

DOMESTIC FUEL OIL SPILL POLICY



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Approved By: W. Lahey
Deputy Minister

| | | |
|-------------------------|------------|---|
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| | Revisions: | 1. December- 2003, (technical) 2. December 2005 (technical-change in remedial criteria) |

I. PREAMBLE

Policy Statement

The intent of this policy is to provide guidance for the remediation of domestic fuel oil spills in Nova Scotia.

Definitions

“Domestic Fuel Oil Spill” means the release of fuel oil on a residential land use property with three or less units, from a petroleum storage tank with a capacity of less than or equal to 500 imperial gallons (2270 liters).

“Certified Cleanup Contractor” means, for the purpose of this policy only, an individual with an appropriate level of combined education and experience in remediation of petroleum hydrocarbon spills (See Appendix E).

“Site Professional” means, for the purpose of this policy only, an individual with education to a bachelor’s degree level in an appropriate engineering, science or applied science discipline and a minimum of eight years of general professional practice of which a minimum of five years shall be specific practical experience in all phases of environmental site assessment, development and implementation of remediation plans, compliance monitoring, and contaminated site health and safety (See Appendix E).

“Managed Site” means, for the purpose of this policy only, a site where the remedial criteria have been met with the exception of residual contamination located in inaccessible areas (e.g. under footings, utilities, etc.). This residual contamination exceeds applicable remediation criteria.

“Record of Site Conditions for Domestic Fuel Oil Spill” means a record to be completed by the Certified Cleanup Contractor or Site Professional upon the Department’s acceptance of the Remediation Report or Remediation Form For

Domestic Fuel Oil Spill. This record may be accessed through the Environmental Registry.

"Environmental Emergency" means an emergency situation in which there is a release or an impending release of a contaminant in such quantities that mitigation of the release is beyond the capability of the person responsible because the person responsible lacks the resources, is unknown, or is otherwise unwilling or unable to control and manage the release.

"Residential Property" means any property where the primary activity of the land use is residential or recreational activity.

"Commercial Property" means any property where the primary activity of the land use is commercial (e.g., shopping mall) and not residential or manufacturing. This does not include operations where food is grown.

"Industrial Property" means any property where the primary activity of the land use involves the production, manufacture, or construction of goods.

"Impacted Party" means any property owner (persons, corporations, government) whose property has been impacted due to migration of contamination.

"Off Site Property" means any property impacted from contamination originating from another site. The property may be owned by private individuals, corporations and/or government.

"Underground Services" means any infrastructure installed underground to provide specific service to a property, i.e. utilities.

"Off Site Impacts" means an effect caused by contamination which has migrated from another property.

"Property Owner" means the owner of a property by legal title.

"Source Property Owner" means the owner of the property which was the origin of the domestic oil spill.

"Off Site Property Owner" means the owner of an off site property by legal title.

"Person Responsible" means:

- a) a person responsible for the substance that is over, in, on or under the domestic fuel oil spill site,
- b) any other person whom the Minister considers to be responsible for causing or contributing to the release of a substance into the environment,
- c) the owner or occupier of, or an operator on, the domestic fuel oil spill site,
- d) any previous owner, occupier or operator of the domestic fuel oil spill site who was the owner, occupier or operator at any time when the substance was released over, in, on or under the domestic fuel oil spill site,

- e) a successor, assignee, executor, administrator, receiver, receiver manager or trustee of a person referred to in subclauses a) to d) or
- f) a person who acts as the principal or agent of a person referred to in subclauses a) to e).

Legislation

The *Environment Act*, S. 8(2)(b), states that

The Minister, for the purposes of the administration and enforcement of this Act, and after engaging in such public review as the Minister considers appropriate, shall establish and administer policies, programs, standards, guidelines, objectives, codes of practice, directives and approval processes pertaining to the protection and stewardship of the environment.

The *Environment Act*, S. (73)(b) and (c) also state that

The Minister may prescribe the concentration, amount, level and rate, including the maximum concentration, amount, level and rate of a substance that may be released into the environment and determine the manner in which a report of a release of a substance is to be made and the contents of the report.

Objectives

The objective of this policy is to provide clarification on the minimum requirements for the assessment, remediation and reporting of domestic fuel oil spills in Nova Scotia. This policy also establishes minimum eligibility requirements for both Certified Cleanup Contractors and Site Professionals.

Application

This policy applies to all domestic fuel oil spills in Nova Scotia.

II. PROCESS

Notification

- 1 Notification by the person responsible must be provided to NSEL and impacted parties with the following time limits:
 - Environmental Emergency - Immediately (Complete Notification requirements as identified in Part VI of the *Environment Act* and submit completed Notification Form in Appendix G).
 - Non emergency - within 10 working days (Complete and submit Notification Form in Appendix G)

Roles/Responsibilities

- 1 The person responsible, property owner or their insurance company must retain a Certified Cleanup Contractor or Site Professional to manage the assessment and remediation of a domestic fuel oil spill.

- 2 A Certified Cleanup Contractor may perform the remediation of a domestic fuel oil spill at sites where the contamination has not migrated under the building, off site properties have not been impacted, the groundwater is nonpotable and there is no obvious indication of the presence of free product on the groundwater. A Certified Cleanup Contractor must endorse all reports/records submitted to the Department.
- 3 If a Certified Cleanup Contractor encounters contamination under the building, impacts to off site properties, free product on groundwater or possible impacts to potable water supplies, a Site Professional must be retained to complete the work. The Certified Cleanup Contractor shall submit a completed Remediation Form for Domestic Fuel Oil Spill (Appendix C) to the Department. A Site Professional is required for all sites requiring the installation of monitoring wells. A Site Professional must endorse all reports/records submitted to the Department.
- 4 Site Professionals must have Errors and Omissions Liability Insurance Coverage with a minimum of \$1,000,000 coverage or aggregate, with no environmental exclusion.

