Tecumseh Hamlet MCEA - Evaluation of Alternative Solutions

Table F.1 Stormwater Management - Southeast Hamlet Stormwater Management

	Criteria for Evaluating Alternatives	Alternative Solution #1	Alternative Solution #2	Alternative Solution #3
	Description	Do Nothing. Do not implement regional quality or quantity control measures. Development would need to be limited or private/on-site stormwater management infrastructure will need to be provided.	Implement regional SWM Facility that serves future developable lands only. Maintain separate Antaya Drain Outlet.	Implement regional SWM Facility that serves future developable lands and the upstream Antaya Drain area.
A	**Natural Environment**			
1	**Vegetation/Tree (potential to impact or remove vegetation or trees, impacts to existing wood lot)**	No direct impacts anticipated.	Potential negative impacts to Mixed Meadow and Deciduous Forest located in the Southeast Hamlet area. Maintaining the existing Antaya Drain will have comparable less impact to this area.	Potential negative impacts to Mixed Meadow and Deciduous Forest located in the Southeast Hamlet area. Modifying the existing Antaya Drain will have comparable more impact to this area.
	Rating	●	◑	○
2	**Terrestrial Habitat & Wildlife (potential to impact wildlife, significant wildlife habitat, habitat connectivity)**	No direct impacts anticipated.	Southeast Hamlet area contains candidate Significant Wildlife Habitat (SWH). Drainage of candidate SWH will not be altered and drainage adjacent to area will not be impacted.	Southeast Hamlet area contains candidate Significant Wildlife Habitat (SWH). Drainage of candidate SWH will need to be maintained however exterior drainage patterns will reduce recharge of drain adjacent to this area.
	Rating	●	◑	○
3	**Fisheries / Aquatic Habitat & Wildlife (potential to impact aquatic habitat & wildlife)**	Potential to introduce suspended solids, oil and other contaminants to the downstream drainage system.	Stormwater management facility will provide quality and quantity control of runoff prior to discharging into downstream drains.	Stormwater management facility will provide quality and quantity control of runoff prior to discharging into downstream drains.
	Rating	○	◕	◑
4	**Species at Risk (SAR) (potential to impact habitat of Species at Risk e.g., Bobolink, Northern Myotis, Eastern Fox snake, Butternut)**	No direct impacts anticipated.	Southeast Hamlet area contains candidate SAR habitat. SWMF will not impact habitat.	Southeast Hamlet area contains candidate SAR habitat). SWMF will not impact habitat.
	Rating	●	◑	◑
5	**Surface Water & Groundwater Resources (potential to impact groundwater resources, source water protection, located in vulnerable area, risk to drinking water, wells, aquifer)**	Potential to introduce suspended solids, oil and other contaminants to the downstream drainage system.	Minimal potential for impact to surface water and groundwater quality. The SE THSPA is located partially within areas identified as Intake Protection Zone 3 with a low to moderate vulnerability score (4.5).	Minimal potential for impact to surface water and groundwater quality. The SE THSPA is located partially within areas identified as Intake Protection Zone 3 with a low to moderate vulnerability score (4.5).
	Rating	○	◑	◑

Tecumseh Hamlet MCEA - Evaluation of Alternative Solutions

Table F.1 Stormwater Management - Southeast Hamlet Stormwater Management

6	**Climate Change (potential to impact emission of greenhouse gases, carbon removal, carbon storage/sink (e.g., trees and vegetation))**	No increase in GHG emissions due to no construction activities or vegetation removal. However, providing no stormwater management facility in this area will not mitigate flood risk for existing or proposed areas.	Increase in GHG emissions as a result of construction activities including emissions from heavy vehicles. Construction will also result in vegetation removal which may impact carbon storage benefits provided by vegetation. However, the lands are predominantly agricultural and any existing vegetation will be retained to the extent possible with removals kept to a minimum. Where possible, disturbed areas will be revegated using non-invasive, preferably native plantings and/or seed mix appropriate to the site conditions and adjacent vegetation communities. SWMFs are considered green infrastructure and may provide carbon sequestration benefits through functioning as a carbon sink. This stormwater management solution will mitigate flooding for proposed areas only. Smaller SWMF surface area under ultimate condtions has compartively more impact.	Increase in GHG emissions as a result of construction activities including emissions from heavy vehicles. Construction will also result in vegetation removal which may impact carbon storage benefits provided by vegetation. However, the lands are predominantly agricultural and any existing vegetation will be retained to the extent possible with removals kept to a minimum. Where possible, disturbed areas will be revegated using non-invasive, preferably native plantings and/or seed mix appropriate to the site conditions and adjacent vegetation communities. SWMFs are considered green infrastructure and may provide carbon sequestration benefits through functioning as a carbon sink. This stormwater management solution will mitigate flooding for existing and proposed areas. Larger SWMF surface area under ultimate condtions has least impact.
	Rating	○	◑	●
7	**Climate Change Resilience (potential impact of the effects of climate change on the undertaking)**	Providing no stormwater management facility in this area will not mitigate flood risk for existing or proposed areas.	The proposed SWMF will store runoff up to and including a Urban Stress Test event mitigating impacts to downsteam areas. This solution does not mitigate flood risk for existing area upstream of the SE THSPA.	The proposed SWMF will store runoff up to and including a Urban Stress Test event mitigating impacts to downsteam areas. This solution does mitigate flood risk for existing area upstream of the SE THSPA.
	Rating	○	◑	◕
	Summary Natural Environment	◔	◑	◔

Tecumseh Hamlet MCEA - Evaluation of Alternative Solutions

Table F.1 Stormwater Management - Southeast Hamlet Stormwater Management

	Criteria for Evaluating Alternatives	Alternative Solution #1	Alternative Solution #2	Alternative Solution #3
B	**Socio-Cultural Environment**			
1	**Community Impacts (potential to impact adjacent land uses and activities including residential, recreational, transportation, public service facilities, and infrastructure)**	Lack of mitigation of flood risk for existing and proposed areas has the potential to negatively impact the community in the event of heavy precipitation or extreme weather events. Reduced opportunity to provide additional community feature within development.	This solution addresses flood risk mitigation for the proposed future development areas. However, lack of mitigation of flood risk for existing areas has the potential to negatively impact the community in the event of heavy precipitation or extreme weather events. Additional green space to accommodate the SWMF would be integrated into the recreational, active transportation and community amenities.	This solution addresses flood risk mitigation for the proposed future development areas. Includes mitigation of flood risk for existing areas and reduces impact the community in the event of heavy precipitation or extreme weather events. Additional green space to accommodate the SWMF would be integrated into the recreational, active transportation and community amenities.
	Rating	○	◕	●
2	**Economic Impacts (potential to impact adjacent land uses and activities including commercial and industrial)**	No direct impacts are anticipated.	Existing drains shall be maintained to provide drainage for external areas.	Existing drains shall be maintained to provide drainage for external areas.
	Rating	●	●	●
3	**Conformity to Land Use Planning Policies (PPS, County of Essex Official Plan, Town of Tecumseh Official Plan, Tecumseh Hamlet Secondary Plan)**	Does not conform to municipal land use policies. Proposed Tecumseh Secondary Plan land use plan would not be achievable.	Meets the SWM servicing needs to support future development. Conforms to provincial and municipal land use policies and Secondary Plan.	Meets the SWM servicing needs to support future development. Conforms to provincial and municipal land use policies and Secondary Plan.
	Rating	○	●	●
4	**Heritage Resources (potential to impact built heritage resources and/or cultural heritage landscapes)**	No direct impacts anticipated.	Potential for minor and temporary impacts during construction to potential cultural heritage landscape at the Canadian Pacific Rail Line. No direct, permanent, adverse impacts are anticipated. No changes are anticipated to occur within the rail corridor.	Potential for minor and temporary impacts during construction to potential cultural heritage landscape at the Canadian Pacific Rail Line. No direct, permanent, adverse impacts are anticipated. No changes are anticipated to occur within the rail corridor.
	Rating	●	◕	◕
5	**Archaeological Resources (potential to impact archaeological resources)**	No direct impacts anticipated.	Potential for negative impacts to archaeological resources. Southeast Hamlet area is located partially within areas of high archaeological potential. Stage 1 AA recommends a Stage 2 AA be completed in these areas prior to any development.	Potential for negative impacts to archaeological resources. Southeast Hamlet area is located partially within areas of high archaeological potential. Stage 1 AA recommends a Stage 2 AA be completed in these areas prior to any development.
	Rating	●	◔	◔
6	**Indigenous Communities (potential to impact traditional land and resource use and treaty rights)**	No direct impacts anticipated.	No direct impacts anticipated.	No direct impacts anticipated.
	Rating	●	●	●
	Summary Socio-Cultural Environment	◑	◕	◕

Tecumseh Hamlet MCEA - Evaluation of Alternative Solutions

Table F.1 Stormwater Management - Southeast Hamlet Stormwater Management

	Criteria for Evaluating Alternatives	Alternative Solution #1	Alternative Solution #2	Alternative Solution #3
C	**Financial Factors**			
1	**Estimated Capital Costs (includes Engineering and Construction Costs)**	No stormwater management facility implemented, thus no capital costs incurred.	Comparatively lower costs due to smaller stormwater pond and smaller pump station. Smaller SWM Facility and shorter storm sewer network.	Comparatively higher costs due to larger stormwater pond and larger pump station. Smaller SWM Facility and shorter storm sewer network.
	Rating	●	◑	○
2	**Estimated Operating & Maintenance Costs**	No stormwater management facility implemented however, maintenance of existing drains will continue to be required.	Maintenance of Drain and SWMF Required.	Maintenance of Drain and SWMF Required.
	Rating	◕	◕	◕
	Summary Financial Factors	◕	◑	◔

	Criteria for Evaluating Alternatives	Alternative Solution #1	Alternative Solution #2	Alternative Solution #3
D	**Technical Factors**			
1	**Flood Risk Mitigation**	Flood risk for existing or proposed areas will not be mitigated.	Does mitigaite flood risk for the SE THSPA. Does not mitigate flood risk for existing areas upsream of the Study Area.	Does mitigaite flood risk for the SE THSPA.
	Rating	○	◑	●
2	**Future Development Feasibility**	This solution would reduce the ability for these lands to develop as onsite private SWM solutions affects the scale of development able to be accommodated.	SWM solution is typical for similar development lands. Does not add resiliency associated with infill of existing development area fronting on to Lesperance Rd (upstream Antaya Drain drainage area).	SWM is typical for similar development lands. Adds resiliency associated with infill of existing development area fronting on to Lesperance Rd (upstream Antaya Drain drainage area).
	Rating	○	◑	●
3	**Compatibility with Other Initiatives (i.e. CR19 Improvements, other Municipal Servicing infrastructure)**	Low - high complexity due to shallow outlet and limited capacity of the existing outlet.	High - stormwater outlet can be placed at a depth and alignment that best suits the future improvements along CR19.	Highest - stormwater outlet can be placed at a depth and alignment that best suits the future improvements along CR19. One consolidated outlet from this drainage area will allow for an flexible outlet solution.
	Rating	○	◑	●
4	**Solution Adaptability**	No Adaptability - limited by outlet conditions and will not meet current or future design parameters or servicing needs.	Highest - High level of adaptability to increase storage capacity to respond to changes to climate, design parameters or servicing needs. Allows the maintenance of existing drainage within the Hydro One corridor.	High - High level of adaptability to increase storage capacity to respond to changes to climate, design parameters or servicing needs. Can service the development area and the upstream Antaya Drainage Area.
	Rating	○	◑	●

Tecumseh Hamlet MCEA - Evaluation of Alternative Solutions

Table F.1 Stormwater Management - Southeast Hamlet Stormwater Management

5	**Complexity of Construction**	N/A	Solution requires two separate stormwater outlets to the East Townline Drain increasing complexity. Does not require the interception of the upstream Antaya Drain.	Solution requires one consolidated outlet to the East Townline Drain reducing complexity. However, incorporating the Antaya Drain drainage increases complexity. Requires extension of the storm system to intercept the upstream Antaya Drain.
	Rating	●	◑	○
6	**Construction Duration (estimated)**	N/A	The stormwater management facilities can be built in conjunction with the first phases of development in the Secondary Planning Area as well as can be coordinated with the implementation of other municipal servicing infrastructure.	The stormwater management facilities can be built in conjunction with the first phases of development in the Secondary Planning Area as well as can be coordinated with the implementation of other municipal servicing infrastructure.
	Rating	●	◕	◕
7	**Design Life & Maintenance**	N/A	Moderate - Typical design life for a stormwater management facility. Requires minimal maintenance. Pump stations have limited design life and require repair/improvement over the course of the design life.	Moderate - Typical design life for a stormwater management facility. Requires minimal maintenance. Pump stations have limited design life and require repair/improvement over the course of the design life.
	Rating	●	◕	◕
	Summary Technical Factors	◔	◑	◕
	Criteria for Evaluating Alternatives	**Alternative Solution #1**	**Alternative Solution #2**	**Alternative Solution #3**
	Overall Summary	**Least Preferred**	**Most Preferred**	**Somewhat Preferred**

Order of Preference

Most Preferred	●
More Preferred	◕
Somewhat Preferred	◑
Less Preferred	◔
Least Preferred	○

