

GeoEnviroLogic Professional Development

3831 West 50th Ave, Vancouver, BC, V6N 3V4,

Phone: (604) 617-6623 Fax: (604) 263-7429

Email: RZapf-Gilje@shaw.ca Website: www.geoenvirologic.ca

Session 3: "Standards" Session November 5, 2009 - 8:15 to 12:00 Terminal City Club (TCC) 837 West Hastings Street, Vancouver, BC

- 8:15 - 8:25 Registration and Breakfast
- 8:25 – 8:30 Introductions and Overview
- 8:30 – 8:45 Review of Reference Materials
- Minimum qualified candidate
 - Syllabus and reference list
 - Roster practice guidelines and checklists
- 8:45 – 10:15 Group Topics

GROUP #1

A. Historical and Visual Site Information (5%)

1. APEC and PCOC: Identify all applicable potential APEC and PCOC based on review of existing information from various sources and based on assessment of site conditions observed during a site reconnaissance.

B. Assessment of Affected Media and Migration Pathway (20%)

1. Soil: Interpret site geology and soil stratigraphy.
2. Hydrogeology: Assess groundwater flow and contaminant transport (dissolved and Non-aqueous phase liquids - NAPL).
3. Surface hydrology: Interpret significance of precipitation on a contaminated site in terms of contaminant transport (surface water, groundwater, soil and sediment).
4. Sediment: Interpret sediment characteristics and its significance for contaminant distribution and release.
5. Soil vapour: Understand soil vapour concentrations and migration.
6. Air: Understand impact on indoor and outdoor air quality by dust and vapours from site contamination.
7. Biota: Understand significance of food-chain transfers and the significance of observations such as stressed vegetation and effects on aquatic life.

GROUP #2

C. Contaminant Characteristics (15%)

1. Chemistry and biochemistry: Interpret physical, chemical and

biological properties of contaminants and their significance on fate, transport, treatment and relative human health and ecological risks.

2. Chemical composition of mixtures: Understand the significance of chemical compositions of common types of contamination substances including but not limited to: fuels, lubricants, solvents, paints, wood preservatives, coal tar, metal plating, and landfill leachate.
3. Sources of Contamination: Be familiar with common residential, commercial and industrial activities that may result in site contamination including but not limited to: Fuel storage and handling, metal fabrication, wood preservation, solvent cleaning, coal gasification, and landfilling.

D. Investigation Approach and Methods (15%)

1. Sampling rationale: Interpret available information to develop a defensible sampling rationale that will satisfy the investigation objectives.
2. Sampling plans: Assess sampling plans to determine whether they are consistent with the investigation objectives and sampling rationale.
3. Sampling techniques: Understand the significance of the use of proper equipment and methods for sampling of soil, sediment, groundwater, surface water and soil vapour.
4. Field observations and records: Assess field records in terms of adequacy for data interpretation included but not limited to: Borehole logs, well installation details, visual/olfactory signs of contamination, sampling details, etc.
5. Laboratory testing methods: Understand applicability and limitations of common laboratory sampling methods including but not limited to: Gas chromatography, gas chromatography/mass spectroscopy, infrared spectroscopy, petroleum analytical methods (e.g. LEPH/HEPH vs. EPH).
6. Field screening techniques: Understand applicability and limitations of common laboratory sampling methods including but not limited to: soil vapour headspace, immunoassay, colorimetric, pH/conductivity/temperature, X-ray fluorescence.
7. QA/QC practices: Assess field and laboratory work in terms of acceptable QA/QC methods and interpretation.

GROUP #3

E. Data Synthesis and Interpretation (15%)

1. Data integration and presentation: Assess the investigation data in terms of adequate presentation in tables and figures.
2. Adequacy of testing: Review sampling programs to assess the adequacy of the testing performed (number, type and location of

samples).

3. Nature and extent of contamination: Assess APEC and AEC: number, types, characteristics, PCOC, delineation.
4. Nature and extent of migration pathways: Assess migration pathways: types, characteristics, preferential routes, relative importance.
5. Background conditions: Assess regional and local background conditions.

F. Risk Assessment Principles and Screening (5%)

1. Problem formulation: Identify/screen sources, exposure pathways, receptors
2. Acceptable risk: Carcinogens Non-carcinogens.
3. Exposure scenarios: Interpret current and future site uses.
4. High risk: Recognize imminent and high risk to human health and environment, and immediate risks to public welfare (e.g. explosion hazard, etc.).

GROUP #4

G. Remediation Design, Implementation and Confirmation (25%)

1. Remediation techniques: Be familiar with common soil, sediment, groundwater, water and soil vapour remediation methods.
2. Remedial design: Understand technical, regulatory and cost aspects of common remediation methods, and be able to evaluate the selection of appropriate alternatives.
3. Remediation implementation: Understand health and safety standards, construction techniques/constraints, monitoring requirements, and requirements associated with off-site transport and disposal of contamination and record keeping.
4. Remediation Confirmation: Assess confirmatory sampling program and results in terms of adequacy to demonstrate the site meets the applicable requirements of a remediated site.

10:15 – 11:15 Mini Quiz: writing and discussion

11:15 – 12:00 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.