

Niagara 4 // 7 Region

REGIONAL MUNICIPALITY OF NIAGARA SOUTH NIAGARA FALLS WASTEWATER SOLUTIONS

V2.5 – Thorold South Servicing Short List Alternatives Evaluation

Alignment 1a - Turner

Open-Cut through NPCA regulated wetlands (Turner Road Unopened Road Allowance)

Alignment 1b – Turner

- Tunnelled along Turner Rd. and Brown Rd. Alignment 1c – Turner
- Tunnelled along Turner Rd. (NPCA regulated lands), open-cut downstream Alignment 1d – Barron

Shallow Sewer along Barron Rd. (Can accept future gravity/pumped flows from across Allanport Industrial Area)

Alignment 1e – Barron

Tunnelled Deep-Sewer along Barron Rd. (To accept future gravity flows across Allanport Industrial Area)

Alignment 1f – Barron

Open-Cut Deep-Sewer along Barron Rd. (To accept future gravity flows across Allanport Industrial Area)

Alignment 1g – Chippawa Creek

Open-Cut/Tunnelled Sewer along Chippawa Creek Road

anment 2a - Beechwood

Forcemain Outlet to Open-Cut Sewer at Nichols Lane and Beechwood Road

Alignment 2b - Garner

0.6

☐ Kilometers

Forcemain Outlet to Open-Cut Sewer at Nichols Lane and Beechwood Road

CITY OF

THOROLD



TEAMING FOR NIAGARA'S FUTURE 📥 📥

Thorold South Servicing Alignment Alternatives

South Niagara Falls Wastewater Solutions Schedule C Class Environmental Assessment



Weighted Criteria	Alignment I.a. Thorold South (Open-Cut – Turner Road) <mark>Screened Out</mark>	Alignment I.b. Thorold South (Tunnelling – Turner Road)	
	 Forcemain from New Black Horse SPS south along Highway 58/Allanport Road outletting to Allanport Road gravity sewer at Barron Road Gravity sewer running along Allanport Road south to Turner Road unopened road allowance and then east along Turner Road outletting to Montrose Road Trunk Sewer north of Welland River crossing Construction of forcemain / sewer by open-cut 	 Forcemain from New Black Horse SPS south along Highway 58/Allanport Road outletting to Allanport Road gravity sewer at Barron Road Gravity sewer running along Allanport Road south to Turner Road unopened road allowance and then east along Turner Road outletting to Montrose Road Trunk Sewer north of Welland River crossing Construction of forcemain and sewer along Highway 58/Allanport by open-cut Construction of sewer along Turner Road/Brown Road by tunnelling 	 Forcemain from outletting to All Gravity sewer r allowance and north of Wellan Construction of Construction of and open-cut al
Environmental (25%)	 NPCA Regulated lands along Turner Road unopened road allowance (between Allanport Road and Thorold Townline Road) Further environmental investigation (including fieldwork required for this alternative) Future maintenance of sewer within NPCA regulated wetland requires additional coordination and approvals to satisfy environmental requirements Further environmental studies required, open-cut significantly impacts Slough Forest Wetland Continuity – Likely significant recreation / reconfiguration and restoration required if open-cut were to be approved through mature swamp area. Open-cut construction of this alternative was screened out as it is not preferred by NPCA 	 NPCA Regulated lands along Turner Road unopened road allowance (between Allanport Road and Thorold Townline Road) Tunnelling/trenchless installation across entire length of Turner Road less impact to NPCA regulated wetlands and slough forest – shallow groundwater interaction to be evaluated Further environmental investigation (including fieldwork required for this alternative) Future maintenance of sewer within NPCA regulated wetland requires additional coordination and approvals to satisfy environmental requirements 	 NPCA Regulated and Thorold Tow Tunnelling/trench limit impact – sha Further environm Future maintena and approvals to
Social / Cultural (25%)	- Consideration for the open-cut construction of this alternative was removed following major environmental impact screening.	 Low social, cultural and heritage impact Direct servicing of developable land Provides for enhanced servicing of Thorold South growth area along Allanport Road Provides south trunk along Brown Road for future servicing of Southwest Niagara Falls growth (from north of Brown Road as well as lands immediately south of Brown Road) Growth areas within Southwest Niagara Falls will be serviced through local / smaller trunks that outlet to the Brown Road sewer Expectation that Southwest Niagara Falls will develop with or without Beechwood Trunk (as long as Brown Road trunk is available for outlet, upstream sewers will be constructed by City/development community) Minimizes construction within road right-of-way (ROW) which will reduce traffic impact and business disruption Traffic control will be required along Allanport Road 	 Low social, cultu Direct servicing of Provides for enh Provides south tr (from north of Br Growth are trunks that Expectation (as long as by City/dev) Minimizes constribusiness disrupt Traffic control with
Legal / Jurisdictional (10%)	 Consideration for the open-cut construction of this alternative was removed following major environmental impact screening. 	 Required Easements / Property: Additional easement width from New Black Horse SPS location (at existing fire hall) to Highway 20 (existing 6.0 metre-wide watermain easement cannot accommodate watermain and new FM) Crossings and Restrictions: 1 rail crossing along Allanport Road – where transition from forcemain to gravity sewer occurs Additional Permitting: Consideration for MTO owned sections of Highway 58 (north of Highway 20) and Highway 20 (between Highway 58 and Thorold Townline Road) NPCA Permit (including extensive study in support of) for the open-cut sewer construction along Turner Road unopened road allowance 	 Required Easer location (at exist cannot accommodiate forcemain to grading Additional Perm Considerat Highway 20 NPCA Pern constructio
Technical (20%)	 Consideration for the open-cut construction of this alternative was removed following major environmental impact screening. 	 Total Length: 2.0 km of 400mm dia. Forcemain Profile: ~6.8 km of 3.1m to 10.7m deep 600mm - 900mm dia. sewer Provides greatest future servicing flexibility Crossings: Significant watercourse crossing 200 metres south of Highway 20 drives depth of forcemain Provides greatest future servicing flexibility Constructability: Constructability: Continuous rising FM will require ~12m to 15m depth at Fire Station Black Horse SPS location, FM would require to be tunnelled or installed by open-cut with air release and drain chamber Significant watercourse crossing, immediately west of Garner Road south leg intersection drives depth of sewer along Brown Road – section from Garner Road to Heartland Forest Road proposed shaft likely requires tunnelling FM natural feature crossing at existing Black Horse SPS location and watercourse south of Highway 20 	 Total Length: 2. Profile: ~6.8 km Crossings: Sign forcemain Provides greates Constructability Continuous rising FM would require Significant water drives depth of s Road proposed s FM natural featu Highway 20 FM crosses under