Tecumseh Hamlet MCEA - Evaluation of Alternative Design Concepts

Table F.2 Transportation - North of CP Rail Corridor

	Criteria for Evaluating Alternatives	Design Concept #1 Off-Street Cycling Facilities (MUP) and On-Street Parking	Design Concept #2 Off-Street Cycling Facilities (MUP) and No Parking	Design Concept #3 On-Street Cycling Facilities and No Parking
A	**Natural Environment**			
1	**Vegetation/Tree (potential to impact or remove vegetation or trees)**	No direct impacts anticipated.	No direct impacts anticipated.	No direct impacts anticipated.
	Rating	●	●	●
2	**Terrestrial Habitat & Wildlife (potential to impact wildlife, significant wildlife habitat, habitat connectivity)**	No direct impacts anticipated.	No direct impacts anticipated.	No direct impacts anticipated.
	Rating	●	●	●
3	**Fisheries / Aquatic Habitat & Wildlife (potential to impact aquatic habitat & wildlife)**	Where roadways require enclosure or relocation of municipal drains, necessary permitting and confirmation of compensation requirements may be required. Specifically, the enclosure of the LaChance Drain along the proposed Intersection Road corridor widening and urbanization will need to be mitigated.	Where roadways require enclosure or relocation of municipal drains, necessary permitting and confirmation of compensation requirements be required. Specifically, the enclosure of the LaChance Drain along the proposed Intersection Road corridor widening and urbanization will need to be mitigated.	Where roadways require enclosure or relocation of municipal drains, necessary permitting and confirmation of compensation requirements be required. Specifically, the enclosure of the LaChance Drain along the proposed Intersection Road corridor widening and urbanization will need to be mitigated.
	Rating	◕	◕	◕
4	**Species at Risk (SAR) (potential to impact habitat of Species at Risk e.g., Bobolink, Northern Myotis, Eastern Foxsnake, Butternut)**	No direct impacts anticipated.	No direct impacts anticipated.	No direct impacts anticipated.
	Rating	●	●	●
5	**Surface Water & Groundwater Resources (potential to impact groundwater resources, source water protection, located in vulnerable area, risk to drinking water, wells, aquifer)**	Groundwater: Minimal potential for impact to surface water and groundwater quality. Intersection Rd is located partially within areas identified as Intake Protection Zone 3 and are not located within an IPZ assigned a vulnerability score. Surface Water: Greater area of roadway will have a higher quantity of runoff and a lower quality of runoff.	Groundwater: Minimal potential for impact to surface water and groundwater quality. Intersection Rd is located partially within areas identified as Intake Protection Zone 3 and are not located within an IPZ assigned a vulnerability score. Surface Water: Smallest area of roadway will have the lowest quantity of runoff and a highest quality of runoff.	Groundwater: Minimal potential for impact to surface water and groundwater quality. Intersection Rd is located partially within areas identified as Intake Protection Zone 3 and are not located within an IPZ assigned a vulnerability score. Surface Water: Greater area of roadway will have a higher quantity of runoff and a lower quality of runoff.
	Rating	◔	◕	◔

Tecumseh Hamlet MCEA - Evaluation of Alternative Design Concepts

Table F.2 Transportation - North of CP Rail Corridor

6	**Climate Change (potential to impact emission of greenhouse gases, carbon removal, carbon storage/sink (e.g., trees and vegetation))**	Highest area of imperviousness. The provision of active transportation infrastructure will make walking and cycling a more viable alternative travel mode in the Town of Tecumseh which may support the reduction of GHG emissions. The Project will generate additional impervious surfaces (i.e. pavement) in the area which may contribute to the urban heat island effect and impact carbon storage benefits provided by vegetation. However, the lands are predominantly agricultural and any existing vegetation will be retained to the extent possible with removals kept to a minimum. A planting zone is provided as part of the cross-section which will use non-invasive, preferably native plantings and/or seed mix appropriate to site conditions and adjacent vegetation communities. Increased runoff from to impervious area is intensified due to climate change impacts. Upper Little River Watershed Flood Level grades shall be maintained and overland flow routes must be provided.	Lowest area of imperviousness. The provision of active transportation infrastructure will make walking and cycling a more viable alternative travel mode in the Town of Tecumseh which may support the reduction of GHG emissions. The Project will generate additional impervious surfaces (i.e. pavement) in the area which may contribute to the urban heat island effect and impact carbon storage benefits provided by vegetation. However, the lands are predominantly agricultural and any existing vegetation will be retained to the extent possible with removals kept to a minimum. A planting zone is provided as part of the cross-section which will use non-invasive, preferably native plantings and/or seed mix appropriate to site conditions and adjacent vegetation communities. Increased runoff from to impervious area is intensified due to climate change impacts. Upper Little River Watershed Flood Level grades shall be maintained and overland flow routes must be provided.	Lower area of imperviousness. The provision of active transportation infrastructure will make walking and cycling a more viable alternative travel mode in the Town of Tecumseh which may support the reduction of GHG emissions. The Project will generate additional impervious surfaces (i.e. pavement) in the area which may contribute to the urban heat island effect and impact carbon storage benefits provided by vegetation. However, the lands are predominantly agricultural and any existing vegetation will be retained to the extent possible with removals kept to a minimum. A planting zone is provided as part of the cross-section which will use non-invasive, preferably native plantings and/or seed mix appropriate to site conditions and adjacent vegetation communities. Increased runoff from to impervious area is intensified due to climate change impacts. Upper Little River Watershed Flood Level grades shall be maintained and overland flow routes must be provided.
	Rating	◔	◕	◑
7	**Climate Change Resilience (potential impact of the effects of climate change on the undertaking)**	Minimal impacts to project activities as a result of variation in climate parameters such as temperature, precipitation, and wind are anticipated. There is potential for temporary impacts (e.g., delays) to the project during construction due to extreme weather events. Study Area is not located within a flood plain area limiting the potential impact of extreme storm events impacting the project. Drainage system are designed based on ERCA Guidelines including testing the system conditions under Urban Stress Test conditions.	Minimal impacts to project activities as a result of variation in climate parameters such as temperature, precipitation, and wind are anticipated. There is potential for temporary impacts (e.g., delays) to the project during construction due to extreme weather events. Study Area is not located within a flood plain area limiting the potential impact of extreme storm events impacting the project. Drainage system are designed based on ERCA Guidelines including testing the system conditions under Urban Stress Test conditions.	Minimal impacts to project activities as a result of variation in climate parameters such as temperature, precipitation, and wind are anticipated. There is potential for temporary impacts (e.g., delays) to the project during construction due to extreme weather events. Study Area is not located within a flood plain area limiting the potential impact of extreme storm events impacting the project. Drainage system are designed based on ERCA Guidelines including testing the system conditions under Urban Stress Test conditions.
	Rating	◕	◕	◕
	Summary Natural Environment	◑	◕	◕

Tecumseh Hamlet MCEA - Evaluation of Alternative Design Concepts

Table F.2 Transportation - North of CP Rail Corridor

	Criteria for Evaluating Alternatives	Design Concept #1	Design Concept #2	Design Concept #3
B	**Socio-Cultural Environment**			
1	**Community Impacts (potential to impact adjacent land uses and activities including residential, recreational, transportation, public service facilities, and infrastructure)**	On-street bike lanes and often not preferred to be used by cyclists due to the proximity to vehicle traffic. To promote a corridor that is accessible to all ages and abilities, the use of a multi-use path is preferred	Potential for minor and temporary impacts to traffic flow and access as a result of construction activities.	Potential for minor and temporary impacts to traffic flow and access as a result of construction activities.
	Rating	◕	◕	◕
2	**Economic Impacts (potential to impact adjacent land uses and activities including commercial and industrial)**	No direct impacts anticipated. Can have economic benefit to the THSPA area by reducing the need for private parking areas and promoting in/out traffic accessing local business.	No direct impacts anticipated. Greater need to rely on private parking areas.	No direct impacts anticipated. Greater need to rely on private parking areas.
	Rating	●	◕	◕
3	**Conformity to Land Use Planning Policies (PPS, County of Essex Official Plan, Town of Tecumseh Official Plan, Tecumseh Hamlet Secondary Plan)**	Conforms to provincial and municipal land use policies and no amendment is required. Accommodates development and supports complete streets objectives. Generally meets the Complete Streets Design Handbook guidance for collector roads providing high level of service for walking and cycling. Parking is not recommended in the Complete Streets Design Handbook for collector roadways.	Conforms to provincial and municipal land use policies and no amendment is required. Accommodates development and supports complete street objectives. Generally meets the Complete Streets Design Handbook guidance for collector roads providing high level of service for walking and cycling. This alternative accommodates vehicles at a lower level of service as no on-street parking is provided.	Conforms to provincial and municipal land use policies and no amendment is required. Accommodates development and supports complete street objectives. Generally meets the Complete Streets Design Handbook guidance for collector roads providing high level of service for walking and cycling. This alternative provides active transportation facilities however onstreet cycling facilities are not accessible for all ages and abilities.
	Rating	◔	◕	◕
4	**Heritage Resources (potential to impact built heritage resources and/or cultural heritage landscapes)**	Direct impacts as a result of construction and road resurfacing from the Maisonneuve Street extension and Intersection Road improvements to the cultural heritage landscape at Banwell Road. Potential for minor and temporary impacts during construction to the potential cultural heritage landscape at 11945 Intersection Road due to the Intersection Road improvements.	Direct impacts as a result of construction and road resurfacing from the Maisonneuve Street extension and Intersection Road improvements to the cultural heritage landscape at Banwell Road. Potential for minor and temporary impacts during construction to the potential cultural heritage landscape at 11945 Intersection Road due to the Intersection Road improvements.	Direct impacts as a result of construction and road resurfacing from the Maisonneuve Street extension and Intersection Road improvements to the cultural heritage landscape at Banwell Road. Potential for minor and temporary impacts during construction to the potential cultural heritage landscape at 11945 Intersection Road due to the Intersection Road improvements.
	Rating	◑	◑	◑

Tecumseh Hamlet MCEA - Evaluation of Alternative Design Concepts

Table F.2 Transportation - North of CP Rail Corridor

5	**Archaeological Resources (potential to impact archaeological resources)**	Potential for negative impacts to archaeological resources. The proposed extension of Gouin Street is located wholly and the proposed extension of Maisonneuve Street is located partially within areas of high archaeological potential. Stage 1 AA recommends a Stage 2 AA be completed in these areas prior to any development.	Potential for negative impacts to archaeological resources. The proposed extension of Gouin Street is located wholly and the proposed extension of Maisonneuve Street is located partially within areas of high archaeological potential. Stage 1 AA recommends a Stage 2 AA be completed in these areas prior to any development.	Potential for negative impacts to archaeological resources. The proposed extension of Gouin Street is located wholly and the proposed extension of Maisonneuve Street is located partially within areas of high archaeological potential. Stage 1 AA recommends a Stage 2 AA be completed in these areas prior to any development.
	Rating	◑	◑	◑
6	**Indigenous Communities (potential to impact traditional land and resource use and treaty rights)**	Potential for negative impacts to Aboriginal archaeological sites. Gouin Street is located within areas of high archaeological potential (within 100 m of Banwell Road and 300 m from Gouin Drain) and Maisonneuve Street is located partially within areas of high archaeological potential (within 100 m Banwell Road). Potential may be reduced in certain locations based on modern disturbance.	Potential for negative impacts to Aboriginal archaeological sites. Gouin Street is located within areas of high archaeological potential (within 100 m of Banwell Road and 300 m from Gouin Drain) and Maisonneuve Street is located partially within areas of high archaeological potential (within 100 m Banwell Road). Potential may be reduced in certain locations based on modern disturbance.	Potential for negative impacts to Aboriginal archaeological sites. Gouin Street is located within areas of high archaeological potential (within 100 m of Banwell Road and 300 m from Gouin Drain) and Maisonneuve Street is located partially within areas of high archaeological potential (within 100 m Banwell Road). Potential may be reduced in certain locations based on modern disturbance.
	Rating	◑	◑	◑
	Summary Socio-Cultural Environment	◑	◑	◑
	Criteria for Evaluating Alternatives	**Design Concept #1**	**Design Concept #2**	**Design Concept #3**
C	**Financial Factors**			
1	**Estimated Capital Costs (includes Engineering and Construction Costs)**	High cost due to wide full depth road pavement area and additional provisions for bike path protection.	Lowest cost compared to other design concepts due to smallest area of full roadway pavement.	Moderate cost compared to other design concepts.
	Rating	◔	●	◑
2	**Estimated Operating & Maintenance Costs**	Difficulty maintaining the travel lane during snow removable and street cleaning due to parked vehicles creating an obstacle. Does not require additional enforcement and potential metering or other cost recovery systems. Due to the separation of the driving lane and the cycle/ pedestrian lane, separate snow removal vehicles will need to be used in order to clear snow during winter months (one for the multiuse pathway and one for the travel lane).	Due to the separation of the driving lane and the cycle/ pedestrian lane, separate snow removal vehicles will need to be used in order to clear snow during winter months (one for the multiuse pathway and one for the travel lane). Does not require additional enforcement and potential metering or other cost recovery systems.	Snow removal vehicles will be able to clear both the road and cycling lanes at the same time leaving a smaller sidewalk area for smaller equipment. Requires additional enforcement and potential metering or other cost recovery systems.
	Rating	◑	◕	●
	Summary Financial Factors	◔	◕	◕

Tecumseh Hamlet MCEA - Evaluation of Alternative Design Concepts

Table F.2 Transportation - North of CP Rail Corridor

	Criteria for Evaluating Alternatives	Design Concept #1	Design Concept #2	Design Concept #3
D	**Technical Factors**			
1	**Network Requirements (will the alternative accommodate local roadway network requirements)**	Best - This alternative offers off-street cycling facilities which separate the travel lane from the cycling facilities with the use of a planting zone. This alternative also allows additional user parking along the ROW.	Good - This alternative offers off-street cycling facilities which separate the travel lane from the cycling facilities with the use of a planting zone.	Acceptable - This alternative offers on-street cycling facilities which are separated from the travel lane through the use of line painting.
	Rating	●	◕	◑
2	**Compatibility (is the alternative compatible with existing and proposed infrastructure)**	Potential for compatibility issues. On street parking is currently not permitted, and could hinder existing landowners ability to utilize their existing driveways.	Compatible with existing and proposed infrastructure. Multi-use paths are being implemented locally (along Lesperance Road) and already exist along Intersection Road.	Generally compatible with existing and proposed infrastructure. The local area does not currently have on-street cycling facilities.
	Rating	◔	●	◕
3	**Safety (potential to impact driver, pedestrian, and cyclist safety)**	Safe - This alternative offers separated off-street cycling facilities and sidewalk facilities through the use of planting zones. However, there may be issues with the drivers ability to visually see users who may be utilizing the sidewalk and or the multi-use path due to the on-street parking.	Safest - This alternative offers separated off-street cycling facilities and sidewalk facilities through the use of planting zones.	Moderately Safe - Cyclists and motor vehicles will have minimal separation (line painting). This alternative does not support a significant form of separation between the travel lane and the cyclist lane. The sidewalk location in this alternative is separated from the travel lane through the use of a planting zone.
	Rating	◕	●	◑
4	**Complexity of Construction**	Potential for compatibility issues. On street parking is currently not permitted, and could hinder existing landowners ability to utilize their existing driveways.	Compatible with existing and proposed infrastructure. Multi-use paths are being implemented locally (along Lesperance Road) and already exist along Intersection Road.	The local area does not currently have on-street cycling facilities. With the number and close proximity of local road intersections, cycling facilities are not ideal.
	Rating	◕	●	◕
5	**Construction Duration (estimated)**	Long construction duration, this alternative requires the most amount of asphalt and concrete surfacing.	Shortest construction duration, this alternative requires the least amount of asphalt and concrete surfacing.	Long construction duration, this alternative requires the most amount of asphalt and concrete surfacing.
	Rating	◕	●	◕
6	**Design Life & Maintenance**	Difficulty maintaining the travel lane during snow removable and street cleaning due to parked vehicles creating an obstacle. Due to the separation of the driving lane and the cycle/ pedestrian lane, separate snow removal vehicles will need to be used in order to clear snow during winter months (one for the multiuse pathway and one for the travel lane). Off road facilities can be more readily maintained/rehabilitated as these projects are less costly and easier to implement.	Due to the separation of the driving lane and the cycle/ pedestrian lane, separate snow removal vehicles will need to be used in order to clear snow during winter months (one for the multiuse pathway and one for the travel lane). Off road facilities can be more readily maintained/rehabilitated as these projects are less costly and easier to implement.	Snow removal within bike lanes can be done during regular road removal operations. On road facilities must be maintained/rehabilitated along with the roadway surface which is more costly and harder to implement.
	Rating	◑	◕	◕
	Summary Technical Factors	◑	◕	◑