Assessment/Remediation Requirements

- 1 Monitoring wells are required on all sites involving potable groundwater. In rare cases deviation from this requirement may be considered. The Site Professional must be able to rationalize any deviation from this requirement. Monitoring wells may also be required on sites with large spills, sites where offsite impacts are likely or at sites with nearby lakes or watercourses.
- 2 Site Professionals shall meet the minimum hydrogeological requirements established in Appendix F for site assessments/ remediation involving sites with groundwater monitoring wells.
- 3 In cases involving off site impacts, the Site Professional shall consult with the off site property owner or their representative prior to locating any monitoring wells or treatment infrastructure on the off site property. The Site Professional should consult the municipality and all utility operators to identify the location, size and nature of underground services located on off site properties.
- 4 Upon completion of any groundwater monitoring requirements, the wells must be immediately sealed in a manner sufficient to prevent vertical movement of water within the well or into the well from the surface (Appendix F). The Site Professional must submit a well abandonment plan to the department for review. No monitoring well shall be abandoned unless the method is given prior approval by an NSEL inspector.
- 5 The following tabulated remedial criteria shall be applied to all releases from domestic fuel oil spill sites and where domestic fuel oil spills impact neighboring commercial properties¹

Remedial Criteria:

Soil-Residential Properties:

| <i>Parameter</i> | <i>Matrix</i> | <i>units</i> | <i>Remedial Criteria</i>¹ |
|--|----------------------|---------------------|---|
| Modified Total Petroleum Hydrocarbon (TPH) | soil | mg/kg | 140 |
| benzene | soil | mg/kg | 0.01 |
| toluene | soil | mg/kg | 0.08 |
| ethylbenzene | soil | mg/kg | 0.02 |
| xylene | soil | mg/kg | 2.3 |

Potable Groundwater-Residential Properties²:

| <i>Parameter</i> | <i>Matrix</i> | <i>units</i> | <i>Remedial Criteria</i> |
|--|----------------------|---------------------|---------------------------------|
| Modified Total Petroleum Hydrocarbon (TPH) | Potable Groundwater | mg/L | 3.2 |
| benzene | Potable Groundwater | mg/L | 0.005 |
| toluene | Potable Groundwater | mg/L | 0.024 |
| ethylbenzene | Potable Groundwater | mg/L | 0.0024 |
| xylene | Potable Groundwater | mg/L | 0.30 |

Soil- Commercial Properties

| Parameter | Matrix | units | Remedial Criteria¹ |
|--|---------------|--------------|--------------------------------------|
| Modified Total Petroleum Hydrocarbon (TPH) | soil | mg/kg | 840 |
| benzene | soil | mg/kg | 0.01 |
| toluene | soil | mg/kg | 0.08 |
| ethylbenzene | soil | mg/kg | 0.02 |
| xylene | soil | mg/kg | 2.3 |

Potable Groundwater- Commercial Properties²:

| Parameter | Matrix | units | Remedial Criteria |
|--|---------------------|--------------|--------------------------|
| Modified Total Petroleum Hydrocarbon (TPH) | Potable Groundwater | mg/L | 15 |
| benzene | Potable Groundwater | mg/L | 0.005 |
| toluene | Potable Groundwater | mg/L | 0.024 |
| ethylbenzene | Potable Groundwater | mg/L | 0.0024 |
| xylene | Potable Groundwater | mg/L | 0.3 |

- 6 A person responsible, property owner or their insurance company may utilize the Atlantic RBCA process in place of the Domestic Fuel Oil Spill Remediation Criteria to evaluate, remediate or manage a site, however, the use of the Tier I Look Up tables and Tier II risk assessments for domestic fuel oil spills, will not be accepted unless full environmental site assessments are performed on the properties. Site assessments must be performed by a Site Professional. Minimum criteria for environmental site assessments are provided in the Atlantic RBCA User Guidance For Petroleum Impacted Sites in Atlantic Canada, Version 2.0
- 7 Off site impacts from a domestic fuel oil spill must be remediated to the remedial criteria of this policy. Alternatively, third party impacts may be assessed utilizing the Atlantic RBCA process (including Tier I Look Up table and the Tier II risk assessment approach) or managed through the use of a Managed Site approach, providing written agreement is acquired from the affected third parties.

- 8 In the case where a commercial property furnace oil spill has impacted an off site residential property, the off site impacts of the residential property must be remediated to the remedial criteria of this policy. Alternatively, third party impacts may be assessed utilizing the Atlantic RBCA process (including Tier I Look Up table and the Tier II risk assessment approach) or managed through the use of a Managed Site approach, providing written agreement is acquired from the affected third parties.
- 9 The Contaminated Site Close-Out Sampling Procedures provided in Appendix A are considered the minimum standard in determining the amount and location of close-out sampling.