Alignment I.c. **Thorold South** (Tunnelling / Open-Cut – Turner Road)

- New Black Horse SPS south along Highway 58/Allanport Road anport Road gravity sewer at Barron Road
- nning along Allanport Road south to Turner Road unopened road hen east along Turner Road outletting to Montrose Road Trunk Sewer d River crossing
- f forcemain and sewer along Highway 58/Allanport by open-cut
- sewer along Turner Road by tunnelling through NPCA regulated lands ong Brown Road
- l lands along Turner Road unopened road allowance (between Allanport Road nline Road)
- nless installation through NPCA regulated lands only (with open-cut west of allow groundwater interaction to be evaluated
- nental investigation (including fieldwork required for this alternative)
- nce of sewer within NPCA regulated wetland requires additional coordination satisfy environmental requirements

ral and heritage impact

- of developable land
- anced servicing of Thorold South growth area along Allanport Road
- runk along Brown Road for future servicing of Southwest Niagara Falls growth rown Road as well as lands immediately south of Brown Road)
- eas within Southwest Niagara Falls will be serviced through local / smaller outlet to the Brown Road sewer
- n that Southwest Niagara Falls will develop with or without Beechwood Trunk Brown Road trunk is available for outlet, upstream sewers will be constructed elopment community)
- ruction within road right-of-way (ROW) which will reduce traffic impact and ion
- ill be required along Allanport Road
- nents / Property: Additional easement width from New Black Horse SPS ing fire hall) to Highway 20 (existing 6.0 metre-wide watermain easement odate watermain and new FM)
- **Restrictions:** 1 rail crossing along Allanport Road where transition from vity sewer occurs

nitting:

- ion for MTO owned sections of Highway 58 (north of Highway 20) and 0 (between Highway 58 and Thorold Townline Road)
- mit (including extensive study in support of) for the open-cut sewer on along Turner Road unopened road allowance
- .0 km of 400mm dia. Forcemain
- of 3.1m to 10.7m deep 600mm 900mm dia. sewer
- nificant watercourse crossing 200 metres south of Highway 20 drives depth of

st future servicing flexibility

- g FM will require ~12m to 15m depth at Fire Station Black Horse SPS location, e to be tunnelled or installed by open-cut with air release and drain chamber rcourse crossing, immediately west of Garner Road south leg intersection sewer along Brown Road – section from Garner Road to Heartland Forest shaft likely requires tunnelling
- re crossing at existing Black Horse SPS location and watercourse south of
- er rail corridor and then outlets to gravity trunk sewer immediately south



