

Revisions to the LTVSPA Assessment Report – Section 7

White Cells- original text

Grey cells- new text

Yellow highlight- area of original text to be changed

Bright Green highlight- area of new text

Section 7– Threats and Risk Assessment Water Quality

Section	Page	Text	Reason For Change				
7	7-2	Dillon Consulting Ltd. was the primary consultant who completed the threats and risk assessment work for these groundwater systems. LTVCA staff created mapping products needed in threats analysis, and analysed certain types of threats.	Need to add a paragraph how Threat and Risk Assessment was done for IPZ-3				
Proposed revision		Dillon Consulting Ltd. was the primary consultant who completed the threats and risk assessment work for these groundwater systems. Threats and risk assessment in the EBA and IPZ-3 were completed by LTVCA staff based on the event modelling in the EBA. Threats and risk assessment in the IPZ-3 for the Stoney Point intake were also undertaken by LTVCA staff based on an extension of the IPZ-3 delineation and vulnerability scoring in the Essex Region SPA. LTVCA staff created mapping products needed in threats analysis, and analysed certain types of threats.					
7	7-2, 3	Table 7-1 Technical Studies on Drinking Water Threats and Risk Assessment	Update Table with Tech Report on IPZ-3				
Proposed revision		Add rows: <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%; border: none;">Wheatley</td> <td style="border: none;">Name of report, ERCA, Month, 2014</td> </tr> <tr> <td style="border: none;">Stoney Point</td> <td style="border: none;">Name of report, LTVCA Month 2014</td> </tr> </table>	Wheatley	Name of report, ERCA, Month, 2014	Stoney Point	Name of report, LTVCA Month 2014	
Wheatley	Name of report, ERCA, Month, 2014						
Stoney Point	Name of report, LTVCA Month 2014						
7	7-3	Work related to IPZ-3 is yet to be completed	Specify which IPZ-3s as some work has been done.				
Proposed revision		Work related to IPZ-3 has been undertaken on the Wheatley Intake and the IPZ-3 from the Stoney Point intake in Essex Region SPA has been extended into the Lower Thames Valley SPA.					
7	7-33	Highgate is currently classified as a GUDI (groundwater under the direct influence of surface water) system. As described in section 4.3.4, the MOE directed that the workplans for WHPA-E and WHPA-F for the Highgate system not be included in the Assessment Report as information available at this time indicates that the system does not meet the test in Rule 49 (3).	Highgate is no longer classified as GUDI				
Proposed revision		Highgate is no longer classified as a GUDI (groundwater under the direct influence of surface water) system.					
7	7-5	The activities 1 to 18 and 21 are prescribed drinking threats related to drinking water quality and are discussed in this section	Minor editorial revision				
Proposed revision		The activities 1 to 18 and 21 are prescribed drinking water threats related to drinking water quality and are discussed in this section					
7	7-6	WHPA-E and WHPA-f are delineated for drinking water systems designated to be groundwater under the direct influence of surface water (GUDI). Work related to IPZ-3 is yet to be completed. As described in Section 4.3.4 and 7.1, the MOE directed that the workplans for WHPA-E and WHPA-F for the Highgate system not be included in the Assessment Report as information available at this time indicates that the system does not meet the test in Rule 49 (3).	No longer relevant				
		Delete text					
7	7-7	According to the Technical Rules: Assessment Report, vulnerability scores for Great Lakes IPZ range from 3.5 to 7.0 (depending on whether it is for IPZ-1 or IPZ-2), and for WHPA, range from 2 to 10	Discussion of ranges for IPZ-3 needed.				

