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PROJECT: **Meritage Landing Phase 3, 43 Unit Townhome and 44 Unit Multi-Unit Developments Southeast of Cross Street West and George Street Dunnville Urban Area, Haldimand County Mountainview Homes (Niagara) Limited and 918965 Ontario Limited SCO-Terra Consulting Group Limited Ref. No. E-20542**

SUBJECT: **Cost Recovery Structure - Dunnville Northwest Quadrant Upfronted Infrastructure**

Background:

Implementation of the Northwest Quadrant (NWQ) Pump Station is required in conjunction with the development of Meritage Landing Phase 3, comprised of a 43-unit townhouse condominium development by Mountainview Homes (Niagara) Limited and a distinct 44-unit, 6-plex and 4-plex condominium development by 918965 Ontario Limited. The NWQ pump station will replace a temporary sanitary pump station implemented to service Meritage Landing Phases 1 and Phase 2 (Kingfisher Place and Robin Heights), with capacity to service Meritage Landing (18.81% allocation); and other future development areas within the Northwest Quadrant of Dunnville (81.19% allocation), as defined by Haldimand County.

This schedule summarizes the wastewater servicing requirements for the northwest quadrant of Dunnville established collaboratively with Haldimand County Engineering Services. Cost estimates for external wastewater, watermain and roadworks to be front-ended by Meritage Landing Phase 3, and the structure for cost recovery from benefitting parties within the affected sewershed are identified. Costs shall be recovered by Haldimand County through the planning and development approval process, and reimbursed to the front-ending parties, including finance charges accruing from the date of substantial completion of the works, proportionate to wastewater servicing capacity assigned to each benefitting party.

Dunnville NWQ Wastewater Servicing Review:

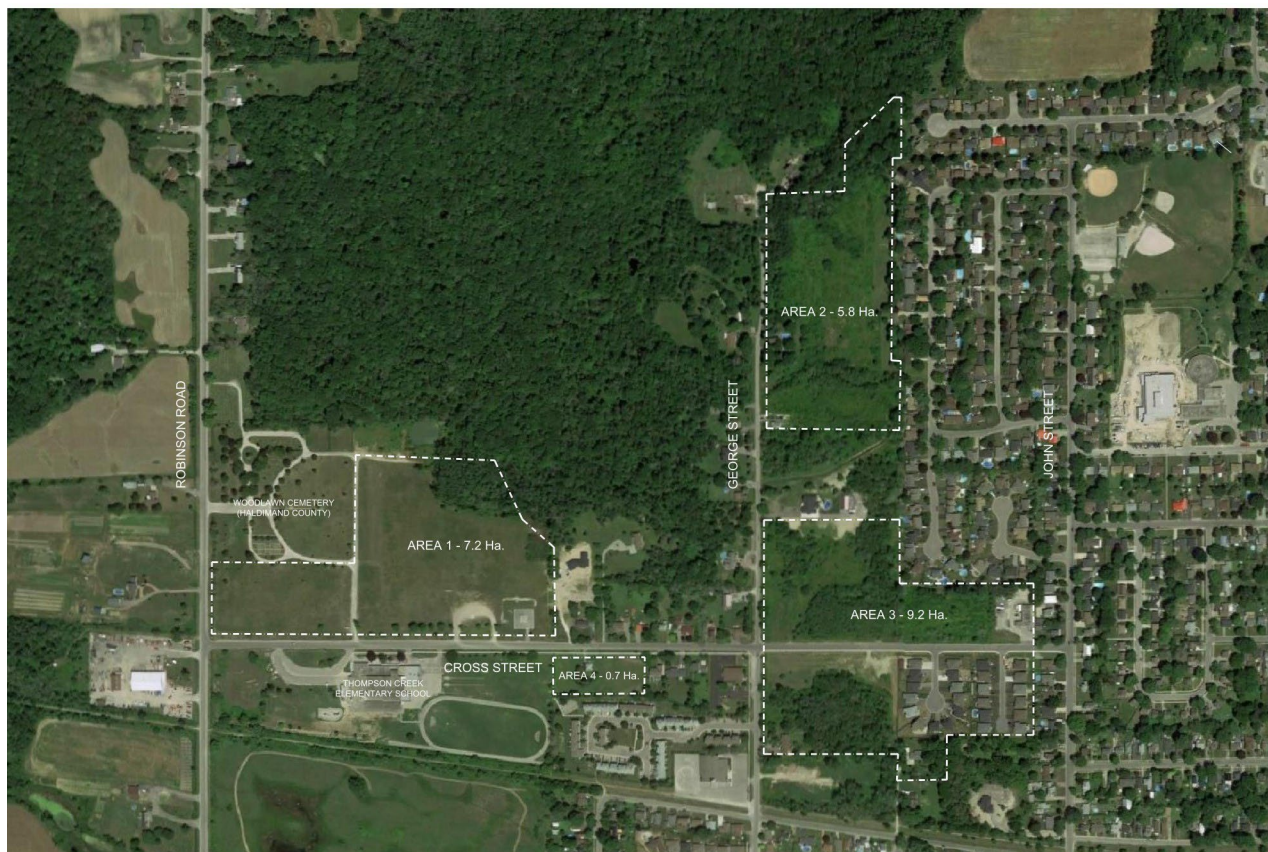
In July 2020 Haldimand County Engineering Services updated the catchment area for the Dunnville NWQ sewer basin relative to the Dunnville Master Servicing Plan (Stantec 2008), to reflect known or anticipated development and projected servicing requirements. Sco-Terra has refined the catchment area based on current conditions. The updated sanitary sewer catchment is defined by four areas:

- Area 1 – Woodlawn Cemetery and Hospital Helipad Lands, 739 Cross Street West (7.2 hectares)
- Area 2 – George Street North, East Side / North of County NWQ Stormwater Block (5.8 hectares)
- Area 3 – Between John Street and George Street, bisected by Cross Street West (9.2 hectares)
- Area 4 – Thomson Crossing Infill Proposal, 718 Cross Street West (0.7 hectares)

A preceding Review of Dunnville NWQ Wastewater Servicing is set out in a Technical Memorandum dated July 27, 2020 from Phil Wilson, Manager, Water & Wastewater Engineering, Haldimand County to Richard Pellerin, Principal, Sco-Terra Consulting Group Limited, included herein as attachment-1.

Northwest Quadrant (NWQ) Sewer Basin:

The Dunnville NWQ sanitary catchment area or basin, updated by Sco-Terra (2022) in collaboration with Haldimand County Engineering Services, is defined by four distinct areas identified in Figure 1:



Area 1 – Woodlawn Cemetery and Hospital Helipad Lands (7.2 Hectares):

Area 1 consists of an approximate 7.2 hectare County-owned parcel located north of Cross Street West and east of Robinson Road, comprised of unused lands within the Woodlawn Cemetery and the Hospital Helipad site, identified as having a high potential for low-density residential development within the 20-year planning horizon. The northerly portion of Area 1, approximately 3.0 hectares, is situated outside the Dunnville urban boundary. However, the updated Official Plan adopted by Council proposes to add these lands through modification of the urban boundary, subject to the Province's review and approval. An extensive wooded area extends into the northeast corner of the external Woodlawn Cemetery lands, proposed to be added to the urban boundary through OP modification.

Area 2 – George Street North, East Side (5.8 hectares):

Area 2 is comprised of an approximate 5.8 hectare parcel located east of George Street, north of the County's NWQ stormwater management block, deemed as having a low likelihood of development within

the 20-year planning horizon. There are 3-4 rural residential lots within this parcel fronting onto George Street. The north half of Area 2 is situated within the Grand River Conservation Authority (GRCA) regulation limits, with unevaluated wetlands, floodplain area and wooded area located at its north limit, proximal to an extensive woodland area and wetland complex, including provincially significant wetlands, situated north and west.

Area 3 – Meritage Landing, Massi Lands, East of Massi and Existing (9.2 Hectares):

Area 3 includes 9.2 hectares of designated lands situated between John Street and George Street, bisected by Cross Street West, including existing development such as Meritage Landing Phases 1 and 2 (Kingfisher Place and Robin Heights), and proximal lands having a high potential for development within the 20-year planning horizon, including Meritage Landing Phase 3, the Massi property and a development parcel east of the Massi lands.

The County projected design populations for each of the above three service areas, based on gross land area and assumed development densities. An equivalent population of 637 was projected for Area 3. However, proposed development within Area 3 is relatively well defined, through Site Plan advancement for Meritage Landing Phase 3 and Concept Plan development for other projects such as the Massi Lands. As a result, the design population for Area 3 is further evaluated herein under design basis information, based on known development yields, densities and resulting design population for proposed development.