Weighted Criteria	Alignment I.a. Thorold South (Open-Cut – Turner Road) Screened Out • Forcemain from New Black Horse SPS south along Highway 58/Allanport Road outletting to Allanport Road gravity sewer at Barron Road • Gravity sewer running along Allanport Road south to Turner Road unopened road allowance and then east along Turner Road outletting to Montrose Road Trunk Sewer north of Welland River crossing • Construction of forcemain / sewer by open-cut	Alignment I.b. Thorold South (Tunnelling – Turner Road) • Forcemain from New Black Horse SPS south along Highway 58/Allanport Road outletting to Allanport Road gravity sewer at Barron Road • Gravity sewer running along Allanport Road south to Turner Road unopened road allowance and then east along Turner Road outletting to Montrose Road Trunk Sewer north of Welland River crossing • Construction of forcemain and sewer along Highway 58/Allanport by open-cut • Construction of sewer along Turner Road/Brown Road by tunnelling	 Forcemain from outletting to Al Gravity sewer r allowance and north of Wellan Construction o Construction o and open-cut a
		 FM crosses under rail corridor and then outlets to gravity trunk sewer immediately south Approx. 5 metres deep along Allanport Road (existing ground falls to the south and supports open-cut construction through the area) Depth will increase to pick up catchment north of rail (and south of watercourse crossing) Going deeper at intersection of Turner Road and Thorold Townline Road will provide for pick-up of future Niagara Falls areas to the south of Brown Road Ability to capture catchment from north (and south) of Brown Road in Niagara Falls will drive depth of sewer (~8 metres from Thorold-Townline east) 	 Approx. 5 metres open-cut constru- (and south of wa Going deeper at up of future Niag Ability to capture depth of sewer (
Financial (20%)	 Consideration for the open-cut construction of this alternative was removed following major environmental impact screening. 	 To Commission: Additional property/easement required along Highway 58, north of Highway 20 Shortest length, open-cut construction outside of travelled road Tunnelled sewer requirements along Turner Road / Brown Road 	To Commission Additional Shortest le Tunnelled regulated la Road
Overall Rank	Low	Moderate	
Differentiator	Open-cut through Turner Road Unopened Road Allowance will require extensive environmental study, protection and recreation. The open-cut option was determined to have low viability and has been screened out.	Allanport Road alignment best services Thorold South growth area. Sewer along Turner and Brown Road provides trunk connections for future growth in Southwest Niagara Falls. Tunnelled section through Turner Road unopened road allowance will be expensive but can be combined with deeper tunnelled section along Turner Road and Brown Road to provide deep service connection for larger catchment area in South Thorold.	Allanport Road along Turner an Southwest Niag Tunnelled secti expensive but o in South Thoro lands to reduce

Alignment I.c. Thorold South (Tunnelling / Open-Cut – Turner Road)

- m New Black Horse SPS south along Highway 58/Allanport Road Ilanport Road gravity sewer at Barron Road
- running along Allanport Road south to Turner Road unopened road I then east along Turner Road outletting to Montrose Road Trunk Sewer nd River crossing
- of forcemain and sewer along Highway 58/Allanport by open-cut
- of sewer along Turner Road by tunnelling through NPCA regulated lands along Brown Road
- es deep along Allanport Road (existing ground falls to the south and supports ruction through the area) Depth will increase to pick up catchment north of rail ratercourse crossing)
- It intersection of Turner Road and Thorold Townline Road will provide for pick-Igara Falls areas to the south of Brown Road
- e catchment from north (and south) of Brown Road in Niagara Falls will drive (~8 metres from Thorold-Townline east)

n:

- I property/easement required along Highway 58, north of Highway 20 length, open-cut construction outside of travelled road
- sewer requirements along Turner Road, and open-cut once outside of NPCA lands along Turner Road unopened road allowance. Open-cut along Brown



d alignment best services Thorold South growth area. Sewer and Brown Road provides trunk connections for future growth in agara Falls.

tion through Turner Road unopened road allowance will be can provide deep service connection for larger catchment area old. Open-cut will be utilized outside of the NPCA regulated be construction costs.



