

AN UPDATE ON ALBERTA ENVIRONMENT'S 2008 DRAFT SOIL MONITORING DIRECTIVE

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Alberta Environment



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2008 Draft Soil Monitoring Directive

**Soil Monitoring Directive
(Draft)**

June 2008

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- Released in summer of 2008 for public consultation
- Intended to be an integrated regulatory document to guide Soil Monitoring and Soil Management programs in Alberta

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Soil Monitoring and Soil Management Programs in Alberta



- Soil Monitoring Program to screen for possible contamination to soil environment at a plant site
- Soil Management Program to manage the contamination and mitigate environmental risks
- Established on a prescribed basis with two 1996 documents
- As terms and conditions in some industrial operational Approvals

Existing Framework in Alberta

Guideline for Monitoring and Management of Soil Contamination Under EPEA Approvals



May 1996

Chemicals Assessment and Management Division
Environmental Regulatory Service

Soil Monitoring Directive



May 1996

Chemicals Assessment and Management Division
Environmental Regulatory Service

Why Revise the Directive?

- To support Alberta's new direction in contaminated site management
 - new environmental standards (Alberta Tier 1 and Tier 2 Guidelines)
 - Increased demand on environmental information
- To update and consolidate the two 1996 documents

Why Revise the Directive (cont'd)?

- To simplify industrial operating Approvals
 - move common content in Approvals to the new Directive
- To incorporate progress over the past 12 years
 - practical experience in implementing the 1996 Directive
 - progress in scientific research and other regulatory jurisdictions

Revision Approach

- Focus on the needs of AENV's program delivery (Regional Services)
- Adopt a living document approach
- Separate regulatory requirements from professional guidance
- Strengthen and standardize information collection to enable reporting of provincial trends

Major Sections of 2008 Draft Directive

- Baseline Soil Assessment (for new plant)
- Operational Soil Monitoring Program (for operating plant)
- Soil Management Program (for operating plant)

Soil Sampling for Baseline Soil Assessment

- Focus on the footprint areas of the proposed plant
- Reasonably uniform area: sample at least 4 major locations, following a Very Detailed Survey Intensity Level
- Site with significant variability: all major mapping units
- Area with proposed infrastructure below ground: to a depth interval below the base of proposed infrastructure
- Where a formal EIA is required, follow the term of reference for that EIA and relevant requirements in this Directive
- Fill materials must be properly analysed

Analytical Parameters for Baseline Soil Assessment

- pH using 0.01 M CaCl₂ method
- Electrical conductivity (EC) using saturated paste method
- Cation exchange capacity (CEC)
- Organic carbon content
- Texture (percent sand, silt and clay)
- Median of particle size above 75 µm
- Sodium adsorption ratio (SAR)
- Total trace element content by strong acid digestion
- Baseline concentrations of chemicals corresponding to facility-specific substances

Operational Soil Monitoring Program



- For operating plants
- Targeting at plant-wide locations of known release and potential contamination
- Program design for sampling, analytical requirements and soil quality standards
- Outlined requirements for proposals and reports

Guiding Approach to Operational Soil Monitoring Program



- Selecting sampling locations: not to miss the known and most likely zones of contamination
- Sample collection, handling and analysis: to accurately represent substance characteristics in field conditions
- Focus on facility-specific substances

Examples of Facility-specific Substances

- Strong acid digestible trace elements (Hg, Pb, Cd, Cr, etc.)
- Other harmful inorganics (As, B, S, etc.)
- Salts
- Hydrocarbons (BTEX, PAH, fractions F1, F2, F3 and F4)
- Process chemicals (methanol, glycols, amines, etc.)
- Halogenated organics (brominated or chlorinated sterilants, dioxins, furans, etc.)
- Toxic organic precursors, intermediates, products, by-products, additives, catalysts or wastes, etc.

Example Plant



Major Sampling Locations for Operational Soil Monitoring Program

- Background locations
- Known contaminated areas;
- Potential contamination areas, including but not limited to:
 - storage areas
 - near process areas
 - chemical loading and unloading facilities
 - machinery servicing and maintenance areas
 - near underground sumps, tanks and pipelines
 - any impacted off-site areas
 - near unlined drainage ditches
 - low-lying areas that may be affected by surface run-off
 - under above-ground chemical pipe racks
 - near oil production and disposal wells
 - any other areas where contamination may occur

Analytical Requirements for Operational Soil Monitoring Program

- Each soil sample must be analyzed for:
 - pH using 0.01 M CaCl₂ method; and
 - EC, SAR, chloride using saturated paste method
- Sample be analyzed to provide delineation for
 - relevant facility-specific substances
 - any substance exceeding or may exceed applicable soil quality standards
 - any parameter as requested in writing by the Director
- Method detection limit must be below applicable soil quality standards

Soil Management Program



- Target at contaminated areas
- Priority to stop on-going release
- Subsequent delineation to fully characterize contaminated zones
- Timely remediate where possible
- Risk-manage contaminated zone where immediate remediation not feasible

Intended Outcomes of the Three Programs

- Well defined baseline or background soil conditions
- What facility areas of a plant site have soil contamination?
- Which facility areas need to be improved, remediated, or risk-managed and get all of them done.
- Where to focus further environmental investigations at the time of plant decommissioning?
- What may be the likely environmental liability related to soil contamination at a plant site?

Process Forward

- Compilation of public comments
- Revision Team review and decision on comments
- Incorporation of team decisions into revised Directive
- Managerial approval and release of the Directive
- Implementation of the Directive

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Questions ?

