HURON GEOSCIENCES

TRANSPORT PATHWAYS ADJUSTMENTS
Ausable Bayfield Maitland Valley Source Protection Region

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1.0 INTRODUCTION

As part of the drinking water source protection planning process, the Ausable Bayfield Maitland Valley Source Protection Region is assembling a technical Assessment Report. The Assessment Report is assembled to meet Technical Rules (December 2008) issued under the Clean Water Act (2006). A key deliverable of the Assessment Report is to identify threats within vulnerable areas, including Well Head Protection Areas (WHPAs); Intake Protection Zones (IPZs); Vulnerable Aquifers; and Significant Recharge Areas.

Within Well Head Protection Areas, vulnerability scores were developed by intersecting Aquifer Vulnerability scores, typically derived from the Intrinsic Susceptibility Index (ISI) or Aquifer Vulnerability Index (AVI), with the time-of-travel capture zones associated with the WHPA. Where anthropogenic transport pathways exist that circumvent the natural vulnerability of the aquifer, the Aquifer Vulnerability score can be increased according to the following technical rules 38, 39 and 40, listed below:

> 39. Where the vulnerability of an area identified as low in accordance with rule 38 is increased because of the presence of a transport pathway that is anthropogenic in origin, the area shall be identified as an area of medium or high vulnerability, high corresponding to greater vulnerability.
>
> 40. Where the vulnerability of an area identified as medium in accordance with rule 38 is increased because of the presence of a transport pathway that is anthropogenic in origin, the area shall be identified as an area of high vulnerability.
>
> 41. When determining whether the vulnerability of an area is increased for the purpose of rules 39 and 40 and the degree of the increase, the following factors shall be considered:
>
> (1) Hydrogeological conditions.
>
> (2) The type and design of any transport pathways.
>
> (3) The cumulative impact of any transport pathways.
>
> (4) The extent of any assumptions used in the assessment of the vulnerability of the groundwater.
>
> Clean Water Act, Technical Rules (December, 2009)

Based on these rules, before an adjustment to aquifer vulnerability to account for transport pathway must consider the hydrogeology of the site, the type and design of any transport pathways, the cumulative impact of the pathways and any assumptions used in developing the original aquifer vulnerability rating.

2.0 METHODOLOGY

Preliminary identification of Transport Pathways was completed through aerial photo interpretation. Properties and areas of interest were identified from the 2007 photos in a GIS environment. Properties located in the WHPA were also visited as part of a larger effort to evaluate drinking water threats throughout the region. As part of these visits, routine questions were asked of the property owners about the location and condition of any wells on the property. The results of these site visits were entered and stored in a geo-referenced database, facilitating review as part of the Transport Pathways review.

Similarly, a number of stewardship programs have been carried out in the Region both relating to Source Water Protection, as well as municipal programs. Well head upgrades are a common constituent of these programs, and properties where work has been completed have been recorded, entered into a geo-referenced data and were useful tools in evaluating potential Transport Pathways.

As part of a provincial initiative to verify the Water Well Information System (WWIS) and as part of the data collection phase of the proposed Drinking Water Source Protection project, the Ausable Bayfield and Maitland Valley Conservation Authorities undertook a review of the Water Well Information System: specifically, the Water Well Records with respect to spatial accuracy and well record completeness. Phase One (2005) refined the WWIS based on existing data and Phase Two (2006/2007) field verified these records with the ultimate goal of updating provincial records.

Field verification using Global Positioning System (GPS) technology was implemented to capture the position of the well. This location was compared against WWIS Records in order to verify their accuracy. To capture the well location, a team of two individuals visited properties within the 25-year time-of-travel wellhead protection area (WHPA) for municipal wells within the Ausable Bayfield Maitland Valley (ABMV) region. Upon completion of the GPS coordinate reading, a photograph was taken of the well in context to surrounding buildings, and the condition of the well was noted. This data was available for review of the Transport Pathways in the Region.

In the Ausable Bayfield Maitland Valley Source Protection Region (SPR) transport pathways can be grouped into several categories, namely: pits and quarries; private wells; and urban areas and private well clusters. Detailed methodology and consideration of these areas are outlined below. In assigning transport pathway adjustments, the hydrogeology of the site and the condition of the pathway were considered, as well as the cumulative impact of transport pathways.