	Alignment I.d. Thorold South (Barron Road Shallow Sewer)	Alignment I.e. Thorold South (Tunnelling – Barron Road Deep Sewer)	
Weighted Criteria	 Forcemain from New Black Horse SPS south along Highway 58/Allanport Road outletting to gravity sewer along Barron Road, east of rail corridor Gravity sewer running along Barron Road/McLeod Road east to Beechwood Road and then south along Beechwood Road to Brown Road and then east along Brown Road outletting to Montrose Road Trunk Sewer Construction of forcemain / sewer at open-cut depth (except at crossings) 	 Forcemain from New Black Horse SPS south along Highway 58/Allanport Road outletting to gravity sewer along Barron Road, east of rail corridor Gravity sewer running along Barron Road/McLeod Road east to Beechwood Road and then south along Beechwood Road to Brown Road and then east along Brown Road outletting to Montrose Road Trunk Sewer Construction of forcemain by open-cut depth (except at crossings) Construction of deep gravity sewer by tunnelling to provide future outlet for Thorold local sewer picking up south Allanport Road development 	 Forcemain from outletting to gravity sewer then south alo outletting to M Construction c Construction c local sewer pice
Environmental (25%)	 Low environmental impact Alignment follows built right-of-way (ROWs) mitigating environmental impacts 	 Low environmental impact Alignment follows built right-of-way (ROWs) mitigating environmental impacts 	 Low environment Alignment follow
Social / Cultural (25%)	 Low social, cultural and heritage impact Direct servicing of developable land Shallow open-cut option objective to balance cost savings associated with open cut to as deep as practical with catchment / service area for Allanport South Area Provides trunk along McLeod Road, Beechwood Road and Brown Road that will provide servicing benefit to South Thorold and Southwest Niagara Falls Requires construction within Barron Road ROW <10 years after reconstruction project - increased traffic impact and business disruption. Traffic control will be required along Allanport Road and Barron Road 	 Low social, cultural and heritage impact Direct servicing of developable land Deeper tunnelled sub-option provides for enhanced servicing of Thorold South growth area along Allanport Road with connection at Barron Road for future local servicing from Allanport Road south Provides trunk along McLeod Road, Beechwood Road and Brown Road that will provide servicing benefit to South Thorold and Southwest Niagara Falls Requires construction within Barron Road ROW <10 years after reconstruction project - increased traffic impact and business disruption partially mitigated by tunnelled sewer. Traffic control will be required along Allanport Road and Barron Road 	 Low social, cultu Direct servicing Deeper open-cu along Allanport Road south Provides trunk a servicing benefi Requires constr increased traffic deep open-cut of Significant traffic road closures)
Legal / Jurisdictional (10%)	 Required Easements / Property: Additional easement width from New Black Horse SPS location (at existing fire hall) to Highway 20 (existing 6.0 metre-wide watermain easement cannot accommodate watermain and new FM) Crossings and Restrictions: 1 rail crossing along Allanport Road – where transition from forcemain to gravity sewer occurs Additional Permitting: Consideration for MTO owned sections of Highway 58 (north of Highway 20) and Highway 20 (between Highway 58 and Thorold Townline Road) 	 Required Easements / Property: Additional easement width from New Black Horse SPS location (at existing fire hall) to Highway 20 (existing 6.0 metre-wide watermain easement cannot accommodate watermain and new FM) Crossings and Restrictions: 1 rail crossing along Allanport Road – where transition from forcemain to gravity sewer occurs Additional Permitting: Consideration for MTO owned sections of Highway 58 (north of Highway 20) and Highway 20 (between Highway 58 and Thorold Townline Road) 	 Required Ease location (at exis cannot accomm Crossings and forcemain to gra Additional Pern Highway 20) an
Technical (20%)	 Total Length: 2.0 km of 400mm dia. Forcemain Profile: ~6.9 km of 3.3m to 8.8m deep 600mm - 900mm dia. sewer by open-cut with trenchless crossings of rail corridor Crossings: Significant watercourse crossing 200 metres south of Highway 20 drives depth of forcemain Constructability: Continuous rising FM will require ~12m to 15m depth at Fire Station Black Horse SPS location, FM would require to be tunnelled or installed by open-cut with air release and drain chamber Significant watercourse crossing, immediately west of Garner Road south leg intersection drives depth of sewer along Brown Road – section from Garner Road to Heartland Forest Road proposed shaft likely requires tunnelling FM natural feature crossing at existing Black Horse SPS location and watercourse south of Highway 20 FM outlets to gravity trunk sewer at intersection of Allanport Road and Barron Road (to provide for future connection/outlet from Allanport Road local sewer) Depth of gravity sewer along Barron Road, McLeod Road and Beechwood Road driven by future connection allowance at Allanport Road and Barron Road) Significant watercourse crossing, immediately west of Garner Road south leg intersection drives depth of sewer along Barron Road, McLeod Road and Beechwood Road driven by future connection allowance at Allanport Road and Barron Road (for future local sewer running north along Allanport Road, and rail crossing along Barron Road) Significant watercourse crossing, immediately west of Garner Road south leg intersection drives depth of sewer along Brown Road – section from Garner Road south leg intersection drives depth of sewer along Brown Road – section from Garner Road south leg intersection drives depth of sewer along Brown Road – section from Garner Road south leg intersection drives depth of sewer along Brown Road – section from Garner Road to Heartland Forest Road proposed shaft likely requires	 Total Length: 2.0 km of 400mm dia. Forcemain Profile: ~6.9 km of 8.3m to 12m deep 600mm - 900mm dia. Sewer by tunnelling to mitigate construction disruption and restoration requirements Crossings: Significant watercourse crossing 200 metres south of Highway 20 drives depth of forcemain Constructability: Continuous rising FM will require ~12m to 15m depth at Fire Station Black Horse SPS location, FM would require to be tunnelled or installed by open-cut with air release and drain chamber Significant watercourse crossing, immediately west of Garner Road south leg intersection drives depth of sewer along Brown Road – section from Garner Road to Heartland Forest Road proposed shaft likely requires tunnelling FM natural feature crossing at existing Black Horse SPS location and watercourse south of Highway 20 FM outlets to gravity trunk sewer at intersection of Allanport Road and Barron Road (to provide for future connection/outlet from Allanport Road local sewer) Depth of gravity sewer along Barron Road, McLeod Road and Beechwood Road driven by future connection allowance at Allanport Road and Barron Road) Deep sewer along Barron Road, McLeod Road and Brown Road includes: Increased risk for tunnelling within mixed-face overburden/rock conditions or entirely through rock 	 Total Length: 2 Profile: ~6.9 km crossings of rail Crossings: Sig forcemain Constructabilit Continuous risir FM would requir Significant wate drives depth of s Road proposed FM natural featu Highway 20 FM outlets to gr for future connection north along Alla Significant wate drives depth of s Road proposed Significant wate drives depth of s Road proposed FM crossing at Deep sewer alo