Reporting Requirements

- 1 The Certified Cleanup Contractor must complete a “Remediation Form for Domestic Fuel Oil Spill” and submit it to the Department within 10 working days of completion of remedial activities. Upon acceptance of a “Remediation Form for Domestic Fuel Oil Spill” by the Department, the Certified Cleanup Contractor will complete and submit to the Department a “Record of Site Conditions for Domestic Fuel Oil Spill (Form B)” (Appendix C) within 20 working days.
- 2 The Site Professional must submit a Remediation Report to the Department which includes the following information:
 - Site Location including civic address and property identification number
 - Land uses, buildings and underground services associated with the on site property and any off site properties located within 150m of the spill
 - Estimated quantity of the release and time frame of spill
 - Identification of any off site impacts
 - Evaluation of groundwater usage (current and reasonable foreseeable future) AND
 - Any surface water bodies or water courses within 150m of the spill
 - Surface drainage pattern
 - Approximate groundwater flow regimes
 - Figure/map identifying the property infrastructure, spill delineation, monitoring well locations and location of all sampling points
 - Potential receptors both on and off site
 - Delineation of contamination in three dimensions
 - All sampling laboratory analysis results
 - Test pit and borehole logs
 - All monitoring well laboratory analysis results
 - Proposed well abandonment details
- 3 The Site Professional must submit a Certificate of Insurance to the Department with the Remediation Report.
- 4 In the case of inaccessible impacted soils, the Site Professional must justify leaving any residual contamination which exceeds the remedial criteria of this policy. Engineering controls must be designed and installed on Managed Sites to close the appropriate pathways of exposure. As such, for Managed Sites, the Site Professional must also provide the following information in the Remediation

Report:

- Volume and location of impacted soils exceeding remedial criteria
 - Treatment systems explored to remediate the impacted soils
 - Comments from structural engineer regarding removal of impacted soils beneath footings or foundations
 - Qualitative evaluation of applicable exposure pathways
 - An explanation of how the potential health risks to receptors have been addressed
 - Details regarding necessary monitoring program and provision of all monitoring results
 - Conditions or restrictions associated with necessary engineering controls
- 5 The conditions associated with maintenance of engineered controls and monitoring of a Managed Site shall be included in a “Record of Site Conditions for Domestic Fuel Oil Spill.”
- 6 Upon acceptance of the Remediation Report by the Department, the Site Professional must complete and submit to the Department a “Record of Site Conditions for Domestic Fuel Oil Spill (Form A)” (Appendix B) for the source property within 20 working days.
- 7 Upon acceptance of the Remediation Report by the Department, the Site Professional must complete and submit to the Department a “Record of Site Conditions for Domestic Fuel Oil Spill” for the affected off site property within 20 working days.

Footnotes:

1. The tabulated remedial criteria in this document are based on the most stringent current Atlantic RBCA (ARBCA) V 2.0 Tier I look up table values. In the case of subsequent ARBCA revisions, the latest Tier I look up table value must be used. The latest ARBCA laboratory method must be used for analysis. Non-aqueous phase liquids (NAPL) must not be present in groundwater and soils must not contain liquid or free product. If the building or dwelling has no foundation/slab or one in poor condition, remediation must include installation of a vapour barrier and concrete foundation. The Site Professional must ensure that off site criteria will be met in the future by demonstrating that the plume is declining or at steady state.
2. On non-potable sites where groundwater monitoring wells are required and ecological receptors are not a concern, groundwater remedial criteria shall default to the applicable ARBCA V. 2 Tier I look up table coarse grained value. On non-potable sites where groundwater monitoring wells are required and ecological receptors represent a concern, groundwater remedial criteria shall default to the potable groundwater criteria of this policy.

References

The following documents should also be referenced:

- 1) Atlantic RBCA User Guidance For Petroleum Impacted Sites, Version 2.0, October 2003 as subsequently revised from time to time.
- 2) Canada-Wide Standards for Petroleum Hydrocarbons (PHC) in Soil. Canadian Council of Ministers of the Environment. June 6, 2000
- 3) *Emergency Spill Regulations* (NS Reg. 59/95)

Inquiries

Inquiries with respect to this policy should be directed to the local regional office of the Nova Scotia Environment & Labour of Environment and Labour.

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Date: December 1, 2005

Original Approved by
W. Lahey
Deputy Minister

APPENDIX A
Contaminated Site Close-Out Sampling Procedures

CONTAMINATED SITE CLOSE-OUT SAMPLING PROCEDURES

SOILS

| Minimum Verification Sampling Requirements for Excavation Floor and Sidewalls | | |
|---|-----------------|------------------------|
| Floor Area (m ²) | Floor Sample(s) | Sample(s) per Sidewall |
| <25 | 1 | 1 |
| 25-50 | 1 | 2 |
| 50-100 | 2 | 2 |
| 100-250 | 2 | 4 |
| 250-500 | 3 | 5 |
| 500-750 | 3 | 6 |
| 750-1000 | 4 | 7 |

The above table is not to be used to determine number of assessment samples.

- * For excavations deeper than 4m, and for areas greater than 1000m², site specific verification (and compliance) requirements are needed.
- ** In cases where less than two sidewall samples are required, one sidewall sample should be collected from the bottom of the down gradient sidewall.

GROUNDWATER

The following procedure is to be followed upon the decommissioning of a groundwater remediation system or a groundwater monitoring program at a contaminated site:

1. Ensure that the current groundwater usage is in accordance with the proposed remediation objectives.
2. Record the necessary documentation to confirm compliance with the remediation criteria including the most recent suite of analytical results.
3. A post monitoring schedule is to be implemented which will include groundwater sampling (as a minimum) during the following time frames over a one year period:
 3. One full round during the recharge period in the Spring or Fall
 4. One full round during low flow time in July/August
4. All post decommissioning monitoring data are to be recorded for review after monitoring is completed.
5. Ultimately, all monitoring wells and other access points should be properly abandoned.