Table 1 – Area 3 Development Projection and Design Population				
Parcel	Area (ha)	Development Density	PPU	Equivalent Population
Existing Development ⁽¹⁾ (28 Residential Equiv.)	3.37 (8.32 ac)	existing	2.47	70
Meritage Landing PH. 3A (43 Townhouse Units)	1.47 (3.64 ac)	adult condo	2.0	86
Meritage Landing PH. 3B (44 Units)	0.68 (1.69 ac)	seniors apartment	1.5	66
Massi Lands (71 Townhouse)	2.8 (6.91 ac)	adult condo	2.0	142
Massi Lands (24 Quad Units)		seniors apartment	1.5	36
Parcel east of Massi (30 Townhouse Units)	0.88 (2.18 ac)	35 units/hectare	2.0	60
TOTAL	9.2	-	-	460
<p>(1) Existing Development is assessed at 28 S.F. Residential Unit Equivalents, including:</p> <ul style="list-style-type: none"> (a) Meritage Landing Phase 1 – Kingfisher Place, 12 S.F. Residential Units (b) Meritage Landing Phase 2 – Robin Heights, 13 S.F. Residential Units (c) 403 Cross Street Dry Storage/Contractor Yard = 1 S.F. Residential Equivalent (0.92 ac) (d) 449 Helena Street (0.91 ac) (e) 519 George Street (0.46 ac) <p>(2) The Dunnville Inn Bed & Breakfast located at 809 George Street has been excluded from Area 3, due to its recent development and low likelihood for redevelopment with the planning horizon.</p> <p>(3) A vacant residential lot at 600 John Street has been excluded from Area 3, based on anticipated sanitary servicing from John Street due to topographical constraints relative to Kingfisher Place.</p>				

Area 4 – Thompson Crossing (0.7 Hectares):

A 31-unit infill townhouse development proposed at 718 Cross Street West is included in the NWQ sanitary sewer catchment area analysis. A pre-consultation meeting with Haldimand County was undertaken for this project in December 2021.

NWQ Pump Station Design Basis:

The calculation of Equivalent Population for the NWQ sewer basin incorporates information provided by Haldimand County, including an average residential density of 2.47 persons per unit (ppu) applied to Areas 1, 2 and 4. The design population for Area 3 is more accurately defined, as detailed in preceding Table 1.

The overall design population for the NWQ sanitary sewer basin is summarized in the following Table 2:

Table 2 – Equivalent Population			
Parcel	Area (Ha.)	Development Density (units per hectare)	Equivalent Population
<i>High Development Potential Within 20-Year Planning Horizon</i>			
Area 1	7.2 ⁽¹⁾	20 ⁽¹⁾	356 ⁽¹⁾
Area 3	9.2	varies	460
Area 4	0.68	45.6	77
20-Year Total	17.1		893
<i>Low Development Potential Within 20-Year Planning Horizon</i>			
Area 2 ⁽²⁾	5.8 ⁽¹⁾	20 ⁽¹⁾	287 ⁽¹⁾
TOTAL	22.9	-	1,180
(1) Data provided by Haldimand County Engineering Services, P. Wilson Technical Memo dated July 27, 2020. (2) Area 2 is constrained by Hazards and Natural Heritage Features including floodplain (GRCA), unevaluated wetlands (GRCA), wooded area (GRCA) and proximity to provincially significant wetlands (MECP).			

Based on current projections of Equivalent Population for Area 3, the Dry Weather Sewage Flow for the NWQ sanitary sewer basin is summarized in the following Table 3:

Table 3 – Dry Weather Flow				
Parcel	Equivalent Population	Per capita Flow (L/cap-day)	Dry Weather Flow (m³/day)	% Total
<i>High Development Potential Within 20-Year Planning Horizon</i>				
Area 1	356 ⁽¹⁾	280 ⁽¹⁾	100 ⁽¹⁾	30.21%
Area 3	460	280 ⁽¹⁾	129	38.97%
Area 4	77	280 ⁽¹⁾	22	6.65%
20-Year Total	893		251	75.83%
<i>Low Development Potential Within 20-Year Planning Horizon</i>				

Area 2	287 ⁽¹⁾	280 ⁽¹⁾	80 ⁽¹⁾	24.17%
TOTAL	1,180		331	100%
(1) Data provided by Haldimand County Engineering Services, P. Wilson Technical Memo dated July 27, 2020. (2) Harmon Peaking Factor, M for Population 1,180 persons = 3.75.				