Section	Page	Text	Reason For Change
		(depending on whether it is for WHPA-A, WHPA-B, WHPA-C or WHPA-D).	
<i>Proposed revision</i>		According to the Technical Rules: Assessment Report, vulnerability scores for Great Lakes IPZ-1 and IPZ-2 range from 3.5 to 7.0 (depending on whether it is for IPZ-1 or IPZ-2). For intakes in Lake St Clair, vulnerability for IPZ-3 must be lower than the score for IPZ-2 and vary depending on the travel time to the intake. For WHPA the vulnerability ranges from 2 to 10 (depending on whether it is for WHPA-A, WHPA-B, WHPA-C or WHPA-D).	
7	7-7	dependent on the circumstances associated with activity	Missed 'the'
<i>Proposed revision</i>		dependent on the circumstances associated with the activity	
7	7-8	Hence, the circumstances of the activity are considered to determine the level of risk associated with a water threat.	No such thing as a water threat
<i>Proposed revision</i>		Hence, the circumstances of the activity are considered to determine the level of risk associated with a drinking water threat.	
7	7-8	BTEX	Spell out the acronym the first time
<i>Proposed revision</i>		Benzene, Toluene, Ethylbenzene, and Xylene (BTEX)	
7	7-9	The Percent of Impervious Areas within the grids touching WHPA and IPZ have been calculated; however HVA and SGRA have yet to be calculated.	Remove whole sentence.
<i>Proposed revision</i>		The Percent of Impervious Areas within the grids touching WHPA and IPZ have been calculated; however HVA and SGRA have yet to be calculated.	
7	7-10	This was undertaken for each part of the WHPA and IPZ which have been delineated.	Only done where the vulnerability score can produce a threat.
<i>Proposed revision</i>		This was undertaken for each part of the WHPA and IPZ where the vulnerability could result in the activities being a drinking water threat. This evaluation has not been completed for IPZ-3.	
7	7-14	The Clean Water Act also allows the Source Protection Committee to include activities that they consider being drinking water threats but are not prescribed drinking water threats, upon approval of the Director. These are called other activities (Rule 119). The Source Protection Committee can also identify additional circumstances (not already in the tables of drinking water threats) under which they consider the activity to be a prescribed drinking water threat. The Source Protection Committee is considering a few such other activities, as discussed in Section 7.3. These include geothermal systems (harnessing underground temperature), transportation corridors (shipping or road transport of materials) and rifle ranges (shooting practice areas). Other activities may be listed as threats only if the Source Protection Committee identifies them as drinking water threats, and similar to the prescribed threats, if the hazard score is greater than 4 and the risk score calculated is greater than 40, and if the hazard score (calculated based on certain criteria set out in the technical rules) is agreed upon by the Director (MOE).	Need to reflect additional local threats for the LTV
<i>Proposed revision</i>		The Clean Water Act also allows the Source Protection Committee upon approval of the Director, to include activities that they consider drinking water threats but are not prescribed drinking water threats. These are called other activities (Rule 119) and are often referred to as local threats. The SPC has requested permission to consider transportation of fuel as threat. Appendix 13 contains the director's letter granting that request. The Source Protection Committee can also identify additional circumstances (not already in the tables of drinking water threats) under which they consider the activity to be a prescribed drinking water	

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		<p>threat. The Source Protection Committee is considering a few such other activities, as discussed in Section 7.3. These include geothermal systems (harnessing underground temperature), transportation corridors (shipping or road transport of materials) and rifle ranges (shooting practice areas).</p> <p>Other activities may be listed as threats only if the Source Protection Committee identifies them as drinking water threats, and similar to the prescribed threats, if the hazard score is greater than 4 and the risk score calculated is greater than 40, and if the hazard score (calculated based on certain criteria set out in the technical rules) is agreed upon by the Director (MOE). This information is included in the Director's letter included in Appendix 13 MOE communications. Event based modelling may be used to determine if these other activities (local threats), or prescribed drinking water threats, are considered significant drinking water threats.</p>	
Appendix 13	new	Add Appendix 13 – Ministry of Environment Communications	
<i>Proposed revision</i>		<i>To include:</i> Approval of AR Approval of transportation threats Approval of alternative methods for IPZ-3	
7	7-15	The sources of some of the issues is yet to be determined.	Grammar
<i>Proposed revision</i>		The sources of some of the issues are yet to be determined.	
7	7-15	Also as per rule 115 , activities that contribute to the issue within the issue contributing area must be identified and are deemed to be a significant risk to the source of drinking water for those systems included in the Terms of Reference for an SPA.	Deemed to be significant threat not risk? Also, it is not Rule 115 that makes these significant.
<i>Proposed revision</i>		Also as per rule 131 , activities that contribute to the issue within the issue contributing area must be identified and are deemed to be a significant drinking water threat for systems included in the Terms of Reference for an SPA.	
7	7-15	Significant risks must be mitigated through the source protection plan.	Threat or risk?
<i>Proposed revision</i>		Significant threats must be mitigated or prevented through the source protection plan.	
7	7-15	As per Technical Rules 68, 130 and 131, a third intake protection zone (IPZ-3) for surface water intakes may be delineated, based on an extreme event, to include the activity and area known to contribute to the drinking water quality issue. These tasks are yet to be completed and will be part of an amended Assessment Report .	Revise in relation to current ICA position.
<i>Proposed revision</i>		As per Technical Rules 68, 130 and 131, a third intake protection zone (IPZ-3) for surface water intakes may be delineated, based on an extreme event, to include the activity and area known to contribute to the drinking water quality issue. These tasks are yet to be completed and may be part of an amended Assessment Report if an ICA is delineated for an issue under the rules (115).	
7	7-16	The threats analysis for IPZ of the West Elgin, Wheatley and Chatham/South Kent intakes on Lake Erie was based on reviewing the Ministry of Environment tables of drinking water threats and the vulnerability scores of these IPZ. The vulnerability scores and vulnerable areas were considered to generate the listing of land use activities that are or would be drinking water threat in each vulnerable area. The listing details land use activities that, given the vulnerability score for each specific vulnerable area, would present low, moderate, or significant drinking water threats.	Need to specify which IPZs now that IPZ-3 exist and describe IPZ-3/EBA threats assessment
<i>Proposed</i>		The threats analyses for IPZ-1 and IPZ-2 of the West Elgin, Wheatley and Chatham/South Kent intakes on	