Note: The above close-out sampling procedures shall commence only after remediation activities are completed to the appropriate guidelines and objectives for the site.

APPENDIX B
Form A
Record of Site Conditions for Domestic Fuel Oil Spill
(Site Professional)

Form A

Record of Site Conditions for Domestic Fuel Oil Spill (Site Professional)

****Note for the purpose of this document only, site is defined as the area of the domestic fuel oil spill. Site is not the full property.

Information which may be accessed through the Environmental Registry

Site Information

Property Civic Address:

Property Identification number:

Property Owner: (Name only)

Source Property Owner: (Name only)

Site Professional

Company Name, Contact Name:

Prescribed Wording

1. The Department was notified of a domestic fuel oil spill on _____
2. Site assessment, remediation and management upon which this record relies has been overseen by the undersigned Site Professional.
3. All reports related to the domestic fuel oil spill have been provided to the person responsible and the owner of the property identified in this record. The property owner has been advised to retain these documents for permanent record and disclose such information in future property transactions.
4. The site assessment, remediation and management have been performed in accordance with the Domestic Fuel Oil Spill Policy, dated _____
5. Remediation of the domestic fuel oil spill has been performed and the following criteria have been met:

- Remedial criteria as defined in the Domestic Fuel Oil Spill Policy, dated _____, or

- In all areas accessible to remediation, the remedial criteria as defined in the Domestic Fuel Oil Spill Policy, dated _____ have been met, however, residual contamination in excess of the remedial criteria set out above, remain (specify physical location and levels) _____. Engineering controls have been installed to close the pathways of exposure. The following conditions must be maintained on the property:

_____, or

- The Atlantic Risk Based Corrective Action (RBCA) Tier _____ approach was used to assess and manage the spill. An environmental site assessment was completed. The following remedial objectives have been met:

Signature of Site Professional: _____

Date: _____

Information Subject to Freedom of Information & Protection of Privacy Act

Date

Property Owner

(Name, Mailing Address and Telephone Number):

Person Responsible (if different from above)

Person and/or Company (Name, Mailing Address and Telephone Number):

Source Property Owner (Name, Civic Address and Telephone Number):

Site Professional

Company Name, Contact Name, Mailing Address and Business Telephone Number:

APPENDIX C
Remediation Form for Domestic Fuel Oil Spill/
Form B - Record of Site Conditions for Domestic Fuel Oil Spill
(Certified Cleanup Contractor)

Remediation Form For Domestic Fuel Oil Spill

The following document must be completed by the Certified Cleanup Contractor who performs the remediation of a domestic fuel oil spill and submitted to NSEL within 10 working days of completion of remedial activities. If it is determined during the course of the remedial work that impacts exist under a building, have migrated to off site properties, threaten potable water supplies, or evidence of free product on groundwater exists, then NSEL shall be notified immediately and the Certified Cleanup Contractor shall inform the person responsible that the services of a Site Professional are required to oversee or complete the work. Note information provided in this form is subject to the *Freedom of Information & Protection of Privacy Act*.

Site Information

Property Civic Address:

Property Identification Number:

Property Owner:

Person Responsible (if different from above)

Company (Name, Mailing Address and Telephone Number):

Other (Name, Civic Address)

Certified Cleanup Contractor

Name of Certified Cleanup Contractor:

Name of Company:

Certified Cleanup Contractor Mailing Address:

Telephone Number:

Site Conditions

1) Location of contamination on property

- Above ground
- Below ground
- Near infrastructure such as sanitary sewers, water lines, catchbasins or storm sewer
- Near ditch
- Inside building
- Outside building
- Near watercourses, wetlands
- Near foundation
- On native soil
- On paved surface
- Near structures such as power poles, transformers, etc. (Specify:_____)

2) Type of Foundation or Slab and Integrity

- Concrete
- Concrete block or brick
- Earthen floor
- Sump
- Other(describe)_____

Describe condition of foundation/slab:_____

3) Amount and duration of release?

Liters _____ Gallons _____

Duration of Release Hours Days

Weeks Other specify:_____

4) Has the spill migrated under the building?

- Yes No

5) How much contaminated soil was removed?

yd³ _____ ft³ _____ m³ _____ Tonnes _____

6) Where was the contaminated soil taken for treatment and disposal?

7) Neighboring property land use?

- residential commercial other (specify)_____
- industrial agricultural

- 8) Is there evidence of vapours entering the building?
 Yes No
- 9) Has the neighboring property been impacted?
 Yes No
- 10) Are there potable groundwater supplies in the area?
 No Yes Approximate distance _____
11. Are there potable surface water supplies in the area?
 No Yes Approximate distance _____
- 12) Is the property impacted by the spill located in an area serviced by municipal water?
 Yes No
- 13) What is the source of municipal water supply?
 groundwater surface water
- 14) Is there evidence of groundwater contamination?
 No Yes
- 15) Is there an on site sewage disposal system in the area?
 No Yes Distance from source
- 16) Attach a copy of all close-out sampling results for the remediation and provide a sketch of the spill in relation to the other infrastructure located on the property.

Based on the information collected with respect to the criteria detailed in this site remediation, are the services of a Site Professional required to further evaluate the extent of the contamination?

