

ALBERTA ENVIRONMENT
ENVIRONMENTAL PROTECTION AND ENHANCEMENT ACT

CODE OF PRACTICE
FOR THE LAND TREATMENT
AND DISPOSAL
OF SOIL CONTAINING HYDROCARBONS

Published in ... 2001

ALBERTA ENVIRONMENT
ENVIRONMENTAL PROTECTION AND ENHANCEMENT ACT
**CODE OF PRACTICE FOR THE LAND TREATMENT AND DISPOSAL
OF SOIL CONTAINING HYDROCARBONS**

Published in ... 2001

Table of Contents

1	Preface	3
2	Definitions	3
3	Bound by the Code	4
4	Registration	4
5	Notification Requirements	5
6	Classification of SCH	5
7	Siting and Design Requirements	6
8	Operational Requirements	6
9	Monitoring Requirements	8
10	Analytical Methods	9
11	Reporting	10
12	Record Keeping	10
13	Effective Date	10
Schedule 1	Registration Form for Class I Land Treatment for Soil Containing Hydrocarbons (multiple or continuous treatment)	11
Schedule 2	Registration Form for Class II Land Treatment for Soil Containing Hydrocarbons (one-time treatment)	12
Schedule 3	Alberta Environment Regional Directors and Map Boundaries	13

ALBERTA ENVIRONMENT

**CODE OF PRACTICE FOR THE LAND TREATMENT AND DISPOSAL
OF SOIL CONTAINING HYDROCARBONS**

Preface

The Code of Practice for the Land Treatment and Disposal of Soil Containing Hydrocarbons is incorporated by the *Waste Control Regulation* (A.R. 192/96), under the authority of section 36 of the *Environmental Protection and Enhancement Act*, S.A., 1992, c. E-13.3, as amended.

Definitions

- 2(1) All definitions in the *Environmental Protection and Enhancement Act* and *Regulations* apply, unless otherwise defined or modified in this Code of Practice.
- (2) In this Code of Practice:
- (a) "Class I land treatment of SCH" means land treatment of SCH for a continuous period of two calendar years or more at the same location;
 - (b) "Class II land treatment of SCH" means one-time land treatment of SCH for a continuous period of not more than two calendar years at the same location;
 - (c) "closure" means the time at which a land cell or a land treatment facility is no longer used to treat or store SCH and
 - (i) the site has been made compatible with the surrounding soil, or
 - (ii) the SCH has been removed for use or disposal elsewhere;
 - (d) "coarse-grained soils" means soil having median grain size greater than 75 micrometers, such as sand or gravel;
 - (e) "Director" means the Director responsible for issuing the registration under this Code of Practice;
 - (f) "fine-grained soils" means soil having median grain size of 75 micrometers or less, such as clay or silts;
 - (g) "hazardous SCH" means SCH with a flash point less than 61 degrees Celsius when tested according to the *Standard Test Methods for Flash Point by Pensky-Martens Closed Tester*, ASTM D93, with the stirrer disconnected;
 - (h) "land cell" means an area of land where SCH is land treated or stored in piles;
 - (i) "land treatment" means the controlled application of a substance on the soil surface and incorporation of the substance into the upper soil zone in such a manner that physical, chemical or biological degradation of the substance takes place, but does not include land treatment of sludge as defined in the *Wastewater and Storm Drainage Regulation* (A.R. 119/93);

- (j) "non-hazardous SCH" means SCH with a flash point equal to or greater than 61 degrees Celsius;
- (k) "one-time" means a single generation event of SCH caused by the removal of storage tanks or accidental releases;
- (l) "on-site" means the location where SCH is or was generated;
- (m) "run-off" means any rainwater or meltwater that drains as surface flow from the land cell where the SCH has been land treated or stored;
- (n) "soil containing hydrocarbons" means soil that contains refined petroleum hydrocarbon products that are used or could be used as fuel or lubricants but does not include soil that contains benzene, toluene, ethyl benzene or xylene, or any combination of them, as the sole contaminant;
- (o) "SCH" means soil containing hydrocarbons;
- (p) "SCH pile" means any non-containerized accumulation of SCH on the land;
- (q) "total petroleum hydrocarbons" means the total concentration of purgeable and extractable hydrocarbons;
- (r) "uppermost formation" means a continuous water-saturated geological stratum or strata that is projected to be the most probable pathway for lateral transport of potentially contaminated groundwater.

