Environmental Management Requirements (EMR) for Hazardous Materials and Contaminated Sites

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Preface

The purpose of this manual, “Environmental Management Requirements (EMR) for Hazardous Materials and Contaminated Sites”, is to provide a resource to Alberta Infrastructure staff and consultants dealing with the removal and disposal of hazardous materials found within a building and the management of contaminated sites on projects managed and contracted by Alberta Infrastructure.

The current scope of the EMR includes the following “hazardous materials”* in buildings and on sites:

- Asbestos
- Biohazardous materials
- Chloroflorocarbons (CFCs) (refrigerants)
- Polychlorinated Biphenyls (PCBs)
- Hydrocarbons
- Lead
- Mercury
- Mould
- Radioactive compounds
- Salt
- Unidentified abandoned chemicals

*Not all of these materials are regulated as “hazardous materials” under legislation.

This edition of “Environmental Management Requirements (EMR) for Hazardous Materials and Contaminated Sites” is intended to be periodically updated to reflect the department’s EMR requirements and objectives and to assist staff and consultants in implementing the objectives of the EMR. Suggestions on how to improve this manual are welcome. Please address comments and suggestions as follows:

For hazardous materials within buildings:

Manager, Building Environment Unit (BEU)
Tel: 780-422-7472

For contaminated sites:

Director, Site Services Section
Tel: 780-422-7624

Technical Services Branch
Capital Projects Division
Alberta Infrastructure
3rd Floor, Infrastructure Building
6950 - 113 Street NW, Edmonton, AB T6H 5V7
The Technical Resource Centre (Public Internet Site) contains:

- Environmental
  - Environmental Management Requirements (EMR) for Hazardous Materials and Contaminated Sites;
  - Hazardous Materials Work Process
  - Contaminated Site Work Process
  - Environmental Management Requirement Checklist
    - Asbestos Checklist
    - Biohazardous Material Checklist
    - CFCs Checklist
    - Hydrocarbon Checklist
    - Lead Checklist
    - Mercury Checklist
    - Mould Checklist
    - PCB Checklist
    - Radioactive Checklist
    - Unidentified Abandoned Chemicals Checklist
    - (http://www.infrastructure.alberta.ca/992.htm)
- EMR related Basic Master Specifications for Owned Infrastructure (http://www.infrastructure.alberta.ca/507.htm);
- General TRC Site (http://www.infrastructure.alberta.ca/500.htm)

The following internal documents and resources are available to the Alberta Infrastructure (INFRAS) project management team:

- Environmental Policy – Hazardous Materials (see Policy Compendium)
- The Project Information Management System (PIMS) Repository (Intranet Site) contains:
  - Environmental Management Plan (EMP) (under development)
  - Environmental Management Requirements (EMR) introduction and template (under development)
  - Construction Start-Up Meeting Agendas and Minutes templates;

These documents and other EMR related documents will only be published in electronic format. These are the latest editions.
1.0 Management of Contaminated Sites

1.1 Introduction

Contaminated sites represent a significant environmental liability in addition to their impacts on humans and the surrounding environment.

A multiphase process is used to assess and manage environmental issues related to contaminated sites.

Below is more information on the typical phases of an environmental site assessment. Please note that each site is different and may skip phases.

1.2 Phase I Environmental Site Assessment (ESA)

The purpose of the Phase I ESA is to identify actual and potential site contamination. Such identification involves the evaluation and reporting of existing information collected through records review, site visits, and interview. CSA Z768-01 specifies the mandatory and optional records review of Phase I ESA.

1.3 Phase II Environmental Site Assessment (ESA)

The purpose of a Phase II ESA is to confirm the presence of and characterize the substances of concern at a given site. Characterization may range from a simple identification to a full delineation of the contamination on site:

The principal components of a Phase II ESA are as followings:

a) Review of existing Phase I ESA or other background information;

b) Development of sampling/investigation plans;

c) Conducting site investigation;
   i) Intrusive testing of soil and/or groundwater;
   ii) Electromagnetic (EM) survey, if salt contamination is a concern

d) Comparison of analyzed samples with the appropriate guideline based on the land use; and

e) Reporting

It should be noted that full delineation might not be achieved as part of this assessment. A supplemental Phase II ESA would be required to achieve complete delineation of contaminants both horizontally and vertically. CSA Z769-00 standard has been developed to assist Clients and Assessors to plan, implement, and interpret the results of Phase II ESA.
1.4 Phase III, IV AND V Risk Management Plan (RMP) or Remediation Action Plan (RAP)