- No Yes

If the answer to the above question is No then, the attached "Record of Site Conditions for Domestic Fuel Oil Spill (Form B)" should be completed and submitted to the department upon confirmation of acceptance of the Remediation Form from NSEL.

Signature of Certified Cleanup Contractor _____

Attach sketch of property and spill location:

Form B

Record of Site Conditions for Domestic Fuel Oil Spill
(Certified Cleanup Contractor)

****Note for the purpose of this document only, site is defined as the area of the domestic fuel oil spill. Site is not the full property.

Information which may be accessed through the Environmental Registry

Site Information

Property Civic Address:

Property Identification number:

Property Owner: (Name Only)

Certified Cleanup Contractor

Company Name, Contact Name:

Prescribed Wording

1. The Department was notified of a domestic fuel oil spill on _____
2. Remediation upon which this record relies has been overseen by the undersigned Certified Cleanup Contractor.
3. A completed Remediation Form for Domestic Fuel Oil Spill has been provided to the person responsible and the owner of the property identified in this record. The property owner has been advised to retain this document for permanent record and disclose such information in future property transactions.
4. Remediation has been performed in accordance with the Domestic Fuel Oil Spill Policy, dated _____
5. The remedial criteria as defined in the Domestic Fuel Oil Spill Policy, dated _____ have been met.

Signature of Certified Cleanup Contractor: _____

Date: _____

Information Subject to Freedom of Information & Protection of Privacy Act:

Date

Property Owner

(Name, Mailing Address and Telephone Number):

Person Responsible (if different from above)

Person and/or Company (Name, Mailing Address and Telephone Number):

Certified Cleanup Contractor

Name of Certified Cleanup Contractor:

Name of Company:

Mailing Address:

Business Telephone Number:

APPENDIX D
Domestic Fuel Oil Spill Fact Sheet for Homeowners

Domestic Fuel Oil Spill Fact Sheet for Homeowners

Definition

A petroleum product spill or leak is considered a release of a contaminant under the "Environment Act".

When a release of petroleum occurs there is the potential for contamination of soil and groundwater which may affect private wells, drinking water supplies, or adjacent properties. Releases may also result in the presence of petroleum vapors at concentrations that may affect the health of some individuals. If a homeowner or occupant has concerns regarding health effects due to exposure, they should consult their family physician or the local Medical Officer of Health.

A simple furnace oil cleanup can mean replacing the leaking tank and supply lines and removing contaminated soil to a treatment facility. A complex project may mean replacing the house foundation and treating groundwater. Costs can range from several thousand dollars to several hundred thousand dollars.

The person responsible for a fuel oil spill may include an individual such as the homeowner or occupant, or a company, such as the fuel supplier. The person responsible for the spill, is accountable for the costs associated with any emergency action, site assessment and/or remediation deemed necessary.

Homeowner/Occupant Responsibilities

Once a spill has occurred the homeowner or occupant responsibilities include, but are not limited to, the following actions:

- ▶ Contain the spill, if possible, to the best of your ability. This may include construction of a small berm, placement of absorbent material (such as cat litter) and/or contacting the fuel company to have residual fuel in the tank removed.
- ▶ For initial emergency action, the person responsible may choose to hire a contractor to contain the release.
- ▶ Contact the local municipal works department if the spill has entered a municipal sewer through a floor drain.
- ▶ Under the *Environment Act* and the *Emergency Spill Regulations*, you are required to report a spill of furnace oil which is equal to or exceeds 22 imperial gallons (100 liters). Also, you are required to report spills involving less than this quantity if they may potentially cause an adverse effect.
- ▶ Adverse effect is often difficult to determine. There are four primary questions used to determine potential for adverse effect. Will the spill threaten drinking water supplies? Are there any streams or lakes nearby? Are there any vapors within the building? Has the spill impacted neighboring properties? If you answer yes to any of these questions, you have the potential for adverse effect and should notify the Department of the spill.

- ▶ If you are unable to determine if there is the potential for adverse effect, then you should err on the side of caution and contact NSEL.
- ▶ Contact the local office of Nova Scotia Environment & Labour of Environment and Labour (NSEL) when required to report a spill. If the spill has occurred between the hours of 4:30 pm and 8:30 am, on a weekend or holiday, call 1-800-565-1633. You are required to notify NSEL of a reportable spill as soon as you become aware of the release.
- ▶ Contact your insurance company. Where the property is insured, the insurance company may cover all or a portion of the cleanup costs. If you are a homeowner with insufficient insurance coverage and are the person responsible for the spill, you are liable for the cleanup costs.
- ▶ In cases where the spill is reportable, the person responsible shall hire a Certified Cleanup Contractor or Site Professional to assess the site and manage the cleanup. Contact the local office of the NSEL for information on locating a Certified Cleanup Contractor or Site Professional.

Nova Scotia Environment & Labour (NSEL) Responsibilities

Although, NSEL does not conduct the actual cleanup of the property, we are responsible to ensure the work has been performed in accordance with departmental requirements. NSEL has the authority to direct a person responsible, to contain or clean up the affected area to current remediation standards.

If the spill is reportable and the person responsible has not acquired the services of a

Certified Cleanup Contractor or Site Professional, NSEL will require the person to do so.

Where emergency action is required, the responsible person may be ordered to complete the cleanup within a specified time frame.

