CANADIAN ENVIRONMENTAL LAW ASSOCIATION
L'ASSOCIATION CANADIENNE DU DROIT DE L'ENVIRONNEMENT

August 4, 2008 **BY FAX**

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Ministry of the Environment
Drinking Water Management Division
Source Protection Programs Branch
2 St. Clair Avenue West
Toronto, ON M4V 1L5

Dear Mr Willson;

RE: EBR Registry No. 010-3893: Proposed Regulation - Definitions of Words and Expressions Used in the *Clean Water Act, 2006*

EBR Registry No. 010-3873: Proposed Regulation – Assessment Reports under the *Clean Water Act, 2006*

EBR Registry No. 010-3866 Proposed Technical Rules – Assessment Reports under the *Clean Water Act, 2006*

These are the comments of the Canadian Environmental Law Association ("CELA") and Environmental Defence Canada ("EDC") with respect to the above-noted proposals. These comments are being provided to you pursuant to the EBR Registry notices regarding the proposals.

PART I - BACKGROUND

CELA is a non-profit, public-interest group established in 1970 to use existing laws to protect the environment and advocate environmental law reform. Funded as a community legal clinic specializing in environmental law, CELA represents individuals and citizens' groups before trial and appellate courts and administrative tribunals on a wide variety of environmental protection and resource management matters.

Since its inception, CELA has advocated the timely development of effective laws, regulations and policies to protect water resources within Ontario and across Canada. Among other things, CELA represented the Concerned Walkerton Citizens at the Walkerton Inquiry, and was actively involved in the development of the *Safe Drinking Water Act, 2002* ("SDWA"), the *Clean Water Act, 2006* ("CWA"), and regulations, policies and guidelines thereunder.

EDC is a national environmental charity which serves to protect the environment and human health. EDC was instrumental in the drafting of the Statement of Expectations on Source Water Protection signed by numerous organizations and submitted to the Minister of the Environment during the creation of the CWA, and continues to play a key role as co-organizer of the Ontario Water Guardians Network.

PART II - GENERAL COMMENTS ON THE PROPOSALS

This joint letter by CELA and EDC concurrently addresses all three of the above-noted EBR postings. Since all three postings are generally intended to facilitate the preparation of Assessment Reports ("AR's"), CELA and EDC are responding to the three postings in one letter. In the interest of brevity and convenience, the three proposals are hereinafter collectively referred to as the "Rules and Regulations."

In general terms, CELA and EDC are supportive of the proposed assessment process entrenched within the Rules and Regulations for the purposes of evaluating threats to drinking water quantity and quality. We are particularly pleased to see the inclusion of landscape hardening and reduced water base flow modelling in water quantity threat assessment. We are also pleased that surface water quantity threats will be assessed in a meaningful manner, and that a 25 year ecological timeframe has been adopted for treating long-term threats to drinking water quantity.

However, it is our position that there is considerable room for improvement in terms of strengthening the content, clarity and effectiveness of the three proposals. In summary, our overall recommendations are as follows:

1. Despite the volume and detail of the three proposals (especially the Technical Rules), there are numerous key words, phrases and concepts (such as "aquifer" or "watershed") which, surprisingly, remain undefined to date. In our view, this fundamental terminology requires proper definition in order to facilitate implementation of the AR stage of the source protection planning process.

2. From the province's perspective, we appreciate the desirability of providing regulatory guidance that is sufficiently prescriptive to direct all 19 SPC's as they carry out their various AR duties and responsibilities. However, there is also a need to ensure that the Rules and Regulations contain adequate flexibility to enable SPC's to properly address local issues, priorities, or concerns, particularly where there are exceptional circumstances that appear to fall outside of the province-wide direction contained within the Rules and Regulations.

3. There is considerable detail and significant complexity associated with the three proposals. For example, the 41 page "Summary" document for the Technical Rules is almost as long as the 58 page Rules. Similarly, the Tables of Drinking Water Threats comprise 241 pages. Therefore, once the Rules and Regulations have been finalized, we recommend that the MOE should prepare concise, plain language summaries of the AR requirements, and should undertake appropriate public education and community outreach programs regarding these requirements. Such programs should be aimed not only at SPC's (which typically include expert and non-expert members), but should also extend to other stakeholder groups and members of the public at large who are expected to participate meaningfully in the AR stage.

The rationale for these overall conclusions is more fully described below, and we have made a number of specific recommendations intended to enhance the Rules and Regulations before they are finalized and implemented. Where applicable, we have identified which of our comments correspond to the specific questions raised in the proposed Technical Rules' **Questions for Public Consideration and Comment** (Summary, pp. 37-41).

Before turning to the substance of the three proposals, CELA and EDC would be remiss if we did not also comment upon the public notice/comment opportunities that the MOE has provided in relation to these proposals. We acknowledge that after the proposals were revealed in late June, the MOE has held several public workshops and information sessions for various sectors and stakeholders, including CELA and EDC. However, it must be noted that these events were largely "by invitation" meetings, and it cannot be assumed that all Ontarians interested in, or potentially affected by, the three proposals were able to participate in these events.

This is why CELA and EDC submit that the current EBR comment period (45 days) should have been extended to at least 60 days, particularly since this comment runs well into the summer months, when there are other competing priorities and commitments (i.e. vacation). Indeed, the sheer volume of the three proposals and associated documentation (numbering in the hundreds of pages) militates towards a longer public comment period. In addition, we are disappointed by the generally unhelpful content of the three EBR Registry Notices, which essentially recounted the same verbatim history of CWA initiatives and previous consultation efforts, but provided little or no explanatory detail on the substance or effect of the proposals themselves (i.e. no regulatory impact statement). We trust that the MOE will take these comments regarding consultation into account as it formulates the public notice/comment opportunities for the next round of draft Rules and Regulations proposed under the CWA.