2.1 Pits and Quarries

Pits and quarries were primarily identified through aerial photography. Where prudent, these operations were examined by a roadside or windshield survey in order to ascertain the type of operations. There are relatively few pits and quarries in the region. Where they exist, and dependent on their depth with respect to the water table, aquifer vulnerability was adjusted from low to moderate or high, or from moderate to high. Details of any such adjustments are provided in section 3.0 for individual WHPAs.

2.2 Private Wells

Private wells were first identified using the WWIS. Information made available from the well record improvement project undertaken by the Maitland Valley and Ausable Bayfield Conservation Authorities was used to evaluate the condition of the wells, which was current for the WHPAs for the year 2006. Additional information was gathered from site visits carried out as part of the Source Water Protection Committee consultation, and Stewardship programs to determine if any upgrades had occurred since 2006.

Wells that were not in compliance with existing regulations were identified as being potential conduits for water that increase the vulnerability of the aquifer locally. Vulnerability scores were adjusted for 30m surrounding the well, and were adjusted a maximum of one level (i.e. low to moderate; or moderate to high).

Additionally, several properties for which no well record exists, nor any well obvious by site inspection, yet have structures which require water were identified. In these cases, vulnerability scores were adjusted for 60m surrounding any of the principal structures on the property, and were adjusted a maximum of one level.

Details of all vulnerability adjustments for private wells are provided in section 3.0 for individual WHPAs.

2.3 Urban Areas and Private Well Clusters

Urban areas inside WHPAs were delineated based on aerial photography. These areas warrant special consideration as potential areas for Transport Pathway adjustments under Technical Rule 41 (3) as the cumulative effects of a high density of abandoned historic wells are common. Although these areas today are serviced by a municipal well, most were historically serviced by private wells. Additionally, the age of these wells precludes the existence of a record for the wells.

As part of this review, the historical servicing of these urban areas was reviewed, and the areas themselves visited to determine if former private wells could be in existence. Where this information indicates that wells are in existence and are substantially non-compliant, vulnerability scores were adjusted for the areas, and were adjusted a maximum of one level.

Areas where the aquifer being exploited by the municipal is poorly protected, vulnerability scores can be adjusted to account for a reduction in the natural protection of the aquifer due to the installation of underground services, including: sewer lines; septic systems; water supply and electricity supply lines. Where the hydrogeology warranted it, aquifer vulnerability scores were adjusted a maximum of one level in these areas.

Details of all vulnerability adjustments within urban areas are provided in section 3.0 for individual WHPAs.

3.0 RESULTS

3.1 Belgrave WHPA

Aquifer vulnerability within the Belgrave WHPA was adjusted for several undocumented wells that were inspected and georeferenced as part of the Well Location Update completed by the Ausable Bayfield Maitland Valley Source Protection Region (2007). These wells were located as part of the project, and were found to have wells that are out of compliance with provincial requirements for well construction. Vulnerability was adjusted one level for a 30m area surrounding the wells, based on the updated coordinates.

Additional adjustments were completed for undocumented wells which were not visited as part of the Well Location Update. In these cases, wells were assumed to be within 30m of the principal structure on the property, and vulnerability was therefore adjusted for 60m surrounding the principal structure to account for the uncertainty with both the location of the well and the condition of the well.

No adjustments to the Urban area were incorporated into the WHPA as all residences are on municipal water, there were not sufficient records of wells which pre-date the system, and the depth to the services (placed at typical depths) are insignificant in comparison to the depth to the municipal supply aquifer.

3.2 Century Heights WHPA

Aquifer vulnerability within the Century Heights WHPA was adjusted for several undocumented wells that were inspected and georeferenced as part of the Well Location Update completed by the Ausable Bayfield Maitland Valley Source Protection Region (2007). These wells were located as part of the project, and were found to have wells that are out of compliance with provincial requirements for well construction. Vulnerability was adjusted one level for a 30m area surrounding the wells, based on the updated coordinates.

Additional adjustments were completed for undocumented wells which were not visited as part of the Well Location Update. In these cases, wells were assumed to be within 30m of the principal structure on the property, and vulnerability was therefore adjusted for 60m surrounding the principal structure to account for the uncertainty with both the location of the well and the condition of the well.

No adjustments to the Urban area were incorporated into the WHPA as all residences are on municipal water, there were not sufficient records of wells which pre-date the system, and the depth to the services (placed at typical depths) are insignificant in comparison to the depth to the municipal supply aquifer.