Based on current projections of Equivalent Population for Area 3, updated Harmon Peaking Factor calculations, and the application of inflow and infiltration allowances in accordance with Haldimand County Design Criteria, the Peak Wet Weather Sewage Flow for the NWQ sanitary sewer basin is summarized in the following Table 4:

Table 4 – Peak Wet Weather Flow				
Parcel	Average Dry Weather Flow (L/s)	Peak Dry Weather Flow (L/s)	Inflow and Infiltration (L/s)	Peak Wet Weather Flow (L/s)
<i>High Development Potential Within 20-Year Planning Horizon</i>				
Area 1	1.16 ⁽¹⁾	4.35	1.66	6.01
Area 3	1.49	5.59	2.12	7.71
Area 4	0.25	0.94	0.16	1.10
20-Year Total	2.90	10.88	3.94	14.82
<i>Low Development Potential Within 20-Year Planning Horizon</i>				
Area 2	0.93	3.49	1.33 ⁽¹⁾	4.82
TOTAL	3.83	14.37	5.27	19.64
Ultimate Firm Capacity of NWQ Wastewater Pump Station				20.0
(1) Data provided by Haldimand County Engineering Services, Technical Memo dated July 27, 2020. (2) Harmon Peaking Factor, M for Population 1,180 persons = 3.75. (3) Inflow and infiltration (i/i) allowance = 0.23 L/s per hectare, Haldimand County Design Criteria.				

Cross Street West / George Street North Sanitary Sewer Extensions to Service Areas 1 to 4:

At the request of Haldimand County Engineering Services, Sco-Terra completed an evaluation of wastewater servicing within the northwest quadrant of Dunnville, including sanitary servicing alternatives for Area 1, the County-owned 7.2 hectare cemetery and hospital helipad parcel located across from the Thomson Creek Elementary School site, and Area 2, a privately held 5.8 hectare parcel located east of George Street North. The attached Drawing Exhibit 03, *Cross Street West Hybrid Sewer Concept* was selected by the County as the preferred alternative:

- Cross Street West terminal manhole located 180 metres west of George Street and 223.4 metres west of Meritage Landing Street A – Multi-Unit Development Entrance;
- West terminal manhole - 3.0 m depth to invert to achieve full gravity servicing west to Area 4;
- 200 mm diameter sanitary sewer at 0.50% gradient within Cross Street West;
- Local Sanitary Pump Station required within Area 1 to convey sewage by forcemain to Cross Street West Terminal manhole;
- George Street North terminal manhole located 360 metres north of Cross Street West.

The following Table 5 summarizes the sanitary sewer, maintenance hole structure and pumping station wet well structure depths and resulting excavation depths, established based on final sanitary sewer design evaluation undertaken for extension of gravity servicing to 16 metres west of George Street and 12 metres north of Cross Street, to accommodate future development of: *Area 1 - Cemetery/Helipad Lands (7.2 hectares)* owned by Haldimand County; *Area 2 - George Street North Lands (5.8 hectares)*; Area 3 including Meritage Landing and other future development (9.2 hectares); and Area 4 proposed infill development (0.7 hectares).

Table 5 – Cross Street Sanitary Sewer Extension West of George Street and North of Cross Street			
Terminal maintenance hole SA12 is located at the Cross Street West / George Street Intersection, 43.4 m west of Meritage Landing Phase 3 west entrance - Street 'A', Multi-Unit Development. Sanitary sewer stubs will be extended 16 metres west of George Street and 12 metre north of Cross Street from terminal maintenance hole SA12, to facilitate future servicing of Areas 1, 2 and 4.			
Location	NWQ SPS	Area 3 – MLP3 Street A to NWQ SPS	
		Depth to Invert (m)	Excavation Depth (m)
Sanitary Sewer Invert	SA12 to SPS	3.9 m to 5.35 m (12.8 ft. to 17.55 ft.)	4.05 m to 5.50 m (13.3 ft. to 18.55 ft.)
Sanitary Manholes	SA12 to SA1	3.9 m to 4.9 m (12.8 ft. to 16.1 ft.)	4.35 m to 5.35 m (14.3 ft. to 17.55 ft.)
Cross/George	SA12	3.9 m to invert	4.35 m (subgrade)
Cross/Street A	SA9	4.1 m to invert	4.55 m (subgrade)
Cross/Street B	SA6	4.3 m to invert	4.75 m (subgrade)
Cross/Street C	SA2	4.65 m to invert	5.10 m (subgrade)
Cross Street	SA1	4.9 m to invert	5.35 m (subgrade)
Sewer Invert at NWQ	NWQ Inlet	5.35 m to Invert	EL. 178.80 – 173.45
NWQ Pump Off	1.70 m	7.05 m	EL. 171.75
Wet Well Depth	0.75 m	7.80 m	EL. 171.00
U/S Base Slab	0.305 m	8.10 m	EL. 170.70
Subgrade Depth	0.30 m	8.40 (27.6 ft.)	EL. 170.40