Tecumseh Hamlet MCEA - Evaluation of Alternative Design Concepts

Table F.2 Transportation - North of CP Rail Corridor

Criteria for Evaluating Alternatives	Design Concept #1	Design Concept #2	Design Concept #3
Overall Summary	**Least Preferred**	**Most Preferred**	**More Preferred**

Order of Preference

Most Preferred	●
More Preferred	◕
Somewhat Preferred	◑
Less Preferred	◔
Least Preferred	○

Tecumseh Hamlet MCEA - Evaluation of Alternative Design Concepts

Table F.3 Transportation - South of CP Rail Corridor

	Criteria for Evaluating Alternatives	Design Concept #1	Design Concept #2	Design Concept #3	Design Concept #4
		Off-Street Cycling Facilities (MUP) and On-Street Parking	Off-Street Cycling Facilities (MUP) and No Parking	On-Street Cycling Facilities and No Parking	Off-Street Cycling Facilities, No Parking, and Bio Swale Median
A	**Natural Environment**				
1	**Vegetation/Tree (potential to impact or remove vegetation or trees)**	No direct impacts anticipated. Tree planting compensation will be integrated into the proposed road improvements.	No direct impacts anticipated. Tree planting compensation will be integrated into the proposed road improvements.	No direct impacts anticipated. Tree planting compensation will be integrated into the proposed road improvements.	No direct impacts anticipated. Tree planting compensation will be integrated into the proposed road improvements. Greatest oppurtunity to incorproate tree canopy with boulevard and median planting.
	Rating	◕	◕	◕	●
2	**Terrestrial Habitat & Wildlife (potential to impact wildlife, significant wildlife habitat, habitat connectivity)**	No direct impacts anticipated.	No direct impacts anticipated.	No direct impacts anticipated.	No direct impacts anticipated.
	Rating	●	●	●	●
3	**Fisheries / Aquatic Habitat & Wildlife (potential to impact aquatic habitat & wildlife)**	No direct impacts anticipated.	No direct impacts anticipated.	No direct impacts anticipated.	No direct impacts anticipated.
	Rating	●	●	●	●
4	**Species at Risk (SAR) (potential to impact habitat of Species at Risk e.g., Bobolink, Northern Myotis, Eastern Foxsnake, Butternut)**	No direct impacts anticipated.	No direct impacts anticipated.	No direct impacts anticipated.	No direct impacts anticipated.
	Rating	●	●	●	●
5	**Surface Water & Groundwater Resources (potential to impact groundwater resources, source water protection, located in vulnerable area, risk to drinking water, wells, aquifer)**	Minimial potential for impact to surface water and groundwater quality. Shields St is located partially within areas identified as Intake Protection Zone 3 and are not located within an IPZ assigned a vulnerability score.	Minimial potential for impact to surface water and groundwater quality. Shields St is located partially within areas identified as Intake Protection Zone 3 and are not located within an IPZ assigned a vulnerability score.	Minimial potential for impact to surface water and groundwater quality. Shields St is located partially within areas identified as Intake Protection Zone 3 and are not located within an IPZ assigned a vulnerability score.	Minimial potential for impact to surface water and groundwater quality. Shields St is located partially within areas identified as Intake Protection Zone 3 and are not located within an IPZ assigned a vulnerability score. Bioswales have the ability to improve runoff quality.
	Rating	◑	◑	◑	●
6	**Climate Change (potential to impact emission of greenhouse gases, carbon removal, carbon storage/sink (e.g., trees and vegetation))**	High area of imperviousness. The provision of active transportation infrastructure will make walking and cycling a more viable alternative travel mode in the Town of Tecumseh which may support the reduction of GHG emissions. T The Project will generate additional impervious surfaces (i.e. pavement) in the area which may contribute to the urban heat island effect and impact carbon storage benefits provided by vegetation. However, the lands are predominantely agricultural and any existing vegetation will be retained to the extent possible with removals kept to a minimum. A planting zone is provided as part of the cross-section which will use non-invasive, preferably native plantings and/or seed mix appropriate to site conditions and adjacent vegetation communities. Increased runoff from to impervious area is intensitifed due to climate change impacts. Upper Little River Watershed Flood Level grades shall be maintained and overland flow routes must be provided.	Low area of imperviousness. The provision of active transportation infrastructure will make walking and cycling a more viable alternative travel mode in the Town of Tecumseh which may support the reduction of GHG emissions. The Project will generate additional impervious surfaces (i.e. pavement) in the area which may contribute to the urban heat island effect and impact carbon storage benefits provided by vegetation. However, the lands are predominantely agricultural and any existing vegetation will be retained to the extent possible with removals kept to a minimum. A planting zone is provided as part of the cross-section which will use non-invasive, preferably native plantings and/or seed mix appropriate to site conditions and adjacent vegetation communities. Increased runoff from to impervious area is intensitifed due to climate change impacts. Upper Little River Watershed Flood Level grades shall be maintained and overland flow routes must be provided.	High area of imperviousness. The provision of active transportation infrastructure will make walking and cycling a more viable alternative travel mode in the Town of Tecumseh which may support the reduction of GHG emissions. The Project will generate additional impervious surfaces (i.e. pavement) in the area which may contribute to the urban heat island effect and impact carbon storage benefits provided by vegetation. However, the lands are predominantely agricultural and any existing vegetation will be retained to the extent possible with removals kept to a minimum. A planting zone is provided as part of the cross-section which will use non-invasive, preferably native plantings and/or seed mix appropriate to site conditions and adjacent vegetation communities. Increased runoff from to impervious area is intensitifed due to climate change impacts. Upper Little River Watershed Flood Level grades shall be maintained and overland flow routes must be provided.	Lowest area of imperviousness. The provision of active transportation infrastructure will make walking and cycling a more viable alternative travel mode in the Town of Tecumseh which may support the reduction of GHG emissions. The Project will generate additional impervious surfaces (i.e. pavement) in the area which may contribute to the urban heat island effect and impact carbon storage benefits provided by vegetation. However, the lands are predominantely agricultural and any existing vegetation will be retained to the extent possible with removals kept to a minimum. A planting zone is provided as part of the cross-section which will use non-invasive, preferably native plantings and/or seed mix appropriate to site conditions and adjacent vegetation communities. Increased runoff from to impervious area is intensitifed due to climate change impacts. Upper Little River Watershed Flood Level grades shall be maintained and overland flow routes must be provided.
	Rating	◔	◑	◔	●
7	**Climate Change Resilience (potential impact of the effects of climate change on the undertaking)**	Minimal impacts to project activities as a result of variation in climate parameters such as temperature, precipitation, and wind are anticipated. There is potential for temporary impacts (e.g., delays) to the project during construction due to extreme weather events. Study Area is not located within a flood plain area limiting the potential impact of extreme storm events impacting the project.	Minimal impacts to project activities as a result of variation in climate parameters such as temperature, precipitation, and wind are anticipated. There is potential for temporary impacts (e.g., delays) to the project during construction due to extreme weather events. Study Area is not located within a flood plain area limiting the potential impact of extreme storm events impacting the project.	Minimal impacts to project activities as a result of variation in climate parameters such as temperature, precipitation, and wind are anticipated. There is potential for temporary impacts (e.g., delays) to the project during construction due to extreme weather events. Study Area is not located within a flood plain area limiting the potential impact of extreme storm events impacting the project.	Bioswales have the ability to improve runoff quality due to long term climate change impacts. Minimal impacts to project activities as a result of variation in climate parameters such as temperature, precipitation, and wind are anticipated. There is potential for temporary impacts (e.g., delays) to the project during construction due to extreme weather events. Study Area is not located within a flood plain area limiting the potential impact of extreme storm events impacting the project.
	Rating	◑	◑	◑	●
	Summary Natural Environment	◑	◕	◑	●

Tecumseh Hamlet MCEA - Evaluation of Alternative Design Concepts

Table F.3 Transportation - South of CP Rail Corridor

	Criteria for Evaluating Alternatives	Design Concept #1	Design Concept #2	Design Concept #3	Design Concept #4
B	**Socio-Cultural Environment**				
1	**Community Impacts (potential to impact adjacent land uses and activities including residential, recreational, transportation, public service facilities, and infrastructure)**	Potential for minor and temporary impacts to adjacent residential and institutional (Secondary School) uses as a result of construction activities including noise, vibration, and dust. Potential for minor and temporary impacts to traffic flow and access as a result of construction activities. Community access to McAuliffe Park facilities will be impacted as a result of the extension of Shields Street since the extension bisects the park property and creates separation between facility areas.	Potential for minor and temporary impacts to adjacent residential and institutional (Secondary School) uses as a result of construction activities including noise, vibration, and dust. Potential for minor and temporary impacts to traffic flow and access as a result of construction activities. Community access to McAuliffe Park facilities will be impacted as a result of the extension of Shields Street since the extension bisects the park property and creates separation between facility areas.	Potential for minor and temporary impacts to adjacent residential and institutional (Secondary School) uses as a result of construction activities including noise, vibration, and dust. Potential for minor and temporary impacts to traffic flow and access as a result of construction activities. Community access to McAuliffe Park facilities will be impacted as a result of the extension of Shields Street since the extension bisects the park property and creates separation between facility areas.	Potential for minor and temporary impacts to adjacent residential and institutional (Secondary School) uses as a result of construction activities including noise, vibration, and dust. Potential for minor and temporary impacts to traffic flow and access as a result of construction activities. Community access to McAuliffe Park facilities will be impacted as a result of the extension of Shields Street since the extension bisects the park property and creates separation between facility areas. Planting zones paired with bioswale medians will visually enhance the public realm/streetscape.
	Rating	◔	◔	◔	◑
2	**Economic Impacts (potential to impact adjacent land uses and activities including commercial and industrial)**	No direct impacts anticipated. Road design inlcudes on-street parking which will provide additional spaces for park users.	No direct impacts anticipated.	No direct impacts anticipated.	No direct impacts anticipated. Road design will be better integrated into the park lands and more easily fit into the enhanced McAuliffe Park layout.
	Rating	◑	◑	◑	●
3	**Conformity to Land Use Planning Policies (PPS, County of Essex Official Plan, Town of Tecumseh Official Plan, Tecumseh Hamlet Secondary Plan)**	Conforms to provincial and municipal land use policies and no amendment is required. Accommodates development and supports complete streets objectives. Generally meets the Complete Streets Design Handbook guidance for collector roads providing high level of service for walking and cycling. This alternative accommodates vehicles at a higher level of service due to the provision for on-street parking.	Conforms to provincial and municipal land use policies and no amendment is required. Accommodates development and supports complete street objectives. Generally meets the Complete Streets Design Handbook guidance for collector roads providing high level of service for walking and cycling. This alternative accommodates vehicles at a lower level of service as no on-street parking is provided.	Conforms to provincial and municipal land use policies and no amendment is required. Accommodates development and supports complete street objectives. Generally meets the Complete Streets Design Handbook guidance for collector roads providing high level of service for walking and cycling. This alternative provides active transportation facilites however onstreet cycling facilities are not accessible for all ages and abilites.	Conforms to provincial and municipal land use policies and no amendment is required. Accommodates development and supports complete street objectives. Generally meets the Complete Streets Design Handbook guidance for collector roads providing high level of service for walking and cycling. This alternative puts the greatest emphasis active transportation uses and integration into the park's pathway system.
	Rating	◔	◑	◑	●
4	**Heritage Resources (potential to impact built heritage resources and/or cultural heritage landscapes)**	No direct impacts anticipated.	No direct impacts anticipated.	No direct impacts anticipated.	No direct impacts anticipated.
	Rating	●	●	●	●
5	**Archaeological Resources (potential to impact archaeological resources)**	No direct impacts anticipated.	No direct impacts anticipated.	No direct impacts anticipated.	No direct impacts anticipated.
	Rating	●	●	●	●
6	**Indigenous Communities (potential to impact traditional land and resource use and treaty rights)**	No direct impacts anticipated.	No direct impacts anticipated.	No direct impacts anticipated.	No direct impacts anticipated.
	Rating	●	●	●	●
	Summary Socio-Cultural Environment	◑	◑	◑	◕

Tecumseh Hamlet MCEA - Evaluation of Alternative Design Concepts

Table F.3 Transportation - South of CP Rail Corridor

	Criteria for Evaluating Alternatives	Design Concept #1	Design Concept #2	Design Concept #3	Design Concept #4
C	**Financial Factors**				
1	**Estimated Capital Costs (includes Engineering and Construction Costs)**	High cost due to wide full depth road pavement area and additonal provisions for bike path protection.	Lowest cost compared to other design concepts due to smallest area of full roadway pavement.	Moderate cost compared to other design concepts.	Highest Cost due to additional raised planters and additonal landscaping.
	Rating				
2	**Estimated Operating & Maintenance Costs**	Difficulty maintaining the travel lane during snow removable and street cleaning due to parked vehicles creating an obstacle. Due to the separation of the driving lane and the cycle/ pedestrian lane, separate snow removal vehicles will need to be used in order to clear snow during winter months (one for the multiuse pathway and one for the travel lane). Landscaping will be comparible easier to maintain and the right-of-way will be served via a conventional storm sewer system that will require typical inspection and maintenance.	Due to the separation of the driving lane and the cycle/ pedestrian lane, separate snow removal vehicles will need to be used in order to clear snow during winter months (one for the multiuse pathway and one for the travel lane). Landscaping will be comparible easier to maintain and the right-of-way will be served via a conventional storm sewer system that will require typical inspection and maintenance.	Snow removal vehicles will be able to clear both the road and cycling lanes at the same time leaving a smaller sidwalk area for smaller equipment. Landscaping will be comparible easier to maintain and the right-of-way will be served via a conventional storm sewer system that will require typical inspection and maintenance.	Due to the separation of the driving lane and the cycle/ pedestrian lane, separate snow removal vehicles will need to be used in order to clear snow during winter months (one for the multiuse pathway and one for the travel lane). Largest quantity of landscaping that will need to be maintained regularily. Median bioswale will need regular inspection and maintenace to ensure that the facility is functioning properly.
	Rating				
	Summary Financial Factors				