Alignment I.f. Thorold South (Open-Cut – Barron Road Deep Sewer)

m New Black Horse SPS south along Highway 58/Allanport Road ravity sewer along Barron Road, east of rail corridor

running along Barron Road/McLeod Road east to Beechwood Road and ong Beechwood Road to Brown Road and then east along Brown Road lontrose Road Trunk Sewer

of forcemain by open-cut depth (except at crossings)

of deep gravity sewer by tunnelling to provide future outlet for Thorold cking up south Allanport Road development

ntal impact

ws built right-of-way (ROWs) mitigating environmental impacts

ural and heritage impact

of developable land

ut sub-option provides for enhanced servicing of Thorold South growth area Road with connection at Barron Road for future local servicing from Allanport

along McLeod Road, Beechwood Road and Brown Road that will provide fit to South Thorold and Southwest Niagara Falls

ruction within Barron Road ROW <10 years after reconstruction project - c impact and business disruption with larger construction footprint required for construction.

ic control will be required along Allanport Road and Barron Road (with potential

ements / Property: Additional easement width from New Black Horse SPS sting fire hall) to Highway 20 (existing 6.0 metre-wide watermain easement modate watermain and new FM)

I Restrictions: 1 rail crossing along Allanport Road – where transition from avity sewer occurs

mitting: Consideration for MTO owned sections of Highway 58 (north of highway 20 (between Highway 58 and Thorold Townline Road)

2.0 km of 400mm dia. Forcemain

n of 8.3m to 12m deep 600mm - 900mm dia. Sewer by open-cut with trenchless I corridor

nificant watercourse crossing 200 metres south of Highway 20 drives depth of

ty:

ng FM will require ~12m to 15m depth at Fire Station Black Horse SPS location, ire to be tunnelled or installed by open-cut with air release and drain chamber ercourse crossing, immediately west of Garner Road south leg intersection

sewer along Brown Road – section from Garner Road to Heartland Forest I shaft likely requires tunnelling

ure crossing at existing Black Horse SPS location and watercourse south of

ravity trunk sewer at intersection of Allanport Road and Barron Road (to provide ection/outlet from Allanport Road local sewer)

y sewer along Barron Road, McLeod Road and Beechwood Road driven by on allowance at Allanport Road and Barron Road (for future local sewer running anport Road, and rail crossing along Barron Road)

ercourse crossing, immediately west of Garner Road south leg intersection sewer along Brown Road – section from Garner Road to Heartland Forest I shaft likely requires tunnelling

existing Black Horse SPS location and watercourse south of Highway 20 ong Barron Road/McLeod Road, Beechwood Road and Brown Road includes:



Weighted Criteria	Alignment I.d. Thorold South (Barron Road Shallow Sewer) • Forcemain from New Black Horse SPS south along Highway 58/Allanport Road outletting to gravity sewer along Barron Road, east of rail corridor • Gravity sewer running along Barron Road/McLeod Road east to Beechwood Road and then south along Beechwood Road to Brown Road and then east along Brown Road outletting to Montrose Road Trunk Sewer • Construction of forcemain / sewer at open-cut depth (except at crossings)	Alignment I.e. Thorold South (Tunnelling – Barron Road Deep Sewer) • Forcemain from New Black Horse SPS south along Highway 58/Allanport Road outletting to gravity sewer along Barron Road, east of rail corridor • Gravity sewer running along Barron Road/McLeod Road east to Beechwood Road and then south along Beechwood Road to Brown Road and then east along Brown Road outletting to Montrose Road Trunk Sewer • Construction of forcemain by open-cut depth (except at crossings) • Construction of deep gravity sewer by tunnelling to provide future outlet for Thorold local sewer picking up south Allanport Road development	 Forcemain from outletting to gravity sewer then south alo outletting to M Construction of Construction of local sewer production
		 Increased risk for significant dewatering requirements from deep sewer/shafts near Welland River / bedrock fractures Significant watercourse crossing, immediately west of Garner Road south leg intersection drives depth of sewer along Brown Road – section from Garner Road to Heartland Forest Road proposed shaft likely requires tunnelling FM crossing at existing Black Horse SPS location and watercourse south of Highway 20 	o Increased
Financial (20%)	 To Commission: Additional property/easement required along Highway 58, north of Highway 20 Shallow sewer sub-option mitigates construction costs. 	 To Commission: Additional property/easement required along Highway 58, north of Highway 20 Deep tunnelled gravity sewer significantly increases construction costs (to reduce disruption) 	To Commissio Additional Significan open-tren
Overall Rank	Very High	High	
	Sewer along Allanport Road to Barron Road mitigates environmental issues and provides servicing benefit to both Thorold and Southwest Niagara Falls.	Sewer along Allanport Road to Barron Road mitigates environmental issues and provides servicing benefit to both Thorold and Southwest Niagara Falls.	Sewer along A and provides s
Differentiator	Local sewer running north along Allanport Road will be required to pick up the south section of the Allanport growth area.	Local sewer running north along Allanport Road will be required to pick up the south section of the Allanport growth area.	Local sewer ru south section o
	Shallow sub-alternative objective is to balance level of enhanced servicing to south Allanport Road area with cost savings of shallow, open-cut construction	Service to entire Allanport South area will require deep tunnelled sewer and significantly increased construction costs	

Alignment I.f. Thorold South (Open-Cut – Barron Road Deep Sewer)

- m New Black Horse SPS south along Highway 58/Allanport Road ravity sewer along Barron Road, east of rail corri<u>dor</u>
- running along Barron Road/McLeod Road east to Beechwood Road and ong Beechwood Road to Brown Road and then east along Brown Road lontrose Road Trunk Sewer
- of forcemain by open-cut depth (except at crossings)
- of deep gravity sewer by tunnelling to provide future outlet for Thorold cking up south Allanport Road development
- risk for significant dewatering requirements for deep sewer construction

n:

I property/easement required along Highway 58, north of Highway 20 at restoration requirements and potential for cost increase due to limitations on ach restrictions to limit dewatering of deep trenches (and resulting impact)



- Allanport Road to Barron Road mitigates environmental issues servicing benefit to both Thorold and Southwest Niagara Falls.
- unning north along Allanport Road will be required to pick up the of the Allanport growth area.