Based on Haldimand County ES requirement for a future gravity sanitary sewer extension within Cross Street West, to 180 metres west of George Street at a terminal manhole depth of 3.0 metres, required to service Area 4 – Infill Development by gravity sanitary service and to receive sanitary forcemain discharge from a future, local sanitary pump station within 7.2 hectare Area 1 – Cemetery/Helipad lands, the required depth of the Northwest Quadrant Pump Station is 8.40 metres or 27.6 feet.

Cost estimates have been prepared for external water distribution, sanitary servicing and related road reconstruction works necessary to accommodate the future development of: *Area 1 - Cemetery/Helipad*

Lands (7.2 hectares) owned by Haldimand County; Area 2 - George Street North Lands (5.8 hectares); Area 3 including Meritage Landing and other future development (9.2 hectares); and Area 4 a smaller proposed infill development (0.7 hectares).

Table 6 – Cross Street West Gravity Sewer Extension, Watermain Extension and Road Reconstruction			
Terminal sanitary maintenance hole located at Cross Street West / George Street Intersection, 43.4 metres west of Meritage Landing Phase 3 west entrance – Street ‘A’ to Multi-Unit Development with 16 m sanitary sewer extension west to service Areas 1 and 4; and 12 m sanitary sewer extension north to service Area 2 – George Street North.			
External Infrastructure	Invert depth (m)	Exc. depth (m)	Cost
138.0 m - 200mm dia. sanitary sewer (SA9 to SPS), Cross Street West	3.9 m to 5.35 m	4.05 m to 5.5 m	\$17,388.
1200mm OPSD maintenance holes (SA9 to SPS)	3.9 m to 4.9 m	4.35 m to 5.35 m	
63.4 m of road reconstruction west of SA9, incl. Cross Street/George Street intersection bulk excavation, stockpile, backfill, removals trench dewatering, engineered fill watermain extension through intersection road cross-culvert replacement underground utility support-replacement overhead utility support - HONI 3P 575V sidewalks, curb, grading and reinstatement	-	-	\$113,316.
NWQ Wastewater Pumping Station, Stage 1 Capacity 10.0 L/s, Ultimate Firm Capacity 20.0 L/s			
3.0 m diameter X 7.95 m (H) wet well extended precast base slab OPSD safety platform at 5.0m interval (HC Class 1 Wastewater Pumping Station)	8.25 m (27.1 ft.) structure height	8.40 m (27.6 ft.) excavation depth	\$921,396.
100mm Sanitary Forcemain to John Street Maintenance Hole, Including Road Restoration			
100mm diameter Sanitary Forcemain	2.0 m		\$78,750.
SUB-TOTAL CONSTRUCTION	-	-	\$1,130,850.
12% Engineering and Project Management	-	-	\$135,702.
HST (13%)	-	-	\$164,652.
TOTAL CONSTRUCTION COST	-	-	\$1,431,204.
(1) All cost estimates to be adjusted to final tendered costs front-ended by Mountainview and 918965. (2) Finance charges to be applied at Bank Prime + 3%, calculated annually from substantial completion. (3) Future benefitting parties shall pay proportionate share of external servicing costs based on calculation of firm wastewater servicing capacity in accordance with HC Engineering Design Criteria, payable to Haldimand County as a condition of Planning Act approval administered by the County.			

Staging of NWQ Sewage Pumping Station:

Table 7 – NWQ Pumping Station Staging				
Parcel	Average Dry Weather Flow (L/s)	Peak Dry Weather Flow (L/s)	Inflow and Infiltration (L/s)	Firm Capacity (L/s)
<i>High Development Potential Within 5-Year Planning Horizon (Stage 1)</i>				
Area 3	1.49	5.59	2.12	7.71
Area 4	0.25	0.94	0.16	1.10
Stage 1	1.74	6.53	2.28	8.81
Interim Firm Capacity of NWQ Wastewater Pump Station				12.0 L/s
<i>High Development Potential Within 20-Year Planning Horizon</i>				
Area 1	1.16 ⁽¹⁾	4.35	1.66	6.01
<i>Low Development Potential Within 20-Year Planning Horizon</i>				
Area 2	0.93	3.49	1.33 ⁽¹⁾	4.82
TOTAL	3.83	14.37	5.27	19.64
Ultimate Firm Capacity of NWQ Wastewater Pump Station				20.0 L/s
(1) Data provided by Haldimand County Engineering Services, Technical Memo dated July 27, 2020. (2) Harmon Peaking Factor, M for Population 1,180 persons = 3.75. (3) Inflow and infiltration (i/i) allowance = 0.23 L/s per hectare, Haldimand County Design Criteria.				