Certified Cleanup Contractor/Site Professional Responsibilities

In cases, where the environmental impact does not extend under a building, impact another property (other property owners include private individuals, corporations or governments), or impact a potable water supply, the person responsible may use the services of a Certified Cleanup Contractor, who will:

- ▶ simply excavate the contaminated soil.
- ▶ dispose of the material at an approved facility.
- ▶ submit a completed remediation form within 10 working days to the department containing a summary of the estimated volume of the spill, quantity of material removed and disposal location.

In all other cases, the person responsible will require the services of a Site Professional. Once a Site Professional has evaluated the condition of the property, a report must be submitted to NSEL detailing the extent of contamination and the proposed method of remediation for the property. NSEL will review this report and determine if the remedial action satisfies departmental requirements.

A record of the incident will be maintained with the Department.

Appendix E
Domestic Fuel Oil Spill Policy
Standards for Minimum Eligibility Criteria for Registry as a Certified Cleanup Contractor/Site
Professional

Nova Scotia Environment and Labour

Domestic Fuel Oil Spill Policy Standards for Minimum Eligibility Criteria for Registry as a Certified Cleanup Contractor / Site Professional

I PURPOSE

This document provides minimum eligibility criteria as established by Nova Scotia Environment and Labour for Certified Cleanup Contractors and Site Professionals in the province of Nova Scotia as defined under the *Domestic Fuel Oil Spill Policy*.

II BACKGROUND

Under the Domestic Fuel Oil Spill Policy, sites must be assessed and/or remediated by either a Certified Cleanup Contractor or a Site Professional. Nova Scotia Environment and Labour (NSEL) has developed a framework to register Certified Cleanup Contractors and Site Professionals. The following sections detail registration eligibility requirements.

III APPLICATION

1.0 Certified Cleanup Contractor/Site Professional

- a) A Certified Cleanup Contractor is required to register with a department approved licensing body, to assess and remediate hydrocarbon impacts resulting from domestic fuel oil spills under the *Domestic Fuel Oil Spill Policy*. Certified Cleanup Contractors are limited to remediating sites where there are no obvious indications of free product on groundwater, the impacts do not exist under dwellings, do not impact off site properties, and do not threaten potable water supplies.
- b) A Site Professional is required to register with a department approved licensing body, to assess, remediate, or manage hydrocarbon impacts resulting from domestic fuel oil spills under the *Domestic Fuel Oil Spill Policy*.

2.0 Registration - Eligibility Requirements

(a) Certified Cleanup Contractors

A person presently certified as a Petroleum Storage System Installer may be eligible for registration as a Certified Cleanup Contractor as defined in the Domestic Fuel Oil Spill Policy provided they:

- (i) make application with a department approved licensing body (to be established) to be registered as a Certified Cleanup Contractor,
- (ii) make provision to attend the Certified Cleanup Contractor's two day Environmental Site Investigation/Remediation Course for Certified Cleanup Contractors before Dec 31, 2003, and
- (iii) submit a list of sites in which they have been employed as a Underground Petroleum Storage Tank Installer since Jan 1, 1997 or submit an up-to-date *Underground Petroleum Storage Tank Installers Licensed Log Book*.

(b) Site Professionals

A Person presently acting as a "Site Professional" under the department's *"Guidelines for the Management of Contaminated Sites in Nova Scotia"* may be eligible for registration as a Site Professional as defined in the *Domestic Fuel Oil Spill Policy* provided they:

- (i) make application with a department approved licensing body (to be established) to be registered as a Site Professional,
- (ii) attain education to a bachelor's degree level in an appropriate engineering, science or applied science discipline by December 31, 2006, and
- (ii) can successfully demonstrate a minimum of eight years of general professional practice of which a minimum of five years shall be specific practical experience in all phases of environmental site assessment, development and implementation of remediation plans, compliance monitoring, and contaminated site health and safety.

Persons who do not meet the above mentioned eligibility requirements are required to register as new entries (Section 3.0).

3.0 Registration - New Entries

a) Certified Cleanup Contractor

No person seeking registration as a Certified Cleanup Contractor shall be registered unless that person has successfully:

- (i) made application with a department approved licensing body (to be established) to be registered as a Certified Cleanup Contractor,
- (ii) completed the Certified Cleanup Contractor's two day Environmental Site Investigation/Remediation Course for Certified Cleanup Contractors,
- (iii) passed the Registration Exam for Certified Cleanup Contractors, and
- (iv) provided references demonstrating they have experience with the remediation of hydrocarbon impacted sites.

(b) Site Professional

No person seeking registration as a Site Professional shall be registered unless that person can successfully demonstrate they have:

- (i) made application with a department approved licensing body (to be established) to be registered as a Site Professional,
- (ii) education to a bachelor's degree level in an appropriate engineering, science or applied science discipline, and
- (iii) a minimum of eight years of general professional practice of which a minimum of five years shall be specific practical experience in all phases of environmental site assessment, development and implementation of remediation plans, compliance monitoring, and contaminated site health and safety.

4.0 Applications

No person seeking registration shall be considered unless the application is complete and the associated work experience/educational reference documentation are judged satisfactory by NSEL or the licensing body.

Site Professionals seeking Registration must be able to demonstrate proof of appropriate liability insurance coverage through issuance of Certificates of Insurance. The Site Professional must have Errors and Omissions Liability Insurance coverage of \$1,000,000 with no environmental exclusions.

5.0 Fees

In addition to meeting the requirements above there may be administrative charges associated with writing examinations, attending courses, registration fees, and renewal fees, which will be established by the department approved licensing body and revised from time to time.