	Alignment I.g. Thorold South (Chippawa Creek Road)	Alignment 2.a. Southwest Niagara Falls (Beechwood Road)	
Weighted Criteria	 Forcemain from New Black Horse SPS south along Highway 58/Allanport Road outletting to Allanport Road gravity sewer at Barron Road Gravity sewer running along Allanport Road south to Chippawa Creek Road and then east along Chippawa Creek Road outletting to Montrose Road Trunk Sewer north of Welland River crossing 	 Forcemain from New Black Horse SPS east Uppers Lane to Thorold Townline Road, south along Thorold Townline Road to Highway 20/Lundy's Lane, east along Highway 20/Lundy's Lane and Nichols Lane outletting to gravity sewer at Beechwood Road Gravity sewer running along Beechwood Road south to Brown Road and then east along Brown Road outletting to Montrose Road Trunk Sewer 	 Forcemain from Road, south alo Highway 20/Lui Gravity sewer r Brown Road ou
Environmental (25%)	 Alignment follows built right-of-way (ROWs) mitigating environmental impacts Deep sewer along Chippawa Creek Road near Welland River Increased potential for frac-out risk near Welland River Increased risk for significant dewatering requirements from deep sewer/shafts near Welland River / bedrock fractures 	 Watercourse crossings along Beechwood Road and Brown Road NPCA regulated lands / screening area near Nichols Lane is floodplain – construction impacts less significant (no additional fill to be placed within floodplain limits) 	 Majority of alignr NPCA regulated less significant (r
Social / Cultural (25%)	 Low social, cultural and heritage impact Direct servicing of developable land in Allanport Road area Provides trunk along Chippawa Creek Road, that may provide servicing benefit to developable land in area Planning studies show limited planned growth in area of Chippawa Creek Road Existing constraints to growth including radius around Alignment provides limited servicing benefit to Southwest Niagara Falls (anticipated that Southwest Niagara Falls will convey flows by separate trunk sewer to Brown Road) Traffic control will be required along Allanport Road and Chippawa Creek Road 	 Low social, cultural and heritage impact Least direct servicing of developable land Section of forcemain/sewer along Beechwood Road from Nichols Lane to McLeod Road does not directly front immediate growth area Opportunity to capture future/ultimate growth in Southwest Niagara Falls (outside of currently identified GA1 area) Postpones required infrastructure to service Allanport growth area. Significant future infrastructure still required to service this area of South Thorold including ~4.0 km of tunnelled trunk sewer through environmentally sensitive area (or equivalent PS and FM north to Black Horse PS). Who will front the costs for this infrastructure? Will this seriously impede/obstruct growth/development in the area? Least amount of traffic disruption – Beechwood Road is less travelled than Allanport Road and Garner Road 	 Low social, cultu Fronting develop further distance Postpones requi Significant including ~ equivalent Who will fra growth/dev Traffic control wi Beechwood Driv Increased disrup developed
Legal / Jurisdictional (10%)	 Required Easements / Property: Additional easement width from New Black Horse SPS location (at existing fire hall) to Highway 20 (existing 6.0 metre-wide watermain easement cannot accommodate watermain and new FM) Crossings and Restrictions:1 rail crossing along Allanport Road – where transition from forcemain to gravity sewer occurs Additional Permitting: Potential for PTTW/EASR requirements for significant dewatering near Welland River if open-cut construction is considered 	 Required Easements / Property: 1 rail crossing along Nichols Lane – by forcemain Crossings and Restrictions: Consideration for MTO owned section of Highway 20 (between Highway 58 and Thorold Townline Road) Additional Permitting: Uppers Lane will require property coordination 	 Required Easer Crossings and Highway 58 and Additional Perm
Technical (20%)	 Total Length: 2.0 km of 400mm dia. Forcemain Profile: ~9.8 km of 2.5m to 9.6m deep 900mm dia. sewer Crossings: Significant watercourse crossing 200 metres south of Highway 20 drives depth of forcemain Constructability: Provides greatest future servicing flexibility Continuous rising FM will require ~12m to 15m depth at Fire Station Black Horse SPS location, FM would require to be tunnelled or installed by open-cut with air release and drain chamber Significant watercourse crossing, immediately west of Garner Road south leg intersection drives depth of sewer along Brown Road – section from Garner Road to Heartland Forest Road proposed shaft likely requires tunnelling FM natural feature crossing at existing Black Horse SPS location and watercourse south of Highway 20 FM crosses under rail corridor and then outlets 	 Total Length: 4.2 km of 400mm dia. forcemain (based on outlet at Nichols Lane and Beechwood Road) Profile: 4.9 km of 3.7m to 10.7m deep 600mm - 900mm dia. sewer Crossings: Rail crossing along Nichols Lane drives depth of forcemain Constructability: Provides future servicing flexibility Transition to gravity sewer at intersection of Nichols Lane and Beechwood Road provides for additional length of trunk sewer along Beechwood Road with depth that may better collect flows from City of Niagara Falls development to the east Transition to gravity sewer along Beechwood Road allows for gravity sewer outlet to be located at general highpoint south of hydro corridor (and sewer that is <5m along Beechwood Road) Continuous rising FM will require >5m depth at Fire Station Black Horse SPS location, FM would be ~10m depth at locations through the Uppers Lane unopened road allowance or installed by open-cut with 2 air release and 2 drain chambers Significant watercourse crossing, immediately west of Garner Road south leg intersection drives depth of sewer along Brown Road – section from Garner Road to Heartland Forest Road proposed shaft likely requires tunnelling Provides central servicing spine for future flexibility to service Southwest Niagara Falls growth areas 	 Total Length: 5. Profile: 3.8 km of Crossings: Rail Constructability Provides future set as sewer along Gar Continuous rising would be ~10m of installed by open of Significant drives dept Road proparince ased t Existing/recently the Garner Road

Alignment 2.b. Southwest Niagara Falls (Garner Road)

m New Black Horse SPS east along Uppers Lane to Thorold Townline long Thorold Townline Road to Highway 20/Lundy's Lane, east along undy's Lane and Nichols Lane outletting to gravity sewer at Garner Road running along Garner Road south to Brown Road and then east along utletting to Montrose Road Trunk Sewer

ment will be constructed within Road ROW

d lands / screening area near Nichols Lane is floodplain – construction impacts (no additional fill to be placed within floodplain limits)

ural and heritage impact

pable land has existing City of Niagara Falls servicing (/future plans) – and is from Beechwood growth area

ired infrastructure to service Allanport growth area.