	Criteria for Evaluating Alternatives	Design Concept #1	Design Concept #2	Design Concept #3	Design Concept #4
D	**Technical Factors**				
1	**Network Requirements (will the alternative accommodate local roadway network requirements)**	Good - This alternative offers off-street cycling facilities which separate the travel lane from the cycling facilities needing additonal transitions at intersections.Parking provide additional barriers.	Good - This alternative offers off-street cycling facilities which separate the travel lane from the cycling facilities with the use of a planting zone.	Acceptable - This alternative offers on-street cycling facilities which are separated from the travel lane through the use of line painting.	Best- This alternative offers off-street cycling facilities which separate the travel lane from the cycling facilities with the use of a planting zone. The pathways will be better integrated into the existing and proposed pathway network and designated pedestiran crossings will better direct traffic at key interesctions (both vehicular and non-vehicular).
	Rating				
2	**Compatibility (is the alternative compatible with existing and proposed infrastructure)**	Potential for compatibility issues. On street parking is currently not permitted, and could hinder existing landowners ability to utilize their existing driveways.	Compatible with existing and proposed infrastructure. Multi-use paths are being implemented locally (along Leserpance Road) and already exist along Intersection Road.	The local area does not currently have on-street cycling facilites. With the number and close proximity of local road intersections, cycling facilities are not ideal.	Most compatible with existing and proposed infrastructure. Cross section is most suitable within park land areas where integration of the roadway within an enchanced park area is priority.
	Rating				
3	**Safety (potential to impact driver, pedestrian, and cyclist safety)**	Safe - This alternative offers separated off-street cycling facilities and sidewalk facilities through the use of planting zones. However, there may be issues with the drivers ability to visually see users who may be utilizing the sidewalk and or the multi-use path due to the on-street parking.	Very Safe- This alternative offers separated off-street cycling facilities and sidewalk facilities through the use of planting zones.	Safe - Cyclists and motor vehicles will have minimal separation (line painting). This alternative does not support a significant form of separation between the travel lane and the cyclist lane. The sidewalk location in this alternative is separated from the travel lane through the use of planting zones.	Most Safest - This alternative offers separated off-street cycling facilities and sidewalk facilities through the use of a planting zones.
	Rating				
4	**Complexity of Construction**	Moderately complex due to adding parking areas and need to integrate into collector roadway and perpendicular intersections.	Least Complex compared to alternatives 1, 3 and 4.	Moderately complex due to the need to implement bike lane mixing zone at intersection.	Most Complex due to the need to construct raised planters and median bioswale.
	Rating				
5	**Construction Duration (estimated)**	Longer construction duration, this alternative requires the most amount of asphalt and concrete surfacing.	Shortest construction duration, this alternative requires the least amount of asphalt and concrete surfacing.	Longer construction duration, this alternative requires the most amount of asphalt and concrete surfacing.	Longer construction duration, this alternative requires the most amount of asphalt and concrete surfacing.
	Rating				
6	**Design Life & Maintenance**	Difficulty maintaining the travel lane during snow removable and street cleaning due to parked vehicles creating an obstacle. Due to the separation of the driving lane and the cycle/ pedestrian lane, separate snow removal vehicles will need to be used in order to clear snow during winter months (one for the multiuse pathway and one for the travel lane). Off road faciliites can be more readily maintained/rehabilitated as these projects are less costly and easier to implement.	Due to the separation of the driving lane and the cycle/ pedestrian lane, separate snow removal vehicles will need to be used in order to clear snow during winter months (one for the multiuse pathway and one for the travel lane). Off road faciliites can be more readily maintained/rehabilitated as these projects are less costly and easier to implement.	Snow removal within bike lanes can be done during regular road removal operations. On road faciliites must be maintained/rehabilitated along with the roadway surface which is more costly and harder to implement.	Due to the separation of the driving lane and the cycle/ pedestrian lane, separate snow removal vehicles will need to be used in order to clear snow during winter months (one for the multiuse pathway and one for the travel lane). Off road faciliites can be more readily maintained/rehabilitated as these projects are less costly and easier to implement.
	Rating				
	Summary Technical Factors				

Tecumseh Hamlet MCEA - Evaluation of Alternative Design Concepts

Table F.3 Transportation - South of CP Rail Corridor

Criteria for Evaluating Alternatives	Design Concept #1	Design Concept #2	Design Concept #3	Design Concept #4
Overall Summary	**Least Preferred**	**More Preferred**	**Less Preferred**	**Most Preferred**

Order of Preference

Most Preferred ●

More Preferred ◕

Somewhat Preferred ◑

Less Preferred ◔

Least Preferred ○

Tecumseh Hamlet MCEA - Evaluation of Alternative Design Concepts

Table F.4 Water Servicing

	Criteria for Evaluating Alternatives	Design Concept #1	Design Concept #2	Design Concept #3
		East alignment (Odessa/CR42)	Center Alignment (Odessa/CR42)	West Alignment (CR43/CR42)
A	**Natural Environment**			
1	**Vegetation/Tree (potential to impact or remove vegetation or trees)**	Potential negative impacts to a Swamp White Oak Mineral Deciduous Swamp (also Natural Environment Overlay) in the northern portion of the watermain, as well as the removal of some treed Fencerows.	Potential negative impacts to a Swamp White Oak Mineral Deciduous Swamp (also Natural Environment Overlay) in the northern portion of the watermain, as well as the removal of some treed Fencerows.	Potential negative impacts to a Swamp White Oak Mineral Deciduous Swamp (also Natural Environment Overlay) in the northern portion of the watermain, as well as the removal of some treed Fencerows.
	Rating	◔	◔	◔
2	**Terrestrial Habitat & Wildlife (potential to impact wildlife, significant wildlife habitat, habitat connectivity)**	Potential for minor and temporary disturbance to wildlife due to noise and dust during construction. Trunk watermain is proposed to run partially through candidate Significant Wildlife Habitat (Bat Maternity Colonies, Reptile Hibernaculum, Amphibian Breeding Habitat, and Terrestrial Crayfish) and confirmed Significant Wildlife Habitat (Special Concern and Rare Wildlife Species). The trunk watermain is proposed within the proposed municipal ROW. Proposed to install watermain trenchlessly within sensitive areas.	Potential for minor and temporary disturbance to wildlife due to noise and dust during construction. Trunk watermain is proposed to run partially through candidate Significant Wildlife Habitat (Bat Maternity Colonies, Reptile Hibernaculum, Amphibian Breeding Habitat, and Terrestrial Crayfish) and confirmed Significant Wildlife Habitat (Special Concern and Rare Wildlife Species). The trunk watermain is proposed within the proposed municipal ROW. Proposed to install watermain trenchlessly within sensitive areas.	Potential for minor and temporary disturbance to wildlife due to noise and dust during construction. Trunk watermain is proposed to run partially through candidate Significant Wildlife Habitat (Bat Maternity Colonies, Reptile Hibernaculum, Amphibian Breeding Habitat, and Terrestrial Crayfish) and confirmed Significant Wildlife Habitat (Special Concern and Rare Wildlife Species). The trunk watermain is proposed within the proposed municipal ROW. Proposed to install watermain trenchlessly within sensitive areas.
	Rating	◔	◔	◔
3	**Fisheries / Aquatic Habitat & Wildlife (potential to impact aquatic habitat & wildlife)**	Proposed to cross 3 drains. Drains within the Project Area likely provide seasonal habitat for fish. Potential for temporary impacts to fish habitat.	Proposed to cross 3 drains. Drains within the Project Area likely provide seasonal habitat for fish. Potential for temporary impacts to fish habitat.	Proposed to cross 3 drains. Drains within the Project Area likely provide seasonal habitat for fish. Potential for temporary impacts to fish habitat.
	Rating	◑	◑	◑
4	**Species at Risk (SAR) (potential to impact habitat of Species at Risk e.g., Bobolink, Northern Myotis, Eastern Foxsnake, Butternut)**	Potential for minor and temporary disturbance to SAR due to noise and dust during construction. Trunk watermain is proposed to run partially through candidate SAR habitat (Bobolink, Eastern Meadowlark, Wood Thrush, Red-headed Woodpecker, SAR bats, Eastern Foxsnake, Butler's Gartersnake, Willowleaf Aster, Eastern Flowering Dogwood, Butternut, Eastern Prairie Fringed-orchid, and Purple Twayblade). Proposed to install watermain trenchlessly within candidate SAR habitat.	Potential for minor and temporary disturbance to SAR due to noise and dust during construction. Trunk watermain is proposed to run partially through candidate SAR habitat (Bobolink, Eastern Meadowlark, Wood Thrush, Red-headed Woodpecker, SAR bats, Eastern Foxsnake, Butler's Gartersnake, Willowleaf Aster, Eastern Flowering Dogwood, Butternut, Eastern Prairie Fringed-orchid, and Purple Twayblade). Proposed to install watermain trenchlessly within candidate SAR habitat.	Potential for minor and temporary disturbance to SAR due to noise and dust during construction. Trunk watermain is proposed to run partially through candidate SAR habitat (Bobolink, Eastern Meadowlark, Wood Thrush, Red-headed Woodpecker, SAR bats, Eastern Foxsnake, Butler's Gartersnake, Willowleaf Aster, Eastern Flowering Dogwood, Butternut, Eastern Prairie Fringed-orchid, and Purple Twayblade). Proposed to install watermain trenchlessly within candidate SAR habitat.
	Rating	◔	◔	◔

Tecumseh Hamlet MCEA - Evaluation of Alternative Design Concepts

Table F.4 Water Servicing

5	**Surface Water & Groundwater Resources (potential to impact groundwater resources, source water protection, located in vulnerable area, risk to drinking water, wells, aquifer)**	Minimal potential for impact to surface water and groundwater quality. Located partially within areas identified as Intake Protection Zone 3 and not located within an IPZ assigned a vulnerability score. However, the trunk watermain is proposed to run adjacent to a former landfill site south of CR22 which presents potential to encounter contaminated soils during construction.	Minimal potential for impact to surface water and groundwater quality. Located partially within areas identified as Intake Protection Zone 3 and not located within an IPZ assigned a vulnerability score. However, the trunk watermain is proposed to run adjacent to a former landfill site south of CR22 which presents potential to encounter contaminated soils during construction.	Minimal potential for impact to surface water and groundwater quality. Located partially within areas identified as Intake Protection Zone 3 and not located within an IPZ assigned a vulnerability score. However, the trunk watermain is proposed to run adjacent to a former landfill site south of CR22 which presents potential to encounter contaminated soils during construction.
	Rating	◕	◕	◕
6	**Climate Change (potential to impact emission of greenhouse gases, carbon removal, carbon storage/sink (e.g., trees and vegetation))**	Increase in GHG emissions as a result of construction activities including emissions from heavy vehicles. Construction will also result in vegetation removal which may impact carbon storage benefits provided by vegetation. However, the lands are predominately agricultural and any existing vegetation will be retained to the extent possible with removals kept to a minimum. Where possible, disturbed areas will be revegated using non-invasive, preferably native plantings and/or seed mix appropriate to the site conditions and adjacent vegetation communities.	Increase in GHG emissions as a result of construction activities including emissions from heavy vehicles. Construction will also result in vegetation removal which may impact carbon storage benefits provided by vegetation. However, the lands are predominately agricultural and any existing vegetation will be retained to the extent possible with removals kept to a minimum. Where possible, disturbed areas will be revegated using non-invasive, preferably native plantings and/or seed mix appropriate to the site conditions and adjacent vegetation communities.	Increase in GHG emissions as a result of construction activities including emissions from heavy vehicles. Construction will also result in vegetation removal which may impact carbon storage benefits provided by vegetation. However, the lands are predominately agricultural and any existing vegetation will be retained to the extent possible with removals kept to a minimum. Where possible, disturbed areas will be revegated using non-invasive, preferably native plantings and/or seed mix appropriate to the site conditions and adjacent vegetation communities.
	Rating	◕	◕	◕
7	**Climate Change Resilience (potential impact of the effects of climate change on the undertaking)**	Minimal impacts to project activities as a result of variation in climate parameters such as temperature, precipitation, and wind are anticipated. There is potential for temporary impacts (e.g., delays) to the project during construction due to extreme weather events. Study Area is not located within a flood plain area limiting the potential impact of extreme storm events impacting the project.	Minimal impacts to project activities as a result of variation in climate parameters such as temperature, precipitation, and wind are anticipated. There is potential for temporary impacts (e.g., delays) to the project during construction due to extreme weather events. Study Area is not located within a flood plain area limiting the potential impact of extreme storm events impacting the project.	Minimal impacts to project activities as a result of variation in climate parameters such as temperature, precipitation, and wind are anticipated. There is potential for temporary impacts (e.g., delays) to the project during construction due to extreme weather events. Study Area is not located within a flood plain area limiting the potential impact of extreme storm events impacting the project.
	Rating	●	●	●
	Summary Natural Environment	◔	◔	◔