Section	Page	Text	Reason For Change
<i>revision</i>		Lake Erie was based on reviewing the Ministry of Environment Tables of Drinking Water Threats and the vulnerability scores of the IPZ. The vulnerability scores and vulnerable areas were considered to generate the listing of land use activities that are or would be drinking water threat in each vulnerable area. The listing details land use activities that, given the vulnerability score for each specific vulnerable area, would present low, moderate, or significant drinking water threats. In the Event Based Areas activities are identified as significant drinking water threats through the event based modelling which is described in section 4.	
7	7-16	For the threats analysis in the Ridgetown and Highgate WHPAs, an inventory of land use activities that may be associated with prescribed drinking water threat was conducted. The inventory was based on a review of multiple data sources including public records, data provided through questionnaires completed by municipal officials, previous contaminant/historical land use information, and data collected during windshield surveys. No site specific information was collected; therefore, all prescribed drinking water threat activities are considered potential rather than confirmed .	Discuss local threat if it is evaluated for WHPAs
<i>Proposed revision</i>		For the threats analysis in the Ridgetown and Highgate WHPAs, an inventory of land use activities that may be associated with prescribed drinking water threat was conducted. The inventory was based on a review of multiple data sources including public records, data provided through questionnaires completed by municipal officials, previous contaminant/historical land use information, and data collected during windshield surveys. No site specific information was collected; therefore, all prescribed drinking water threat activities are considered potential rather than confirmed . Due to the transient nature of the transportation threats it is not possible to inventory people engaged in these activities	
7.1.5	7-16	A tier 2, or site-specific, risk assessment is planned for 2010 to confirm the number of locations at which significant threats occur.	Revise to reflect that tier 2 is not being completed and describe the verification process
<i>Proposed revision</i>		A site-specific risk assessment to confirm the existence of significant threats will be necessary as part of implementation.	
7.2	7-17	The Source Protection Committee has not identified any 'other' (not prescribed) activities or circumstances (not in the tables of drinking water threats) at this point. However, the Source Protection Committee has expressed a concern to the MOE over the risks associated with the transportation of materials through pipelines or other corridors.	Change to reflect new local threat approval
<i>Proposed revision</i>		The Source Protection Committee has been approved to consider transportation of fuel as a local threat.	
7.2	7-17	Activities that contribute to issues are deemed a significant risk by the Clean Water Act.	Improve clarity
<i>Proposed revision</i>		Activities that contribute to issues within an ICA are deemed a significant threat by the Clean Water Act.	
7.2.1	7-18	For activities related to the use of land as livestock grazing or pasturing land, an outdoor confinement area or a farm-animal yard, no chemical or pathogen threats were identified in IPZs with vulnerability scores at or greater than 4.5 (chemical) and 4.2 (pathogen) due to current land use (scores lower than these do not result in these activities being identified as threats in IPZs).	Improve clarity
<i>Proposed revision</i>		For activities related to the use of land as livestock grazing or pasturing land, an outdoor confinement area or a farm-animal yard, no chemical or pathogen threats were identified in IPZ-1 or IPZ-2 with vulnerability scores at or greater than 4.5 (chemical) and 4.2 (pathogen) due to current land use (scores lower than these do not result in these activities being identified as threats in IPZs). These activities have not been inventoried in the IPZ-3, however in this area they cannot be considered significant drinking water threats due to the vulnerability scoring of the area.	