Bound by the Code of Practice

- 3(1) A person responsible for SCH who uses land treatment to manage SCH must meet the requirements set out in this Code of Practice.
- (2) A person responsible for
 - (a) oilfield waste,
 - (b) any other waste or contaminated soil that is not SCH,
 - (c) one-time land treatment of 10 tonnes of SCH or less, or
 - (d) the treatment of SCH by treatment technologies other than land treatment,is not bound by this Code of Practice.

Registration

- 4(1) A person responsible must not commence or continue the land treatment of more than 10 tonnes of SCH until a registration number is obtained from the Director.
- (2) The application for a registration number must
 - (a) include the information described in:
 - (i) Schedule 1 for Class I land treatment of SCH; or
 - (ii) Schedule 2 for Class II land treatment of SCH; and
 - (b) be submitted to the Director of the Region in which the land treatment of SCH will occur as determined from Schedule 3.

- (3) Subsection 4(1) does not apply to a person who treats SCH at a facility that is approved under the *Environmental Protection and Enhancement Act* or the *Oil and Gas Conservation Act* for the land treatment of SCH.

Notification Requirements

- 5(1) At least thirty (30) days prior to applying for a registration number under section 4, a person responsible must provide written notice.
 - (2) The notice under subsection 5(1) must be to:
 - (a) the local authority in which the land treatment is to take place;
 - (b) all residents and owners of property who have a property line within 450 metres of the land cell.
 - (3) Notice under subsections 5(1) and 5(2) must either be:
 - (a) in person; or
 - (b) by double registered mail.
 - (4) In addition to the notice required in subsection 5(2), for a Class I land treatment of SCH, a person responsible must also advertise once in a newspaper having general circulation in the area of the proposed land treatment of SCH.
 - (5) Notice under subsections 5(1) to 5(4) must include:
 - (a) the legal land description of the site to be used for land treatment of SCH;
 - (b) the name of the person(s) responsible;
 - (c) information on the rationale, nature and scope of the proposed operation; and
 - (d) the name and telephone number of a contact for further information and discussion of any concerns regarding the proposed land treatment of SCH.

Classification of SCH

- 6(1) Prior to commencing or continuing any land treatment of SCH, a person responsible must characterize and classify the SCH by screening a representative sample of SCH in the field for flammability.
 - (2) The screening method for the purposes of subsection 6(1) must be done as follows:
 - (a) remove a fresh representative sample of SCH from the subsurface environment;
 - (b) take the sample to a location that is safe for testing;
 - (c) break the sample to allow maximum exposure; and
 - (d) heat the sample immediately for five seconds with a propane torch or a Bunsen burner, with the flame held approximately five centimeters away from the sample.
 - (3) Where a sample has been screened in accordance with subsections 6(1) and 6(2) and it does not ignite, the SCH shall be classified as non-hazardous SCH.
 - (4) Where a sample has been screened in accordance with subsections 6(1) and 6(2) and it ignites and sustains a flame, representative samples of the SCH must be subject to the

flash point test set out in *Standard Test Methods for Flash Point by Pensky-Martens Closed Tester*, ASTM D93, but with the stirrer disconnected.

- (5) Where representative samples tested in accordance with subsection 6(4) result in a flash point for the SCH that is less than 61 °C, the SCH must be:
- (a) classified as hazardous SCH; and
 - (b) called "waste solids containing flammable liquids, n.o.s. (gasoline, or the name of any other fuel, as the case might be), Class 4.1, UN3175, PG II".