Tecumseh Hamlet MCEA - Evaluation of Alternative Design Concepts

Table F.4 Water Servicing

	Criteria for Evaluating Alternatives	Design Concept #1	Design Concept #2	Design Concept #3
B	**Socio-Cultural Environment**			
1	**Community Impacts (potential to impact adjacent land uses and activities including residential, recreational, transportation, public service facilities, and infrastructure)**	Moderate impacts to adjacent residential uses as a result of construction activities including noise, vibration, and dust. Moderate impacts to traffic flow and access as a result of construction activities. In particular, access to McAuliffe Park via Shields Street will be temporarily impacted by construction. Crossing of CPR Railway is required which will require boring of the trunk watermain to avoid impacts to the railway. Crossing of the Hydro One Corridor is required which will require caution working in the vicinity of existing hydro infrastructure.	Moderate impacts to adjacent residential uses as a result of construction activities including noise, vibration, and dust. Moderate impacts to traffic flow and access as a result of construction activities. In particular, access to McAuliffe Park via Shields Street will be temporarily impacted by construction. Crossing of CPR Railway is required which will require boring of the trunk watermain to avoid impacts to the railway. Crossing of the Hydro One Corridor is required which will require caution working in the vicinity of existing hydro infrastructure.	Moderate impacts to adjacent residential and institutional (Tecumseh Vista Academy Secondary School) uses as a result of construction activities including noise, vibration, and dust. Minor impacts to traffic flow and access as a result of construction activities. Crossing of CPR Railway is required which will require boring of the trunk watermain to avoid impacts to the railway. Crossing of the Hydro One Corridor is required which will require caution working in the vicinity of existing hydro infrastructure.
	Rating			
2	**Economic Impacts (potential to impact adjacent land uses and activities including commercial and industrial)**	Minor impacts to the business park in the south of the Hamlet as a result of construction activities including noise, vibration, and dust. Moderate impacts to traffic flow and access as a result of construction activities.	Minor impacts to the business park in the south of the Hamlet as a result of construction activities including noise, vibration, and dust. Moderate impacts to traffic flow and access as a result of construction activities.	Moderate impacts to the business park in the south of the Hamlet as a result of construction activities including noise, vibration, and dust. Moderate impacts to traffic flow and access as a result of construction activities.
	Rating			
3	**Conformity to Land Use Planning Policies (PPS, County of Essex Official Plan, Town of Tecumseh Official Plan, Tecumseh Hamlet Secondary Plan)**	Conforms to provincial and municipal land use policies and no amendments are required. Water servicing needs accommodate buildout of the Tecumseh Hamlet Secondary Plan area.	Conforms to provincial and municipal land use policies and no amendments are required. Water servicing needs accommodate buildout of the Tecumseh Hamlet Secondary Plan area.	Conforms to provincial and municipal land use policies and no amendments are required. Water servicing needs accommodate buildout of the Tecumseh Hamlet Secondary Plan area.
	Rating			
4	**Heritage Resources (potential to impact built heritage resources and/or cultural heritage landscapes)**	Potential for minor and temporary impacts during construction to potential cultural heritage landscapes at 11945 Intersection Road and the Canadian Pacific Rail Line. No direct, permanent, adverse impacts are anticipated.	Potential for minor and temporary impacts during construction to potential cultural heritage landscapes at 11945 Intersection Road and the Canadian Pacific Rail Line. No direct, permanent, adverse impacts are anticipated.	Potential for minor and temporary impacts during construction to potential cultural heritage landscapes at 11945 Intersection Road and the Canadian Pacific Rail Line. Direct, temporary, construction-related disturbance due to grading and excavation to the potential cultural heritage landscape along Banwell Road and built heritage resource at 2551 Banwell Road.
	Rating			

Tecumseh Hamlet MCEA - Evaluation of Alternative Design Concepts

Table F.4 Water Servicing

5	**Archaeological Resources (potential to impact archaeological resources)**	Potential for negative impacts to archaeological resources. Proposed watermain is located within areas of high archaeological potential. Stage 1 AA recommends a Stage 2 AA be completed in these areas prior to any development.	Potential for negative impacts to archaeological resources. Proposed watermain is located within areas of high archaeological potential. Stage 1 AA recommends a Stage 2 AA be completed in these areas prior to any development.	Potential for negative impacts to archaeological resources. Proposed watermain is located within areas of high archaeological potential. Stage 1 AA recommends a Stage 2 AA be completed in these areas prior to any development.
	Rating			
6	**Indigenous Communities (potential to impact traditional land and resource use and treaty rights)**	Potential for negative impacts to Aboriginal archaeological sites. Watermain route is located within areas of high archaeological potential (within 100 m of Intersection Road and County Road 42 and 300 m from channelized drains). Potential may be reduced in certain locations based on modern disturbance.	Potential for negative impacts to Aboriginal archaeological sites. Watermain route is located within areas of high archaeological potential (within 100 m of Intersection Road and County Road 42 and 300 m from channelized drains). Potential may be reduced in certain locations based on modern disturbance.	Potential for negative impacts to Aboriginal archaeological sites. Watermain route is located within areas of high archaeological potential (within 100 m of Intersection Road, County Road 42, and Banwell Road and 300 m from channelized drains). Potential may be reduced in certain locations based on modern disturbance.
	Rating			
	Summary Socio-Cultural Environment			

	Criteria for Evaluating Alternatives	Design Concept #1	Design Concept #2	Design Concept #3
C	**Financial Factors**			
1	**Estimated Capital Costs (includes Engineering and Construction Costs)**	High - Proposed alignment largely coincides with the proposed ROW within the development thus reducing capital costs for property acquisition.	Highest - Proposed alignment requires many additional alignments within the proposed development area that do not correspond with the ROW alignment within the development thus increasing the capital costs for property acquisition.	Moderately low - Proposed alignment coincides with the proposed ROW within the development thus reducing capital and additional costs for property acquisition.
	Rating			
2	**Estimated Operating & Maintenance Costs**	Moderate - Sections of watermain under the Gouin ponds will be difficult to maintain/repair.	Moderately high - Sections of watermain under the Gouin, LaChance and Desjardins ponds will be difficult to maintain/repair.	Moderate - Sections of watermain under the Gouin ponds will be difficult to maintain/repair.
	Rating			
	Summary Financial Factors			

Tecumseh Hamlet MCEA - Evaluation of Alternative Design Concepts

Table F.4 Water Servicing

	Criteria for Evaluating Alternatives	Design Concept #1	Design Concept #2	Design Concept #3
D	**Technical Factors**			
1	**Municipal Services (will the alternative accommodate servicing needs)**	Acceptable - the proposed watermain alignment allows for staged development within the northern portion of the study area. However, the south property owners may need to acquire additional easements to access the trunk watermain.	Acceptable - the proposed watermain alignment allows for staged development within the northern portion of the study area. However, the south property owners may need to acquire additional easements to access the trunk watermain.	Best - the proposed watermain alignment allows for staged development within the development area, therefore each property owner will have access to the trunk watermain independent of requiring additional property easements.
	Rating	◑	◑	●
2	**Complexity of Construction**	Moderate - the proposed watermain alignment largely coincides with the proposed ROW, however where it differs property acquisition for the alignment would be required and adds to the complexity of construction. The proposed alignment requires an easement beneath the Gouin Pond. This substantially increases the construction complexity by requiring potential casings around the watermain and or very deep excavation to maintain minimum MOE separation.	Highest - the proposed alignment requires an easement beneath the Gouin Pond, Lachance Pond & the Desjardin East Pond. This substantially increases the construction complexity by requiring potential casings around the watermain and or very deep excavation to maintain minimum MOE separation.	Lowest - the proposed watermain alignment coincides with the proposed ROW within the development thus reducing capital and additional costs for property acquisition. The proposed alignment requires an easement beneath the Gouin Pond. This substantially increases the construction complexity by requiring potential casings around the watermain and or very deep excavation to maintain minimum MOE separation.
	Rating	◑	◔	●
3	**Construction Duration (estimated)**	Moderate - Watermain construction will require a phased implementation. The proposed trunk watermain is partially within proposed right of ways in current privately owned lands and therefore necessary agreements would need in place prior to construction.	Longest - Watermain construction will require a phased implementation. The proposed trunk watermain is mostly within proposed right of ways in current privately owned lands and therefore necessary agreements would need in place prior to construction.	Shortest - Watermain construction will require a phased implementation. The proposed trunk watermain is mostly within already accessible right of way corridors and therefore be easiest to access.
	Rating	◕	◔	●
4	**Design Life & Maintenance**	Maintenance is relatively less difficult due to the number of trunk watermain segments underneath the proposed SWM Ponds.	Maintenance is relatively more difficult due to the increased number of trunk watermain segments underneath the proposed SWM Ponds.	Maintenance is relatively less difficult due to the number of trunk watermain segments underneath the proposed SWM Ponds.
	Rating	●	◑	●
	Summary Technical Factors	◑	◔	●

	Criteria for Evaluating Alternatives	Design Concept #1	Design Concept #2	Design Concept #3
	Overall Summary	**Somewhat Preferred**	**Least Preferred**	**Most Preferred**

Order of Preference

Most Preferred	●
More Preferred	◕
Somewhat Preferred	◑
Less Preferred	◔
Least Preferred	○

Tecumseh Hamlet MCEA - Evaluation of Alternative Design Concepts

Table F.5 Wastewater Servicing

	Criteria for Evaluating Alternatives	Design Concept #1	Design Concept #2
		West Alignment	Central Alignment
A	**Natural Environment**		
1	**Vegetation/Tree (potential to impact or remove vegetation or trees)**	Potential negative impacts to a Swamp White Oak Mineral Deciduous Swamp (also Natural Environment Overlay) in the northern portion of the sanitary sewer, as well as the removal of some treed Fencerows.	Potential negative impacts to a Swamp White Oak Mineral Deciduous Swamp (also Natural Environment Overlay) in the northern portion of the sanitary sewer, as well as the removal of some treed Fencerows.
	Rating		
2	**Terrestrial Habitat & Wildlife (potential to impact wildlife, significant wildlife habitat, habitat connectivity)**	Sanitary sewer is proposed to run partially through candidate Significant Wildlife Habitat. To avoid impacts to candidate Significant Wildlife Habitat, proposed to install trunk sanitary sewer trenchlessly through this area.	Sanitary sewer is proposed to run partially through candidate Significant Wildlife Habitat. To avoid impacts to candidate Significant Wildlife Habitat, proposed to install trunk sanitary sewer trenchlessly through this area.
	Rating		
3	**Fisheries / Aquatic Habitat & Wildlife (potential to impact aquatic habitat & wildlife)**	Proposed alignment crosses 3 municipal drains. Drains within the Study Area likely provide season habitat for fish. Potential for temporary impacts to fish habitat. To avoid impacts to drains, it is proposed to install trunk sanitary sewer trenchlessly through this area.	Proposed alignment crosses 3 municipal drains. Drains within the Study Area likely provide season habitat for fish. Potential for temporary impacts to fish habitat. To avoid impacts to drains, it is proposed to install trunk sanitary sewer trenchlessly through this area.
	Rating		
4	**Species at Risk (SAR) (potential to impact habitat of Species at Risk e.g., Bobolink, Northern Myotis, Eastern Foxsnake, Butternut)**	Potential for minor and temporary disturbance to SAR due to noise and dust during construction. Sanitary sewer is proposed to run partially through candidate SAR habitat.	Potential for minor and temporary disturbance to SAR due to noise and dust during construction. Sanitary sewer is proposed to run partially through candidate SAR habitat.
	Rating		
5	**Surface Water & Groundwater Resources (potential to impact groundwater resources, source water protection, located in vulnerable area, risk to drinking water, wells, aquifer)**	Minimal potential for impact to surface water and groundwater quality. Located partially within areas identified as Intake Protection Zone 3 and not located within an IPZ assigned a vulnerability score. However, the sanitary sewer is proposed to run adjacent to a former landfill site south of CR22 which presents potential to encounter contaminated soils during construction. Environmental testing of soils in the vicinity of the landfill have been completed to confirm condition of soil.	Minimal potential for impact to surface water and groundwater quality. Located partially within areas identified as Intake Protection Zone 3 and not located within an IPZ assigned a vulnerability score. However, the sanitary sewer is proposed to run adjacent to a former landfill site south of CR22 which presents potential to encounter contaminated soils during construction. Environmental testing of soils in the vicinity of the landfill have been completed to confirm condition of soil.
	Rating		

Tecumseh Hamlet MCEA - Evaluation of Alternative Design Concepts

Table F.5 Wastewater Servicing

6	**Climate Change (potential to impact emission of greenhouse gases, carbon removal, carbon storage/sink (e.g., trees and vegetation))**	Increase in GHG emissions as a result of construction activities including emissions from heavy vehicles. Construction will also result in vegetation removal which may impact carbon storage benefits provided by vegetation. However, the lands are predominantly agricultural and any existing vegetation will be retained to the extent possible with removals kept to a minimum. Where possible, disturbed areas will be revegated using non-invasive, preferably native plantings and/or seed mix appropriate to the site conditions and adjacent vegetation communities.	Increase in GHG emissions as a result of construction activities including emissions from heavy vehicles. Construction will also result in vegetation removal which may impact carbon storage benefits provided by vegetation. However, the lands are predominantly agricultural and any existing vegetation will be retained to the extent possible with removals kept to a minimum. Where possible, disturbed areas will be revegated using non-invasive, preferably native plantings and/or seed mix appropriate to the site conditions and adjacent vegetation communities.
	Rating		
7	**Climate Change Resilience (potential impact of the effects of climate change on the undertaking)**	Minimal impacts to project activities as a result of variation in climate parameters such as temperature, precipitation, and wind are anticipated. Change to precipitation and groundwater conditions can have impacts to capacity of designed sanitary sewer. Flexibility and safety factors have been included in the design to accommodate impacts from climate change.	Minimal impacts to project activities as a result of variation in climate parameters such as temperature, precipitation, and wind are anticipated. Change to precipitation and groundwater conditions can have impacts to capacity of designed sanitary sewer. Flexibility and safety factors have been included in the design to accommodate impacts from climate change.
	Rating		
	Summary Natural Environment		

Tecumseh Hamlet MCEA - Evaluation of Alternative Design Concepts

Table F.5 Wastewater Servicing

	Criteria for Evaluating Alternatives	Design Concept #1	Design Concept #2
B	**Socio-Cultural Environment**		
1	**Community Impacts (potential to impact adjacent land uses and activities including residential, recreational, transportation, public service facilities, and infrastructure)**	Moderate impacts to adjacent residential and institutional (Tecumseh Vista Academy Secondary School) uses as a result of construction activities including noise, vibration, and dust. Moderate impacts to traffic flow and access as a result of construction activities. In particular, access to McAuliffe Park via Shields Street will be temporarily impacted by construction. Crossing of CPR Railway is required which will require boring of the sanitary sewer to avoid impacts to the railway. Crossing of the Hydro One Corridor is required which will require caution working in the vicinity of existing hydro infrastructure. Shorter distance of trunk infrastructure.	Moderate impacts to adjacent residential uses as a result of construction activities including noise, vibration, and dust. Minor impacts to traffic flow and access as a result of construction activities. Crossing of CPR Railway is required which will require boring of the sanitary sewer to avoid impacts to the railway. Crossing of the Hydro One Corridor is required which will require caution working in the vicinity of existing hydro infrastructure. Longer distance of trunk infrastructure.
	Rating		
2	**Economic Impacts (potential to impact adjacent land uses and activities including commercial and industrial)**	No direct impacts to the business park in the south of the Hamlet are anticipated. Construction of the sanitary system will open lands to accommodate proposed development.	No direct impacts to the business park in the south of the Hamlet are anticipated. Construction of the sanitary system will open lands to accommodate proposed development.
	Rating		
3	**Conformity to Land Use Planning Policies (PPS, County of Essex Official Plan, Town of Tecumseh Official Plan, Tecumseh Hamlet Secondary Plan)**	Conforms to provincial and municipal land use policies and no amendments are required. Sewer design is based on the Tecumseh Hamlet Secondary Plan Concept.	Conforms to provincial and municipal land use policies and no amendments are required. Sewer design is based on the Tecumseh Hamlet Secondary Plan Concept.
	Rating		
4	**Heritage Resources (potential to impact built heritage resources and/or cultural heritage landscapes)**	Potential for minor and temporary impacts during construction to potential cultural heritage landscapes at 11945 Intersection Road, the Canadian Pacific Rail Line, and Banwell Road. No direct, permanent, adverse impacts are anticipated.	Potential for minor and temporary impacts during construction to potential cultural heritage landscapes at 11945 Intersection Road and the Canadian Pacific Rail Line. No direct, permanent, adverse impacts are anticipated.