PART IV - SPECIFIC COMMENTS ON THE PROPOSALS

In this Part, we outline our comments and concerns in relation to: (a) the Definitions Regulation; (b) the Assessment Report Regulation; (c) the Technical Rules; and (d) the need to act upon other related matters.

(a) The Definitions Regulation

LACK OF KEY DEFINITIONS

We have reviewed the proposed definitions of "highly vulnerable aquifer", "significant groundwater recharge area", "surface water intake protection zone", and "wellhead protection area." While we generally do not take issue with these broadly framed definitions, CELA and EDC hasten to point out that some of these definitions contain words or phrases which themselves may require further sub-definitions for the purposes of greater certainty.

For example, the critically important word "aquifer" is not defined in the draft regulation or the CWA, but it is used frequently throughout the proposed Technical Rules. Similarly, the terms "water", "groundwater" and "surface water" are not defined in the draft regulation or the CWA. In our view, to avoid unnecessary debate over the interpretation of these words and concepts, it

would be extremely helpful to provide further definitions of these words within the draft regulation (or, alternatively, in the "Miscellaneous" Regulation (O.Reg.286/07)).

Another key word that is not defined under the draft regulation is "cluster", although this term is found in other CWA regulations and is referenced in the Technical Rules. Given that municipalities, MOE officials and SPC's may be examining "clusters" of wells or intakes for possible elevation within the CWA source protection planning process, it would be useful to have a clear upfront definition of this term in the draft regulation.

PRESCRIBED DRINKING WATER THREATS LIST

In section 2 of the draft Definitions Regulation, the MOE has proposed a list of 18 prescribed drinking water threats. In reviewing this list, it appears to us that some known or suspected threats to drinking water sources have been omitted from this list (e.g. cemeteries; storage, treatment, or discharge of mine tailings; transportation of dangerous goods via linear facilities such as highways or railways, etc.).

Moreover, it seems to CELA and EDC that this list of prescribed drinking water threats is primarily (if not exclusively) aimed at land uses and activities which may affect the quality of drinking water sources, rather than the quantity of such sources. Thus, we view this list of prescribed threats as unacceptably narrow in light of the stated purpose of the CWA (i.e. "to protect existing and future sources of drinking water"). We are also mindful of the CWA's statutory definition of "drinking water threat" (i.e. "an activity or condition that adversely affects or has the potential to adversely affect the quality or quantity of any water that is or may be used as a source of drinking water"). Accordingly, consideration should be given by the MOE to expanding this list to include potential threats to drinking water quantity (large-scale water bottling operations, golf course irrigation, de-watering of mines, pits, quarries, etc.).

At the July 15, 2008 public session on the Rules and Regulations in Mississauga, the MOE apparently conceded that the draft prescribed drinking water threats list contains no entry for water quantity threats, despite ongoing efforts by the MOE to gauge water quantity threats throughout Ontario. At this meeting, the MOE mentioned that at least one further threat will be added to the list in order to cover drinking water quantity threats. It is our understanding that such an addition will also require revisions to the accompanying Tables of Drinking Water Threats. We support the inclusion of drinking water quantity threats, and we look forward to the MOE's implementation of this commitment.

In addition, we would urge the MOE to consider including "transport pathways" and "conditions" as drinking water threats in a short paragraph (i.e. a new subsection 2(3)?) in the draft regulation immediately following the prescribed drinking water threats list. The current prescribed list is comprised only of threats that are activities, such as the storage, disposal or application of toxic chemicals or other substances. Transport pathways and conditions are not "activities" *per se*, but they are clearly integral to the threat assessment process.

In particular, we recommend that these two categories of non-activity threats be included and defined in the Definition Regulation after the prescribed threats list for two main reasons. First, mentioning these other threat categories may help to avoid any possible confusion or debate,

particularly among those who have been following CWA developments and who are familiar with the Technical Experts Committee's ("TEC") 2004 list of drinking water threats. In fact, there are some material differences in the terminology used in the TEC list and the MOE's prescribed list, which can and most likely will lead to differing interpretations over what constitutes a threat within the AR stage of the source protection planning process.

Secondly, prescribing these non-activity threats would help to provide a broader and more accurate identification of important threat categories for members of the public, few of whom are likely to take the time to wade through the tabular list of approximately 3,000 potential threat "circumstances". We would further note that the need for listing all threat categories in one place for the sake of convenience and clarity was also discussed at the July 15th Rules and Regulations public session in Mississauga.

The following format could be used to introduce non-activity threat categories and identify several example threats: "Transport pathways, such as natural or human-made pathways, including abandoned wells, stormwater infiltration areas…"; and "Conditions, such as the presence of a contaminant in surface or sub-surface soil (also known as 'brownfield sites', and referred to in the TEC list as historical commercial/industrial sites of concern)…"

In this way, the MOE and the public would be assured that all threat categories (water quality/quantity, and activities/non-activities), are explicitly and concisely mentioned in the same place within the Definitions Regulation.

(b) Assessment Report Regulation

LACK OF KEY DEFINITIONS

We have no comment on the proposed definitions set out in section 1 of the draft AR Regulation, nor do we take exception to the definition of "record" in subsection 2(2). However, having regard for section 4.1 of the draft AR regulation, it would be prudent for this regulation (or the Definition Regulation) to include an appropriate definition of "watershed", particularly since this term occurs throughout the CWA and the proposed Technical Rules but is not defined in either document.

Most Source Protection Areas/Regions contain a number of distinct watersheds within their broad territorial boundaries. However, in the absence of a proper definition or provincial direction in the draft AR Regulation, it is unclear whether a single "global" watershed characterization report must be prepared to cover all watersheds, or whether an individual watershed characterization report must be prepared for each specific watershed identified within each Source Protection Area/Region. In this regard, we note that section 15(2)(a) and (b) of the CWA specifically require AR's to identify "all watersheds", and to characterize the quality/quantity of water in "each" watershed.