Section	Page	Text	Reason For Change
7.2.2	7-18	As can be seen from Table 7-5, there are no locations of activities that 'are or would be' significant threats within the IPZ, the HVA and SGRA. There are however locations where significant threats 'are or would' occur in the WHAP-A, WHAP-B and WHPA-C.	Need to specify which IPZs now that IPZ-3 exist
<i>Proposed revision</i>		As can be seen from Table 7-5, there are no locations of activities that 'are or would be' significant threats within the IPZ-1, IPZ-2, the HVA and SGRA. There are however locations where significant threats 'are or would' occur in the WHAP-A, WHAP-B and WHPA-C as well as IPZ-3 where event based modelling has identified significant threats (in an EBA).	
7.2.3	19	Table 7-5 : Number of Locations of Significant Drinking Water Threats	Update with IPZ-3, confirm values haven't changed
		<i>Replace with tables appended to this change log</i>	
7.2.3 and on	7-20, 22, 23, 26, 27, 28	http://www.ene.gov.on.ca/en/water/cleanwater/provincialTables.php .	Bad web link
		https://www.ontario.ca/environment-and-energy/provincial-tables-circumstances	
7.2.3 and on	7-20, 22, 23, 26, 27, 28	http://www.ene.gov.on.ca/en/water/cleanwater/cwa-technical-rules.php .	Bad web link
		http://www.ontario.ca/environment-and-energy/tables-drinking-water-threats	
Table 7-7, 7-8, 7-9, 7-10, 7-12	7-22 to 7-25	Table 7-7, 7-8, 7-9, 7-10, 7-12	Update based on threats verification
		<i>Replace with tables appended to this change log</i>	
7.2.7	27	The table on the map and the Table 7-12 below indicate the vulnerability score and vulnerable area in which the activities 'are or would' be low, moderate or significant threats. The level of threat is dependent upon the vulnerable area (IPZ-1 or 2).	Need to add for IPZ-3/EBA
<i>Proposed revision</i>		The table on the map and the Table 7-12 below indicate the vulnerability score and vulnerable area in which the activities 'are or would' be low, moderate or significant threats. The level of threat is dependent upon the vulnerable area (IPZ-1 or 2). In the EBA significant threats are determined through the use of event based models.	
7.2.9		<i>New section to be added</i>	To document number of significant threats in the EBA separate from PDWT in IPZ-1, 2.
		7.2.9 Threats in EBA Tables 7-14 and 7-15 identify the numbers of suspected significant threats in the Event Based Areas (EBA) for Wheatley and Stoney Point intakes. These threats are considered significant threats as a result of the event based modelling used to delineate the IPZ-3 as described in section 4.2.5. An IPZ-3 is created to contain the parts of the EBA which extend beyond the IPZ-1 and IPZ-2. These EBA are based on the	