Based on identified development potential within the NWQ sewer basin, Haldimand County requires that the NWQ sanitary pumping station, replacing the interim Meritage Landing pumping station, consider the following factors:

- (i) shall be modular in design to achieve an ultimate firm capacity of 20 L/s to service development within the sewer basin for the full build-out condition.
- (ii) SPS property footprint and equipment/civil works with greater than a 20-year lifespan should be designed/constructed for the build-out capacity of 20 L/s.
- (iii) A 100mm forcemain is adequate to accommodate capacity for both the 20-year and build-out capacity.

Opportunities for staging of the NWQ wastewater pump station are limited to mechanical-electrical upgrades necessary to achieve firm capacities beyond the front-end servicing of Areas 3 and 4 projected to substantially develop over a 5-year planning horizon. Area 1 is projected to develop within the 20-year planning horizon. Area 2 is projected by Haldimand County as having low potential to develop within the 20-year planning horizon.

The NWQ Wastewater Pump Station engineering and implementation shall conform to the Haldimand County Class 1 Pump Station design requirements.

Proportionate Cost Sharing of NWQ SPS and External Up-Fronted Infrastructure

Table 8 – Proportionate Cost Sharing, Area 1 to 4			
Parcel	Area (Ha.)	Equivalent Population	Proportionate Cost (2024 \$'s)
<i>High Development Potential Within 20-Year Planning Horizon</i>			
Area 1	7.2 ⁽¹⁾	356 ⁽¹⁾	\$431,787.
Area 3	9.2	460	\$557,927
Area 4	0.68	77	\$93,392.
20-Year Total	17.1	893	1,083,106.
<i>Low Development Potential Within 20-Year Planning Horizon</i>			
Area 2 ⁽²⁾	5.8 ⁽¹⁾	287 ⁽¹⁾	\$348,098.
TOTAL	22.9	1,180	\$1,431,204.
(1) Data provided by Haldimand County Engineering Services, P. Wilson Technical Memo dated July 27, 2020. (2) Area 2 is constrained by Hazards and Natural Heritage Features including floodplain (GRCA), unevaluated wetlands (GRCA), wooded area (GRCA) and proximity to provincially significant wetlands (MECP).			

Table 9 – Area 3 Design Population and Proportionate Costs				
Parcel	Area (ha)	Development Density	Equivalent Population	Proportionate Cost (2024 \$'s)
Existing Development ⁽¹⁾ (28 Residential Equiv.)	3.37 (8.32 ac)	existing	70	\$84,902.
Meritage Landing PH. 3A (43 Townhouse Units)	1.47 (3.64 ac)	adult condo	86	\$104,308.
Meritage Landing PH. 3B (44 Units)	0.68 (1.69 ac)	seniors apartment	66	\$80,050.
Massi Lands (71 Townhouse)	2.8 (6.91 ac)	adult condo	142	\$172,230.
Massi Lands (24 Quad Units)		seniors apartment	36	\$43,664.
Parcel east of Massi (30 Townhouse Units)	0.88 (2.18 ac)	35 units/hectare	60	\$72,773.
TOTAL	9.2	-	460	\$557,927

- (4) Existing Development is assessed at 28 S.F. Residential Unit Equivalents, including:
 - (f) Meritage Landing Phase 1 – Kingfisher Place, 12 S.F. Residential Units
 - (g) Meritage Landing Phase 2 – Robin Heights, 13 S.F. Residential Units
 - (h) 403 Cross Street Dry Storage/Contractor Yard = 1 S.F. Residential Equivalent (0.92 ac)
 - (i) 449 Helena Street (0.91 ac)
 - (j) 519 George Street (0.46 ac)
- (5) The Dunnville Inn Bed & Breakfast located at 809 George Street has been excluded from Area 3, due to its recent development and low likelihood for redevelopment with the planning horizon.
- (6) A vacant residential lot at 600 John Street has been excluded from Area 3, based on anticipated sanitary servicing from John Street due to topographical constraints relative to Kingfisher Place.