1.4.1 Development of RMP or RAP (PHASE III)

An action plan would be required if the Phase II ESA reveals that existing levels of contaminants did not meet the guidelines. The development of either a Risk Management Plan (RMP) or a Remediation Action Plan (RAP) is recommended at the end of the Phase II ESA. This recommendation is based on a variety of factors including:

- site and contaminants characteristics
- severity of risk to the surrounding environment
- time required to remediate the site
- availability of funds

1.4.2 Implementation of RAP or Risk Reduction (Phase IV)

This is the phase where physical removal of contaminants occurs. There are a wide variety of technologies available for the remediation of contaminated soils and groundwater depending on the contaminant and soil types including:

- Excavation and disposal (dig and dump);
- Encapsulation;
- Landfarming – see Code of Practice for Land Treatment of Soil Containing Hydrocarbons;
- Soil Vapour Extraction (SVE);
- Thermal desorption;
- Groundwater pump and treat;
- Enhanced Natural Attenuation.

1.4.3 Monitoring (Phase V)

Groundwater and soil monitoring is an essential part of any RMP. Monitoring frequency is specified in the RMP and agreed upon by all site stakeholders. Samples analysis results are evaluated after each monitoring event and testing frequency may be adjusted accordingly.

1.5 Responsibilities

The responsibility of INFRAS project management team is to be aware of the environmental phases and the role of the environmental consultant. For information on this process see Contaminated Site Work Process.
1.0 Management of Contaminated Sites

.2 The Environmental Management portion related to the management of contaminated sites resides with Alberta Transportation.

.3 Site Services Section, Technical Services Branch, Alberta Infrastructure is the contact for site contamination issues.

1.6 Contact

Director, Site Services Section
Tel: 780-422-7624

1.7 Additional References

- Alberta Tier 1 Soil and Groundwater Remediation Guidelines (http://environment.gov.ab.ca/info/library/7751.pdf )
- Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health (http://ceqg-rcqe.ccme.ca/ )
- Z768-01 Phase I Environmental Site Assessment, CSA International
- Z769-00 Phase II Environmental Site Assessment, CSA International
- Code of Practice for Land Treatment of Soil Containing Hydrocarbons (http://www.qp.alberta.ca/documents/codes/HYDROCARBONS.pdf )
- Remediation Certificates for Petroleum Storage Tank Sites (http://environment.alberta.ca/documents/Remediation-Certificates-for-PST-Sites-Fact-Sheet.pdf )
2.0 Management of Hazardous Materials for Buildings

2.1 Introduction

Additions to existing buildings, renovation and demolition projects may involve the disturbance of “hazardous materials”. These “hazardous materials” include:

- Asbestos (U)
- Biohazardous materials (U/R)
- Chloroflorocarbons (CFCs) (refrigerants) (R)
- Hydrocarbons
- Lead (R)
- Mercury (R)
- Mould (U)
- Polychlorinated Biphenyls (PCBs) (R)
- Radioactive compounds (R)
- Unidentified abandoned chemicals (U/R)

(U) = Unregulated materials
(R) = Regulated materials
(U/R) = Some materials in this category are unregulated others are regulated

2.2 Hazardous Materials Survey

.1 The Project Manager is to contact the Building Environment Unit to discuss the project and to obtain environmental file information for the building.

.2 If there is any potential that “hazardous materials” may be disturbed, the Project Manager to review all available and pertinent environmental file information to determine if there has been an appropriate hazardous materials survey.

.3 If there is no environmental information for the building, or if existing information is not applicable to the project, the Project Manager will initiate a hazardous materials survey. Contact the Building Environment Unit.

