

Challenges in ERA: Assessing the Groundwater Pathway

Risk Symposium

May 2007, UBC



Not talking about...

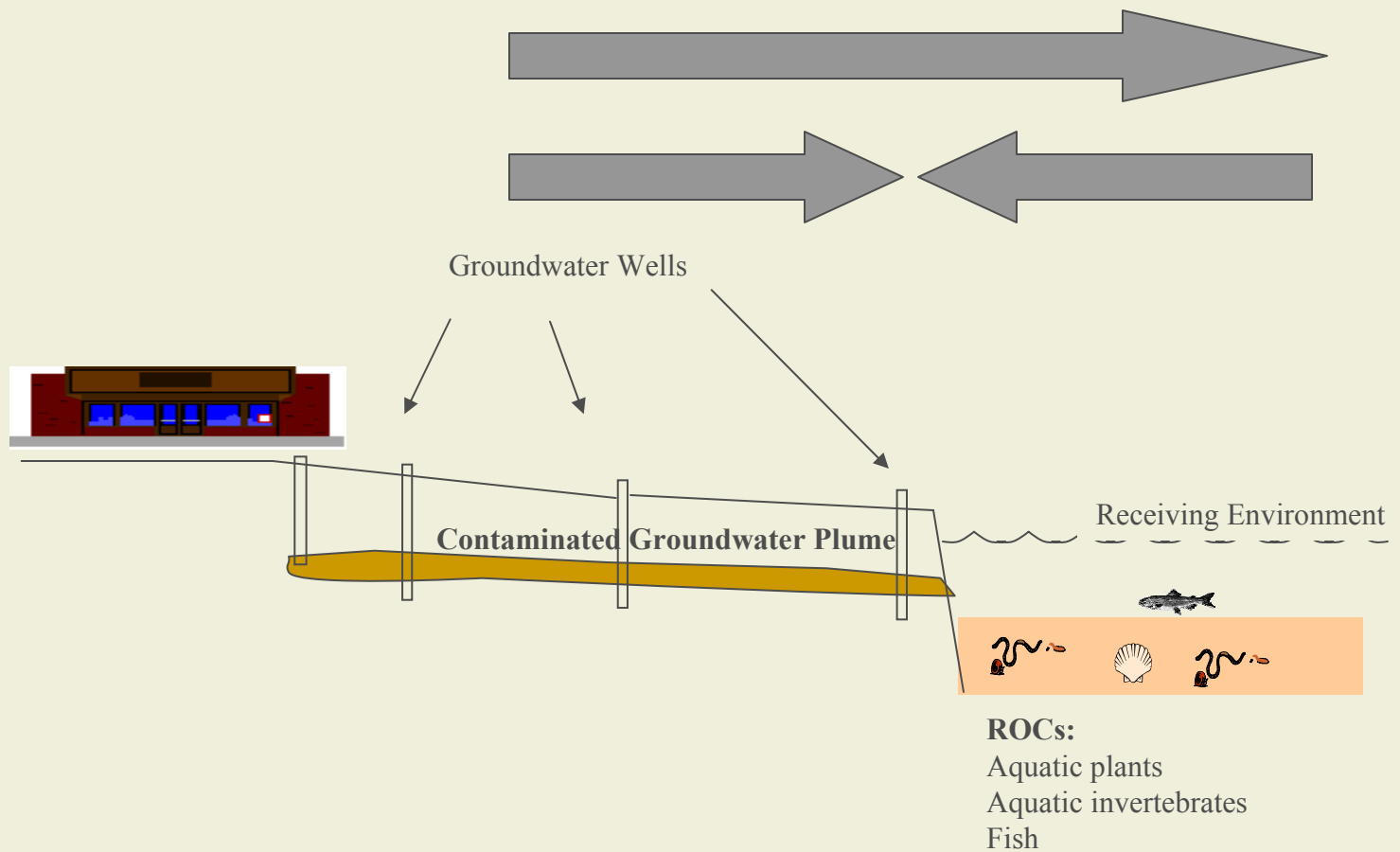
- Representative groundwater sampling (seasonality, depth, hydraulic connection, etc.)
- Bioassay test selection
- Benthic sampling and statistics
- Interstitial water sampling
- Plume modelling
- Confounding factors such as hardness, brine adjustment, redox shifts, etc.
- Future conditions (moving plume)



Question

- EC20 is stated protection goal for aquatic receptors in their environment
- This implies that measures of exposure and effects are in the receiving environment (not in the groundwater). Mixing is implicit.
- *Are we seeing a trend (?) towards judging groundwater only through toxicity testing of groundwater (EC20 of groundwater as a decision criteria)?*

Alternative Views of Groundwater





Goal of ERA Groundwater

- To assess spatial extent and magnitude of effects to aquatic receptors (in their environment)



Staged Approach

1. Assess Groundwater

- Chemistry & bioassays
- Groundwater data are essentially measures of “hazard” (doesn’t factor in receiving environment)
- Problem: How to predict field effects from groundwater data
- If toxic, don’t stop here...