t future infrastructure still required to service this area of South Thorold ~4.0 km of tunnelled trunk sewer through environmentally sensitive area (or t PS and FM north to Black Horse PS).

ront the costs for this infrastructure? Will this seriously impede/obstruct evelopment in the area?

vill be required along Garner Road (more residences, traffic than along ve and Allanport Road)

ption to area residents - adjacent/fronting areas to east have been recently

ments / Property: 1 rail crossing along Nichols Lane – by forcemain

I Restrictions: Consideration for MTO owned section of Highway 20 (between d Thorold Townline Road)

mitting: Uppers Lane will require property coordination

5.3 km of 400mm dia. Forcemain

of 3.5m to 10.7m deep 600mm - 900mm dia. sewer

il crossing along Nichols Lane drives depth of forcemain

ty:

servicing flexibility

avity sewer at intersection of Nichols Lane and Garner Road provides for gravity arner Road that is in general 5 metres of depth and less

ng FM will require >5m depth at Fire Station Black Horse SPS location, FM depth at locations through the Uppers Lane unopened road allowance or en-cut with 2 air release and 2 drain chambers

t watercourse crossing, immediately west of Garner Road south leg intersection oth of sewer along Brown Road – section from Garner Road to Heartland Forest posed shaft likely requires tunnelling – Brown Road sewer depth will be to achieve catchment area / conveyance of flows west of Garner Road

y constructed City of Niagara Falls servicing along Garner Road indicates that d corridor is already congested with existing underground servicing and utilities



Weighted Criteria	Alignment I.g. Thorold South (Chippawa Creek Road) • Forcemain from New Black Horse SPS south along Highway 58/Allanport Road outletting to Allanport Road gravity sewer at Barron Road • Gravity sewer running along Allanport Road south to Chippawa Creek Road and then east along Chippawa Creek Road outletting to Montrose Road Trunk Sewer north of Welland River crossing	Alignment 2.a. Southwest Niagara Falls (Beechwood Road) • Forcemain from New Black Horse SPS east Uppers Lane to Thorold Townline Road, south along Thorold Townline Road to Highway 20/Lundy's Lane, east along Highway 20/Lundy's Lane and Nichols Lane outletting to gravity sewer at Beechwood Road • Gravity sewer running along Beechwood Road south to Brown Road and then east along Brown Road outletting to Montrose Road Trunk Sewer	 Forcemain from Road, south ald Highway 20/Lu Gravity sewer n Brown Road ou
	 Increased risk for significant dewatering requirements from deep sewer/shafts near Welland River / bedrock fractures 		
Financial (20%)	 To Commission: Additional property/easement required along Highway 58, north of Highway 20 Nearly 10 km of gravity sewer with potential for extensive dewatering / trenchless construction requirements 	 To Commission: Most cost-efficient Southwest Niagara Falls focused alternative (potentially more cost-efficient with extension of forcemain south along Beechwood Road to high-point) Will still require 4.0 km of sewer along Brown Road, or equivalent pumping/forcemain solution to service South Thorold 	 To Commission Most expension congested projects) Will still reconsolution to
Overall Rank	Low	High	
Differentiator	Sewer along Chippawa Creek Road provides servicing benefit to Allanport Road development area but does not provide servicing benefit to Southwest Niagara Falls. The Chippawa Creek Road gravity sewer is longest and most expensive sewer option.	Beechwood Road alignment best provides central trunk gravity sewer for future growth areas in Southwest Niagara Falls. Deep trunk sewer along Brown Road could support future servicing of south limits of Thorold South.	Garner Road a Niagara Falls (east and imme Shortest length for direct servic limits of Thorol

Alignment 2.b. Southwest Niagara Falls (Garner Road)

m New Black Horse SPS east along Uppers Lane to Thorold Townline long Thorold Townline Road to Highway 20/Lundy's Lane, east along undy's Lane and Nichols Lane outletting to gravity sewer at Garner Road running along Garner Road south to Brown Road and then east along outletting to Montrose Road Trunk Sewer

ion:

ensive Southwest Niagara Falls construction alternative (primarily due to d Garner Road ROW ex. underground services and recent road reconstruction

equire 4.0 km of sewer along Brown Road, or equivalent pumping/forcemain o service South Thorold



alignment will be located further from west growth in Southwest (and there are already existing City trunk sewer connections for ediate area development).

h of trunk sewer on Brown Road which provides less flexibility icing of future growth areas in Niagara Falls and potential south Id South.