City of Guelph

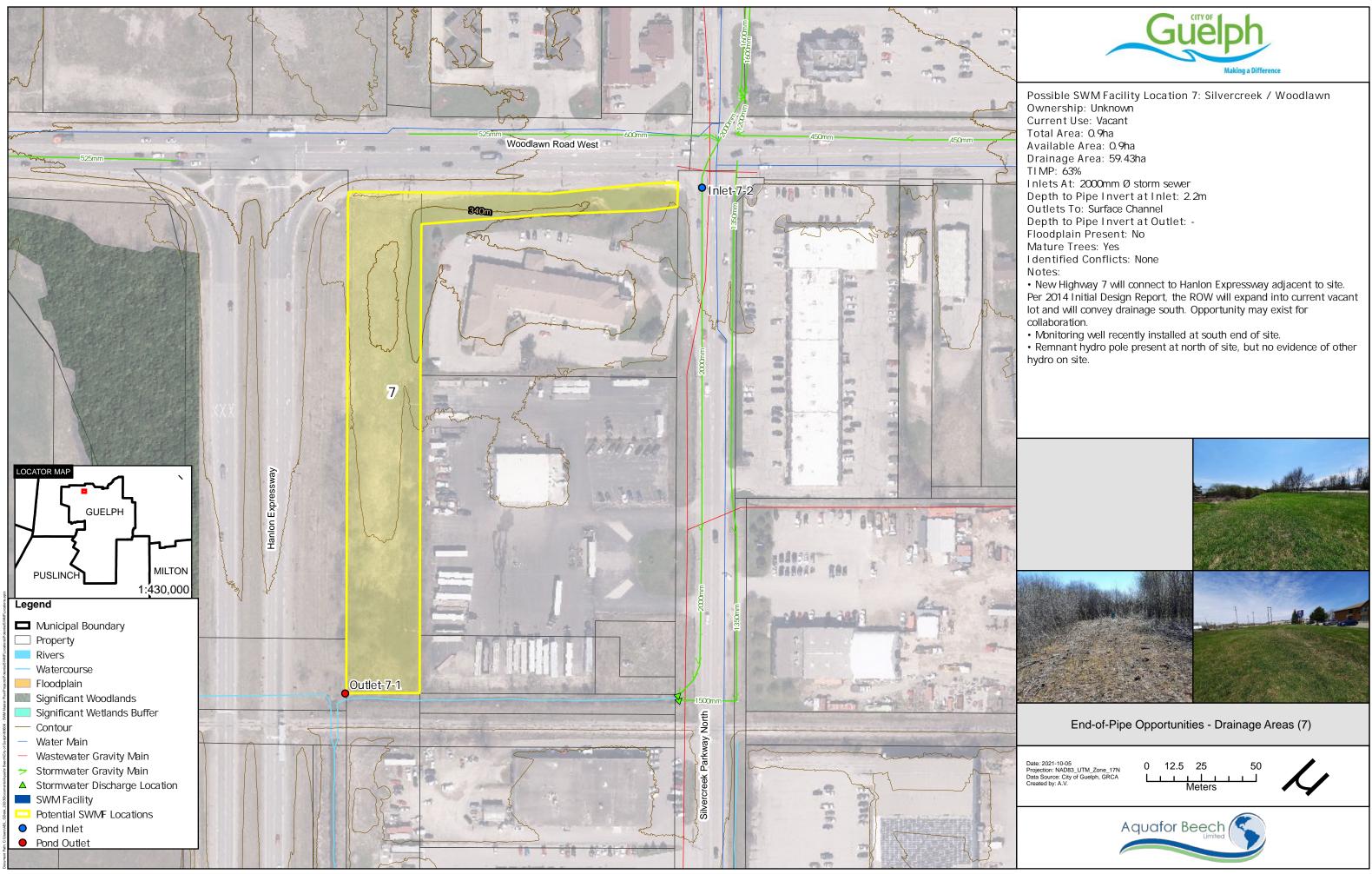
Stormwater Management Master Plan