Siting and Design Requirements

- 7(1) A person responsible must not treat SCH:
- (a) in residential areas, unless the land cells are on-site for one-time treatment or storage of SCH;
 - (b) in wetlands;
 - (c) in critical wildlife habitats;
 - (d) in drainage ways;
 - (e) on coarse-grained soils;
 - (f) within 100 meters of:
 - (i) the shore of a natural area that permanently contains water such as a river, lake or creek;
 - (ii) a man-made surface structure that permanently contains water, such as an irrigation canal, drainage ditch or reservoir, but not a roadside ditch or a dugout.
- (2) A person responsible must land treat SCH in land cells that:
- (a) are bermed;
 - (b) include containment structures that collect and retain hydrocarbon contaminated run-off water for further treatment or disposal;
 - (c) are graded to a slope that does not exceed nine (9) per cent; and
 - (d) have a base that is a minimum of one meter above the water table.
- (3) For Class I land treatment of SCH, the containment structures referred to in subsection 7(2)(b) must include a collection pond to receive potentially contaminated surface water run-off from the land cell(s).
- (4) Subsections 7(1)(e), 7(1)(f), 7(2)(c) and 7(2)(d) do not apply to land cells underlined by:
- (a) barriers of fine-grained soils, pavements or liners that prevent hydrocarbon migration to the soil and water surrounding the land cell; and
 - (b) are equivalent in terms of allowable seepage rate to a compacted clay liner that has a field-measured hydraulic conductivity of 1×10^{-7} cm/s and is
 - (i) 0.60 meters in thickness for Class I land treatment of SCH, or
 - (ii) 0.30 meters in thickness for Class II land treatment of SCH.

Operational Requirements

- 8(1) A person responsible must land treat hazardous SCH:
- (a) on-site; or

- (b) at a facility approved to treat hazardous waste, to process hazardous recyclables, or that is registered under this Code.
- (2) A person responsible must not land treat SCH when:
- (a) there is free liquid in the SCH being applied to the land; or
 - (b) the receiving soil is
 - (i) saturated with water,
 - (ii) covered with ice or snow, or
 - (iii) frozen; or
 - (c) the thickness of the layer of SCH is larger than the depth of tillage or mixing; or
 - (d) upon application, the concentration of total petroleum hydrocarbons in the treatment zone of the land cell exceeds three (3) per cent by weight.
- (3) A person responsible treating SCH must:
- (a) supervise and retain control of the land cell(s) until closure is completed;
 - (b) restrict access to the land cells to authorized persons only;
 - (c) post signage around the land cell(s) stating that SCH are being land treated;
 - (d) control the release of particulate matter and odours from land cell(s); and
 - (e) cultivate or mix the SCH land treatment zone at least once every four weeks during treatment.
- (4) A person responsible must at closure collect and analyze representative samples of the treated SCH and of the soils underlying the treatment zone to ensure that the treated SCH
- (a) meets the applicable treatment objective set out in Table 1; and/or
 - (b) is removed from the land cell for re-use or disposal, and the site is made compatible with the next intended use.

Table 1 - Land Treatment Objectives for SCH

Proposed Use of Treated SCH	Total Petroleum Hydrocarbon (mg/kg)
Residential/Parkland	
Coarse-grained	180
Fine-grained	430
Agricultural	
Coarse-grained	580
Fine-grained	1160
Commercial/Industrial	
Coarse-grained	1070
Fine-grained	2160

- (5) A person responsible must not release any run-off from the land cells to the environment or to a storm drainage system, unless the run-off meets the limits set out in Table 2.

Table 2 - Discharge Limits for Run-off from Land Cells Used to Treat SCH

Parameters	Limits
Total petroleum hydrocarbons (TPH)	10 mg/L
pH	6.5 to 8.5 units

Monitoring Requirements

- 9(1) A person responsible for Class I land treatment of SCH must install and operate a groundwater monitoring system and conduct a soils sampling program in accordance with subsections 9(2) through 9(7).
- (2) At a minimum, the groundwater monitoring system must include:
- (a) one groundwater monitoring well immediately upgradient of the land cells; and
 - (b) two groundwater monitoring wells downgradient of the land cells, one of which is located immediately adjacent to the land treatment area.
- (3) Groundwater monitoring wells referred to in subsection 9(2) must be:
- (a) designed to meet the requirements in Appendix Two of the *Guidelines for Land Treatment of Industrial Wastes* published by Alberta Environment;
 - (b) protected from damage; and
 - (c) locked except when being sampled.
- (4) Any groundwater monitoring well referred to in subsection 9(2) that is no longer able to produce representative groundwater samples must be repaired or replaced before the next scheduled sampling date.
- (5) From each groundwater monitoring well referred to in subsection 9(2), representative water samples must be collected and analyzed in accordance with Table 3.