.4 The Building Environment Unit:

.1 will conduct a hazardous materials survey, if resources are available, or
.2 if resources are unavailable, will recommend that an environmental consultant be retained to conduct the hazardous materials survey.
2.0 Management of Hazardous Materials for Buildings

2.3 Contract Documents

.1 The Building Environment Unit is available for consultation and assistance in preparing hazardous materials specifications using INFRAS Basic Master Specifications (BMS).

.2 When developing contract documents consider the need for a Mandatory Pre-Tender Site Meeting.

.3 The Building Environment Unit is to be kept informed and involved during the development of contract documents and should review specifications for every project.

.4 Environmental consultants may be engaged by the Project Manager to develop the contract documents under the guidance of the Building Environment Unit.

2.4 Waste Generator Number

.1 A Waste Generator Number must be assigned by Alberta Environment before regulated hazardous materials are transported and disposed.

.2 Building Environment Unit possesses a generic Waste Generator Number (G4537) available for use on Alberta Infrastructure projects.

.3 The Contractor is to advise Alberta Environment of the projects utilizing Infrastructure’s Waste Generator Number and inform the Project Manager and the Building Environment Unit that this has been done.

2.5 Manifest

.1 An Environment manifest is required to accompany each load of “regulated” hazardous materials.

.2 A non-hazardous waste manifest from the appropriate authority is required to accompany each load of “unregulated” hazardous materials.

2.6 Environmental Consultants

The Project Manager is to engage an environmental consultant to monitor and air test contractor’s performance of the hazardous materials abatement and/or remediation.

Hazardous Materials Compliance Checklist

.1 Hazardous Materials Compliance Checklists are used by Project Managers as a tool to verify that the consultant and contractor are taking appropriate actions when handling hazardous materials. The checklist is used when undertaking a project or work that involves a hazardous material (i.e., Typically building renovations or demolition, but could also apply to new construction, if biohazards were found or if mercury, radioactive components or chemicals were installed).

.2 Hazardous materials checklists are available for:
2.0 Management of Hazardous Materials for Buildings

- Asbestos;
- Biohazardous materials;
- Chloroflorocarbons (CFCs) (refrigerants);
- Hydrocarbons;
- Lead;
- Mercury;
- Mould;
- Polychlorinated Biphenyls (PCBs);
- Radioactive compounds;
- Unidentified abandoned chemicals.

.3 Each checklist includes a list of regulatory requirements specific to the hazardous material it addresses.

.4 The Project Manager completes the checklist, and files it appropriately.

2.7 Responsibilities

.1 The Environmental Management portion related to the management of hazardous materials during construction, demolition and renovation of buildings resides with Alberta Infrastructure.

.2 It is the responsibility of the INFRAS project management team to engage BEU for information on the management of hazardous materials in buildings work process. Refer to Hazardous Materials Work Process.

2.8 Contact

Manager, Building Environment Unit
Tel: 780-422-7472
3.0  Terms of Reference for Consultants

3.1  Terms of Reference

When writing a Request for Proposal for Consultant Services (RFP), or during direct contract negotiations with a consultant, the following Terms of Reference for Consultants must be included in the Consultant RFP:

.1 The Consultant and sub-consultant(s) involved with the environmental components of the project shall familiarize themselves with the contents of this manual: “Environmental Management Requirements (EMR) for Hazardous Materials and Contaminated Sites”. The manual provides Infrastructure’s requirements and standards related to the departmental EMR.

.2 The Consultant and sub-consultant(s) assigned to the environmental work on this project must possess experience involving the handling and disposal of hazardous materials including those defined in the EMR.

.3 The consultant shall supply the names of key personnel and sub-consultant(s), with their qualifications and experience, and identify the project components each will be responsible for. The consultant shall not make changes to personnel without the consent of the Minister.

.4 The consultant and sub-consultant(s) shall ensure that all applicable codes, bylaws, regulations and environmental guidelines related to the environmental components of the project are complied with.

.5 The consultant shall identify the laboratories that will be used for analytical work and for which component(s) of the project.
4.0 EMR Master Specifications for Buildings

4.1 Master Specifications

The following Infrastructure Basic Master Specifications apply to the EMR and are available in the Technical Resource Centre. These specifications will be regularly reviewed and updated. It is the consultant’s responsibility to ensure the latest version of the Master Specification is used and proper formatting for the specifications is followed.