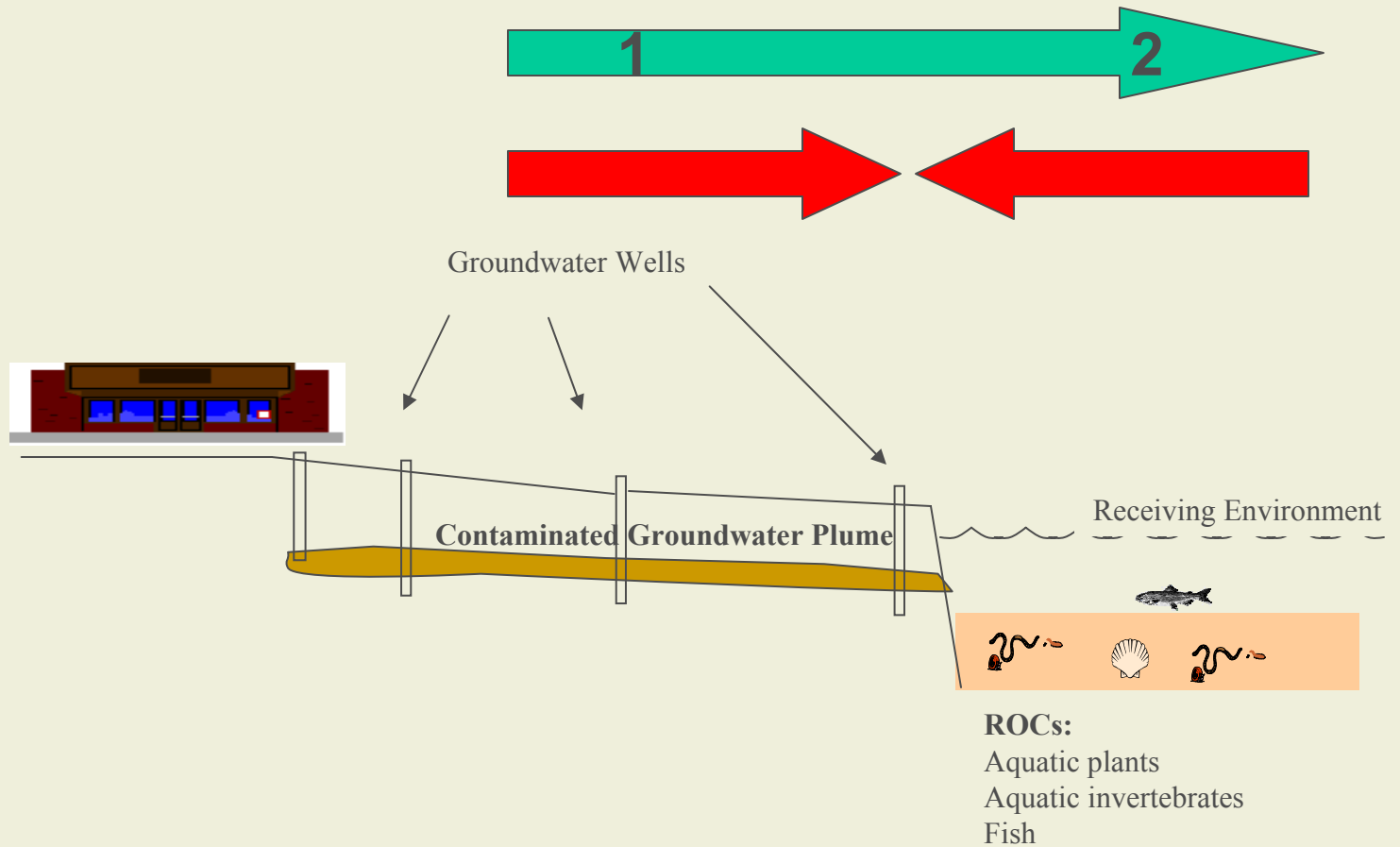


Staged Approach

2. Assess receiving environment quality

- Numerous measures
- Exposure is driven by loadings of groundwater to the environment
- Exposure in the receiving environment is “diluted” groundwater = effects assessment
- Often need weight of evidence

Alternative Views of Groundwater





Discussion

- What lines of evidence (groundwater vs. receiving environment) take primacy? Is that decision:
 - Site-specific?
 - Dependent on uncertainty?
- Who makes that decision (risk assessor vs. risk manager)?
- If groundwater is toxic (how toxic to what?) should risk assessment stop? How does this link to Fisheries Act?
- If the receiving environment measures are healthy, but the groundwater is toxic, what does the risk assessor do? And risk manager do?