Table 3 - Ground Water Monitoring

Sample Type and Number	Frequency	Parameter
One representative sample from each groundwater monitoring well	Before commencement of operations and at closure	<ul style="list-style-type: none"> • PH • major ions (Ca²⁺, Mg²⁺, NH₄⁺, Na⁺, K⁺, Cl⁻, NO₃⁻, and SO₄²⁻) • metal scan • electrical conductivity • total dissolved solids • benzene, toluene, ethylbenzene, and xylene • total petroleum hydrocarbons (purgeables and extractables or F1+F2+F3+F4 CCME fractions), and • water levels
	Annually and at closure	<ul style="list-style-type: none"> • pH, • benzene, toluene, ethylbenzene, and xylene • total petroleum hydrocarbons (purgeables and extractables or F1+F2+F3+F4 CCME fractions), • methyl <i>tert</i>-butyl ether, and • water levels

- (6) A person responsible for Class I land treatment of SCH must collect and analyze representative soil samples in accordance with Table 4.

Table 4 - Soil Monitoring

Sample Type and Number	Frequency	Parameter
<p>Five samples per hectare upon which SCH will or has been applied. This includes</p> <ul style="list-style-type: none"> • four random core samples, and • one composite sample resulting from the combination of at least 20 samples of the surface soil <p>The samples are to be taken from</p> <ul style="list-style-type: none"> • the uppermost 15 centimeters of soil, or • the depth of incorporation and impact of SCH whichever is deeper. 	<p>Before commencement of operations and at closure</p>	<ul style="list-style-type: none"> • pH • major ions (Ca²⁺, Mg²⁺, NH₄⁺, Na⁺, K⁺, Cl⁻, NO₃⁻, and SO₄²⁻) • metal scan • electrical conductivity • benzene, toluene, ethylbenzene, and xylene, and • total petroleum hydrocarbons (purgeables and extractables or F1+F2+F3+F4 CCME fractions)
	<p>Annually and at closure</p>	<ul style="list-style-type: none"> • pH, • benzene, toluene, ethylbenzene, and xylene • total petroleum hydrocarbons (purgeables and extractables or F1+F2+F3+F4 CCME fractions), and • methyl <i>tert</i>-butyl ether, and

Analytical Methods

- 10(1) Collection and analyses of samples required by this Code of Practice must be in accordance with the following:
- (a) for waters samples:
 - (i) the *Standard Methods for Examination of Water and Wastewater*, 19th edition, as amended, published by the American Public Health Association, American Water Works Association, and Water Environment Federation;
 - (ii) the *Methods Manual for Chemical Analysis of Water and Waste* (1996) published by Alberta Environment, as amended;
 - (iii) any other equivalent method accepted in writing by the Director.
 - (b) for soil and SCH samples:
 - (i) the most recent edition of the *Reference Method for the Canada Wide Standard for Petroleum Hydrocarbon in Soil – Tier I Method*;
 - (ii) the most recent edition of *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, U.S. EPA;
 - (iii) the most recent edition of *Manual on Soil Sampling and Methods of Analyses*, published by the Canadian Society of Soil Science; or
 - (iv) any other equivalent method specified in writing by the Director.

Reporting

- 11(1) A person responsible must immediately report by telephone any contravention of the terms and conditions of the Code of Practice to the Director.
- (2) A person must, within seven days of reporting pursuant to 11(1) or within another time period specified in writing by the Director, provide a written report that includes:
- (a) a description of the contravention(s);
 - (b) an explanation as to why the contravention(s) occurred;
 - (c) a summary of all preventative measures and actions that were taken prior to the contravention(s);
 - (d) a summary of all measures that were taken to mitigate the contravention(s) and any remaining problems related to the contravention(s);
 - (e) the names, addresses, phone numbers and responsibilities of the persons responsible at the time that the contravention occurred; and
 - (f) proposed preventative measures designed to prevent future contraventions.

Record Keeping

- 12(1) A person responsible must record the following information:
- (a) results of the classification of SCH carried out pursuant to section 6;
 - (b) results of the analysis of treated SCH carried out pursuant to section 8(5)(a);
 - (c) results of the analysis of run-off water carried out pursuant to section 8(6);
 - (d) results of groundwater monitoring and soil sampling carried out pursuant to sections 9(5) and 9(6), respectively;
 - (e) the source, quantities, characteristics of the SCH; and
 - (f) quantities, characteristics, and locations where treated SCH has been re-used or disposed of.
- (2) A person responsible must:
- (a) retain all records required to be kept under this Code of Practice for a minimum of 5 years from when the records were generated;
 - (b) make the records available to Alberta Environment upon request; and
 - (c) keep records of any concerns raised in response to notification given pursuant to Subsection 5(1) to 5(4), and responses to these concerns

Effective Date

- 12 This Code of Practice is effective ..., 2001.