3.3 Benmiller WHPA

Aquifer vulnerability within the Benmiller WHPA was adjusted for several undocumented wells that were inspected and georeferenced as part of the Well Location Update completed by the Ausable Bayfield Maitland Valley Source Protection Region (2007). These wells were located as part of the project, and were found to have wells that are out of compliance with provincial requirements for well construction. Vulnerability was adjusted one level for a 30m area surrounding the wells, based on the updated coordinates.

Additional adjustments were completed for undocumented wells which were not visited as part of the Well Location Update. In these cases, wells were assumed to be within 30m of the principal structure on the property, and vulnerability was therefore adjusted for 60m surrounding the principal structure to account for the uncertainty with both the location of the well and the condition of the well.

No adjustments to the Urban area were incorporated into the WHPA as all residences are on municipal water, there were not sufficient records of wells which pre-date the system, and the depth to the services (placed at typical depths) are insignificant in comparison to the depth to the municipal supply aquifer.

3.4 Dungannon WHPA

Aquifer vulnerability within the Dungannon WHPA was adjusted for several undocumented wells that were inspected and georeferenced as part of the Well Location Update completed by the Ausable Bayfield Maitland Valley Source Protection Region (2007). These wells were located as part of the project, and were found to have wells that are out of compliance with provincial requirements for well construction. Vulnerability was adjusted one level for a 30m area surrounding the wells, based on the updated coordinates.

Additional adjustments were completed for one undocumented well which was not visited as part of the Well Location Update. In this case, the well was assumed to be within 30m of the principal structure on the property, and vulnerability was therefore adjusted for 60m surrounding the principal structure to account for the uncertainty with both the location of the well and the condition of the well.

No adjustments to the Urban area as it is located entirely outside of all but the WHPA-A, which already has a maximum vulnerability score of 10.

3.5 Huron Sands WHPA

Aquifer vulnerability within the Huron Sands WHPA was adjusted for one undocumented well that was inspected and georeferenced as part of the Well Location Update completed by the Ausable Bayfield Maitland Valley Source Protection Region (2007). This well was located as part of the project, and was found to be out of compliance with provincial requirements for well construction. Vulnerability was adjusted one level for a 30m area surrounding the well, based on the updated coordinates.

Additional adjustments were completed for undocumented wells which were not visited as part of the Well Location Update. In these cases, wells were assumed to be within 30m of the principal structure

on the property, and vulnerability was therefore adjusted for 60m surrounding the principal structure to account for the uncertainty with both the location of the well and the condition of the well.

No adjustments to the Urban area as it is located entirely outside of all but the WHPA-A, which already has a maximum vulnerability score of 10.

3.6 Wingham WHPA

Aquifer vulnerability within the Wingham WHPA was adjusted for several undocumented wells that were inspected and georeferenced as part of the Well Location Update completed by the Ausable Bayfield Maitland Valley Source Protection Region (2007). These wells were located as part of the project, and were found to have wells that are out of compliance with provincial requirements for well construction. Vulnerability was adjusted one level for a 30m area surrounding the wells, based on the updated coordinates.

Additional adjustments were completed for undocumented wells which were not visited as part of the Well Location Update. In these cases, wells were assumed to be within 30m of the principal structure on the property, and vulnerability was therefore adjusted for 60m surrounding the principal structure to account for the uncertainty with both the location of the well and the condition of the well.

No adjustments to the Urban area were incorporated into the WHPA as all residences are on municipal water, there were not sufficient records of wells which pre-date the system, and the depth to the services (placed at typical depths) are insignificant in comparison to the depth to the municipal supply aquifer.

3.7 Atwood WHPA

Aquifer vulnerability within the Atwood WHPA was adjusted for several undocumented wells that were inspected and georeferenced as part of the Well Location Update completed by the Ausable Bayfield Maitland Valley Source Protection Region (2007). These wells were located as part of the project, and were found to have wells that are out of compliance with provincial requirements for well construction. Vulnerability was adjusted one level for a 30m area surrounding the wells, based on the updated coordinates.

Additional adjustments were completed for an undocumented well which was not visited as part of the Well Location Update. In this case, the well was assumed to be within 30m of the principal structure on the property, and vulnerability was therefore adjusted for 60m surrounding the principal structure to account for the uncertainty with both the location of the well and the condition of the well.

No adjustments to the Urban area were incorporated into the WHPA as all residences are on municipal water, there were not sufficient records of wells which pre-date the system, and the depth to the services (placed at typical depths) are insignificant in comparison to the depth to the municipal supply aquifer.

