

# Risk Definitions

- Risk can be defined in two ways. The first definition is given as the product of the likelihood of a specific undesirable event (e.g. injury, fire) and the consequence of the event.
- **Risk = Probability (or Frequency) x Consequence**
- At contaminated sites, exposure events take place repeatedly and the amount (or duration) of exposure is more of a concern than the frequency factor. In these situations it is more beneficial to replace the frequency term with exposure:
- **Risk = Exposure x [Degree of Harm (Consequence)]**

# Current “EMA/CSR” Requirements for “Achieving Acceptable Risk” through Remediation

- Numerical standards
  - CSR scheduled standards
  - Roster review available
- Risk-based standards
  - Quantitative risk assessment
  - Roster review NOT available
- EMA 56 – Selection of Remediation Options (or preferred risk levels by provincial government)

# EMA 56 - Selection of Remediation Options

- (1) A person conducting or otherwise providing for remediation of a site must give preference to remediation alternatives that provide **permanent solutions** to the maximum extent practicable, taking into account the following factors:
  - (a) any potential for **adverse effects on human health** or for **pollution of the environment**;
  - (b) the technical feasibility and **risks** associated with alternative remediation options;
  - (c) remediation costs associated with alternative remediation options and the potential economic benefits, costs and **effects** of the remediation options;
  - (d) other prescribed factors.
- (2) When issuing an approval in principle or a certificate of compliance, a director must consider whether permanent solutions have been given preference to the maximum extent practicable as determined in accordance with any guidelines set out in the regulations.

# Some Problems

- Numerical standards
  - Sched. 4
  - Sched. 5 (mandatory use of “HH intake of soil” and “Soil invert/plants”)
  - Sched. 6 (DW standards for Fe and Mn)
  - Missing standards
  - Sched. 10
- Risk-based standards
  - Limited use of site-specific adjustment of numerical standards
  - Low (or no) dilution factor allowed for soil vapour intrusion
  - No Roster review for simple risk assessments

# Proposed Amendments which will Reduce Cost (and time) to Remediate a Site

- Protocol 6 (coming)
  - Development of site-specific risk-based standards
  - Expedited process through Roster review
- Screening Level Risk Assessment (coming)
  - Simple exposure pathway analysis to eliminate standards that do not apply

....and some that may NOT!

- Proposed ACC may be too conservative
- Proposed HPS may capture too many sites
- Ecological Assertion is too onerous

# Suggestions.....

1. Simpler process for addressing “apparent contamination” due to background concentrations (in soil and groundwater)
2. Preferred Remediation (EMA 56) may be interpreted as being inconsistent with the option to use either numerical or risk-based standards (which are based on acceptable level of protection)
3. Other
4. and
5. so on.....