Appendix I.2 – New End-of-Pipe Stormwater Management Facility Opportunities Part 2

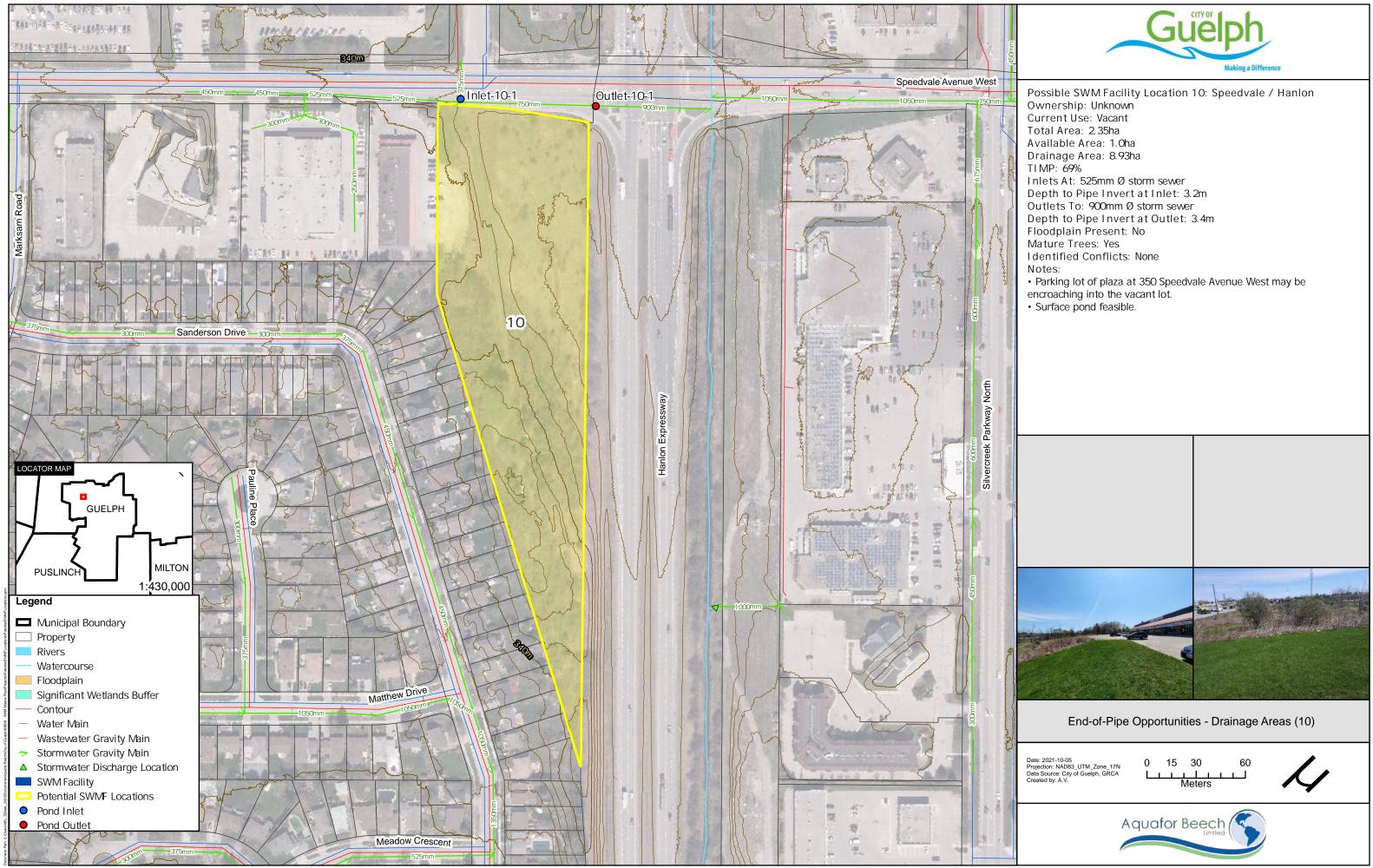
January 2023



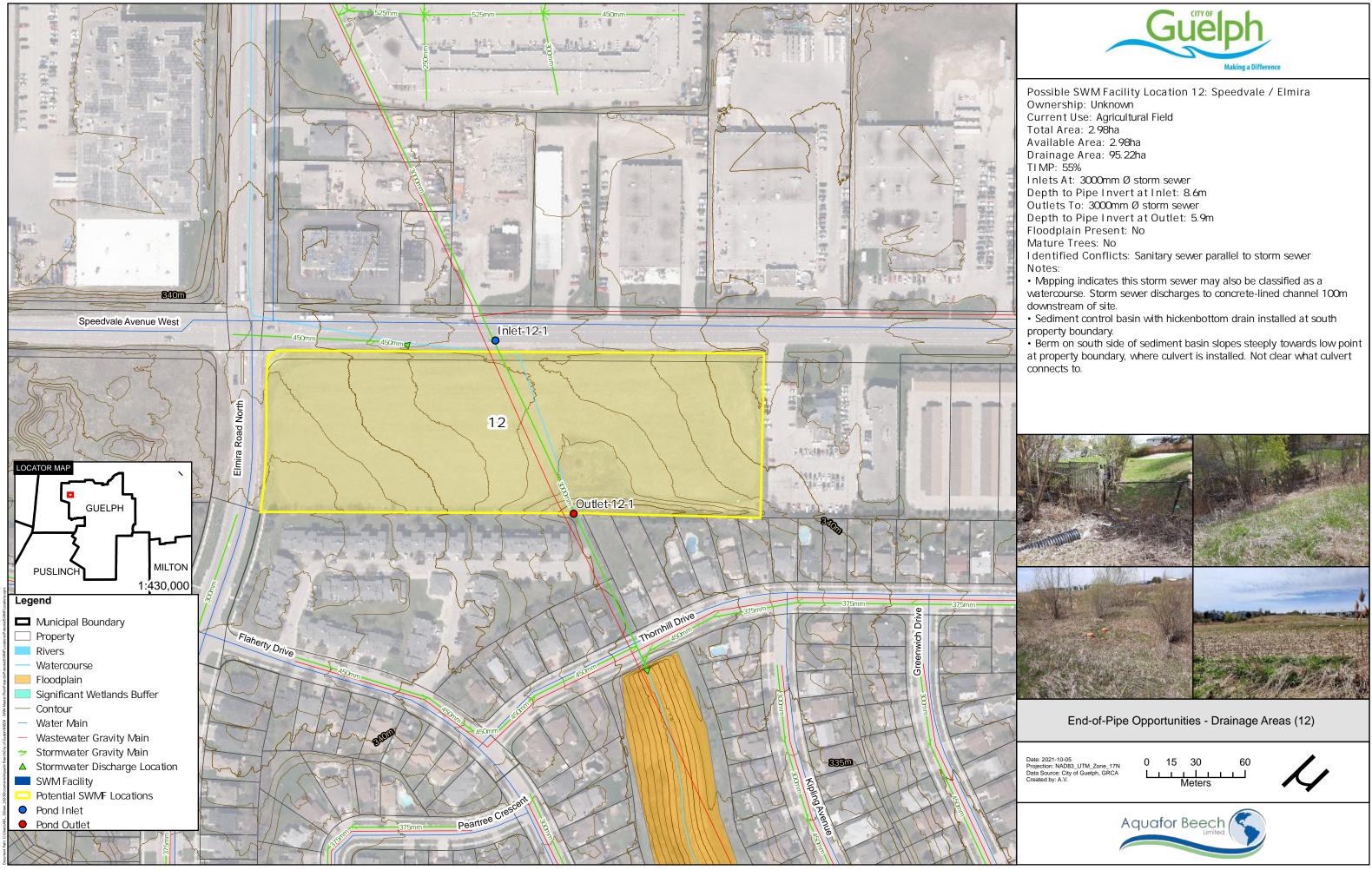