SPC RECORD-KEEPING

While we recognize the need for mandatory record-keeping in relation to AR's, we are unclear on the rationale for imposing a 15 year record retention obligation upon SPC's, particularly since this requirement seems to exceed typical record-keeping practices in other public sector entities.

We are also unclear on the source of funding for decades-long storage/maintenance/retrieval of AR-related records, particularly after the Source Protection Plan has been approved.

AR FORMAT

CELA and EDC are wary of the proposal in section 3 that AR's shall be in an approved form and shall utilize specific computer software (if so provided by the Director). While we appreciate the need for consistency among AR's prepared by SPC's across Ontario, there is also a need to ensure that there is sufficient flexibility to allow individual AR's to address local issues, threats, and concerns at an adequate level of detail. In addition, there is also a need to ensure that AR content is presented to stakeholders and members of the public in an understandable and usable manner. In short, a province-wide "one size fits all" format for AR's is not necessarily conducive to ensuring accessible and traceable decision-making at the local level.

Since the draft AR Regulation has not appended a draft form for discussion purposes, we are not in a position at this time to determine whether our concerns about a "cookie cutter" approach to AR format will be avoided or mitigated by the MOE. Nevertheless, having regard for the sparse (and somewhat cryptic) format that the MOE insisted that SPC's use during preparation of Terms of Reference, we would strongly caution against rigidly insisting upon a uniform format for AR content.

If there is a need for certain issues to be addressed in a standardized manner within AR's, then perhaps the MOE can prescribe an appendix containing the essential AR components it wishes to compare and contrast at the provincial level. Otherwise, the SPC's should be permitted – if not actively encouraged – to develop AR's that best meet local needs, priorities and opportunities, provided that the AR's otherwise meet the requirements of the CWA, regulations, and Technical Rules.

CLIMATE CHANGE IMPACTS (Relates to Question/Input Point #10)

We support the requirement in section 4.7 of the draft AR for SPC's to summarize how its AR conclusions may be affected by climate change in the 25 years following preparation of the AR. While there may be some uncertainty at the local level on the precise nature, extent, duration or magnitude of climate change impacts on water quality/quality, the preponderance of evidence and recent predictive modelling exercises suggest that less frequent but more intense rainfall can be anticipated within Ontario in the near future.

Accordingly, it is crucial that AR's contain a reasonably detailed summary of the possible drinking water implications of climate change. As additional site-specific information becomes available regarding climate change impacts, then the AR and/or Source Protection Plan can be updated or amended accordingly.

More generally, CELA and EDC regard climate change as one of the most important long-term drinking water threats to be considered, although its precise impacts on water quality/quantity may be the hardest to predict or quantify at the local level. We are generally pleased with the degree to which climate change has been integrated into Ontario's source protection planning process.

In the AR's, land within Source Protection Areas/Regions will be classified into 2 categories: that which is considered sensitive to climate change, and that which is not. It has been anticipated by the MOE that sensitive lands will comprise those *already* experiencing water quantity problems, such as the agricultural areas of the southern part of Lake Erie Source Protection Region; and those *that could* experience water quantity problems, should climate change reduce the rate at which aquifers can be recharged. Lands that will most likely be deemed not sensitive to climate change will be those where communities are served by intakes from the Great Lakes. We are satisfied with these classifications, but point out that Great Lakes communities may still encounter water quality problems (e.g. algal blooms) which are caused or compounded by climate change.

Furthermore, where areas are found to be sensitive to climate change, a downscaling of regional climate change modelling will be undertaken in order for better predictions about the effects of climate change in these areas to be made. We are supportive of this direction.

Lastly, we are pleased with the strong provincial integration on the issues of water, energy, and climate change. These are very important links and they will help to reinforce the Canada-Ontario Agreement Respecting the Great Lakes Basin Ecosystem, the Great Lakes Annex, and the CWA.

AR CONSULTATION

CELA and EDC have no specific comments on the proposed AR consultation requirements imposed by section 5 of the draft AR Regulation. However, it must be emphasized that these are minimum requirements, and that SPC's should be encouraged to go beyond these requirements and to provide enhanced public notice/comment opportunities wherever appropriate or desirable to do so.

(c) Technical Rules

LACK OF KEY DEFINITIONS

Like the two draft Regulations, the proposed Technical Rules also lack clear and concise definitions for key words, phrases and concepts which will be of critical importance during the AR stage of the source protection planning process.

For example, while Rule 1 sets out definitions for approximately two dozen matters, it is surprising to CELA and EDC that even at this stage, the proposed Rule fails to provide definitions for basic matters such as: "aquifer", "clusters", "transport pathway", or "watershed." In our view, appropriate definitions should be developed for these terms with public and stakeholder input.

Similarly, CELA and EDC have concerns about some of the proposed definitions which are found within Rule 1. For example, the definition of "allocated quantity of water" needs to be reconsidered, primarily because it is unclear whether "allocated" means permitted volumes or actual volumes of water that are or can be taken. For the same reasons, we have similar concerns in relation to the Rule's proposed definition of "reserved quantity of water". Indeed, the word "reserved" is a misnomer since municipalities do not have or acquire a specific proprietary

interest in the water volumes that they may withdraw from groundwater or surface water at the present time or in the near future. Moreover, the mere fact that municipal water withdrawals are intended to service growth/development envisioned by official plans does not necessarily mean that such withdrawals "trump" other lawful users (or the ecosystem function needs) of the same commonly shared water resources.

We also have some difficulty with the Rule 1 proposal to define of "cone of influence" in qualitative rather than quantitative terms. We are also unclear how the term "allocated quantity" comes into play for a private domestic well (or group of wells) which are exempt from having a water-taking permit (i.e. domestic or farm purposes), and therefore have no specific quantity limits imposed upon it. In any event, regardless of how "cone of influence" may be defined, it may be difficult to delineate such cones in fractured (or karstic) bedrock environments, as are found in many areas across the province.

