The following comments apply to Lake Huron Primary Water Supply System Source Protection Technical Study - Final Phase 1 Report (Stantec, Feb 2008) Appendix 4.1.

Comment No.	Report Section, Par.	Comment
1	Exec Summ, p. 3, last par.	The report states that the wave breaking zone was used to represent the effective shoreline. This seems to provide the connection to shore. What was the role of the 3D cross-shore modeling that was done? Please clarify in the report.
2	Section 2.1.2, par. 5	States that Goderich data is not appropriate for application to the Grand Bend model – however it is mentioned in many places: for example, p. 21. This should be clarified.
3	Section 2.1.2, last par.	Buoy 45008 showed good comparison with Buoy C45149 which is located much closer to the site. I could not find a comparison of these data sets.
4	Section 2.1.3	Was WIS data used to provide waves for IPZ-2 delineation – not clear from text.
5	2.3.3, first par.	Highest winds from directions NW through SW but scale in Figure 2.5 is too coarse to see this – top bin is 10.3 to 20.6 m/s. It would be helpful to subdivide this bin.
6	2.3.3, par. after Figure 2.6.	An extreme value analysis performed on Buoys 45008 and C45149. In Section 2.1.2 it states that the extreme wind was from 45008. Which data were used for the extreme value analysis presented in Table 2.3? Need to clarify and show wind rose for Buoy C45149.
7	Figure 2.7	It is not clear which wave data was used – should be stated in figure caption.
8	Section 2.3.4, Table 2.4	Error in units Wave Condition – is this Wave Height? Should it be m/s?
9	Section 2.3.5	Why are the 10 and 100 year return period flows used for the Ausable River? Module 4 specified bank full – which is more commonly in the range of a 2 year return period event. It would not have affected the in-water IPZ-2 significantly. What flow was used in other tributaries?
10	Section 2.3.6, HCCL Deployment	Notes that Grand Bend intake is typically outside the wave breaking zone. Why were waves considered – especially since the wave breaker zone was used to connect to shore?

11	Section 2.3.7, Figures 2.11 and 2.12	If I understand correctly, Figure 2.12 is a subset of Figure 2.11. Why are higher current velocities to the north observed in Figure 2.12 (b) compared with Figure 2.11 (b)? Typo Figure 2.12 b should be Buoy 45008? This may be due to difficulty in reading the scale.
12	Figure 2.13	Goderich wind data used here, but said to be not appropriate in section 2.1.2. Please clarify.
13	Section 4.1, par. 5	Are there any results from the 2D-vertical model runs?
14	Section 4.1, par. 7	It would be good to show the results from the 6 hour model runs. These might be of interest in the future.
15	Section 4.2.1, par. 2	Comparison of 1 and 2 hour duration events is interesting and helpful to the analysis.
16	Section 4.2.2	If I understand correctly, the 3D model was only used to assess the onshore condition? Did the 3D model include waves? Executive Summary in Addendum, p.10 states that a 3D model including wind and wave influences was used to delineate IPZ-2. Need clarification on how 3D model was used.
17	Section 4.2.2, par. 3	Need further explanation of how interpretive measures were applied with regards to onshore condition. Wouldn't the reverse particle tracking provide the results? What interpretation is required?
18	Section 4.3.1, par. 1	What is the mesh size range, mesh size near the intake?
19	Section 4.3.1, par. 2	Model boundary conditions derived from data described in Section 2 – can more details be provided, i.e. which wind, wave, current data was used?
20	Section 4.3.1, par. 2	How were the combinations of wind and waves selected for the two runs? Why is a NE wind combined with NNW waves? Does this affect the return period of the event?
21	Figure 4.2	Difficult to read – font is very small. Also, scale on x-axis needs explanation.
22	Section 4.3.1, par. after Fig. 4.2	Wouldn't it be most obvious to assume wind and wave directions coincide?
23	Section 4.3.1, p. 35, par. 2	It is not clear why a boundary condition of 0.6 m/s was selected. Winds from Goderich are discussed but were rejected earlier –see comment 3.
24	Same par.	The report states that 0.6m/s was used at the

		boundary but that velocities were "muted" around the study site. Given the relatively uniform bathymetry and shoreline orientation (which is a gradual curve but not complex), the velocity at the site would not be expected to change significantly from what was defined at the boundary. What current conditions were observed around the intake when 0.6m/s was applied at the boundary (assuming no wind or waves)?
25	Figure 4.5	ADCP deployed for 2 mos. Is there any more data of interest?
26	Figure 4.9	Comparing figures 4.9a and 4.9b, it appears that the nearshore current velocities are decreased for the combined currents (with waves). Alternatively the colour scales on the legends may differ? Please clarify.
27	p. 42	Where were the particles released in the 3D model- surface on near lakebed? Are there particle tracking results from the 3D model?
28	Section 4.3.2, p.43	Are the 100 year return period results including IPZ-2 presented?
29	Section 4.3.2, p. 43	Are the 3D results not superseded by the substitution of the breaker zone for the shoreline?
30	Section 5.3.1, p. 58	Moderate uncertainty in IPZ-2. MOE requires designation of high or low uncertainty – moderate is not an option, although I agree it makes sense.
31	Table 5.1	Wind – there is no comment on the quality of wind data, i.e. problems with Goderich data etc. Table says there is no local current data available – what about ADCP? Table should be updated.

The following comments apply to Lake Huron Primary Water Supply System Source Protection Technical Study – Surface Water Vulnerability Assessment Addendum for the Lake Huron Water Treatment Plant (Stantec, Aug 2008). It is assumed that this supersedes the vulnerability and uncertainty analysis in the Stantec (Feb 2008) report.

Comment No.	Report Section, Par.	Comment
1	Exec Summ, p. 1, par. 6	IPZ-2 in-water component was calculated with 3D hydrodynamic model – was it not 2D model that was used for all except cross-shore analysis? If so, this is somewhat misleading.
2	Table 2.1	Rule 64 is not applicable to Type A intakes.
3	Section 2.2	Lake Huron LWS (176.0 m)
4	Section 2.3.2	3D or 2D model used for IPZ-2 delineation – see Comment 1.
5	Section 2.3.2	Velocities based on bank full flow – wasn't 100 year flow used in Ausable River?
6	Section 3.1	Type – V=Sulnerability score
7	Table 4.3	Uncertainty for vulnerability is ranked low. Is there sufficient data and analysis to assess the number of recorded drinking water issues related to the intake. For the source vulnerability factor, Section 3.3.5 mentions review of 2005 and 2006 water quality records based on measurement of limited parameters. Is this sufficient to give a low ranking to uncertainty for the vulnerability scoring?
8	Table 5.1	Below Table 5.1 the report states, "there are no significant data gaps limiting the findings of the addendum." Is this true – for example, with respect to storm outfall catchment areas (listed in Table 5.1), p. 4.3, par. 3 states that trib. velocities were not available and methodologies were therefore used to estimate the velocities, storm sewer outfalls and catchment areas were not available and therefore air photos were used to establish catchment areas, assumptions were made about storm sewers. Although alternative methods were used, there appear to be a number of data gaps that may affect the level of certainty. If identified in this phase, it may be possible to update this information and provide a higher level of certainty in the future.