

## SUMMARY TABLE - Changes to the Essex Region SPA Proposed Assessment Report

<b>UPDATED/NEW TASKS (SEE UPDATED TASKS SECTION IN DECEMBER 2010 MOE LETTER)</b>			
No.	Tasks	Description of Work	AR Sections and Appendices Changed
1	IPZ-3 delineation and vulnerability scoring for Lake St. Clair and Detroit River intakes	The IPZ-3s were delineated and scored for the Stoney Point, Lakeshore (Belle River), Windsor and Amherstburg intakes. The uncertainty levels were added to Section 4.2.10.	Executive Summary, Section 1, <b>Sections</b> 4.2.1.2.3, 4.2.1.3, 4.2.1.4.1, 4.2.2.4, 4.2.2.5, 4.2.3.4, 4.2.3.5, 4.2.4.4, 4.2.4.5, 4.2.5.4, 4.2.10. <b>Maps</b> 4.12b, 4.13b, 4.18b, 4.19b, 4.24b, 4.25b, 4.38b show IPZ-3 delineations and vulnerability scores.
2	IPZ-3 threats and risk assessment (threats and events based) for Lake St. Clair and Detroit River intakes	Both threats based and events based threats and risk assessment were conducted for the Stoney Point and Lakeshore (Belle River) intakes, and threats identification based on spills modeling for the Windsor and Amherstburg intakes. There is also a small number of fuel storage sites identified as existing significant threats through the events based threats approach. Mention is made of the request to MOE to add the transportation of fuel as a 'local' threat (See Updated/New Task No. 4). These changes are reflected in the AR.	<b>Sections</b> 4.2.1.4.4, 4.2.1.4, 4.2.2.6, 4.2.3.6, 4.2.4.6, 4.2.5.6, <b>Maps</b> 4.14, 4.20, 4.30, 4.31, 4.41 include IPZ-3 threats information on the number and level of threats.
3	ICA for E. coli at Amherstburg intake and possibly the delineation of the ICA for the blue-green algae growth in the far western Lake Erie basin dependent on the analysis and whether or not further work is required. (a) If E. coli meets the test in rule 114 and Rule 115, delineate the ICA for E. coli identified at the Amherstburg intake, explain the method used to determine the ICA and identify the significant drinking water threats. (b) If cyanobacteria is an issue, determine the ICA for the cyanobacteria blooms found in the Detroit River and in the nearshore of the western Lake Erie basin, clearly explain the method used to determine the ICA and identify the significant drinking water threats. If the SPC is unable to delineate the ICA for any of the identified issues noted above, a workplan must be included in the amended AR in accordance with	(a) According to the Stantec Consulting report 'Escherichia coli analysis for the Amherstburg Water Treatment Plant' (Feb. 2011), the E. coli levels at this intake in recent years are drastically reduced compared to 2007 and before. Also, according to Rajesh Bejankiwar's '2010 E. coli Monitoring Study for Amherstburg WTP Intake and Surrounding Area' (Feb. 2011), the current 2010 E. coli results at this intake and its surrounding area are not high enough to result in the identification of E. coli as an issue at the Amherstburg intake. Both reports strongly recommended that E. coli not be identified as an issue. Therefore E. coli was removed from the list of issues for this intake. (b) In Stantec Consulting revised issues report from December 2010, cyanobacteria data (microcystins-LR) was examined and found to occur in the raw water at a few intakes. It is noted as a data gap with the need for further monitoring and analysis in the Data Gaps section 4.3.3.	<b>Sections</b> 4.2.5.7, 4.3.3. Stantec's Dec. 2010 report, Stantec's Feb. 2011 and Rajesh Bejankiwar's Feb. 2011 reports are added to Appendix X
4	Evaluation and submission to the Director of the addition of a local threat (transportation corridor).	Based on discussion between ministry staff and the project manager in May 2011, request is made to the MOE to add the transportation of fuel as a local threat, which will help support the event based word conducted. This is mentioned in the AR.	<b>Section</b> 4.2.1.4.4

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### AMENDMENTS TO THE PROPOSED AR (MOE DIRECTIONS 1 TO 14, AS PER DECEMBER 2010 MOE LETTER)