3.8 Clifford WHPA

Aquifer vulnerability within the Clifford WHPA was adjusted for undocumented wells which were not visited as part of the Well Location Update. In these cases, wells were assumed to be within 30m of the principal structure on the property, and vulnerability was therefore adjusted for 60m surrounding the principal structure to account for the uncertainty with both the location of the well and the condition of the well.

No adjustments to the Urban area were incorporated into the WHPA as all residences are on municipal water, there were not sufficient records of wells which pre-date the system, and the depth to the services (placed at typical depths) are insignificant in comparison to the depth to the municipal supply aquifer.

3.9 Harriston WHPA

Aquifer vulnerability within the Harriston WHPA was adjusted for several undocumented wells that were inspected and georeferenced as part of the Well Location Update completed by the Ausable Bayfield Maitland Valley Source Protection Region (2007). These wells were located as part of the project, and were found to have wells that are out of compliance with provincial requirements for well construction. Vulnerability was adjusted one level for a 30m area surrounding the wells, based on the updated coordinates.

Additional adjustments were completed for undocumented wells which were not visited as part of the Well Location Update. In these cases, wells were assumed to be within 30m of the principal structure on the property, and vulnerability was therefore adjusted for 60m surrounding the principal structure to account for the uncertainty with both the location of the well and the condition of the well.

No adjustments to the Urban area were incorporated into the WHPA as all residences are on municipal water, there were not sufficient records of wells which pre-date the system, and the depth to the services (placed at typical depths) are insignificant in comparison to the depth to the municipal supply aquifer.

3.10 Listowel WHPA

Aquifer vulnerability within the Listowel WHPA was adjusted for several undocumented wells that were inspected and georeferenced as part of the Well Location Update completed by the Ausable Bayfield Maitland Valley Source Protection Region (2007). These wells were located as part of the project, and were found to have wells that are out of compliance with provincial requirements for well construction. Vulnerability was adjusted one level for a 30m area surrounding the wells, based on the updated coordinates.

Additional adjustments were completed for undocumented wells which were not visited as part of the Well Location Update. In these cases, wells were assumed to be within 30m of the principal structure on the property, and vulnerability was therefore adjusted for 60m surrounding the principal structure to account for the uncertainty with both the location of the well and the condition of the well.

No adjustments to the Urban area were incorporated into the WHPA as all residences are on municipal water, there were not sufficient records of wells which pre-date the system, and the depth to the services (placed at typical depths) are insignificant in comparison to the depth to the municipal supply aquifer.

3.12 Gowanstown WHPA

Aquifer vulnerability within the Gowanstown WHPA was adjusted for an undocumented well that was inspected and georeferenced as part of the Well Location Update completed by the Ausable Bayfield Maitland Valley Source Protection Region (2007). This well was located as part of the project, and was found to be out of compliance with provincial requirements for well construction. Vulnerability was adjusted one level for a 30m area surrounding the well, based on the updated coordinates.

Additional adjustments were completed for undocumented wells which were not visited as part of the Well Location Update. In these cases, wells were assumed to be within 30m of the principal structure on the property, and vulnerability was therefore adjusted for 60m surrounding the principal structure to account for the uncertainty with both the location of the well and the condition of the well.

No adjustments to the Urban area were incorporated into the WHPA as all residences are on municipal water, there were not sufficient records of wells which pre-date the system, and the depth to the services (placed at typical depths) are insignificant in comparison to the depth to the municipal supply aquifer.

3.13 Lucknow WHPA

Aquifer vulnerability within the Lucknow WHPA was adjusted for several undocumented wells that were inspected and georeferenced as part of the Well Location Update completed by the Ausable Bayfield Maitland Valley Source Protection Region (2007). These wells were located as part of the project, and were found to have wells that are out of compliance with provincial requirements for well construction. Vulnerability was adjusted one level for a 30m area surrounding the wells, based on the updated coordinates.

Additional adjustments were completed for undocumented wells which were not visited as part of the Well Location Update. In these cases, wells were assumed to be within 30m of the principal structure on the property, and vulnerability was therefore adjusted for 60m surrounding the principal structure to account for the uncertainty with both the location of the well and the condition of the well.

No adjustments to the Urban area were incorporated into the WHPA as all residences are on municipal water, there were not sufficient records of wells which pre-date the system, and the depth to the services (placed at typical depths) are insignificant in comparison to the depth to the municipal supply aquifer.

3.14 Molesworth WHPA

Aquifer vulnerability within the Molesworth WHPA was adjusted for an undocumented well which was not visited as part of the Well Location Update. In this case, the well was assumed to be within 30m of the principal structure on the property, and vulnerability was therefore adjusted for 60m surrounding

the principal structure to account for the uncertainty with both the location of the well and the condition of the well.