SCHEDULE 1

Application Form for Registration

CLASS I LAND TREATMENT OF SOIL CONTAINING HYDROCARBONS

The person responsible* shall complete this registration form and forward it to the Director, in accordance with section 4 of the Code of Practice of the Land Treatment and Disposal of Soil Containing Hydrocarbons, before conducting multiple or continuous land treatment of SCH. The following information shall be provided:

- (a) the person responsible's* (operator's) name, address, and telephone number;
- (b) the municipal address or legal land description of the location of the land treatment facility;
- (c) description of the site including
 - (i) site boundaries,
 - (ii) zoning,
 - (iii) current land use, and
 - (iv) area map covering at least 1.5 kilometre radius of the proposed land treatment facility, showing
 - (A) permanent water bodies,
 - (B) water supply wells,
 - (C) residences,
 - (D) institutions, and
 - (E) commercial and industrial developments;
- (e) description of the site hydrogeology to the depth of 6 metres, or 2 metres below the water table, whichever is greater;
- (f) physical and chemical characteristics of background soil and groundwater;
- (g) general identification of the area served, source, quantity, and characteristics of the SCH;
- (h) description of the project including siting, design, operation, monitoring, and closure;
- (i) anticipated schedule and duration of operation of the land treatment facility;
- (j) description of the notification process used, including a list of concerns received and the manner in which these concerns have been addressed;
- (k) copy of development permit or written authorization issued by the local authority;
- (l) name and job title of the person who submits this registration form [if different from (a)].

I acknowledge that I have reviewed a copy of the Code of Practice for the Land Treatment and Disposal of Soil Containing Hydrocarbons, and that I am bound by the provisions of the Code of Practice and any subsequent amendments to it.

Signature of the person responsible* (operator)

Date

* "Person responsible" includes individuals and corporations.

For office use only:

Date received _____

Registered by _____

Registration number: _____

Director's signature

Date

SCHEDULE 2

Application Form for Registration

CLASS II LAND TREATMENT OF SOIL CONTAINING HYDROCARBONS

The person responsible* shall complete this registration form and forward it to the Director, in accordance with section 4 of the Code of Practice of the Land Treatment and Disposal of Soil Containing Hydrocarbons, before conducting one-time treatment of SCH in excess of 10 tonnes. The following information shall be provided:

- (a) the person responsible's* name, address, and telephone number;
- (b) identification of the source, quantity, characteristics, and classification of the SCH;
- (c) the municipal address or legal land description of the location of the land cell(s);
- (d) description of the project including siting, design, operation, monitoring, and closure;
- (e) anticipated schedule and duration of the land treatment;
- (f) description of the notification process used, including a list of concerns received and the manner in which these concerns have been addressed;
- (g) copy of written permission or agreement from the local authority;
- (h) name and job title of the person who submits this registration form [if different from (a)].

I acknowledge that I have reviewed a copy of the Code of Practice for the Land Treatment and Disposal of Soil Containing Hydrocarbons, and that I am bound by the provisions of the Code of Practice and any subsequent amendments to it.

Signature of the person responsible*

Date

* "Person responsible" includes individuals and corporations.

For office use only:

Date received _____

Registered by _____

Registration number: _____

Director's signature

Date

SCHEDULE 3

ALBERTA ENVIRONMENT REGIONAL DIRECTORS AND BOUNDARIES

Director and Region	Address	Fax	Telephone
Northwest Boreal Region	3 rd Floor, Provincial Bldg Bag 900, Box 319621 96 th Avenue Peace River AB T8S 1T4	780 624 6542	780 624 6330
Northeast Boreal Region	Twin Atria 111, 4999 98 Avenue Edmonton AB T6B 2X3	780 427 7824	780 427 7617
Northern East Slopes Region	107, 1111 54 Street Edson AB T7V 1T2	780 723 8386	780 723 8357
Parkland Region	4920 51 Street Red Deer AB T4N 6K8	03 340 5173	403 340 7744
Bow Region	Room 303, Deerfoot Square 2938 11 Street, NE Calgary AB T2E 7L7	403 297 6069	403 297 7948
Prairie Region	2 nd Floor, Provincial Building 200 – 5 th Avenue South Lethbridge AB T7E 1T2	403 382 4428	403 381 5512