential mechanism or response
- Identify marker for that response in biological material of interest
- Use as a screening tool to trigger follow-up activities
- Advantages
  - Integrates all CECs present, as well as site-specific conditions and degradation products
  - Lack of response implies no further action required

# Disadvantages

- Marker may be more closely tied to exposure than to effects
- Relationship between marker and response may not be linear
- Marker may exhibit non-specificity and/or high variability
- May not have marker for all modes of action



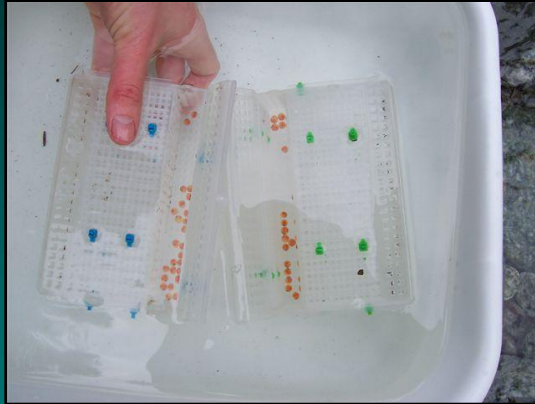
# Desirable Attributes

- Robust
  - Reasonable expectation of success
  - Minimal interferences
  - Relatively stable
- Meaningful
  - Sensitive; yields response at effects levels
  - High signal to noise ratio
- Interpretable
  - Response tied to specific effect or cause (W & T)
- Reproducible
- Rapid
- Realistic tissue volumes

# Possible Approach

- *In-situ* exposure of salmonid embryos through swim-up (biological test system)
- Evaluate effects under site-specific conditions—point- and non-point sources
  - Pilot programs in Washington and Canada
  - Quantifiable response
  - Known exposure
  - Tissue available for analysis of contaminant levels, biomarkers and histopathology

# In situ Study



# Remediation Targets