Furthermore, we suggest that the somewhat simplistic definition of "consumptive activity" may be misleading and should be carefully recrafted. For example, as drafted, the proposed definition may inadvertently exclude certain large-scale water-takings (e.g. impounded areas or artificial reservoirs) which may detain large quantities of water for a prolonged period before returning the water back to the original source (except for incidental evapotranspiration losses).

Similarly, the proposed definition of "consumptive activity" overlooks the subtle but significant difference between what theoretical volume could be taken under water-taking permits, and the actual volume being withdrawn by the permit holders. In our experience, many large-scale water-taking permits vastly overestimate how much water may be taken, but the actual volume taken is often considerably smaller than the permitted volume. Where such discrepancies exist, the MOE should proactively identify and amend such permits so that that permitted volumes more closely resemble what is actually being used on an annual basis. In our view, such an approach would be consistent with the provincial interest in promoting water conservation. Otherwise, by simply tallying up theoretical permitted maximums that realistically will never be withdrawn by permit holders within a given watershed, the resulting water budget analyses and watershed characterization work may be skewed, unreliable or inaccurate.

CELA and EDC have questions and concerns about the proposed definitions of "ten year drought period" and "two year drought period" (both of which are premised solely on precipitation and not other factors which may cause or contribute to drought conditions). For example, does the reference in the "ten year" definition to two year drought mean two consecutive years, or any two single years within the ten year timeframe? A similar question arises in relation to the "two year" definition: does this term refer to two consecutive years, any two single years, or something else entirely? In addition, can the "historic" drought period be identified only where complete meteorological data or records exist, or can it be identified on some other basis (local or aboriginal knowledge, anecdotal information, etc.)?

It is our understanding that other stakeholders have identified interpretive difficulties and other concerns with the modelling equations prescribed by sub-Rules 1(2), 1(3) and 1(4). We defer to these other stakeholders on this point, and suggest that the MOE should carefully reconsider these sub-Rules accordingly.

RISK ASSESSMENT

Rule 11 provides that when conducting risk assessments of potential drinking water threats, SPCs should not attempt to assess risk management measures that may subsequently be developed to mitigate such threats. CELA and EDC strongly support this provision, since the focus of this stage of the AR exercise is the location, nature and extent of the threat itself, rather than the efficacy of measures that may help reduce or prevent the risk to sources of drinking water.

MAPPING STANDARDS

Rule 12 provides direction for the content of maps which will accompany the AR's. CELA and EDC support the need for clear, consistent, legible and user-friendly AR mapping within all Source Protection Areas/Regions. Among other things, standardized mapping will greatly assist in facilitating higher-scale comparisons or analysis at the regional or provincial level.

However, since cartography symbols may evolve as the AR stage proceeds, we submit that it may be preferable in Rule 12(2) to add "as may be amended" after the reference to the MNR's "Mapping Symbology Version 3.0", or, more simply, to provide that the mapping symbology shall be in accordance with standards approved or adopted by the Director.

UNCERTAINTY ANALYSIS

Rules 13 to 15 set out requirements for the preparation of uncertainty analysis in relation to certain matters (vulnerability assessments, boundary delineation of wellhead protection areas and intake protection zones, etc.). CELA and EDC support these requirements, but suggest that these analyses should include both qualitative and quantitative aspects (i.e. statistical analysis).

CONTENT OF WATERSHED CHARACTERIZATION REPORTS

Rule 16 sets out the content requirements for watershed characterization reports. In our view, this provincial list of mandatory items should be regarded as the <u>minimum</u> requirements, and SPC's should be free to include such further or other information as may be necessary to fully and properly characterize their local watershed conditions or matters that may affect water quality/quantity (e.g. invasive species). To ensure this local flexibility is understood and utilized by SPC's, CELA and EDC submit that Rule 16 should be amended to include a residual "basket clause" (e.g. a new Rule 16(9)) to enable SPC's to report upon other relevant local matters where appropriate or necessary.

Rule 16(2) requires the watershed characterization report to list all "areas of settlement, as defined by the *Places to Grow Act, 2005*." While we support this requirement, we submit that there is potential for conflict between the implementation of the CWA and the *Places to Grow Act, 2005*. The two Acts may be difficult to reconcile at the implementation stage: the former may have a constraining effect on urban growth, while the latter is intended to promote it, although admittedly in a more sustainable way. Nevertheless, it has been suggested by some

sectoral SPC members (e.g. representatives of commercial, industrial and municipal interests) that CWA-related constraints on a municipality's economic growth may be problematic.

However, CELA and EDC submit that the need to safeguard drinking water must inform all decisions regarding urban growth and economic expansion, and we are pleased that the Ontario government shares this view since it enacted the CWA. In our view, unconstrained population growth (e.g. growth that is unfettered by restrictions developed pursuant to the CWA), may very well itself result in economic hardship for communities over the long term, particularly if climate change affects the local availability of surface water or groundwater.

Rule 16(5) properly requires the watershed characterization report to include information regarding aquatic habitats and communities within the watershed, but Rule 16(6) goes on to require a comparison of these habitats and communities to those "not impacted by anthropogenic factors." We are unclear what is actually required under Rule 16(6), but we presume that the SPC's are not required to conduct field studies to find aquatic habitats and communities within their Areas or Regions that are "not impacted by anthropogenic factors." Indeed, it may be virtually impossible to find aquatic habitats and communities (particularly in southern Ontario) that are in pristine condition and unimpaired by any current or historic human activity. Thus, we anticipate that all these sub-Rules really require is an assessment of whether or not the aquatic habitats and communities within the watershed are relatively healthy, functional and diverse. If this is the overall intent, then perhaps these sub-Rules should be amended accordingly.