Tecumseh Hamlet MCEA - Evaluation of Alternative Design Concepts

Table F.5 Wastewater Servicing

	Rating		
5	**Archaeological Resources (potential to impact archaeological resources)**	Potential for negative impacts to archaeological resources. Proposed sewer is located within areas of high archaeological potential. Stage 1 AA recommends a Stage 2 AA be completed in these areas prior to any development.	Potential for negative impacts to archaeological resources. Proposed sewer is located within areas of high archaeological potential. Stage 1 AA recommends a Stage 2 AA be completed in these areas prior to any development.
	Rating		
6	**Indigenous Communities (potential to impact traditional land and resource use and treaty rights)**	Potential for negative impacts to Aboriginal archaeological sites. Sanitary sewer route is located within areas of high archaeological potential (within 100 m of Intersection Road, County Road 42, and Banwell Road and 300 m from channelized drains). Potential may be reduced in certain locations based on modern disturbance.	Potential for negative impacts to Aboriginal archaeological sites. Sanitary sewer route is located within areas of high archaeological potential (within 100 m of Intersection Road and County Road 42 and 300 m from channelized drains). Potential may be reduced in certain locations based on modern disturbance.
	Rating		
	Summary Socio-Cultural Environment		
	Criteria for Evaluating Alternatives	**Design Concept #1**	**Design Concept #2**
C	**Financial Factors**		
1	**Estimated Capital Costs (includes Engineering and Construction Costs)**	Comparatively shorter distance for installation will have comparatively lower costs.	Comparatively longer distance for installation will have comparatively higher costs.
	Rating		
2	**Estimated Operating & Maintenance Costs**	Comparatively shorter sewer will have comparatively lower operating and maintenance needs.	Comparatively longer sewer will have comparatively higher operating and maintenance needs.
	Rating		
	Summary Financial Factors		

Tecumseh Hamlet MCEA - Evaluation of Alternative Design Concepts

Table F.5 Wastewater Servicing

	Criteria for Evaluating Alternatives	Design Concept #1	Design Concept #2
D	**Technical Factors**		
1	**Municipal Services (will the alternative accommodate servicing needs)**	Trunk sewer is more centralized to the south development area and more accessible to connect.	Trunk sewer is not centralized and would require additional cost and time to provide service to all development areas within the study area.
	Rating	●	◑
2	**Complexity of Construction**	The proposed trunk alignment requires one easement beneath the proposed Gouin Pond. This adds to the complexity of construction including concerns related to infiltration of stormwater into the sanitary sewer and trench.	The proposed trunk alignment requires multiple easements beneath the proposed stormwater management ponds (Gouin Pond, Lachance Pond & the Desjardin East Pond). This adds to the complexity of construction.
	Rating	◕	◔
3	**Construction Duration (estimated)**	The proposed trunk alignment requires one easement beneath the proposed Gouin Pond. This adds to the complexity of construction, thus lenthening the construction duration.	The proposed trunk alignment requires multiple easements beneath the proposed stormwater management ponds (Gouin Pond, Lachance Pond & the Desjardin East Pond). This adds to the complexity of construction, thus lengthening the construction duration.
	Rating	◕	◔
4	**Design Life & Maintenance**	Maintenance is relatively less difficult due to less segments of sewer underneath the proposed SWM Ponds.	Maintenance is relatively more difficult due to more segments of sewer underneath the proposed SWM Ponds.
	Rating	●	◑
	Summary Technical Factors	◕	◔

	Criteria for Evaluating Alternatives	Design Concept #1	Design Concept #2
	Overall Summary	**Most Preferred**	**Least Preferred**

Order of Preference

Most Preferred	●
More Preferred	◕
Somewhat Preferred	◑
Less Preferred	◔
Least Preferred	○

Tecumseh Hamlet MCEA - Evaluation of Alternative Design Concepts

Table F.6 Stormwater Management - Lachance and Desjardins Stormwater Management Facilities

	Criteria for Evaluating Alternatives	Design Concept #1 Wet Stormwater Management Facility	Design Concept #2 Dry Stormwater Management Facility
A	**Natural Environment**		
1	**Vegetation/Tree** **(potential to impact or remove vegetation or trees)**	Potential negative impacts to Mixed Meadow where the Desjardins Ponds are located. Natural ground/tree vegetation shall be present within either wet or dry ponds.	Potential negative impacts to Mixed Meadow where the Desjardins and LaChance Ponds are located. Natural ground/tree vegetation shall be present within either wet or dry ponds.
	Rating		
2	**Terrestrial Habitat & Wildlife** **(potential to impact wildlife, significant wildlife habitat, habitat connectivity)**	Wet ponds could attract waterbirds that could pose a risk to the nearby Windsor Airport. Measures required to continuously monitor and control wildlife to reduce safety impacts. Desjardins and LaChance Ponds are proposed within candidate Significant Wildlife Habitat (Special Concern and Rare Wildlife Species).	Dry ponds could still act as Significant Wildlife Habitat for some of the identified categories. Desjardins and LaChance Ponds are proposed within candidate Significant Wildlife Habitat (Special Concern and Rare Wildlife Species).
	Rating		
3	**Fisheries / Aquatic Habitat & Wildlife** **(potential to impact aquatic habitat & wildlife)**	Wet ponds may impact fish habitat through outlets into fish habitat. Further, ponds may provide habitat for fish, but would not be considered fish habitat as defined under the Fisheries Act if not connected to fish habitat. Easier and less costly maintenance measures will have long term benefits to downstream watercourses.	Dry ponds may impact fish habitat through outlets into fish habitat. Further, ponds may provide habitat for fish, but would not be considered fish habitat as defined under the Fisheries Act if not connected to fish habitat. Complex and more costly maintenance measures will have long term impacts to downstream watercourses.
	Rating		
4	**Species at Risk (SAR)** **(potential to impact habitat of Species at Risk e.g., Bobolink, Northern Myotis, Eastern Foxsnake, Butternut)**	Wet ponds will require land to store and treat runoff prior to discharge into downstream drains. Desjardins Ponds are proposed within the vicinity of candidate SAR habitat, necessary MECP permitting may be required to facilitate construction.	Dry ponds will require land to store and treat runoff prior to discharge into downstream drains. Desjardins Ponds are proposed within the vicinity of candidate SAR habitat, necessary MECP permitting may be required to facilitate construction.
	Rating		

Tecumseh Hamlet MCEA - Evaluation of Alternative Design Concepts

Table F.6 Stormwater Management - Lachance and Desjardins Stormwater Management Facilities

5	**Surface Water & Groundwater Resources (potential to impact groundwater resources, source water protection, located in vulnerable area, risk to drinking water, wells, aquifer)**	Minimal potential for impact to surface water and groundwater quality. Desjardins Ponds are located partially within areas identified as Intake Protection Zone 3 and not located within an IPZ assigned a vulnerability score. Wet ponds have greater ability to control quality of runoff. Wet ponds can contribute contaminants to groundwater through infiltration.	Minimal potential for impact to surface water and groundwater quality. Desjardins Ponds are located partially within areas identified as Intake Protection Zone 3 and not located within an IPZ assigned a vulnerability score. Dry ponds have less ability to control quality of runoff. Dry ponds have a lesser impact impact existing groundwater quality or recharge.
	Rating		
6	**Climate Change (potential to impact emission of greenhouse gases, carbon removal, carbon storage/sink (e.g., trees and vegetation))**	Increase in GHG emissions as a result of construction activities including emissions from heavy vehicles. Construction will also result in vegetation removal which may impact carbon storage benefits provided by vegetation. However, the lands are predominantly agricultural and any existing vegetation will be retained to the extent possible with removals kept to a minimum. Where possible, disturbed areas will be revegated using non-invasive, preferably native plantings and/or seed mix appropriate to the site conditions and adjacent vegetation communities. Stormwater ponds are considered green infrastructure and may provide carbon sequestration benefits through functioning as a carbon sink. However, wet ponds have a greater potential to contribute to the warming of urban streams and the urban heat island effect due to the permanent pool.	Increase in GHG emissions as a result of construction activities including emissions from heavy vehicles. Construction will also result in vegetation removal which may impact carbon storage benefits provided by vegetation. However, the lands are predominantly agricultural and any existing vegetation will be retained to the extent possible with removals kept to a minimum. Where possible, disturbed areas will be revegated using non-invasive, preferably native plantings and/or seed mix appropriate to the site conditions and adjacent vegetation communities. Stormwater ponds are considered green infrastructure and may provide carbon sequestration benefits through functioning as a carbon sink.
	Rating		
7	**Climate Change Resilience (potential impact of the effects of climate change on the undertaking)**	Wet ponds have greater ability to control quality of increased runoff due to long term climate change impacts. There is potential for temporary impacts (e.g., delays) to the project during construction due to extreme weather events. Study Area is not located within a flood plain area limiting the potential impact of extreme storm events impacting the project.	Dry ponds have less ability to control quality of increased runoff due to long term climate change impacts. MTD (manufactured treatment devices) would be costly and more difficult to modify to meet the future climate change conditions. There is potential for temporary impacts (e.g., delays) to the project during construction due to extreme weather events. Study Area is not located within a flood plain area limiting the potential impact of extreme storm events impacting the project.
	Rating		
	Summary Natural Environment		

Tecumseh Hamlet MCEA - Evaluation of Alternative Design Concepts

Table F.6 Stormwater Management - Lachance and Desjardins Stormwater Management Facilities

	Criteria for Evaluating Alternatives	Design Concept #1	Design Concept #2
B	**Socio-Cultural Environment**		
1	**Community Impacts (potential to impact adjacent land uses and activities including residential, recreational, transportation, public service facilities, and infrastructure)**	No direct impacts are anticipated.	No direct impacts are anticipated.
	Rating	●	●
2	**Economic Impacts (potential to impact adjacent land uses and activities including commercial and industrial)**	No direct impacts are anticipated.	No direct impacts are anticipated.
	Rating	●	●
3	**Conformity to Land Use Planning Policies (PPS, County of Essex Official Plan, Town of Tecumseh Official Plan, Tecumseh Hamlet Secondary Plan)**	Conforms to provincial and municipal land use policies and no amendment is required.	Conforms to provincial and municipal land use policies and no amendment is required.
	Rating	●	●
4	**Heritage Resources (potential to impact built heritage resources and/or cultural heritage landscapes)**	Potential for minor and temporary impacts during construction to Smith Black Cemetery, a designated property in the Town of Tecumseh Municipal Register of Cultural Heritage Properties and to the potential cultural heritage landscape at Banwell Road. The Desjardins Ponds are located adjacent to the historic site and CHL. Potential for minor and temporary impacts during construction to cultural heritage landscapes at 11945 Intersection Road and the Canadian Pacific Rail Line. The Lachance Pond is located adjacent to these CHLs.	Potential for minor and temporary impacts during construction to Smith Black Cemetery, a designated property in the Town of Tecumseh Municipal Register of Cultural Heritage Properties and to the potential cultural heritage landscape at Banwell Road. The Desjardins Ponds are located adjacent to the historic site and CHL. Potential for minor and temporary impacts during construction to cultural heritage landscapes at 11945 Intersection Road and the Canadian Pacific Rail Line. The Lachance Pond is located adjacent to these CHLs.
	Rating	◕	◕

Tecumseh Hamlet MCEA - Evaluation of Alternative Design Concepts

Table F.6 Stormwater Management - Lachance and Desjardins Stormwater Management Facilities

5	**Archaeological Resources (potential to impact archaeological resources)**	Potential for negative impacts to archaeological resources. All ponds are located wholly or partially within areas of high archaeological potential. Stage 1 AA recommends a Stage 2 AA be completed in these areas prior to any development.	Potential for negative impacts to archaeological resources. All ponds are located wholly or partially within areas of high archaeological potential. Stage 1 AA recommends a Stage 2 AA be completed in these areas prior to any development.
	Rating		
6	**Indigenous Communities (potential to impact traditional land and resource use and treaty rights)**	Potential for negative impacts to Aboriginal archaeological sites. All ponds located wholly or partially within areas of high archaeological potential (within 100 m of Banwell Road and 300 m from channelized drains). Potential may be reduced in certain locations based on modern disturbance.	Potential for negative impacts to Aboriginal archaeological sites. All ponds located wholly or partially within areas of high archaeological potential (within 100 m of Banwell Road and 300 m from channelized drains). Potential may be reduced in certain locations based on modern disturbance.
	Rating		
	Summary Socio-Cultural Environment		
	Criteria for Evaluating Alternatives	**Design Concept #1**	**Design Concept #2**
C	**Financial Factors**		
1	**Estimated Capital Costs (includes Engineering and Construction Costs)**	Centralized facilities are cost-effective to construct and maintain. A pump station will be required for the discharge of affluent. Wet ponds require more soil excavation and export from this site and is compartively more expensive.	Centralized facilities are cost-effective to construct and maintain. A pump station will be required for the discharge of affluent. Dry ponds require less soil excavation and export from this site and is compartively more expensive, this includes additonal quality control measures required upstream of these facilities.
	Rating		
2	**Estimated Operating & Maintenance Costs**	Moderately High - Maintenance of the SWM infrastructure is required annally including landscape and maintenance of water fowl mitigation features.	Moderately High - Maintenance of dry ponds including landscaping and maintenance of the dry pond footprint. Additional maintenance for upstream quality control infrastructure such as oil and grit separators.
	Rating		
	Summary Financial Factors		

Tecumseh Hamlet MCEA - Evaluation of Alternative Design Concepts

Table F.6 Stormwater Management - Lachance and Desjardins Stormwater Management Facilities