Dir. No.	Tasks	Description of Work	AR Sections and Appendics Changed
1	Amend the IPZ-1 and IPZ-2 delineation for the intakes for both the Windsor and Amherstburg drinking water systems to comply with Technical Rule 41. This is also noted as an amended task in the MOE letter.	The IPZ-1 and IPZ-2 delineation for the intakes for both the Windsor and Amherstburg drinking water systems were amended to comply with Technical Rule 41. Text revisions were made accordingly in the AR. Text in the AR has been revised accordingly.	<b>Sections</b> 4.2.1.2.1, 4.2.4.2, 4.2.4.3, 4.2.5.2, 4.2.5.3. <b>Map</b> 4.24b, <b>Map</b> 4.25b and <b>Map</b> 4.38b show the revised delineations.
2	Recalculate the vulnerability scores for the IPZs for both the Windsor and Amherstburg drinking water systems to comply with the Technical Rules as a result of the change in factors used to assign a score after complying with Direction #1. This is also noted as an amended task in the MOE letter.	Vulnerability scores for the Windsor and Amherstburg IPZ-1s and IPZ-2s have been reassessed after the revisions in delineations of these zones, and calculated for the full IPZs (not truncated IPZs). The reassessment did not result in a change to the vulnerability scores from the January 2010 Stantec report.	<b>Sections</b> 4.2.4.3, 4.2.4.5, 4.2.5.3, 4.2.5.5.
3	Reassess the number of identified significant drinking water threats and the areas where activities are significant, moderate and low drinking water threats in the IPZs for both the Windsor and Amherstburg drinking water systems. Given the high vulnerability scores for both of the IPZ-1s and IPZ-2s, revising the delineation of the IPZs would have direct implications for the identification and number of significant drinking water threats in these areas.	The tables indicating the number of potential significant drinking water threats has been revised in the AR. Also, due to additional evaluation by Stantec and due to the reduced IPZ-1s and IPZ-2s, there is a reduction in the number of existing significant drinking water threats at the Windsor and Amherstburg intakes. This is now reflected in the AR.	<b>Sections</b> 4.2.4.6 (Table 4.27), 4.2.5.6 (Table 4.36), <b>Map</b> 4.30, <b>Map</b> 4.31 and <b>Map</b> 4.41 show the revised threats numbers. Minor revisions were made to the potential threat level maps to reflect the revised delineations.
4	Provide more documentation of the methods and approaches used to determine the area vulnerability factor and the source vulnerability factor to arrive at the final vulnerability scores for the IPZs for the Windsor and Amherstburg intakes.	The area and source vulnerability factors for the Windsor and Amherstburg IPZ-1s and IPZ-2s were reassessed after the revisions in delineations of these zones, and considering the entire areas of the IPZ-2s including areas in U.S.A. This is now described in detail in the AR. The reassessment did not result in a change to the vulnerability scores from the January 2010 Stantec report.	<b>Sections</b> 4.2.4.5, 4.2.5.5.
5	Reconcile the information in Table 4.27 to match the number of drinking water threats shown in Maps 4.28 and 4.29 for the Windsor drinking water system.	The information in Table 4.27 has been corrected to match the number of drinking water threats shown in Maps 4.28 and 4.29 for the Windsor drinking water system. (minor edit)	Table 4.27 (Section 4)

