



REPORT SPC 08/09– to the Source Protection Committee

FROM: Stan Taylor, P. Eng., Source Water Protection Project Manager

SUBJECT: Intake Protection Zone Delineations – Transport Pathways on Agricultural Lands

DATE: August 10, 2009

PURPOSE

To recommend an approach to the delineation of the Intake Protection Zones for cultivated agricultural lands, in consideration of 'transport pathways' associated with artificial drainage.

BACKGROUND

At the June 24 meeting of the Source Protection Committee (SPC), during the presentation by Stantec Consulting, there was discussion of some concerns associated with the delineation of the Intake Protection Zones (IPZs) for cultivated agricultural lands. This situation is summarized as follows:

- The MOE's Technical Rules (Nos. 72 and 73) stipulate that IPZ-2s and IPZ-3s **may** be extended to include areas which contribute water through 'transport pathways'. Such pathways typically would include artificial drainage systems which facilitate the movement of water into the adjacent water bodies such as ditches and streams with-in the IPZs
- For IPZ-2s only, Rule 65 stipulates that the IPZ-2s **must** be extended to included 'storm sewer sheds' (lands serviced by storm sewers) to account for at least the residual of the 2 hour time of travel of flow in the storm sewer systems. For urban areas in Windsor, for example, Stantec has delineated the extent of the 2 hour time of travel based on estimated flow velocities along the main trunk sewers, and included the full extent of the tributary storm sewer shed to that point in the trunk sewers.
- For agricultural lands, the Consultants have been considering tile drainage systems to be 'transport pathways' for the purpose of delineating the draft IPZ-2s, although the MOE's Technical Rules provide for some discretion in this regard
- Information available from the Province regarding the extent of agricultural lands with tile drainage in the Essex Region, appears to be outdated and unreliable – in many cases showing tile drainage on as little as 10 percent of cultivated lands – whereas some SPC members familiar with agriculture expressed the opinion at the June 24 meeting, that most cultivated lands are typically tile drained in the Essex Region.
- Some SPC members and municipal staff also expressed the opinion that surface drainage systems such as furrows are also prevalent, and are as efficient as tile drainage, if not more efficient, in serving as 'transport pathways' facilitating the movement of water into adjacent

ditches or streams. This opinion is supported by ERCA staff experienced in the analysis of hydrology, drainage systems, etc., including the undersigned.

- Based on the information outlined above it is felt that it would be inconsistent to treat lands which are or may be tile drained, in a manner different from other cultivated agricultural lands which typically need to have some type of artificial drainage measures in place
- Another consideration is that even if there may be some cultivated lands which are not currently tile drained, the lands could easily be tiled in the future. The Director's Rules require future land use activities which could be threats, to be listed in the Assessment Reports. If there is a future change in land use, additional drainage measures such as catch basins, pavement, swales, etc. would often be installed. As such, it would appear to be very questionable to exclude such lands on the basis of assumed non-existence of tile drainage, which will not be feasible to verify at this time in any event.
- Given that the draft vulnerability scores for Essex Region IPZ-2s (except for Windsor), are too low to allow for the possibility of scoring of any significant threats, the implications of being included in the IPZ-2s will likely be minor. The SPC could choose to include policies in the SP Plan, such as incentives, which may be of benefit to landowners, or possibly land use planning approaches which might apply to potential future major land use changes

In summary, it is felt that would be inappropriate to leave 'gaps' in the IPZ-2 delineations on the basis of inadequate information and/ or uncertainty about tile drainage or other drainage measures. It is the staff recommendation that the Consultants be directed to include all cultivated agricultural lands adjacent to the water bodies in the IPZ-2s, recognizing that such lands very likely have some form of drainage measures which facilitate the movement of water into the subject water body, unless there are characteristics or features which indicate otherwise. The lands assessed through Municipal Drainage Reports would be a consideration in this regard, as would the natural direction of fall or topography of the land. This recommendation is intended to provide for a more consistent and defensible approach, while still allowing for judgement on the part of the Consultants, and the Source Protection Committee.

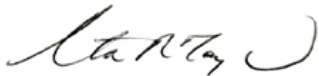
An alternative interim approach, for the first Assessment Report, might be to not include any agricultural lands for the purpose of transport pathways at this time, and to consider this as a data gap. A plan could likely be developed to attempt to better delineate the extent of transport pathways in the Updated Assessment Report in 2010-11, perhaps through estimations of time of travel based on typical flow velocities in agricultural drainage systems. However, there are some uncertainties regarding the technical feasibility, time requirements, and costs associated with this type of approach, as well as the need for additional extensive consultation in 2010-11. This approach would also not address the issue of potential future land use intensification and associated enhanced drainage (e.g. storm sewers) on lands excluded from the IPZ-2s.

With Respect to **IPZ-3s**, the MOE's Technical Rules provide for greater flexibility in terms of transport pathways – storm sewer sheds are not required to be included as they are in IPZ-2s. Also, the water bodies with-in the IPZ-3s are not limited by the 2 hour time of travel as is the case with IPZ-2s. The vulnerability scores in the IPZ-3s will be even lower than those in the IPZ-2s, and the

IPZ-3s for Detroit River and Lake Erie Intakes will not even have vulnerability scores. The main focus in the IPZ-3s will be land use activities with unusually large volumes of material which could reach the intakes in significant concentrations, as determined through modelling. As a result, it is the staff recommendation that transport pathways, for the purpose of delineating **IPZ-3s**, should not be treated the same as in IPZ-2s, and that the IP-3s should generally not be extended to include areas that contribute water through transport pathways. The IPZ-3s will not be addressed in the first Assessment Report as the work will not be able to be completed in time. When the IPZ-3s are being addressed at a later stage, the SPC may wish to consider exceptions on a case by case basis if there are found to be potential significant threats due to large volumes as outlined above.

RECOMMENDATION

THAT the approach to the delineation of the Intake Protection Zones for cultivated agricultural lands, as described in Report SPC 08/09, be endorsed as a guide to the Consultants in carrying out the technical work for the IPZ delineations.



Stan Taylor, P.Eng.
Source Water Protection Project Manager