6.0 Restricted Registration

NSEL and/or the licensing body reserves the right to restrict registration to those persons whom NSEL or the licensing body considers competent and qualified.

7.0 Disciplinary Action

Any registered Certified Cleanup Contractor or Site Professional who does not adhere to the procedures set forth in the *Domestic Fuel Oil Spill Policy* may be subject to disciplinary actions by either NSEL or the licensing body.

Any Certified Cleanup Contractor (described in Section 2(a)(ii)) who has not completed the required training by December 31, 2003 will have their registration revoked.

Any Site Professional (described in Section 2(b)(ii)) who has not attained the appropriate level of required education by December 31, 2006 will have their registration revoked.

8.0 Lists

A list of registered Certified Cleanup Contractors and Site Professionals will be maintained by the licensing body. The list can be obtained by contacting one of the department's offices.

The list will be updated as required on a regular basis to reflect any changes to the status of registered persons. Any disciplinary action which results in the revocation of a person's registration will be posted.

APPENDIX F
Minimum Hydrogeological Investigation Requirements

Minimum Hydrogeological Investigation Requirements

The objective of establishing hydrogeological investigation requirements is to determine the direction and rate of groundwater movement, delineate the principal pathways and factors controlling the migration of contaminants in the subsurface and to quantify the physical parameters controlling groundwater flow and contaminant transport in the subsurface.

The basic information required for hydrogeological review is:

- topography
- thickness, distribution and physical characteristics/properties of soils, fill materials and surficial and bedrock geological materials.
- distribution and types of potential aquifers
- structural make-up of the subsurface
- precipitation and general climatic records
- surface drainage patterns
- groundwater flow regimes
- groundwater recharge/discharge zones
- drainage characteristics of soils
- land use and surface vegetation cover
- groundwater and surface water use in the area
- nature of contamination at the site

Field Program

Once the general subsurface geologic features at the site are known, a drilling program provides a more accurate delineation of the stratigraphic sequence. Test locations should provide an adequately detailed description of the nature, extent and fate of contamination in three directions. A minimum of three boreholes, arranged roughly in a triangular pattern, is required. Each borehole shall be logged in detail and instrumented with a monitoring well. Although most wells will be constructed downgradient from the suspected source, upgradient and lateral locations are required for both background assessment and evaluation of geologically complex settings. In the case of large spill sites, three boreholes are generally not sufficient to completely characterize the hydrogeological system. They do, however, provide enough data to allow construction of a general map of the groundwater flow field.

Design and Installation of Monitoring Wells

Selection of the appropriate monitoring well design and installation method depends on the:

- type of subsurface material encountered
- number of vertical monitoring points required per borehole
- drilling method used
- types of contaminants to be monitored
- end use of the monitoring device

Monitoring wells should be installed such that the location of the wells meets the separation distances identified in the *Well Construction Regulations* of the *Environment Act*. Deviation from this requirement may be considered if prior approval is received from the NSEL inspector.

Groundwater monitoring wells should be constructed with flush-joint, threaded pipe casings which have a minimum inside diameter of 50 mm. A well shall be installed in a boring with a diameter of at least 100mm greater than the diameter of the casing. PVC or stainless steel casing and screen materials are recommended. The material used to construct the well should be compatible with the contaminants being monitored. The site professional should ensure that the groundwater quality has not been significantly modified by the drilling operation, the materials used in well construction and/or sampling.

Permeable filter pack material should be installed around and slightly above the well screen to allow groundwater to flow freely to the well screen. The material should be chemically inert. A uniform quartz sand pack is recommended. The well screen should be factory perforated or continuous slot, wire-wound type with a slot size adequate to ensure that formation water can pass easily into the monitoring well but prevent entry of filter material. Filter packs should extend approximately 0.5 m above the perforated screen interval to allow for compaction of the filter material. All stand pipes shall have a bottom cap or plug to prevent formation materials entering the well during installation.

The monitoring well shall be constructed in a manner which will prevent surface migration of contaminants. Where possible, wells should be constructed to provide depth discrete measurements for individual flow zones. Screen intervals must be located to coincide with the groundwater surface to measure the accumulated thickness of any phase-separated hydrocarbon product (free-product). The site professional should ensure that the well screen is completely isolated in the borehole at the specified depth. The borehole wall near the screen should not be severely modified by the drilling operation.

Installation of a continuously slotted screen that cuts across and links several flow zones should be avoided to minimize the risk of cross contamination. This is of particular concern in subsoil units where free product is evident, and in areas where the location of the stabilized groundwater surface is unknown or where large seasonal fluctuations may occur. In these areas, a nest of several piezometers (installed in separate adjacent boreholes) with slotted screen intervals at varying depths is recommended to enable independent observation of several horizons of flow zones.

The open, annular space between the borehole wall and the casing must be sealed properly to: 1) isolate a discrete zone, 2) prevent migration of surface water, 3) prevent vertical migration of groundwater between strata, and 4) preserve confining conditions by preventing the upward migration of water along the casing. A sealing material of low permeability with known chemical

properties (e.g. expandable clay - bentonite) should be placed above the filter pack to isolate the well screen from the rest of the borehole. Groundwater monitoring wells should be sealed from the top of the filter pack to the ground surface. The use of drill cuttings as backfill will not ensure an adequate seal. The annulus above the "seal" should be backfilled with a clay slurry or cement grout to the surface. The grout should extend above the ground surface and be finished to slope away from the well axis. This plug and apron will inhibit infiltration of surface water. Well heads should be fitted with a water tight cap enclosed in a structure that secures the well against accidental damage, unauthorized access, and vandalism. The recommended design for the construction of a groundwater monitoring well or standpipe piezometers is presented in Figure F1.

