

# **PETROLEUM HYDROCARBONS IN SOIL CANADA-WIDE STANDARD**

## **USER GUIDANCE – OVERVIEW**

**January 2008**

### **Introduction**

Canadian Ministers of Environment (except Quebec) endorsed the Petroleum Hydrocarbons in Soil Canada-Wide Standard (PHC CWS) at their meeting of April 30<sup>th</sup> – May 1<sup>st</sup>, 2001 in Winnipeg. Ministers received the risk management objectives of the standard in terms of the pathways and receptors attached to each land use and the protection targeted for each, as reflected in the Tier 1 levels of the standard and supporting default assumptions. The Technical Supplement to the CWS contains a general description of the site assessment process and information on the pathways and parameters that can be adjusted in Tier 2 to increase the accuracy of the exposure estimate and recalculate the appropriate remediation level. This information allows a user to understand the potential technical scope of a Tier 2 assessment but does not provide an organized approach nor any illustration of the technical adjustment procedures. As part of the development of the PHC CWS, a user guidance document has been prepared that will be of additional benefit for organizing the assessment process, illustrating technical options and ensuring that PHC management leads to clear land and water use decisions. Jurisdictions are the primary audience for the user guidance, however it is recognized that end users will rely upon it to some extent.

### **Intent of the User Guidance**

Under the Harmonization Sub-Agreement on Canada-wide Standards, implementation processes are a jurisdictional responsibility. This is particularly true of the PHC CWS because it has been developed with clause 6.1 of the Sub-Agreement in effect. This clause acknowledges that where environmental effects are confined within jurisdictional borders there is no necessity to coordinate implementation actions. Still, it is recognized that there are definite advantages in developing the broadest and deepest possible consensus on application of the PHC CWS. The national user guidance will be a resource for jurisdictions implementing the CWS, provide the simplest national picture for stakeholders and contribute to a “level playing field” across the country. Rather than being prescriptive, the document is illustrative, providing options and ranges of conditions for implementation.

The user guidance is intended to be a companion document to the Scientific Rationale. It will largely be a stand-alone document, summarizing key scientific methods and assumptions while at the same time avoiding duplication.

### **Framework for CWS Implementation**

The attached Table of Contents from the user guidance provides an outline of the subject matter covered in the document. As well, Figure 1 illustrates the framework for implementation of the CWS.

The general framework for the implementation of the PHC CWS is illustrated by the flow chart presented in Figure 1. Detailed discussion of the management and technical aspects of each of the components and decision points of the framework are expanded upon in the user guidance.

The PHC CWS is a tiered framework offering the proponent the option to comply with a set of reasonably conservative risk-based standards corresponding to a number of defined land uses, exposure scenarios and site characteristics (Tier 1) or to use additional site-specific information to assess and manage the risks through a more precise knowledge of actual or potential exposure (Tiers 2 and 3).

The Tier 1 process comprises an initial site assessment and characterization followed by the selection of the applicable Tier 1 values. If feasible and appropriate, management to Tier 1 would normally be undertaken, leading to unconditional acceptance or closure of the site. Where Tier 1 management is not feasible and/or appropriate, the proponent would proceed to Tier 2 or, in some cases, directly to Tier 3.

Tier 2 levels may be established and used when site-specific information indicates conditions that modify human or ecological exposure to PHC contamination, thereby altering the risks relative to the generic conditions used to derive Tier 1 levels. The Tier 2 levels are determined by adjusting the Tier 1 values using site-specific values for certain parameters determined as part of a more detailed site assessment. Adjustment is limited to parameters that are measurable and stable and, in most cases, do not lead to a requirement for ongoing management. Furthermore, adjustment is only relevant to parameters affecting the governing exposure pathway. This may preclude Tier 2 as an option when the governing pathway is not influenced by any Tier 2 adjustable parameters.

Upon determination of Tier 2 levels, the proponent has the option of managing to the established levels, if feasible and appropriate, or of proceeding to Tier 3. Management to Tier 2 may result in either unconditional or conditional acceptance, depending on the nature of the site-specific adjustments and their site management implications.

In some cases a Tier 3 site-specific ecological risk assessment (ERA) and/or human health risk assessment (HHRA) may be warranted and may be used to derive site-specific remediation objectives or to develop a risk management strategy. Quantitative risk assessment is a complex process with more intensive data requirements than either Tier 1 or Tier 2. Different descriptions of contaminant fate, behaviour and exposure may be involved and models may be used that differ from those used in Tiers 1 and 2, although all models must be validated and calibrated for the site. Tier 3 may be followed when there are technical or socio-economic barriers to the implementation of Tiers 1 and 2, or when the generic land uses defined for Tiers 1 and 2 do not adequately characterize the receptors and exposure pathways present. Since Tier 3 relies on site specific input and, in most cases, involves some form of risk management, sites managed at Tier 3 are usually subject to conditional acceptance or closure. Since many resources exist for site-specific risk assessment, the user guidance provides only a general overview.