Division 02 - Existing Conditions

02 82 01B.doc Asbestos Control General Requirements
02 82 05B.doc Asbestos Containment Procedures
02 82 15B.doc Asbestos Encapsulation
02 82 33B.doc Asbestos Removal
02 84 16B.doc Removal and Disposal of PCB Capacitors and Ballasts
02 84 25B.doc Removal and Disposal of PCB Transformers
02 85 05B.doc Mould Removal General Requirements
02 85 16B.doc Mould Containment Procedures
02 85 33B.doc Mould Removal Procedures
02 91 19B.doc Removal and Disposal of Chloroflorocarbons (CFCs)
02 92 19B.doc Removal and Disposal of Mercury Components
02 95 00B.doc Biohazard Precautions
02 99 00B.doc Removal and Disposal of Radioactive Components in Smoke Detectors

Basic Master Specifications can be found at Infrastructure's Technical Resource Centre (http://www.infrastructure.alberta.ca/3541.htm).
5.0 Procedures for Construction Phase

5.1 Operational Controls

5.1.1 Introduction

Operational controls are established to ensure Infrastructure activities (including those conducted by contractors and consultants) take place with minimum environmental impact in accordance with the specifications, legal and other requirements.

5.1.2 Responsibilities

1. The INFRAS project management team, consultants and contractors are to understand and implement operational controls for their activities that have significant environmental impacts.

2. Development and implementation of operational controls:
   - Identify those activities related to the project that have significant environmental aspects or have the potential for environmental impact. This can be accomplished by conducting a hazard assessment for the project.
   - Review existing procedures and practices to determine if controls already in place manage the risk and hazard potential.
   - Determine activities and potential risks and hazards with significant environmental aspects for which no controls are in place.
   - Review and revise submitted operational controls to ensure they adequately address significant environmental aspects.

3. The consultant site representative provides oversight to contractor activities and identifies issues or hazards before they become incidents. The contractor ensures that all necessary actions to prevent an incident are in place. If an incident occurs, the contractor ensures all corrective actions are undertaken.

5.1.3 Communication of Operational Controls

Contractors and sub-consultants, on behalf of Infrastructure, conduct activities with significant environmental aspects. Environmental expectations for contractor activities are communicated to the contractors by:

- Requests for proposals;
- Contractor prequalification;
- Tender documents;
- Project specifications;
- Pre-project start up meetings;
- Hazard Assessment reports;
- Monitoring reports;
5.0 Procedures for Construction Phase

- Review of emergency response plans;
- Regular communication with Infrastructure project managers.

5.1.4 Monitor Performance of Projects

Qualified consultants may be hired for projects having significant environmental aspects related to hazardous materials and contaminated sites. Consultants monitor on site contractor and sub-contractor activities to ensure that expectations are met for handling hazardous materials and contaminated sites in accordance with project specifications, legal and other requirements.

5.2 Project Start-up

5.2.1 Introduction

.1 Relevant environmental issues are to be discussed at the start up meeting for new construction, renovation and demolition projects and for the management of contaminated sites.

.2 The INFRAS project management team is to ensure that the consultant and contractors are aware of all contractual environmental requirements. The INFRAS project management team and consultant must ensure that environmental requirements are addressed at subsequent project meetings.

5.2.2 Construction Contract Start-up Procedures

.1 The INFRAS project management team, consultants and contractors is to be aware of the clauses pertaining to environmental requirements as stated in the Construction Start-up Meeting Minutes.

.2 Construction Start-Up Meeting Minutes and procedures are located on the PIMS repository. (INFRAS internal resource)

.3 If there are hazardous materials and/or environmental site concerns, INFRAS project management team must provide a copy of these minutes to the relevant TSB contact, Director of Site Services Section and/or Manager of Building Environmental Unit.

5.3 Environmental Incident Reporting

.1 If your project did not originally have an environmental issue, but an incident has occurred, the general information for the project management team is below. An environmental incident occurs when any one of the following events occurs:

.1 An uncontrolled release of a “hazardous material” to the environment resulting in an environmental impact.