No adjustments to the Urban area were incorporated into the WHPA as all residences are on municipal water, there were not sufficient records of wells which pre-date the system, and the depth to the services (placed at typical depths) are insignificant in comparison to the depth to the municipal supply aquifer.

No adjustments to the Urban area as it is located entirely outside of all but the WHPA-A, which already has a maximum vulnerability score of 10.

3.15 Palmerston WHPA

Aquifer vulnerability within the Palmerston WHPA was adjusted for several undocumented wells that were inspected and georeferenced as part of the Well Location Update completed by the Ausable Bayfield Maitland Valley Source Protection Region (2007). These wells were located as part of the project, and were found to have wells that are out of compliance with provincial requirements for well construction. Vulnerability was adjusted one level for a 30m area surrounding the wells, based on the updated coordinates.

Additional adjustments were completed for undocumented wells which were not visited as part of the Well Location Update. In these cases, wells were assumed to be within 30m of the principal structure on the property, and vulnerability was therefore adjusted for 60m surrounding the principal structure to account for the uncertainty with both the location of the well and the condition of the well.

No adjustments to the Urban area were incorporated into the WHPA as all residences are on municipal water, there were not sufficient records of wells which pre-date the system, and the depth to the services (placed at typical depths) are insignificant in comparison to the depth to the municipal supply aquifer.

3.16 Whitechurch WHPA

Aquifer vulnerability was not adjusted for Transport Pathways in the Whitechurch WHPA.

3.17 Auburn WHPA

Aquifer vulnerability within the Auburn WHPA was adjusted for undocumented wells which were not visited as part of the Well Location Update. In these cases, wells were assumed to be within 30m of the principal structure on the property, and vulnerability was therefore adjusted for 60m surrounding the principal structure to account for the uncertainty with both the location of the well and the condition of the well.

No adjustments to the Urban area were incorporated into the WHPA as all residences are on municipal water, there were not sufficient records of wells which pre-date the system, and the depth to the

services (placed at typical depths) are insignificant in comparison to the depth to the municipal supply aquifer.

3.18 Blyth WHPA

Aquifer vulnerability was not adjusted for Transport Pathways in the Blyth WHPA.

3.19 Clinton WHPA

Aquifer vulnerability within the Clinton WHPA was adjusted for several undocumented wells that were inspected and georeferenced as part of the Well Location Update completed by the Ausable Bayfield Maitland Valley Source Protection Region (2007). These wells were located as part of the project, and were found to have wells that are out of compliance with provincial requirements for well construction. Vulnerability was adjusted one level for a 30m area surrounding the wells, based on the updated coordinates.

Additional adjustments were completed for undocumented wells which were not visited as part of the Well Location Update. In these cases, wells were assumed to be within 30m of the principal structure on the property, and vulnerability was therefore adjusted for 60m surrounding the principal structure to account for the uncertainty with both the location of the well and the condition of the well.

No adjustments to the Urban area were incorporated into the WHPA as all residences are on municipal water, there were not sufficient records of wells which pre-date the system, and the depth to the services (placed at typical depths) are insignificant in comparison to the depth to the municipal supply aquifer.

3.20 Kelly WHPA

Aquifer vulnerability within the Kelly WHPA was adjusted for an undocumented well which was not visited as part of the Well Location Update. In this case, the well were assumed to be within 30m of the principal structure on the property, and vulnerability was therefore adjusted for 60m surrounding the principal structure to account for the uncertainty with both the location of the well and the condition of the well.

No adjustments to the Urban area as it is located entirely outside of all but the WHPA-A, which already has a maximum vulnerability score of 10.

3.21 McClinchey WHPA

Aquifer vulnerability was not adjusted for Transport Pathways in the McClinchey WHPA.

3.22 S.A.M. WHPA

Aquifer vulnerability was not adjusted for Transport Pathways in the S.A.M WHPA.

3.23 Carriage Lane WHPA

Aquifer vulnerability was not adjusted for Transport Pathways in the Carriage Lane WHPA.

3.24 Harbour Lights WHPA

Aquifer vulnerability within the Harbour Lights WHPA was adjusted for several undocumented wells which were not visited as part of the Well Location Update. In this case, the wells were assumed to be within 30m of the principal structure on the property, and vulnerability was therefore adjusted for 60m surrounding the principal structure to account for the uncertainty with both the location of the well and the condition of the well.