	Criteria for Evaluating Alternatives	Design Concept #1	Design Concept #2
D	**Technical Factors**		
1	**Performance of Minor System Drainage (ability to accommodate stormwater conveyance during frequent storm events)**	Acceptable - Sewer system will be designed to meet local stormwater guidelines.	Acceptable - Sewer system will be designed to meet local stormwater guidelines.
	Rating	●	●
2	**Performance of Major System Drainage (ability to accommodate stormwater conveyance during infrequent storm events)**	Acceptable - Sewer system will be designed to meet local stormwater guidelines.	Acceptable - Sewer system will be designed to meet local stormwater guidelines.
	Rating	●	●
3	**Water Quantity and Quality Control**	A wet pond meets water quality treatment requirements.	Dry ponds and other controls may not meet local water quality treatment requirements. Maintenance of on-site quality control measures may require inspection and oversight by the Town of Tecumseh to ensure proper operation and to receive credit in MECP Environmental Compliance Approval.
	Rating	●	◑
4	**Drainage Outlet (ability to efficiently convey controlled flows to its ultimate outlet location)**	Effective ability to convey controlled flows to its ultimate outlet location.	Effective ability to convey controlled flows to its ultimate outlet location.
	Rating	●	●
5	**Design Standards (will the alternative meet provincial and conservation authority stormwater management standards)**	Windsor Essex SWM guidelines are met with the proposed wet pond design. However, the wet pond requires extensive waterfowl mitigation measures within the pond corridor.	Windsor Essex SWM guidelines are met with the proposed dry pond design.
	Rating	◕	●
6	**Safety (potential to impact community safety)**	Safety considerations to mitigate waterfowl habitat required to mitigate risk associated with the proximity to the Windsor Airport. Wet ponds are more attractive to waterfowl.	Safety considerations to mitigate waterfowl habitat required to mitigate risk associated with the proximity to the Windsor Airport. Dry ponds are relatively less attractive to waterfowl.
	Rating	◑	◕

Tecumseh Hamlet MCEA - Evaluation of Alternative Design Concepts

Table F.6 Stormwater Management - Lachance and Desjardins Stormwater Management Facilities

7	**Complexity of Construction**	Lowest - Wet ponds are comparatively less complex to construct.	Moderate - Dry ponds are comparatively more complex to construct as additional upstream quality management systems can be complex for these large drainage areas.
	Rating	●	◑
8	**Construction Duration (estimated)**	The footprint of the wet pond is equivalent to the footprint of the dry pond. However, the wet pond requires no further construction components (unlike the dry pond).	On-site quality control measures will be required across the community, needed to replace wet pond quality control which will have some additional construction impacts due to additional time and project complexity and will require occasional refurbishment/reconstruction during the lifecycle.
	Rating	◕	◔
9	**Design Life & Maintenance**	Moderately High - Minimal maintenance of the SWM infrastructure including landscape and maintenance of water fowl mitigation features.	Highest- Minimal maintenance of dry ponds including landscaping and maintenance of the dry pond footprint. Additional maintenance for upstream quality control infrastructure such as oil and grit separators.
	Rating	●	◑
	Summary Technical Factors	◕	◑
	Criteria for Evaluating Alternatives	**Design Concept #1**	**Design Concept #2**
	Overall Summary	**Most Preferred**	**Least Preferred**

Order of Preference	
Most Preferred	●
More Preferred	◕
Somewhat Preferred	◑
Less Preferred	◔
Least Preferred	○

Tecumseh Hamlet MCEA - Evaluation of Alternative Design Concepts

Table F.7 Stormwater Management - Gouin Stormwater Management Facility

	Criteria for Evaluating Alternatives	Design Concept #1	Design Concept #2
		Wet Stormwater Management Facility	**Dry Stormwater Management Facility**
A	**Natural Environment**		
1	**Vegetation/Tree (potential to impact or remove vegetation or trees)**	Potential negative impacts to Mixed Meadow where the Desjardins Ponds are located. Natural ground/tree vegetation shall be present within either wet or dry ponds.	Potential negative impacts to Mixed Meadow where the Desjardins and LaChance Ponds are located. Natural ground/tree vegetation shall be present within either wet or dry ponds.
	Rating		
2	**Terrestrial Habitat & Wildlife (potential to impact wildlife, significant wildlife habitat, habitat connectivity)**	Wet ponds could attract waterbirds that could pose a risk to the nearby Windsor Airport. Measures required to continuously monitor and control wildlife to reduce safety impacts, whch Gouin Pond is proposed patrtially within candidate Significant Wildlife Habitat (Bat Maternity Colonies, Reptile Hibernaculum, Amphibian Breeding Habitat, and Terrestrial Crayfish) and confirmed Significant Wildlife Habitat (Special Concern and Rare Wildlife Species).	Dry ponds could still act as Significant Wildlife Habitat for some of the identified categories. Gouin Pond is proposed patrtially within candidate Significant Wildlife Habitat (Bat Maternity Colonies, Reptile Hibernaculum, Amphibian Breeding Habitat, and Terrestrial Crayfish) and confirmed Significant Wildlife Habitat (Special Concern and Rare Wildlife Species).
	Rating		
3	**Fisheries / Aquatic Habitat & Wildlife (potential to impact aquatic habitat & wildlife)**	Wet ponds may impact fish habitat through outlets into fish habitat. Further, ponds may provide habitat for fish, but would not be considered fish habitat as defined under the Fisheries Act if not connected to fish habitat. Easier and less costly maintenance measures will have long term benefits to downstream watercourses.	Dry ponds may impact fish habitat through outlets into fish habitat. Further, ponds may provide habitat for fish, but would not be considered fish habitat as defined under the Fisheries Act if not connected to fish habitat. Complex and more costly maintenance measures will have long term impacts to downstream watercourses.
	Rating		

Tecumseh Hamlet MCEA - Evaluation of Alternative Design Concepts

Table F.7 Stormwater Management - Gouin Stormwater Management Facility

4	**Species at Risk (SAR) (potential to impact habitat of Species at Risk e.g., Bobolink, Northern Myotis, Eastern Foxsnake, Butternut)**	Wet ponds could attract waterbirds that could pose a risk to the nearby Windsor Airport. Gouin Pond is proposed patrtially within candidate SAR habitat (Bobolink, Eastern Meadowlark, Wood Thrush, Red-headed Woodpecker, SAR bats, Eastern Foxsnake, Butler's Gartersnake, Willowleaf Aster, Eastern Flowering Dogwood, Butternut, Eastern Prairie Fringed-orchid, and Purple Twayblade).	Dry ponds could still act as SAR habitat for some of the identified species. Gouin Pond is proposed patrtially within candidate SAR habitat (Bobolink, Eastern Meadowlark, Wood Thrush, Red-headed Woodpecker, SAR bats, Eastern Foxsnake, Butler's Gartersnake, Willowleaf Aster, Eastern Flowering Dogwood, Butternut, Eastern Prairie Fringed-orchid, and Purple Twayblade).
	Rating		
5	**Surface Water & Groundwater Resources (potential to impact groundwater resources, source water protection, located in vulnerable area, risk to drinking water, wells, aquifer)**	Minimial potential for impact to surface water and groundwater quality. Gouin Pond is located partially within areas identified as Intake Protection Zone 3 and not located within an IPZ assigned a vulnerability score. Wet ponds have greater ability to control quality of runoff. Wet ponds can contribute contaminants to groundwater through infiltration.	Minimial potential for impact to surface water and groundwater quality. Gouin Pond is located partially within areas identified as Intake Protection Zone 3 and not located within an IPZ assigned a vulnerability score. Dry ponds have less ability to control quality of runoff. Dry ponds do not impact existing groundwater quality or recharge.
	Rating		
6	**Climate Change (potential to impact emission of greenhouse gases, carbon removal, carbon storage/sink (e.g., trees and vegetation))**	Increase in GHG emissions as a result of construction activities including emissions from heavy vehicles. Construction will also result in vegetation removal which may impact carbon storage benefits provided by vegetation. However, the lands are predominantely agricultural and any existing vegetation will be retained to the extent possible with removals kept to a minimum. Where possible, disturbed areas will be revegated using non-invasive, preferably native plantings and/or seed mix appropriate to the site conditions and adjacent vegetation communities. Stormwater ponds are considered green infrastructure and may provide carbon sequestration benefits through functioning as a carbon sink. However, wet ponds have a greater potential to contribute to the warming of urban streams and the urban heat island effect due to the permanent pool.	Increase in GHG emissions as a result of construction activities including emissions from heavy vehicles. Construction will also result in vegetation removal which may impact carbon storage benefits provided by vegetation. However, the lands are predominantely agricultural and any existing vegetation will be retained to the extent possible with removals kept to a minimum. Where possible, disturbed areas will be revegated using non-invasive, preferably native plantings and/or seed mix appropriate to the site conditions and adjacent vegetation communities. Stormwater ponds are considered green infrastructure and may provide carbon sequestration benefits through functioning as a carbon sink.

Tecumseh Hamlet MCEA - Evaluation of Alternative Design Concepts

Table F.7 Stormwater Management - Gouin Stormwater Management Facility

	Rating		
7	**Climate Change Resilience (potential impact of the effects of climate change on the undertaking)**	Wet ponds have greater ability to control quality of increased runoff due to long term climate change impacts. There is potential for temporary impacts (e.g., delays) to the project during construction due to extreme weather events. Study Area is not located within a flood plain area limiting the potential impact of extreme storm events impacting the project.	Dry ponds have less ability to control quality of increased runoff due to long term climate change impacts. MTD (manufactured treatment devices) would be costly and more difficult to modify to meet the future climate change conditions. There is potential for temporary impacts (e.g., delays) to the project during construction due to extreme weather events. Study Area is not located within a flood plain area limiting the potential impact of extreme storm events impacting the project.
	Rating		
	Summary Natural Environment		
	Criteria for Evaluating Alternatives	**Design Concept #1**	**Design Concept #2**
B	**Socio-Cultural Environment**		
1	**Community Impacts (potential to impact adjacent land uses and activities including residential, recreational, transportation, public service facilities, and infrastructure)**	No direct impacts are anticipated.	No direct impacts are anticipated.
	Rating		
2	**Economic Impacts (potential to impact adjacent land uses and activities including commercial and industrial)**	No direct impacts are anticipated.	No direct impacts are anticipated.
	Rating		
3	**Conformity to Land Use Planning Policies (PPS, County of Essex Official Plan, Town of Tecumseh Official Plan, Tecumseh Hamlet Secondary Plan)**	Conforms to provincial and municipal land use policies and no amendment is required.	Conforms to provincial and municipal land use policies and no amendment is required.
	Rating		

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Table F.7 Stormwater Management - Gouin Stormwater Management Facility

4	**Heritage Resources (potential to impact built heritage resources and/or cultural heritage landscapes)**	No direct impacts are anticipated.	No direct impacts are anticipated.
	Rating	●	●
5	**Archaeological Resources (potential to impact archaeological resources)**	Potential for negative impacts to archaeological resources. Gouin pond is located partially within areas of high archaeological potential. Stage 1 AA recommends a Stage 2 AA be completed in these areas prior to any development.	Potential for negative impacts to archaeological resources. Gouin pond is located partially within areas of high archaeological potential. Stage 1 AA recommends a Stage 2 AA be completed in these areas prior to any development.
	Rating	◔	◔
6	**Indigenous Communities (potential to impact traditional land and resource use and treaty rights)**	Potential for negative impacts to Aboriginal archaeological sites. Gouin pond is located partially within areas of high archaeological potential (within 100 m of Banwell Road and 300 m from channelized drains). Potential may be reduced in certain locations based on modern disturbance.	Potential for negative impacts to Aboriginal archaeological sites. Gouin pond is located partially within areas of high archaeological potential (within 100 m of Banwell Road and 300 m from channelized drains). Potential may be reduced in certain locations based on modern disturbance.
	Rating	◔	◔
	Summary Socio-Cultural Environment	◕	◕
	Criteria for Evaluating Alternatives	**Design Concept #1**	**Design Concept #2**
C	**Financial Factors**		
1	**Estimated Capital Costs (includes Engineering and Construction Costs)**	Centralized facilities are cost-effective to construct and maintain. Waterfowl mitigation measures for this flight path zone are very costly and require additional design considerations. A pump station will be required for the discharge of affluent. Wet ponds require more soil excavation and export from this site and is compartively more expensive. Waterfowl mitigation measures for the Windsor Airport flight path zone are very costly and require additional design considerations, mitigation measures and regular maintenance and monitoring.	Centralized facilities are cost-effective to construct and maintain. Waterfowl mitigation measures for this flight path zone are very costly and require additional design considerations. A pump station will be required for the discharge of affluent. Dry ponds require less soil excavation and export from this site and is compartively more expensive, this includes additonal quality control measures required upstream of these facilities. Waterfowl mitigation measures for the Windsor Airport flight path zone are minimal for dry ponds that will be less attractive to waterfowl.
	Rating	◔	●

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Table F.7 Stormwater Management - Gouin Stormwater Management Facility

2	**Estimated Operating & Maintenance Costs**	Moderately High - Maintenance of the SWM infrastructure is required annally including landscape and maintenance of water fowl mitigation features.	Moderately High - Maintenance of dry ponds including landscaping and maintenance of the dry pond footprint. Additional maintenance for upstream quality control infrastructure such as oil and grit separators.
	Rating		
	Summary Financial Factors		
	Criteria for Evaluating Alternatives	**Design Concept #1**	**Design Concept #2**
D	**Technical Factors**		
1	**Performance of Minor System Drainage (ability to accommodate**	Acceptable - Sewer system will be designed to meet local stormwater guidelines.	Acceptable - Sewer system will be designed to meet local stormwater guidelines.
	Rating		
2	**Performance of Major System Drainage (ability to accommodate**	Acceptable - Sewer system will be designed to meet local stormwater guidelines.	Acceptable - Sewer system will be designed to meet local stormwater guidelines.
	Rating		
3	**Water Quantity and Quality Control**	A wet pond meets water quality treatment requirements.	Dry ponds and other controls may not meet local water quality treatment requirements. Maintenance of on-site quality control measures may require inspection and oversight by the Town of Tecumseh to ensure proper operation and to receive credit in MECP Environmental Compliance Approval.
	Rating		
4	**Drainage Outlet (ability to efficiently convey controlled flows to its ultimate**	Effective ability to convey controlled flows to its ultimate outlet location.	Effective ability to convey controlled flows to its ultimate outlet location.
	Rating		
5	**Design Standards (will the alternative meet provincial and conservation authority stormwater management**	Windsor Essex SWM guidelines are met with the proposed wet pond design. However, the wet pond requires extensive waterfowl mitigation measures within the pond corridor.	Windsor Essex SWM guidelines are met with the proposed dry pond design.
	Rating		
6	**Safety (potential to impact community safety)**	Safety considerations to mitigate waterfowl habitat required to mitigate risk associated with the proximity to the Windsor Airport. Wet ponds are more attractive to waterfowl. Wet Ponds have higher risk associated with public access. Safety measures must be implemented.	Safety considerations to mitigate waterfowl habitat required to mitigate risk associated with the proximity to the Windsor Airport. Dry ponds are relatively less attractive to waterfowl.