Rule 16(7) requires the provision of information regarding species at risk and their habitat within the watershed. CELA and EDC support this requirement, but would strongly urge that Rule 16(7) be amended to stipulate that site-specific habitat locations shall not be identified if such disclosure may jeopardize the species or the habitat.

WATER BUDGETS AND SUBWATERSHED STRESSES

Rules 27 to 35 set out a number of prescriptive details for determining whether particular subwatersheds are under "significant" or "moderate" stress. CELA and EDC are prepared to defer to professional geoscientists on the overall issue of whether these details (e.g. the prescribed stress thresholds) are likely to result in technically sound and scientifically defensible assessments of subswatershed stress. Nevertheless, we have a number of questions about these proposed Rules.

For example, it is not readily apparent to us why Rule 27 requires groundwater to be evaluated on the basis of surface water subwatersheds, particularly since the contributing area of groundwater may not necessarily be identical or co-extensive with the contributing area of the surface water subwatershed, and *vice versa*.

Similarly, the rationale for the deeming provisions in Rule 29 remains unclear to us since, in effect, this Rule may inadvertently undermine the intent of prescribing "moderate" stress thresholds in Rule 28. In other words, if the indicia in Rule 29 themselves constitute moderate stress (even if the Rule 28 exercise finds low stress), then why bother with the Rule 28 threshold at all? Alternatively, if Rule 29 is intended to be an addendum to Rule 28, then perhaps it should

simply be rolled into a new sub-rule under Rule 28, rather than exist as a stand-alone (and somewhat confusing) provision.

GROUNDWATER VULNERABILITY ASSESSMENT

Rules 36 to 40 prescribe the methodology for evaluating and delineating groundwater vulnerability. We note that the opening paragraph of Rule 36 permits SPC's to utilize "one or more" of the prescribed methods, and to utilize methods that, in the opinion of the Director, "are equivalent or better" than the prescribed methods. Given the difficulty and uncertainty associated with evaluating groundwater vulnerability, CELA and EDC submit that SPC's should be encouraged to not rely solely upon one method, particularly in areas known or suspected to be sensitive to groundwater impacts (e.g. fractured bedrock with little or no overburden). Where possible, SPC's should attempt to utilize a combination of methods and predictive models that are best suited to the areas being assessed.

Rules 38 to 40 refer repeatedly to "transport pathways," but as noted above, the Rules and Regulations do not define this term. In our view, this important term should be defined in a manner which includes both natural and human-made pathways into or through the subsurface.

DELINEATION OF VULNERABLE AREAS: ELEVATED SYSTEMS

Rules 41 to 56 prescribe the requirements for delineating highly vulnerable aquifers, significant groundwater recharge areas, and wellhead protection areas. For the most part, we have no significant concerns about these Rules, but we have some comments regarding the application of these Rules to the delineation of wellhead protection areas ("WHPA's") for elevated non-municipal drinking water systems.

Under the CWA, certain non-municipal systems can be elevated into the source protection planning process, either by municipal resolution or by the Minister of the Environment. It is our understanding that the WHPA's for elevated systems such as clusters (e.g. 6 or more private wells/intakes where water is drawn from the same aquifer or surface water source) will extend to the edges of the land parcel for systems drawing less than 50,000 litres of water per day. For well clusters drawing more than this volume of water, the WHPA will be based on a 2 year travel time to the well(s).

We further understand that the MOE's justification for WHPA delineation for non-municipal systems drawing less than 50,000 litres is that the water will be drawn from a very small area directly beneath the well. According to this view, an extensive WHPA for such circumscribed water takings is therefore unnecessary. We also note that 50,000 litres/day is also threshold for obtaining permits to take water under the *Ontario Water Resources Act*.

In general, we do not fundamentally object to this overall approach, but we point out that there may be a need for local flexibility to enable SPC's to properly address particular situations (e.g. where the well(s) are located very close to the property boundaries and/or may be impacted by activities or conditions occurring on neighbouring lands). In addition, we recommend that the 2 year travel time for systems drawing more than 50,000 litres should be considered the *minimum* travel time to be used in assessing such a system. If a small hamlet or rural community drawing

more than 50,000 litres is elevated, consideration should be given to using a travel time of more than 2 years and up to 25 years.

For example, the community of Burford, located west of Brantford and home to several thousand people on private systems which draw water from a small number of aquifers, appears to be a likely candidate for elevation. When determining the appropriate travel time for this community, the fact that it most likely draws significantly more than 50,000 litres should be taken into account. According to Natural Resources Canada, per capita water usage in Canada in 1998 was 343 litres per day. Based on this figure, a community of 150 people would be expected to draw more than 50,000 litres per day. Transport pathways and any commercial, industrial or agricultural activities that could affect the communal aquifers, given the travel time adopted, would presumably get factored into the drinking water threat assessment process.

DELINEATION OF SURFACE WATER INTAKE PROTECTION ZONES AND 100 YEAR STORM EVENTS (Relates to Question/Input Point #1).

Rules 57 to 77 prescribe the details for delineating surface water intake protection zones ("IPZ's"). We have several comments in relations to certain matters addressed within these Rules.

First, with respect to the classification of intakes, we note that Rule 57 provides that Great Lakes intakes are identified as Type A, "connecting channel" (e.g. the St. Lawrence River) intakes are Type B (if flow direction is unaffected by an impoundment structure), other river intakes are Type C, and all other intakes are Type D. While these broad categories make sense (and determine how IPZ-1 zones are delineated), we anticipate that there may be some implementation difficulty in classifying certain intakes, particularly in eastern Ontario. For example, the massive dam on the St. Lawrence River at Iroquois effectively impounds surface water (and constrains water flow) upriver of the dam, and water management practices at this dam may affect the rate of flow as well as water levels in Lake Ontario. In these circumstances, should surface water intakes in this area (e.g. Quinte, Cataraqui and Raisin-South Nation SPC's) be classified as Type A (Great Lakes), Type B (connecting channel), or Type D (everything else)? Our further comments regarding Great Lakes IPZ's are set out below.