No adjustments to the Urban area were incorporated into the WHPA as all residences are on municipal water, there were not sufficient records of wells which pre-date the system, and the depth to the services (placed at typical depths) are insignificant in comparison to the depth to the municipal supply aquifer.

3.25 Vandewetering WHPA

Aquifer vulnerability within the Vandewetering WHPA was adjusted for an undocumented well which was not visited as part of the Well Location Update. In this case, the well were assumed to be within 30m of the principal structure on the property, and vulnerability was therefore adjusted for 60m surrounding the principal structure to account for the uncertainty with both the location of the well and the condition of the well.

No adjustments to the Urban area as it is located entirely outside of all but the WHPA-A, which already has a maximum vulnerability score of 10.

3.26 Brucefield WHPA

Aquifer vulnerability within the Brucefield WHPA was adjusted for several undocumented wells that were inspected and georeferenced as part of the Well Location Update completed by the Ausable Bayfield Maitland Valley Source Protection Region (2007). These wells were located as part of the project, and were found to have wells that are out of compliance with provincial requirements for well construction. Vulnerability was adjusted one level for a 30m area surrounding the wells, based on the updated coordinates.

Additional adjustments were completed for undocumented wells which were not visited as part of the Well Location Update. In these cases, wells were assumed to be within 30m of the principal structure on the property, and vulnerability was therefore adjusted for 60m surrounding the principal structure to account for the uncertainty with both the location of the well and the condition of the well.

No adjustments to the Urban area were incorporated into the WHPA as all residences are on municipal water, there were not sufficient records of wells which pre-date the system, and the depth to the services (placed at typical depths) are insignificant in comparison to the depth to the municipal supply aquifer.

3.27 Brussels WHPA

Aquifer vulnerability was not adjusted for Transport Pathways in the Brussels WHPA.

3.28 Seaforth WHPA

Aquifer vulnerability within the Seaforth WHPA was adjusted for several undocumented wells that were inspected and georeferenced as part of the Well Location Update completed by the Ausable Bayfield Maitland Valley Source Protection Region (2007). These wells were located as part of the project, and were found to have wells that are out of compliance with provincial requirements for well construction. Vulnerability was adjusted one level for a 30m area surrounding the wells, based on the updated coordinates.

Additional adjustments were completed for undocumented wells which were not visited as part of the Well Location Update. In these cases, wells were assumed to be within 30m of the principal structure on the property, and vulnerability was therefore adjusted for 60m surrounding the principal structure to account for the uncertainty with both the location of the well and the condition of the well.

No adjustments to the Urban area were incorporated into the WHPA as all residences are on municipal water, there were not sufficient records of wells which pre-date the system, and the depth to the services (placed at typical depths) are insignificant in comparison to the depth to the municipal supply aquifer.

3.29 Zurich WHPA

Aquifer vulnerability within the Zurich WHPA was adjusted for several undocumented wells that were inspected and georeferenced as part of the Well Location Update completed by the Ausable Bayfield Maitland Valley Source Protection Region (2007). These wells were located as part of the project, and were found to have wells that are out of compliance with provincial requirements for well construction. Vulnerability was adjusted one level for a 30m area surrounding the wells, based on the updated coordinates.

Additional adjustments were completed for undocumented wells which were not visited as part of the Well Location Update. In these cases, wells were assumed to be within 30m of the principal structure on the property, and vulnerability was therefore adjusted for 60m surrounding the principal structure to account for the uncertainty with both the location of the well and the condition of the well.

No adjustments to the Urban area were incorporated into the WHPA as all residences are on municipal water, there were not sufficient records of wells which pre-date the system, and the depth to the services (placed at typical depths) are insignificant in comparison to the depth to the municipal supply aquifer.

4.0 SUMMARY

In the Ausable Bayfield Maitland Valley Source Protection Region (SPR) transport pathways were grouped into several categories, namely: pits and quarries; private wells; and urban areas and private well clusters. These potential transport pathways were evaluated using both remote sensing techniques and site visits. This evaluation considered the hydrogeology of the site and the condition of the pathway

were considered, as well as the cumulative impact of transport pathways. Adjustments to aquifer vulnerability were undertaken based on these evaluations.

The most common transport pathway adjustment in the Ausable Bayfield Maitland Valley Source Protection Region (SPR) is due to the presence of out of compliance wells. A program to address these wells would be beneficial for the protection of municipal drinking water sources in the SPR.

APPENDIX –A – Maps