Subsoil stratigraphy and lithology (soil types and thickness of layers) should be logged and subsoil units classified according to the Unified Soil Classification system prior to the well construction. A sketch of each completed well should be prepared to accompany visual observations. Apparent groundwater elevations should be recorded on the borehole/well log. All wells should be surveyed relative to a suitable benchmark for the determination of groundwater elevations.

Groundwater Monitoring

All monitoring wells should be monitored for water levels and the presence of any phase separated or free hydrocarbon product floating on the water surface. If liquid product is present its thickness should be measured using an interface probe. Whenever possible, the free product should be removed, its volume recorded and additional monitoring conducted to determine recovery rates. Samples of free product should be collected for laboratory characterization of contaminant.

It is essential that water levels stabilize prior to the use of elevational data for assessment of groundwater flow. Monitoring of water levels and free product thicknesses should be conducted at least twice and on separate site visits. The actual number of monitoring wells depends on well stabilization rates. When appropriate, the site professional shall correct the data for free product and salinity when determining groundwater flow patterns.

Prior to sampling groundwater for dissolved constituent analyses, the well must be purged to remove stagnant water retained in the standpipe water volume or to dryness. The groundwater sample may then be collected using a bailer or other suitable device and transferred to 1000 ml laboratory sample containers. Duplicate samples are recommended. The containers should be glass and must have tight screw-type lids with foil or Teflon cap liners. Collected samples, once transferred, should have no visible head space or evidence of any free product. Samples should be stored in ice filled coolers while on site, and transported as soon as practical to the laboratory, along with chain of custody documentation.

Dedicated sampling devices should be used for each well installation, or equipment must be thoroughly cleaned between each successive well sampling.

The number of samples submitted for laboratory analysis must be sufficient to quantify the total extend (both vertical and lateral) and degree of subsurface contamination.

Analysis parameters will include, but not be limited to:

- Benzene, Toluene, Ethyl benzene and Xylene
- Modified Total Petroleum Hydrocarbon

The domestic on-site water supply well should also be sampled and analyzed for:

- Benzene, Toluene, Ethyl benzene and Xylene
- Modified Total Petroleum Hydrocarbon
- Metals
- Bacteria

The Atlantic Risk Based Corrective Action Laboratory Method shall be used for all analysis of modified total petroleum hydrocarbon, benzene, toluene, ethyl benzene, and xylene.

Initial analytical work-up for contaminant identification should include qualitative analysis of selected samples. These may be samples with elevated field vapour levels and/or free product from observation wells to characterize or confirm the hydrocarbon contaminant. Quantitative methods should then be chosen based on their appropriateness for the identified contaminants.

Laboratories that perform analysis of collected samples should evaluate their QA/QC programs against the required analytical procedures. QC procedures should include the analysis of duplicate spike samples, blanks (field and reagent), check samples and surrogate standard recoveries. Appropriate QA and QC measures should be used to ensure all data generated is suitable for the objectives of the investigation.

Abandonment

When no longer maintained for present or future use, monitoring wells shall be immediately sealed under the guidance of a site professional, in a manner acceptable to an NSEL inspector. The wells shall be sealed in a manner sufficient to prevent the vertical movement of water into the well.

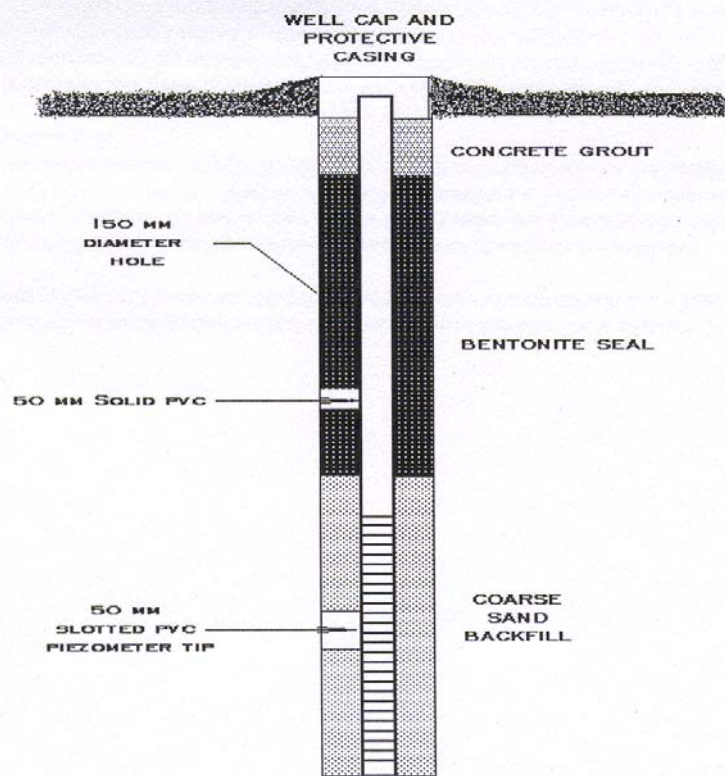


Figure F1
Typical Standpipe Piezometer Detail

APPENDIX G
Notification Form for Domestic Fuel Oil Spills