.2 An environmental regulatory requirement has not been complied with. e.g. appropriate placards have not been applied to vehicles transporting regulated hazardous materials.
5.0 Procedures for Construction Phase

.3 Health or safety has been compromised by an environmental event.

.2 Whenever an environmental incident occurs the Contractor is required to notify and submit reports as follows:

.1 Immediately notify the Infrastructure Project Manager of the incident.
.2 Immediately notify Alberta Environment (phone: 1–800–222–6514).
.3 Immediately submit to Alberta Environment a completed Environment Release Report (fax 780–427–3178) and copy the Infrastructure Project Manager. For more information on Release Reporting see www.environment.alberta.ca/01521.html.

.4 Within 7 days of release, submit to Alberta Environment a completed Environmental Release Follow-up Report (fax: 780–427–3178) and copy the Infrastructure Project Manager.

.3 Whenever an environmental incident occurs, the Project Manager is required to immediately notify the:

.1 Infrastructure Deputy Minister;
.2 Infrastructure EMR contact person;
.3 Building Operator/Manager.

5.4 Emergency Response Plan

5.4.1 Introduction

The purpose of a planned response to hazardous materials spill or release is to minimize the potential impact to the environment and personnel and to contain the immediate hazard. In addition the planned response is intended, as much as possible, to protect workers and the general public in the event of an incident.

5.4.2 Preparedness

The Project Manager must review the contractor’s “Emergency Response Plan” and determine if the following requirements have been fully addressed.

.1 Hazard identification

.1 Hazard survey;
.2 Risk analysis;
.3 Impact analysis;
.4 Roles and responsibility; and
.5 Prevention measures.

.2 Contact lists

.1 Contractor/ subcontractors;
5.0 Procedures for Construction Phase

.2 Project manager;
.3 Consultant; and
.4 Emergency response leader and response team members.

.3 Emergency equipment and resources
.4 Municipal / County Fire Department;
  - Municipal / Regional Ambulance Service;
  - County / Municipal Police / RCMP;
  - Municipal Health Centre / Hospital;
  - Power Utility Company;
  - Gas Utility Company;
  - Water and Sewer Utility Company;
  - Municipal Affairs; (http://www.municipalaffairs.alberta.ca/)
  - Alberta Environment; (http://www.environment.alberta.ca/)
  - Employment and Immigration; (http://www.employment.alberta.ca/)
  - Workers’ Compensation Board; (http://www.chr.alberta.ca/Practitioners/DocList464.cfm)
  - Alberta Transportation – Transportation of Dangerous Goods.

5.4.3 Alert and/or Response

.1 “First responder” is the person who first becomes aware of the emergency situation. The first responder must immediately contact/alert the Emergency Response Leader. The first responder, if qualified, will:
  .1 Takes all reasonable steps to bring the situation under control.
  .2 Performs the duties of Emergency Response Leader until relieved by the Emergency Response Leader
  .3 Is responsible for carrying out the instructions given by the Emergency Response Leader
  .4 First responder or on-site team assesses the emergency as follows:
    - Environmental impact. What are local waterways, prevailing winds, drainage patterns, traffic patterns etc.
    - Occupational injuries. Were any personnel affected by the release or spill of the hazardous material?
    - Equipment damage. Was any equipment damaged as a result of the release or spill of hazardous material?

.2 The “Emergency Response Leader” is responsible for the effective resolution and management of the emergency through the application of:
  .1 The response action plan.
5.0 Procedures for Construction Phase

- Based on the nature of the hazardous release or spill evacuation may or may not be required;
- Isolation of release or spill area;
- Time and event log;
- Establish emergency response post if required; and
- Recovery of hazardous materials.

.3 Resource allocation.
- Emergency response can be handled with in house resources;
- Spill containment and or recovery; and
- Emergency response requires outside emergency responders.

.4 Situation update/review.
- Related environmental contamination has resulted and action is required; and
- Testing and monitoring.