Section	Page	Text	Reason For Change
		specific circumstances (chemical and quantity) modelled under an extreme event. For both intakes fuel spills were modelled based on 15,000 and 34,000 L spills (15 cubic metres and 34 cubic metres). Within this area the modelling has identified that the chemical can arrive at the intake at a concentration which would result in the deterioration of the water as a drinking water source and as such can be identified as a significant drinking water threat in that area. The EBA may contain all or only parts of the IPZ-1, 2, and 3.	
7.3	7-28, 29	A tier 2, or site-specific, risk assessment is planned for 2010 to confirm the number of locations at which significant threats occur. As part of the consultation on this assessment report, those who are believed to be engaging in a significant threat will be notified. This will allow their participation in the tier 2 risk assessment. The tier 2 work involves the examination of land use activities and the circumstances under which they are undertaken, through site visits and discussions with the landowners. The outcome of the tier 2 risk assessment will be part of an amended Assessment Report.	Reflect that tier 2 risk assessment is not planned
Proposed revision		A site-specific risk assessment to confirm the existence of significant threats will be necessary as part of implementation. Although additional efforts have been made to verify significant threats, this has not included on site verification of the threat. Although this level of effort was considered as part of the threats verification, it would still be necessary during implementation. Further it will also be necessary as part of compliance monitoring for part IV implementation in both locations where significant threats have been identified and those where threats have not been identified. This is due in part to the potential for activities and circumstance to change at any location without any regulatory approval process. As part of the consultation on this assessment report, those who are believed to be engaging in a significant threat will be notified.	
7.4	7-29	The delineation and vulnerability assessment of IPZ-3 is yet to be complete. It is estimated to complete this work in fall 2010. Thereafter, the impervious, managed lands and livestock density calculations and associated threats identification and risk assessment will be completed for these vulnerable areas in 2011, to be a part of an amended Assessment Report. Highgate is currently classified as a GUDI (groundwater under the direct influence of surface water) system. As described in Section 4.3.4 and 7.1, the MOE directed that the workplans for WHPA-E and WHPA-F for the Highgate system not be included in the Assessment Report as information available at this time indicates that the system does not meet the test in Rule 49 (3). A preliminary investigation has been completed to determine if there are any conditions. A couple of potential conditions in the Lower Thames Valley Source Protection Area are being considered. More work will be undertaken on identifying and assessing conditions for potential threats, and the Assessment Report will be amended if necessary.	Update to reflect IPZ-3 work, what work was done/not done according to the timeline, comments about Highgate still valid?
Proposed revision		Impervious, managed lands and livestock density calculations and associated threats identification and risk assessment have not been completed for IPZ-3. This is only necessary for the IPZ-3 related to the type D intake at Stoney Point. This work when completed will not identify any significant threats due to the vulnerability score of these areas. A preliminary investigation has been completed to determine if there are any conditions. A couple of potential conditions in the Lower Thames Valley Source Protection Area are being considered. If warranted more work will be undertaken on identifying and assessing conditions for potential threats, and the Assessment Report will be amended if necessary.	
Table 7-14, 7-15		new table	Inventory significant threats in EBA
		Add table 7-14, 7-15 appended to this change log	
		Threats Section Summary	
		Update to reflect revisions to this section	
		System summaries	
		Revise to reflect updated threats inventories	

Threats Tables for Lower Thames Valley SPA Assessment Report

**Table Error! No text of specified style in document.-1, :
Number of Locations of Significant Drinking Water
Threats**

System and Vulnerable Area	Vulnerability Score	Number of Locations of Significant Threats
Chatham/South Kent Water Treatment Plant		
IPZ-1	5.0	0
IPZ-2	4.0	0
Highgate Well Supply System		
WHPA - A	10	32
WHPA - B	6	2
WHPA - C	4	0
WHPA - D	2	0
Ridgetown Well Supply System		
WHPA - A	10	25
WHPA - B	6	0
WHPA - C	2	0
WHPA - D	2	0
West Elgin Water Treatment Plant – Primary Intake		
IPZ-1	6.0	0
IPZ-2	4.2	0
West Elgin Water Treatment Plant – Emergency Intake		
IPZ-1	7.0	0
IPZ-2	5.6	0
Wheatley Water Treatment Plant – Primary Intake		
IPZ-1	6.0	0
IPZ-2	4.8	0
IPZ-3	n/a	tbc
Wheatley Water Treatment Plant – Emergency Intake		
IPZ-1	7.0	0
IPZ-2	5.6	0
Stoney Point Intake (Essex Region SPA)		
IPZ-3	2.7 to 6.3	tbc
HVA and SGRA		
HVA	6.0	0
SGRA	6.0, 4.0 and 2.0	0
* Event modelled threats only (fuel storage and handling)		

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Comment [ct1]:

Comment [ct2]:

Table Error! No text of specified style in document.-2. Number of Locations of Significant Threats in the Highgate WHPAs