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6	Recalculate the percentages of managed lands and livestock density for the IPZ-1 and IPZ-2 separately for all of the intakes. Document the methodology used for both the managed lands and livestock density for each of the sub-areas in the IPZs as required by Technical Rules 16.9 and 16.10.	The percentages of managed lands and livestock density were recalculated separately for each IPZ-1 and IPZ-2. It did not result in any substantial changes in the threats information presented in the AR. Based on the vulnerability scores in the IPZ-s, combined with the percentages of managed lands and livestock densities, the activities associated with these lands can only result in low or no threats in almost all cases. The IPZ-1s for Lakeshore (Belle River), A. H. Weeks (Windsor) and Amherstburg could have moderate threat levels; however managed lands and livestock are not actually occurring or permitted in these urban areas. The revised SGRA delineations also resulted in minor changes to the SGRA livestock density and managed lands maps.	Minor changes to IPZ-1 and IPZ-2 livestock density and managed land <b>Maps</b> 4.15, 4.16, 4.21, 4.22, 4.32, 4.33, 4.34, 4.35, 4.42, 4.43, 4.48, 4.49, 4.57, 4.58, 4.59, 4.60, 4.66, 4.67, 4.75, 4.76, 4.77, 4.78. Minor changes to SGRA livestock density and managed land <b>Maps</b> 4.9 and 4.10. Revisions to methodology in <b>Section</b> 4.1.2.3 and <b>Section</b> 4.1.3.5. Addition of <b>Table 4.77a</b> at the end of Section 4 summarizing results for IPZ-1 and IPZ-2 separately.
7	Re-evaluate threats associated with nutrient application based on the corrected maps for all of the drinking water systems.	See description of change to address MOE Direction 6.	Minor edits to <b>Sections</b> 4.2.2.9, 4.2.3.9, 4.2.4.9, 4.2.5.9, 4.2.6.9, 4.2.7.9, 4.2.8.9, 4.2.9.9 based on the above.
8	Ensure livestock operations are correctly evaluated and document the method of evaluation for all of the drinking water systems.	See description of change to address MOE Direction 6.	Minor edits to <b>Sections</b> 4.2.2.9, 4.2.3.9, 4.2.4.9, 4.2.5.9, 4.2.6.9, 4.2.7.9, 4.2.8.9, 4.2.9.9 based on the above.
9	Clarify in the AR the text on issues and when and how they lead to the identification of significant drinking water threats. Issues in the HVAs and SGRAs cannot lead to the identification of significant drinking water threats.	Clarification on the identification of significant threats based on the issues approach is provided in the relevant sections.	<b>Sections</b> 4.2.1.4.2, 4.2.1.5
10	Update the water budget/water quantity section to address the peer review findings and MNR comments on the Tier 1 water budget. This is also noted as an amended task in the MOE letter.	Improvements and refinements in the analysis have resulted in the identification of some watersheds as having potentially significant levels of groundwater quantity stress. The revised water quantity stress levels tables and maps from the Tier 1 Water Budget are reflected in the AR.	Throughout <b>Section</b> 3. Additional significantly stressed subwatersheds are described in Section 3.5. Maps are revised to reflect refined analysis.

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<b>Dir. No.</b>	<b>Tasks</b>	<b>Description of Work</b>	<b>AR Sections and Appendices Changed</b>
11	Change the term "quaternary subwatershed" to "subwatershed" to be consistent with the definition under the Clean Water Act, 2006. Column headings in the tables should also be amended to reflect this change.	The term "quaternary subwatershed" was changed to "subwatershed" to be consistent with the definition under the Clean Water Act, 2006. Column headings in the tables were also amended to reflect this.(minor edits)	Throughout Section 3 and Map 3.8.
12	Include in the water use table the permitted rate, actual or estimated rate, consumptive use factors, and water use value that were used in the water budget assessment.	In Section 3.4.2.2, two new tables are now included from the Tier 1 Water Budget - Table 3.6b and Table 3.6c to respectively show the max. permitted water use by source for each subwatershed, and the consumption use factors used in the water budget.	<b>Section 3.4.2.2 - Tables 3.6b and 3.6c</b>
13	Provide mapping of the Significant Groundwater Recharge Areas (SGRAs) based on one methodology only as per either Technical rule 44(1) or 44(2) and professional judgement used for Rule 46. document in the report the method used for mapping the SGRAs. This is also noted as an amended task in the MOE letter.	Section 4.1.3.1 describes the method followed to delineate SGRAs. Map 4.6 shows SGRAs delineated as per rule 44(1), which was filtered out to exclude smaller isolated areas and to exclude areas without wells (Map 4.7). The Map 4.8 shows the final SGRAs, with vulnerability categories.	<b>Section 4.1.3.1, Maps 4.6, 4.7 and 4.8</b>
14	Revise Map 4.63 and Map 4.64 to remove transport pathways from the IPZ-1 delineation for the Pelee Island intake or make the necessary corrections to the mapping or legend, whichever is applicable.	No revisions to the Maps are needed.The transport pathways shown in Map 4.63 and Map 4.64 are delineated for the Pelee Island IPZ-2 (not for IPZ-1) as per the methodology described in Section 4.2.1.2.2, and now referred to in Section 4.2.8.3. A 2 hour time of travel and drainage boundaries were used in depicting the transport pathways, as described in the methodology, which was approved by the SPC.	<b>Section 4.2.8.3</b>