5.4.4 Incident Reporting

Refer to Environmental Incident Reporting, Section 6.3

5.4.5 Clean-Up

.1 Clean-up as soon as possible. Every effort should be made to restore the site to an operational condition as soon as possible. Should fatalities result, it will be necessary to wait until the site is released by the Medical Examiner, the Police, and the Alberta Human Services Occupational Health and Safety Officer. The Occupational Health and Safety Contact Centre phone number is 1–866–415–8690. (link: http://work.alberta.ca/occupational-health-safety/13591.html)

.2 In the event of a hazardous environmental release it may be necessary to wait until the site is cleared by Alberta Environment or the local authority's emergency response team, or other regulatory agencies.

5.4.6 Post Incident Recovery

Post incident recovery activities should be initiated as soon as possible, preferably while emergency response activities are underway, to ensure the following:

.1 Restoration of service. An emergency may adversely affect the services provided to building occupants.

.2 Repair of damaged equipment. An emergency incident may result in damage to site equipment or facilities. Temporary equipment or facilities may be required to resume services.

.3 Alternate work plan, rescheduling of work. An emergency incident or spill may require prolonged clean-up activities that may affect work schedules. Alternate work schedules may be required to keep projects on schedule.
6.0 Records Management

6.1 Project Files

.4 Project files are maintained by Alberta Infrastructure to record all activities undertaken on a specific project. It is important that all files on a project involving an ‘environmental component’ are retained by Alberta Infrastructure indefinitely. The rationale is to be able to prove in the future that the appropriate procedures were undertaken in managing environmental issues. Records would indicate that necessary actions were undertaken to prevent or manage an environmental impact.

.5 Alberta Infrastructure Central Records (Third Floor Records) is set up to track Infrastructure projects that contain an environmental component (a part of the environment that the project may affect). Projects could include buildings, renovations, demolition projects, or projects involving contaminated sites.

.6 The Project Manager is responsible to ensure the form/file is identified as a “Project Containing Environmental Components”.

6.2 Environmental Project File Procedures

The Project Manager/Team to contact/engage the Manager, BEU and/or Director, Site Services at the early phases of their project.

.1 Project Files

UNDER DEVELOPMENT
7.0 Training for INFRAS Project Management Team

7.1 Alberta Infrastructure Project Management Team Training

To comply with the new Environmental Management Plan all Alberta Infrastructure project management community members are asked to have the following training to manage their projects:

.1 The following courses are required for all project management community members as identified in the Environmental Policy:

.1 Environmental Management Plan
   Infrastructure University e-learning modules, contact the PMO.

.2 Asbestos Awareness
   ♦ See www.servicealberta.gov.ab.ca/1950.cfm
   ♦ Asbestos awareness e-learning can be obtained from Alberta Construction Safety Association for $30 (non-members) and $20 (members). http://acsa-safety.org/page.php?s=7&p=34
   ♦ Note: Each Branch has the option of doing its own Asbestos Awareness training session.

.2 The following courses are strongly recommended for all project management community members: Note: Each Branch also has the option of doing its own training session focusing on construction and construction sites.

.1 Fundamentals of Occupational Health and Safety (OH&S)
   This course will provide you with fundamental information about health and safety in the Government of Alberta. You will learn about the health and safety framework within the GoA and the Occupational Health & Safety Legislation in Alberta. Participants will also learn about the responsibilities, standards and processes within the seven element GoA OH&S Program.
   Type: ELearning    Length: 2 - 3 hours
   Course Code: AC1086   Audience: All Employees
   Cost: $25    MyAGent Keyword: Fundamentals

.2 Workplace Hazardous Materials Information System (WHMIS)
   Find out what you need to know about hazardous products in the workplace. The purpose of this e-learning course is to familiarize you with WHMIS legislation, the Material Safety Data Sheet (MSDS), and to help you understand the procedures for the safe handling, use, storage and disposal of a controlled product.
   Type: ELearning    Length: 1 hour (approximately)
   Course Code: AC0842   Audience: Role specific
   Cost: $70 for 1 year subscription    MyAGent Keyword: WHMIS
7.0 Training for INFRAS Project Management Team

.3 Transportation of Dangerous Goods (TDG)

See [www.transportation.alberta.ca/519.htm](http://www.transportation.alberta.ca/519.htm)

TDG e-learning can be obtained from Danatec for $34.95 [www.danatec.com](http://www.danatec.com)