Second, Rules 59 and 60 prescribe the use of provincial data and GIS systems to identify surface water bodies. While these tools provide a good starting point for this exercise, SPC's must be free to identify surface water bodies through other appropriate means (local records, staff knowledge, etc.), particularly where smaller watercourses may not have been identified or inventoried within provincial data sets.

Third, it is unclear to us whether the modelling used to delineate IPZ-1 areas under Rule 63 is intended to be two- or three-dimensional in nature. In contrast, the modelling required for assessing groundwater systems is expressly required to be three-dimensional (e.g. Rules 22 and 25). In our view, IPZ-1 areas should be delineated via three-dimensional modelling (i.e. length, width, and depth) in order to more fully address situations where local hydrological conditions (wind, current, water column stratification, etc.) may facilitate (or prevent) the lateral or horizontal movement of drinking water contaminants into the vicinity of the intake crib.

Furthermore, it appears to us that the Rule 65 flexibility to take local hydrodynamic conditions into account is limited to Types B and C intakes.

Fourth, Rule 66 provides the land-based portion of an IPZ-1 area shall be restricted to a 120 metre setback from the high water mark. Given the potential for land-based activities or conditions beyond 120 metres to spill or discharge drinking water contaminants, we are unclear on the scientific basis for prescribing a standardized 120 metres in all cases. Similarly, we are unclear what happens if the Regulation Limit prescribed under the *Conservation Authorities Act* is larger than the Rules' 120 metre setback – will the greater number prevail? This concern also exists in relation to the land-based portion of IPZ-2 areas delineated under Rule 67(3), and IPZ-3 areas delineated under Rule 70(2).

Fifth, CELA and EDC have concern about the time of travel requirements prescribed for IPZ-2 areas under the proposed Rules. For example, it appears to us that under Rule 67(1) and (2), the prescribed time should be equal to or greater than (not "less than") the time needed for a water treatment plant operator to respond to adverse conditions in the quality of the surface water (e.g. reported spill). Similarly, we note that Rule 68 provides that even if an operator requires less time to respond, a minimum of two hours is prescribed in all cases. In our view, two hours is likely an appropriate response timeframe once the operator receives notice of a spill, but we point out that operators may not necessarily get actual notice of smaller, chronic or undetected spills from land-based or water-based sources of contaminants. Therefore, it will be necessary to determine the time of travel for IPZ-2 areas that best meets local needs.

Sixth, in relation to IPZ-3 areas, Rule 70(1) may generate some uncertainty for SPC's dealing with connecting channel intakes that are classified as Type D (see above discussion). In particular, are the eastern Ontario SPC's supposed to describe Lake Ontario (or other upper Great Lakes) as part of the IPZ-3 area that contributes water to intakes within their jurisdiction? We submit that some additional clarity from the MOE on this issue would be helpful.

Seventh, we further note that Rule 70(1) makes reference to the 100 year storm as the upper planning benchmark for extreme weather events. However, in light of recent of climate change modelling results, it is our view that this traditional benchmark may no longer be adequate to safeguard drinking water. Storms of magnitudes that used to be expected once every 100 years are predicted to occur much more frequently. According to a 2007 report published by the Institute for Catastrophic Loss Reduction, 1 in 100 year storms may occur as frequently as once every 10 to 15 years.

We therefore recommend that as a benchmark for planning purposes, *from a drinking water perspective*, the 200 year storm event be adopted under the Rules and Regulations. Vulnerability assessments of groundwater and surface water should take into account the stormwater runoff and combined-sewer overflow that would result from a 200 year storm.

We also recommend that groundwater and surface water assessments take into account the likely increased frequency of short, intense rainfall events that can overwhelm stormwater management systems (particularly where combined sewers still exist). In addition, we recommend that IPZ-3s

be extended into the uppermost reaches of rivers, which at present are considered to have no effect on an intake, even during extreme storm events.

Finally, we are obliged to comment upon the delineation of IPZ's within the Canadian Shield areas of Ontario. At present, the IPZ setback or regulation limit (e.g. the area from a river considered to be under the influence of surface water) is 120 metres for all Source Protection Areas/Regions within the province. However, in parts of Source Protection Areas of Northern Ontario, riparian areas may consist of muskeg. Some of the ground in these muskeg areas is essentially a carpet of floating moss ("moss ground"). The presence of moss ground in a muskeg area affects the area adjacent to rivers, and may increase the breadth of the riparian area under the influence of surface water.

We recommend that in areas where moss ground is present, the IPZ setback lines should run from the end of a moss ground area, where solid ground begins, for 120 metres, in a direction away from the river. The size of IPZs in moss ground areas would increase, but the river would be better buffered from surface water contamination.

VULNERABILITY OF AREAS TO CHEMICALS AND PATHOGENS (Relates to Question/Input Points #5, 6 and 2)

Parts VII, VIII and IX of the Technical Rules propose a number of detailed provisions for assigning "scores" to reflect the relative vulnerability of areas being assessed at the AR stage of the source protection planning process. Parts X and XI of the Rules then establish requirements for determining the significance of various threats to drinking water quantity and quality within these areas. Our understanding of, and comments about, these comprehensive Rules are set out below.