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Vulnerable Area	Vulnerability Score	Significant Threats Related To		
		Pathogens	Chemicals	DNAPLs
WHPA-A	10	31	1	1
WHPA-B	6	0	0	1
WHPA-C	4	0	0	0
WHPA-D	2	0	0	0

Table Error! No text of specified style in document.-3. Significant Threats in the Highgate WHPA

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Prescribed Drinking Water Threat	Type (Chemical, Pathogen or DNAPL)	WHPA
The establishment, operation or maintenance of a system that collects, stores, transmits, treats or disposes of sewage	Chemical, Pathogen	A
The application of agricultural source material to land	Pathogen	A
The application of pesticide to land.	Chemical	A
The application of non-agricultural source material to land	Pathogen	A
The handling and storage of dense non aqueous phase liquids	DNAPL	A, B
The handling and storage of fuel	Chemical	A
Number of occurrences of significant prescribed drinking water threats		39
Total number of locations of significant prescribed drinking water threats		34*

*some parcels may have more than one activity occurring

Table Error! No text of specified style in document.-4. Number of Locations of Significant Threats in the Ridgetown WHPAs

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Vulnerable Area	Vulnerability Score	Significant Threats Related To		
		Pathogens	Chemicals	DNAPLs
WHPA-A	10	15	42	10
WHPA-B	6	0	0	2
WHPA-C	2	0	0	0
WHPA-D	2	0	0	0

Table Error! No text of specified style in document.-5 Significant Threats in the Ridgetown WHPA

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Prescribed Drinking Water Threat	Type (Chemical, Pathogen or DNAPL)	WHPA
Erie Street System		
The establishment, operation or maintenance of a system that collects, stores, transmits, treats or disposes of sewage	Chemical, Pathogen	A
The application of agricultural source material to land	Pathogen	A
The storage of agricultural source material	Chemical, Pathogen	A
The application of non-agricultural source material to land	Chemical, Pathogen	A
The handling and storage of commercial fertilizer	Chemical	A
The handling and storage of pesticide	Chemical	A
The handling and storage of dense non aqueous phase liquids	DNAPL	A, B
The handling and storage of fuel	Chemical	A
The application of fertilizer	Chemical	A
The handling and storage of organic solvents	Chemical	A
The use of land as livestock grazing or pasturing land, an outdoor confinement area or a farm-animal yard	Pathogen	A
Scane Road System		
The handling and storage of fuel	Chemical	A
The application of pesticide	Chemical	A
The application of agricultural source material to land	Pathogen	A
The application of non-agricultural source material to land	Pathogen	A
Number of occurrences of significant prescribed drinking water threats		71
Total number of locations of significant prescribed drinking water threats		25*

*some parcels may have more than one activity occurring

Table Error! No text of specified style in document.-6 Levels of Threats Related to Pathogens and Chemicals in the Wheatley IPZs

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Vulnerable Area	Vulnerability Score	Level of Threat for Activities Related to Pathogens			Level of Threat for Activities Related to Chemicals		
		Significant	Moderate	Low	Significant	Moderate	Low
Wheatley Primary Intake							
IPZ-1	6.0	No	Yes	Yes	No	Yes	Yes
IPZ-2	4.8	No	No	Yes	No	No	Yes
IPZ-3	n/a	No	No	No	Yes*	No	No
Wheatley Emergency Intake							
IPZ-1	7.0	No	Yes	Yes	No	Yes	Yes
IPZ-2	5.6	No	No	Yes	No	No	Yes
* storage and handling of fuel in EBA only							

Table Error! No text of specified style in document.-14 Significant Threats in the Stoney Point EBA

Prescribed Drinking Water Threat	Type (Chemical, Pathogen or DNAPL)	IPZ
The handling and storage of fuel	Chemical	3
Number of occurrences of significant prescribed drinking water threats		
Total number of locations of significant prescribed drinking water threats		

*some parcels may have more than one activity occurring

Table Error! No text of specified style in document.-15 Significant Threats in the Wheatley EBA

Prescribed Drinking Water Threat	Type (Chemical, Pathogen or DNAPL)	IPZ
The handling and storage of fuel	Chemical	1,2,3
Number of occurrences of significant prescribed drinking water threats		
Total number of locations of significant prescribed drinking water threats		

*some parcels may have more than one activity occurring