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### OTHER TASKS (SEE DECEMBER 2010 MOE LETTER - NO FURTHER WORK NEEDED, BUT WORK COMPLETED SO FAR CAN BE INCLUDED IN THE AR)

No.	Tasks	Description of Work	AR Sections and Appendices Changed
1	Issues of turbidity and other issues identified in the proposed AR	Additional data from 2007 to 2010 was reviewed by Stantec Consulting in their report 'Post Phase 2 Report - Issues Analysis for Essex Region Source Protection Area Water Treatment Plants', December 2010. The additional review resulted in an updated description of issues in the AR. The Belle River WTP was decommissioned in January 2009, and the new Lakeshore WTP intake was put into service in May 2009. Therefore issues at the new intake were identified with data available from the date of service. Iron is removed from the list of issues. Turbidity remains to be an issue at all intakes except Pelee island. Organic nitrogen and aluminium remain to be issues at all but Wheatley and Pelee Island intakes. Raw water quality data for Pelee Island and Wheatley remain a gap. No new issues were identified.	Minor revisions. Stantec's Dec. 2010 report is added to Appendix X
2	Confirm unconfirmed existing significant threats at the Windsor and Amherstburg intakes	This is related to the MOE Direction No. 3. Due to additional evaluation by Stantec and due to the reduced IPZ-1s and IPZ-2s, there is a substantial reduction in the number of existing significant drinking water threats at the Windsor and Amherstburg intakes. There is also a small number of fuel storage sites identified as existing significant threats through the events based threats approach. These changes are now reflected in the AR.	<b>Sections</b> 4.2.4.6 (Tables 4.27, 4.30b, 4.31), 4.2.5.6 (Tables 4.36, 4.39), <b>Maps</b> 4.30, 4.31 and 4.41
3	Evaluation of priority conditions.	As per the Stantec report on preliminary conditions analysis, conditions are identified in some IPZ-1s and 2s, and hazard scores are assumed. There is a lack of data to establish the offsite contamination, as noted in data gaps section 4.3.2. The Stantec conditions analysis report is now attached to Appendix X.	Minor revisions to <b>Sections</b> 4.2.2.8, 4.2.3.8, 4.2.4.8, 4.2.5.8, 4.2.6.8, 4.2.7.8, 4.2.8.8, 4.2.9.8, 4.3.2. Stantec report added to Appendix X

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<b>OTHER TASKS</b>			
No.	Tasks	Description of Work	AR Sections and Appendics Changed
1	From MOE letter dated Dec. 15, 2010 "I will also like to to bring to your attention to the calculation of the final vulnerability scores for both the Windsor and Amherstburg drinking water systems is not consistent with Rule 41.The IPZ delineations were truncated at the international boundary and the final vulnerability scores were calculated on the truncated IPZs and not on the full IPZs, as required by the Technical Rules. This could have been as a result of past provincial guidance...."	This is related to MOE direction no. 2. Vulnerability scores for the Windsor and Amherstburg IPZ-1s and IPZ-2s have been reassessed after the revisions in delineations of these zones, and calculated for the full IPZs (not truncated IPZs). This is mentioned in the Assessment Report. The reassessment did not result in a change to the vulnerability scores from the January 2010 Stantec report.	<b>Sections</b> 4.2.4.3, 4.2.4.5, 4.2.5.3, 4.2.5.5.
2	Revise data gaps section	The data gaps section was revised to indicate the work completed to date, and describes the gaps remaining, as well as knowledge gaps. Two new tables were added: Table 4.78 (showing gaps in the issues evaluation), and Table 4.79 (summarizing the gaps in the AR). The main gaps requiring future work are IPZ-3 delineations and event based threats (e.g. large fuel tanks) for the Lake Erie intakes; completing an inventory large fuel tank locations as potential Significant Threats; and data to further evaluate threats related to conditions. Other important gaps are raw water quality data for issues evaluation of the Pelee Island and Wheatley intakes, and data to identify sources of issues which have been identified at the various intakes.	<b>Section</b> 4.3, Table 4.78, Table 4.79
3	Revise potential threats tables	The potential threats levels tables showing the prescribed drinking water threats for each vulnerable area and its scores were revised (minor edits).	Throughout Section 4
4	Minor editorial	Minor editorial changes in AR sections and maps were made.	Throughout the AR