First, we note that under the proposed Tables of Drinking Water Threats, approximately 3,000 "circumstances" under which drinking water is considered to be vulnerable to chemicals or pathogens. Drinking water vulnerability is based on the susceptibility of groundwater or surface water in a particular area to contamination, and the level of danger posed by a particular chemical or pathogen. The drinking water vulnerability of an area is expressed by a *vulnerability score* of 1 to 10. The level of danger posed by a chemical or pathogen is expressed by a *hazard rating*, also from 1 to 10. The higher the score and rating, the higher the risk. Under the proposed Rules, in order for a particular "circumstance" (i.e. the presence of a particular chemical or pathogen in an area, and the nature of the presence) to be considered a significant threat to drinking water in an area, the *risk score* must be equal to or greater than 80. The risk score is the product of an area's vulnerability score and a chemical's or pathogen's hazard rating.

For example, given the application of septage waste to a property more than 10 hectares in size, in an IPZ, where the application may result in the release of ammonia, the threat to drinking water is considered significant where a vulnerability score of at least 9 and a hazard rating of at least 8.9 are recorded. For the same circumstance and vulnerable area, a significant risk score would also result where a vulnerability score of 10 and a hazard rating of 8 are recorded. In both cases, the product of the vulnerability score and hazard rating is at least 80.

It is possible for a drinking water threat to be considered significant where a risk score of less than 80 has been recorded. In order for the significance threshold to be lowered, one of the three following criteria must be met. First, the drinking water threat is not listed in the Tables of Drinking Water Threats but identified as a threat by a SPC. Secondly, the level of uncertainty surrounding the delineation of a WHPA or IPZ, the assessment of the vulnerability of groundwater throughout the Source Protection Area/Region, or the assessment of the vulnerability of a WHPA or IPZ, is classified as ”high”. Lastly, it is considered advisable for subsection 22(2) of the CWA to apply to the area and threat in question in order to protect water quality in a WHPA or IPZ. Subsection 22(2) concerns monitoring and dealing with activities in vulnerable areas in order to keep them from ever becoming significant drinking water threats, or ensuring that if an activity is considered a significant threat, work is undertaken to remove the activity's significant risk status.

For all three above-noted criteria, drinking water threats can be treated as significant where a risk score greater than or equal to 75 has been recorded.

In general, we are content with the MOE's overall approach for assessing chemical and pathogen threats to drinking water and the scoring of vulnerability. In addition to having compiled a wide-ranging collection of "circumstances" deemed to be threats, the MOE's provision for permitting further circumstances to be added (where appropriate) ensures that any future unanticipated drinking water threats can be dealt with through the source protection planning process.

However, given the inherent uncertainty of precisely assessing the vulnerability of an area, we recommend that the significance threshold for risk scores be reduced to 75 from 80. Consequently, where one of the three criteria listed above is used to justify the lowering of the significance threshold, we recommend that it be lowered to 70.

In addition to the general approach to identifying risk level proposed through the Tables of Drinking Water Threats, what the MOE calls semi-quantitative risk analysis ("SQRA") and which is discussed at length above, there is a second approach based on the risk that chemicals contained in large above ground storage tanks may contaminate source water in the event of a 100 year storm (see above discussion of this benchmark). Under Rule 127, it is proposed that the threat posed by the presence of such storage tanks in vulnerable areas be considered significant. We agree that such situations ought to be classified as significant threats to drinking water.

However, we recommend that the proposed threshold for what constitutes a large above ground storage tank should be reconsidered and/or lowered from 150,000 litres. In our view, the actual type and location of chemicals being stored is at least as important as the mere volume, particularly since small quantities of certain chemicals (e.g. petroleum-related products) can seriously impair surface water or groundwater over an extensive area if a spill or discharge occurs.

INCONSISTENCY WITH MULTI-BARRIER APPROACH

We note that Rule 108 calls for the description of drinking water issues where:

> [a chemical or pathogen] is present in water at a surface water intake or in a well, including a monitoring well related to a drinking water system to which clause 15(2)(e) of the [CWA] applies…[where a chemical or pathogen] is present at a concentration that results or would result in drinking water exceeding the standard set out for that [chemical or pathogen] in the Ontario Drinking Water Quality Standards after the treatment by the system's water treatment equipment [emphasis added].

In our view, using AR's to identify issues with drinking water after the treatment process is not consistent with the multi-barrier approach recommended by the Walkerton Inquiry, refined by the TEC, and adopted by the province. The overall purpose of the source protection component of the multi-barrier approach is to avoid overuse of sources of drinking water, and to prevent chemicals or pathogens from impairing raw water supplies (even if these substances may be "treatable", such as e. coli). This upfront focus on safeguarding the raw water supply is intended to minimize the risk of exceedances of Ontario Drinking Water Quality Standards in treated water, and to control (or lower) the cost and complexity of treating water. Thus, the focus of the Technical Rules must be on protecting the quality/quantity of drinking water sources, rather than on what may or may not occur within water treatment and distribution systems.

Through a robust multi-barrier approach, any potential degradation or depletion issues affecting the raw water supply would be identified (and presumably mitigated) long before these matters might pose drinking water problems after treatment. We therefore strongly recommend that the overarching goal of source protection planning should be the detection and mitigation of potential drinking water issues in untreated water.

THE GREAT LAKES

Intakes – Under the proposed Technical Rules, the vulnerability of Great Lakes intakes to off-shore and near-shore currents is determined by mapping the direction and average speed of multi-directional prevailing currents. The delineated area of an IPZ-2 corresponds to the surface area of water that is within a 2 hour travel time of the intake.

We agree that, at the present time, prevailing-current calculations are useful tools for determining travel time to an intake. However, it is difficult (if not impossible) to precisely predict the effects that climate change will have on water density, temperature and even depth. These changes will affect water currents. For this reason, we do not think the delineation of IPZ-2s should depend to the degree proposed on prevailing-current calculations.

