

GeoEnviroLogic Professional Development

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Session 4: "Risk" Session November 5, 2009 – 12:45 to 4:30 Terminal City Club (TCC) 837 West Hastings Street, Vancouver, BC

12:45 – 12:55 Registration and Lunch

12:55 – 1:00 Introductions and Overview

1:00 – 1:15 Review of Reference Materials
- Minimum qualified candidate
- Syllabus and reference list
- Roster practice guidelines and checklists

1:15 – 2:45 Group Topics and Discussions

GROUP #1: ECOLOGICAL RISK ASSESSMENT

1. Problem Formulation (17.5%)
 - a. Risk Assessment Planning
 - b. Integration of Available Information
 - c. Identification of stressors
 - d. Potentially Exposed Receptors
 - e. Selecting Assessment and Measurement Endpoints
 - f. Conceptual Models
 - g. Data Gap Analysis
 - h. Sampling and Analysis Plan

2. Exposure Assessment (12.5%)
 - a. Characterization of Exposure
 - b. Evaluating Data and Models for Analysis
 - i. Strengths and Limitations of Different Types of Data
 - ii. Literature Data – relevant species, study conditions
 - iii. Site Data/Observations - measurement and assessment endpoints; species diversity, richness, abundance
 - c. Measurement and/or Modeling Studies

3. Effects Assessment (12.5%)
 - a. Quantitative and Qualitative Site Observations
 - i. Terrestrial Receptors
 - ii. Aquatic Receptors
 - b. Bioassays
 - i. Field studies
 - ii. Laboratory toxicity tests
 - c. Toxicity Reference Values
 - i. Selection
 - ii. Derivation
 - d. Ecosystem – context of scale relative to contaminated sites
 - e. Ecological Responses
 - i. Stressor-Response Analysis
 - ii. Establishing Cause-and-Effect Relationships
 - iii. Linking Measures of Effect to Assessment Endpoints
4. Risk Characterization (5%)
 - a. Quotient Method
 - b. Observation Method
 - c. Weight of Evidence
 - d. Reporting Risks
5. Uncertainty Analysis (2.5%)
 - a. Identifying Major Types of Uncertainty
 - b. Use of Uncertainty Factors
 - c. Sensitivity Analysis

GROUP #2: HUMAN HEALTH RISK ASSESSMENT

1. Problem Formulation (17.5%)
 - a. Data Collection
 - i. Background Information Useful for Data Collection
 - ii. Review of Available Site Information
 - iii. Addressing Modeling Parameter Needs
 - iv. Preliminary Identification of Potential Human Exposure
 - v. Strategy for Sample Collection
 - vi. QA/QC Measures
 - b. Data Evaluation
 - i. Combining Data Available from Site Investigations
 - ii. Evaluation of Analytical Methods
 - iii. Evaluation of Quantitation Limits
 - c. Chemicals of Potential Concern
 - i. Comparison of Samples with Criteria/Guidelines
 - ii. Comparison of Samples with Standards
 - d. Potentially Exposed Receptors

- e. Potential Exposure Pathways
 - f. Conceptual Model
 - g. Data Gap Analysis
2. Exposure Assessment (17.5%)
- a. Characterization of Exposure Setting
 - i. Characterize Physical Setting
 - ii. Characterize Exposed Receptors
 - iii. Identification of Exposure Routes
 - iv. Identification of Reasonable Maximum Exposure
 - b. Quantification of Exposure: Determining Exposure Concentrations
 - i. Estimation of Chemical Intakes
 - ii. Exposure Concentrations in Various Media
 - iii. Combining Chemical Intakes Across Pathways
3. Toxicity Assessment (7.5%)
- a. Types of Toxicological Information Considered in Toxicity Assessment
 - b. Toxicity Assessment for Non-carcinogenic Effects
 - c. Toxicity Assessment for Carcinogenic Effects
 - d. Identifying Appropriate Toxicity Values for Site Risk Assessment
 - e. Evaluating Chemicals for which no Regulatory Toxicity Values are Available
4. Risk Characterization (5%)
- a. Quantifying Risks
 - i. Risks for Individual Substances
 - ii. Risks for Multiple Substances
 - b. Combining Risks Across Exposure Pathways
 - c. Consideration of Site-Specific Human Studies
 - d. Risk Characterization Results
5. Uncertainty Analysis (2.5%)
- a. Identifying Major Types of Uncertainty
 - b. Use of Uncertainty Factors
 - c. Sensitivity Analysis

2:45 – 3:45 Mini Quiz: writing and discussion

3:45 – 4:30 Group presentation of list of reference and one key topic

A Discussion Forum has been set up at <http://csapexam.proboards.com/>.

Materials will also be posted to http://www.geoenvirologic.ca/course_materials.htm.