Regardless of the parameters used as the basis for management at any tier, the target level of human health and ecological protection afforded at each tier does not change.

# CANADA-WIDE STANDARD FOR PETROLEUM HYDROCARBONS IN SOIL

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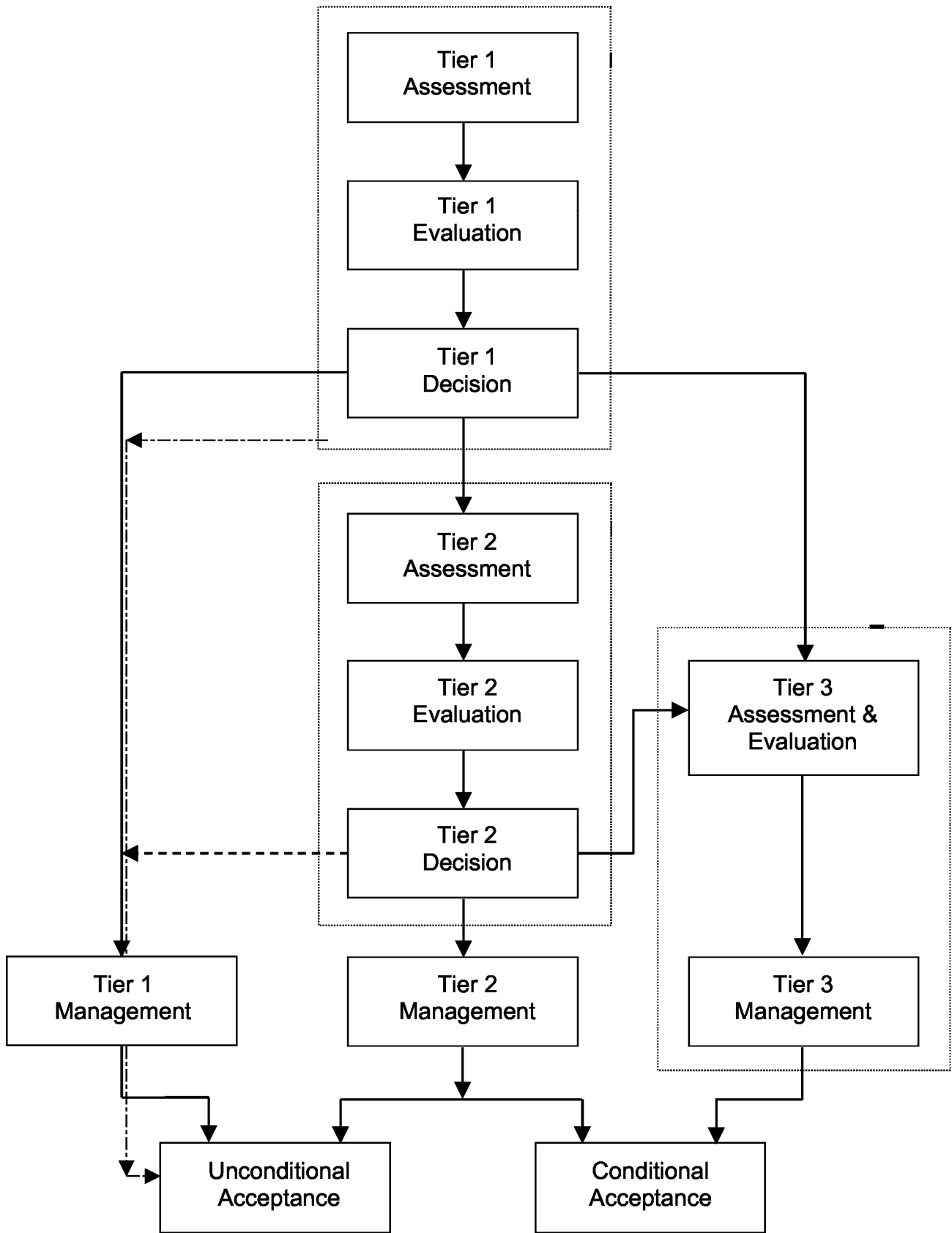
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**Figure 1: PHC CWS Implementation Framework**