We therefore strongly recommend that in addition to taking the travel time of water to an intake into consideration for IPZ-2 size delineation, a minimum radius of 2 kilometres be drawn around each intake. This would mean that an IPZ-2 would provide an intake with a minimum of 1 extra kilometre of protection. This recommendation should be reflected in both the Technical Rules and the accompanying guidance materials that the MOE intends to promulgate in relation to determining the appropriate response time and associated distance for an IPZ-2.

Great Lakes Advisory Committee – Pursuant to section 83 of the CWA, the Minister of the Environment has the authority to establish an advisory committee "to provide advice…on any matter relating to the use of the Great Lakes as a source of drinking water." We feel that such a

committee, if and when appointed, could provide invaluable advice to the MOE on threats to Great Lakes intakes, as well as to SPC's. We therefore strongly encourage the creation of a Great Lakes advisory committee. We also stress that it is very important that such a committee commence its work as soon as possible.

In addition, CELA and EDC emphasize that our previous recommendations made to the MOE concerning the Great Lakes should be adopted and acted upon immediately.

Conceptual Water Budgets – It is our understanding that Great Lake waters are excluded from consideration in the Conceptual Water Budgets to be prepared by SPC's under the proposed Rules and Regulations.

We appreciate the multi-jurisdictional (and international) aspects of Great Lakes water management, including quantity. However, this exclusion may mean during the AR stage, the critically important Great Lakes water quantity, usage and sustainability issues may not be examined by SPC's adequately or at all. For example, in the context of Lake Huron, this exclusion may be problematic if it precludes consideration of the "Big Pipe" in York Region and subsequent failure to return water to the Lake Simcoe/Georgian Bay/Lake Huron watershed. Similarly, this exclusion may limit or prevent meaningful consideration of the surface water intake system at Grand Bend (and its proposed expansion), which takes water from Lake Huron to London with no return flow to the Lake.

We are further concerned that this exclusion may deleteriously affect the extent to which climate change impacts can be properly understood in relation to Great Lakes water quantity over the next 25 years.

We recognize the difficulty of this challenge, but we firmly believe that the Rules and Regulations must ensure that Great Lakes water quantity issues remain a central focus of SPC discussions at the AR stage and beyond.

(d) Supplementary Recommendations on Related Matters

LONG-TERM MUNICIPAL STRATEGIES

In October 2006, seven Draft Guidance Modules were prepared in anticipation of the development of AR's. However, it appears that the draft of Module 2, entitled "Municipal Long Term Water Supply Strategy", is no longer posted on the MOE's website. Moreover, there is no mention of long-term municipal planning in the Rules and Regulations.

In its 2004 report, the TEC explicitly recommended that municipal long-term planning should be an element of the proposed multi-barrier approach to source protection. Under Recommendation 21, the TEC stated that:

> [a]ll municipalities should maintain a long-term (50 year) water supply strategy that sets out their water supply needs, including conservation plans, and the planned sources for meeting their needs.

We strongly recommend that municipal long-term water supply strategies remain an element of the multi-barrier approach to source protection.

WATER-SUPPLY PREDICTIONS FOR THE NEXT 25 TO 30 YEARS

It is our understanding that at the present time, water supply predictions for the next 25 years are only taking into account the changes in water supply that will be brought about by municipal drinking water projects already planned or approved under completed Environmental Assessments ("EA's"). In our view, this scope is too limited, as consideration should also be given to projects that are not currently EA-approved, but which can be reasonably anticipated to occur in the near future (e.g. new or expanded municipal water infrastructure in currently unserviced hamlets or villages).

ASSESSMENT OF AERIAL DEPOSITION OF POLLUTANTS AND CUMULATIVE IMPACTS

The impacts of air pollutants on surface water in general, and the Great Lakes in particular, need to be prevented and reduced significantly. There is widespread and serious concern that the cumulative effects of harmful chemicals in surface water represent a considerable threat to human health, even in extremely small doses. Industrial chemicals and their by-products can enter surface water through aerial deposition (e.g. localized and long-range transport). In addition, they may persist in the environment for a long time and in different phases, alternating between a presence in surface water and the atmosphere through deposition and evaporation.

For these reasons, we strongly recommend that aerial deposition of pollutants and their potential cumulative impacts be considered in the source protection planning process, including the AR stage. In addition, the Ontario government should exercise its regulatory authority over sources of air pollutants in the province in a proactive and effective manner by requiring preventative and elimination approaches to pollutants being released into the atmosphere in order to help protect sources of drinking water.

ELEVATION OF PRIORITY SYSTEMS

Under the SDWA (e.g. section 114), certain non-municipal systems, such as those serving 6 or more households, can be placed under the responsibility of a municipality, just as private "clusters" can be elevated under the CWA. Examples of "priority" non-municipal systems include those serving children (e.g. schools, community centres, and daycare centres). As the AR stage is being implemented across Ontario, we strongly encourage the MOE to ensure that municipalities and SPC's duly consider the elevation of priority non-municipal systems under the CWA where necessary or desirable to safeguard public health and safety. Where proposed elevations may require amendments to already approved Terms of Reference, we submit that MOE approval should be readily available.

PROVINCIAL CONSULTATION WITH FIRST NATIONS ON BAND COUNCIL RESOLUTIONS

First Nations communities have the right to make decisions about their participation in Source Protection Areas/Regions. There are specific provisions contained in the CWA providing for

First Nations' seats on SPC's. First Nations communities in a Source Protection Area/Region are required by law to be briefed on the progress of the source protection process.

A First Nations community can have its drinking water system designated under the CWA through the passage of a band council resolution. The Ontario government should use all necessary means to ensure that all councils have been fully briefed about these rights and opportunities.

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In closing, we appreciate this opportunity to provide comments on the proposed Rules and Regulations, and we trust that the foregoing recommendations will be taken into account as the Rules and Regulations are finalized. In addition, we look forward to reviewing further EBR Registry postings in relation to the CWA.

Yours sincerely,

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