

## **Technical Bulletin**

### **Delineation of Significant Groundwater Recharge Areas**

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Ontario Ministry of Natural Resources  
Ontario Ministry of the Environment

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The Clean Water Act requires the Source Protection Committee to prepare an Assessment Report for each source protection area they represent, in accordance with the regulations, the Director's Technical Rules and the approved terms of reference for that source protection area.

As part of the Assessment Report, committees must identify four types of vulnerable areas within each Source Protection Area. These include wellhead protection areas, intake protection zones, highly vulnerable aquifers, and Significant Groundwater Recharge Areas (SGRAs). Once these areas are delineated, the rules require that vulnerability scores be assigned within these areas.

This technical bulletin provides clarification to Source Protection Committees on the process of identifying and delineating SGRAs under the recently released Technical Rules for the Assessment Report. Requirements for assigning vulnerability scores to the SGRAs are set out in Part VII.2 of the Technical Rules and are not addressed in this bulletin.

SGRAs are delineated through the development of water budgets as per the Technical Rules. The Technical Rules allow the Source Protection Committees to use a number of methods to identify and delineate the SGRAs as set out below.

#### **Part V.2 of the Technical Rules states,**

*44. Subject to rule 45, an area is a significant groundwater recharge area if,*

- (1) the area annually recharges water to the underlying aquifer at a rate that is greater than the rate of recharge across the whole of the related groundwater recharge area by a factor of 1.15 or more; or*

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*(2) the area annually recharges a volume of water to the underlying aquifer that is 55% or more of the volume determined by subtracting the annual evapotranspiration for the whole of the related groundwater recharge area from the annual precipitation for the whole of the related groundwater recharge area.*

*45. Despite rule 44, an area shall not be delineated as a significant groundwater recharge area unless the area has a hydrological connection to a surface water body or aquifer that is a source of drinking water for a drinking water system.*

*46. The areas described in rule 44 shall be delineated using the models developed for the purposes of Part III of these rules and with consideration of the topography, surficial geology, and how land cover affects groundwater and surface water.*

To help Source Protection Committees determine what methodology to apply, the following guidance is provided:

### **Rule 44 (1):**

- The method outlined in this technical rule was developed for areas where the recharge rates within the source protection areas are homogenous. This method can assist in distinguishing between high versus low recharge even when narrow ranges in recharge rates exist across an area.
- The method outlined in the technical rule is dependent on scale. This means that considerable differences can occur in the delineation of SGRAs depending on the scale (e.g. subwatershed/watershed/source protection area/region) at which this method is applied.
- If the method outlined in the technical rule is applied at smaller spatial scales it will likely lead to greater variation in SGRA delineation between adjacent areas and a much higher likelihood of boundary issues occurring between the different areas where it is applied.

### **Rule 44 (2):**

- The method outlined in the technical rule was developed for areas where the recharge rates are heterogeneous throughout the watershed.
- This method is less dependent on scale. This means that it can be applied across a broader range of spatial scales (e.g. subwatershed/watershed/source protection area/region) with fewer differences occurring in SGRA delineation between the scales.

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### Rule 45

- The Clean Water Act defines drinking water systems as having the same meaning as defined under the Safe Drinking Water Act (SDWA). The SDWA defines a drinking water system as “any system of works, excluding plumbing, that is established for the purpose of providing users of the system with drinking water...” This means that any system that provides drinking water, whether it is regulated under the SDWA or not, is a drinking water system for this rule. This includes domestic wells and intakes.
- Rule 45 is an exception rule. It states that you can not delineate an SGRA as per rule 44 unless there is a hydrological connection to a surface water body or aquifer that is a source of drinking water for a drinking water system as defined under the SDWA. Therefore, it excludes any area that does not provide drinking water to someone.
- Using available information, drinking water systems are to be overlaid onto the delineated SGRA per rule 44. Using this information, knowledge of the area and professional judgement establish whether there is a hydrologic connection to a surface water body or aquifer. A groundwater recharge area is only ‘significant’ for the purposes of the Clean Water Act if it has a hydrologic connection to a drinking water system.

### Rule 46

- This rule provides the flexibility to apply engineering judgement to refine SGRAs delineated as per rules 44 and 45. The province expects the technical experts (e.g. P.Eng, P.Geo, etc.) and peer reviewers to use professional judgement in the assessment, delineation, and review of SGRAs.
- In applying professional judgement, consideration must be given to the physiographic/geologic setting to which the SGRA methods are applied. If refinement in spatial scale is desired for delineating SGRAs then it is likely more appropriate to subdivide a Source Protection Area by physiographic/geologic region rather than subwatershed. When moving to this scale, additional work will be required to address edge mapping and to ensure there is a logical flow between the different physiographic regions.

### Water Budget and Risk Assessment Technical Guidance, March 2007

- The province recognizes that the delineation of SGRAs to date has been primarily based on the technical guidance and requests that all Source Protection Committees review the methods used to ensure consistency with the Technical Rules.