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Table F.7 Stormwater Management - Gouin Stormwater Management Facility

	Rating	◑	◕
7	**Complexity of Construction**	Highest - Wet ponds are typically less complex to construct. However, additional measures to maintain waterfowl mitigation in the flight zone is required.	Moderate - Dry ponds are comparatively more complex to construct as additional upstream quality management systems can be complex for these large drainage areas.
	Rating	◔	◕
8	**Construction Duration (estimated)**	The footprint of the wet pond is equivalent to the footprint of the dry pond. However, the wet pond requires no further construction components (unlike the dry pond). Vegetation is a major element of waterfowl mitigation measures and extended pre-growth periods are required at this site in advance of commissioning stormwater ponds.	On-site quality control measures will be required across the community, needed to replace wet pond quality control which will have some additional construction impacts due to additional time and project complexity and will require occasional refurbishment/reconstruction during the lifecycle.
	Rating	◔	◑
9	**Design Life & Maintenance**	Moderately High - Minimal maintenance of the SWM infrastructure including landscape and maintenance of water fowl mitigation features.	Highest- Minimal maintenance of dry ponds including landscaping and maintenance of the dry pond footprint. Additional maintenance for upstream quality control infrastructure such as oil and grit separators.
	Rating	●	◑
	Summary Technical Factors	◕	◕
	Criteria for Evaluating Alternatives	**Design Concept #1**	**Design Concept #2**
	Overall Summary	**Least Preferred**	**Most Preferred**

Order of Preference	
Most Preferred	●
More Preferred	◕
Somewhat Preferred	◑
Less Preferred	◔
Least Preferred	○

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Table F.8 Stormwater Management - Southeast Hamlet Stormwater Management Facility

	Criteria for Evaluating Alternatives	Design Concept #1 North Stormwater Management Facility (Wet), South of CPR Corridor	Design Concept #2 South Stormwater Management Facility (Wet), Partially within the Hydro Corridor
A	**Natural Environment**		
1	**Vegetation/Tree (potential to impact or remove vegetation or trees)**	Potential negative impacts to Mixed Meadow and Deciduous Forest where the pond is proposed to be located. Natural ground/tree vegetation not to be present within the wet ponds.	No direct impacts to natural ELC communities anticipated. Natural ground/tree vegetation not to be present within the wet ponds.
	Rating		
2	**Terrestrial Habitat & Wildlife (potential to impact wildlife, significant wildlife habitat, habitat connectivity)**	Wet ponds could attract waterbirds that could pose a risk to the nearby Windsor Airport; however, this area is outside of the direct Airport flight path zone. Pond is proposed adjacent to candidate Significant Wildlife Habitat (Bat Maternity Colonies, Reptile Hibernaculum, Amphibian Breeding Habitat, and Special Concern and Rare Wildlife Species).	Wet ponds could attract waterbirds that could pose a risk to the nearby Windsor Airport; however, this area is outside of the direct Airport flight path zone. No direct impacts anticipated.
	Rating		
3	**Fisheries / Aquatic Habitat & Wildlife (potential to impact aquatic habitat & wildlife)**	Wet ponds may impact fish habitat through outlets into fish habitat. Further, ponds may provide habitat for fish, but would not be considered fish habitat as defined under the Fisheries Act if not connected to fish habitat.	Wet ponds may impact fish habitat through outlets into fish habitat. Further, ponds may provide habitat for fish, but would not be considered fish habitat as defined under the Fisheries Act if not connected to fish habitat.
	Rating		
4	**Species at Risk (SAR) (potential to impact habitat of Species at Risk e.g., Bobolink, Northern Myotis, Eastern Foxsnake, Butternut)**	Wet ponds could attract waterbirds that could pose a risk to the nearby Windsor Airport; however, this area is outside of the direct Airport flight path zone. Pond is proposed adjacent to candidate SAR habitat (Wood Thrush and Red-headed Woodpecker, SAR bat species, Eastern Foxsnake and Butler's Garternsnake, Willowleaf Aster, Flowering Dogwood, Butternut, Purple Twayblade).	Wet ponds could attract waterbirds that could pose a risk to the nearby Windsor Airport; however, this area is outside of the direct Airport flight path zone. No direct impacts anticipated.
	Rating		

Tecumseh Hamlet MCEA - Evaluation of Alternative Design Concepts

Table F.8 Stormwater Management - Southeast Hamlet Stormwater Management Facility

5	**Surface Water & Groundwater Resources (potential to impact groundwater resources, source water protection, located in vulnerable area, risk to drinking water, wells, aquifer)**	Minimal potential for impact to surface water and groundwater quality. Proposed stormwater management facility is not located within any vulnerable areas.	Minimal potential for impact to surface water and groundwater quality. Proposed stormwater management facility is not located within any vulnerable areas.
	Rating		
6	**Climate Change (potential to impact emission of greenhouse gases, carbon removal, carbon storage/sink (e.g., trees and vegetation))**	Increase in GHG emissions as a result of construction activities including emissions from heavy vehicles. Construction will also result in vegetation removal which may impact carbon storage benefits provided by vegetation. However, the lands are predominantly agricultural and any existing vegetation will be retained to the extent possible with removals kept to a minimum. Where possible, disturbed areas will be revegated using non-invasive, preferably native plantings and/or seed mix appropriate to the site conditions and adjacent vegetation communities. Stormwater ponds are considered green infrastructure and may provide carbon sequestration benefits through functioning as a carbon sink. However, wet ponds have a greater potential to contribute to the warming of urban streams and the urban heat island effect due to the permanent pool.	Increase in GHG emissions as a result of construction activities including emissions from heavy vehicles. Construction will also result in vegetation removal which may impact carbon storage benefits provided by vegetation. However, the lands are predominantly agricultural and any existing vegetation will be retained to the extent possible with removals kept to a minimum. Where possible, disturbed areas will be revegated using non-invasive, preferably native plantings and/or seed mix appropriate to the site conditions and adjacent vegetation communities. Stormwater ponds are considered green infrastructure and may provide carbon sequestration benefits through functioning as a carbon sink. However, wet ponds have a greater potential to contribute to the warming of urban streams and the urban heat island effect due to the permanent pool.
	Rating		
7	**Climate Change Resilience (potential impact of the effects of climate change on the undertaking)**	Wet ponds have greater ability to control quality of increased runoff due to long term climate change impacts. This design concept has limited ability to increase pond storage capacity to respond to changes to climate. There is potential for temporary impacts (e.g., delays) to the project during construction due to extreme weather events. Study Area is not located within a flood plain area limiting the potential impact of extreme storm events impacting the project.	Wet ponds have greater ability to control quality of increased runoff due to long term climate change impacts. This design concept has increased ability to increase pond storage capacity to respond to changes to climate. There is potential for temporary impacts (e.g., delays) to the project during construction due to extreme weather events. Study Area is not located within a flood plain area limiting the potential impact of extreme storm events impacting the project.
	Rating		
	Summary Natural Environment		

Tecumseh Hamlet MCEA - Evaluation of Alternative Design Concepts

Table F.8 Stormwater Management - Southeast Hamlet Stormwater Management Facility

	Criteria for Evaluating Alternatives	Design Concept #1	Design Concept #2
B	**Socio-Cultural Environment**		
1	**Community Impacts (potential to impact adjacent land uses and activities including residential, recreational, transportation, public service facilities, and infrastructure)**	No direct impacts are anticipated.	No direct impacts are anticipated.
	Rating		
2	**Economic Impacts (potential to impact adjacent land uses and activities including commercial and industrial)**	No direct impacts are anticipated.	No direct impacts are anticipated.
	Rating		
3	**Conformity to Land Use Planning Policies (PPS, County of Essex Official Plan, Town of Tecumseh Official Plan, Tecumseh Hamlet Secondary Plan)**	Conforms to provincial and municipal land use policies and no amendment is required.	Conforms to provincial and municipal land use policies and no amendment is required.
	Rating		
4	**Heritage Resources (potential to impact built heritage resources and/or cultural heritage landscapes)**	Potential for minor and temporary impacts during construction to potential cultural heritage landscape at the Canadian Pacific Rail Line. No direct, permanent, adverse impacts are anticipated. No changes are anticipated to occur within the rail corridor.	No direct impacts are anticipated.
	Rating		
5	**Archaeological Resources (potential to impact archaeological resources)**	Potential for negative impacts to archaeological resources. Pond is proposed partially within areas of high archaeological potential. Stage 1 AA recommends a Stage 2 AA be completed in these areas prior to any development.	No direct impacts are anticipated.
	Rating		
6	**Indigenous Communities (potential to impact traditional land and resource use and treaty rights)**	No direct impacts anticipated.	No direct impacts anticipated.
	Rating		
	Summary Socio-Cultural Environment		

Tecumseh Hamlet MCEA - Evaluation of Alternative Design Concepts

Table F.8 Stormwater Management - Southeast Hamlet Stormwater Management Facility

	Criteria for Evaluating Alternatives	Design Concept #1	Design Concept #2
C	**Financial Factors**		
1	**Estimated Capital Costs (includes Engineering and Construction Costs)**	Capital cost associated with SWMF construction including pond excavation, pump station, inlet and outlet structures and diversion of the Antaya Drain into the SWMF. The stormwater management facility is fully in developmental lands and therefore will have lower costs for lands.	Capital cost associated with SWMF construction including pond excavation, pump station, inlet and outlet structures and diversion of the Antaya Drain into the SWMF. Anticipated that implementation of the stormwater management facility partially within the Hydro One Corridor would have additional costs for easement lands and approvals.
	Rating		
2	**Estimated Operating & Maintenance Costs**	Moderately High - Maintenance of the SWM infrastructure is required annually including landscape and maintenance of water fowl mitigation features.	Moderately High - Maintenance of the SWM infrastructure is required annually including landscape and maintenance of water fowl mitigation features.
	Rating		
	Summary Financial Factors		

	Criteria for Evaluating Alternatives	Design Concept #1	Design Concept #2
D	**Technical Factors**		
1	**Development Feasibility**	Minor impacts to the road network configuration as the proposed pond location would require comparatively more ROW to service traffic in the area. Would reduce ability for this land to develop. Onsite private stormwater management solutions affects developability of lands.	Proposed pond location provides the best road network configuration with the most efficient use of the ROW. Encourages the use of vacant utility lands to provide dual purpose.
	Rating		
2	**Compatibility with other Infrastructure**	Due to the condition of the East Townline Drain conditions with the vicinity of this study area, improvements to the drain will be required prior to implementation of this SWMF.	Due to the condition of the East Townline Drain conditions with the vicinity of this study area, improvements to the drain will be required prior to implementation of this SWMF.
	Rating		

Tecumseh Hamlet MCEA - Evaluation of Alternative Design Concepts

Table F.8 Stormwater Management - Southeast Hamlet Stormwater Management Facility

3	**Performance of Minor System Drainage (ability to accommodate stormwater conveyance during frequent storm events)**	Acceptable - Sewer system will be designed to meet local stormwater guidelines.	Acceptable - Sewer system will be designed to meet local stormwater guidelines.
	Rating	●	●
4	**Performance of Major System Drainage (ability to accommodate stormwater conveyance during infrequent storm events)**	Acceptable - Sewer system will be designed to meet local stormwater guidelines.	Acceptable - Sewer system will be designed to meet local stormwater guidelines.
	Rating	●	●
5	**Water Quantity and Quality Control**	A wet pond meets water quality treatment requirements.	A wet pond meets water quality treatment requirements.
	Rating	●	●
6	**Drainage Outlet (ability to efficiently convey controlled flows to its ultimate outlet location)**	Effective ability to convey controlled flows to its ultimate outlet location.	Effective ability to convey controlled flows to its ultimate outlet location.
	Rating	●	●
7	**Design Standards (will the alternative meet provincial and conservation authority stormwater management standards)**	Windsor Essex SWM guidelines are met with the proposed wet pond design. However, the wet pond requires extensive waterfowl mitigation measures within the pond corridor.	Windsor Essex SWM guidelines are met with the proposed wet pond design. However, the wet pond requires extensive waterfowl mitigation measures within the pond corridor.
	Rating	◕	◕
8	**Safety (potential to impact community safety)**	Safety considerations to mitigate waterfowl habitat required to mitigate risk associated with the proximity to the Windsor Airport; however, this area is outside of the direct Airport flight path zone. Wet ponds are more attractive to waterfowl.	Safety considerations to mitigate waterfowl habitat required to mitigate risk associated with the proximity to the Windsor Airport; however, this area is outside of the direct Airport flight path zone. Wet ponds are more attractive to waterfowl.
	Rating	◑	◑
9	**Complexity of Construction**	Low - Typical wet pond and pump station construction.	Low - Typical wet pond and pump station construction, additional caution is required to complete works in proximity to existing power distribution towers.
	Rating	●	◕
10	**Construction Duration (estimated)**	Longer construction duration - This concept will require a longer extension of the storm sewer outlet south along CR19. SWMF is sized based on assumptions listed in the Functional Design Report. Should implementation of the SWMF occur in advance, considerations for confirming the interim sizing/operations is required.	Shorter construction duration - This concept will require a shorter extension to the ultimate CR19 outlet. SWMF is sized based on assumptions listed in the Functional Design Report. Should implementation of the SWMF occur in advance, considerations for confirming the interim sizing/operations is required.
	Rating	◑	●

Tecumseh Hamlet MCEA - Evaluation of Alternative Design Concepts

Table F.8 Stormwater Management - Southeast Hamlet Stormwater Management Facility

11	**Design Life & Maintenance**	Moderately High - Minimal maintenance of the SWM infrastructure including landscape and maintenance of water fowl mitigation features.	Moderately High - Minimal maintenance of the SWM infrastructure including landscape and maintenance of water fowl mitigation features.
	Rating	●	●
	Summary Technical Factors	◕	◕
	Criteria for Evaluating Alternatives	**Design Concept #1**	**Design Concept #2**
	Overall Summary	**Least Preferred**	**Most Preferred**

Order of Preference	
Most Preferred	●
More Preferred	◕
Somewhat Preferred	◑
Less Preferred	◔
Least Preferred	○