Appendix B: Preliminary Mapping – Non-Feasible Sites (18 Sites)



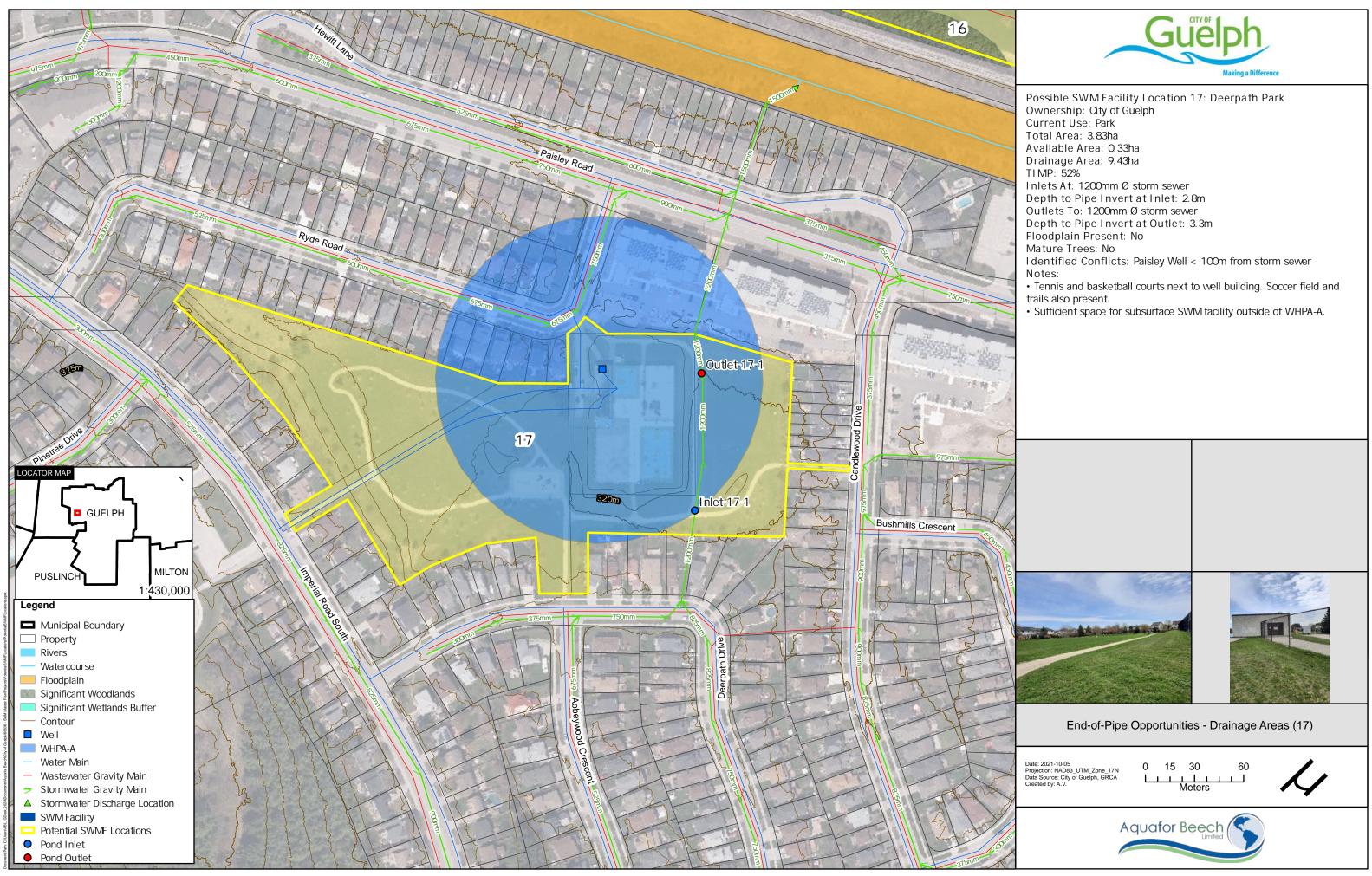








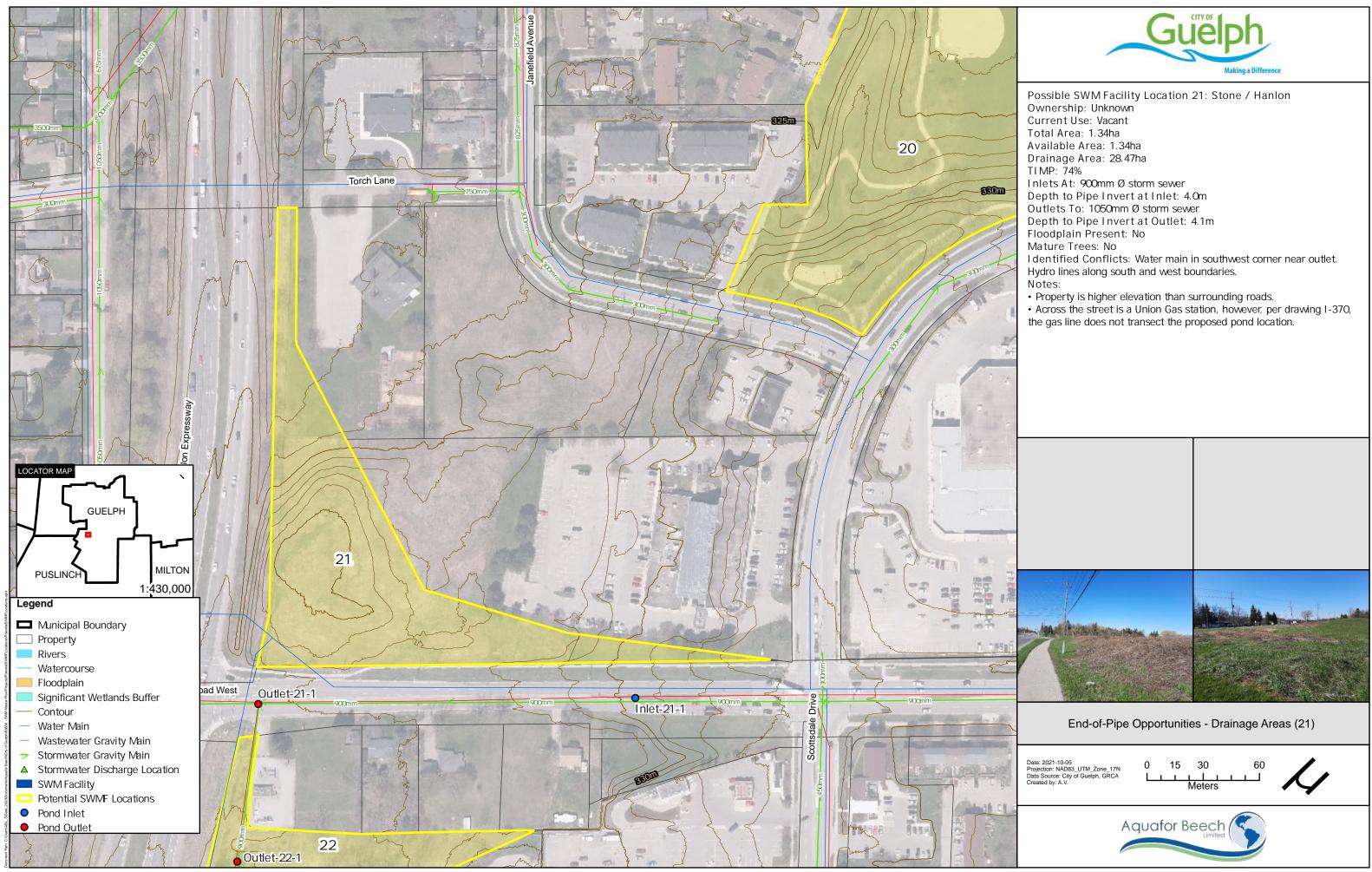




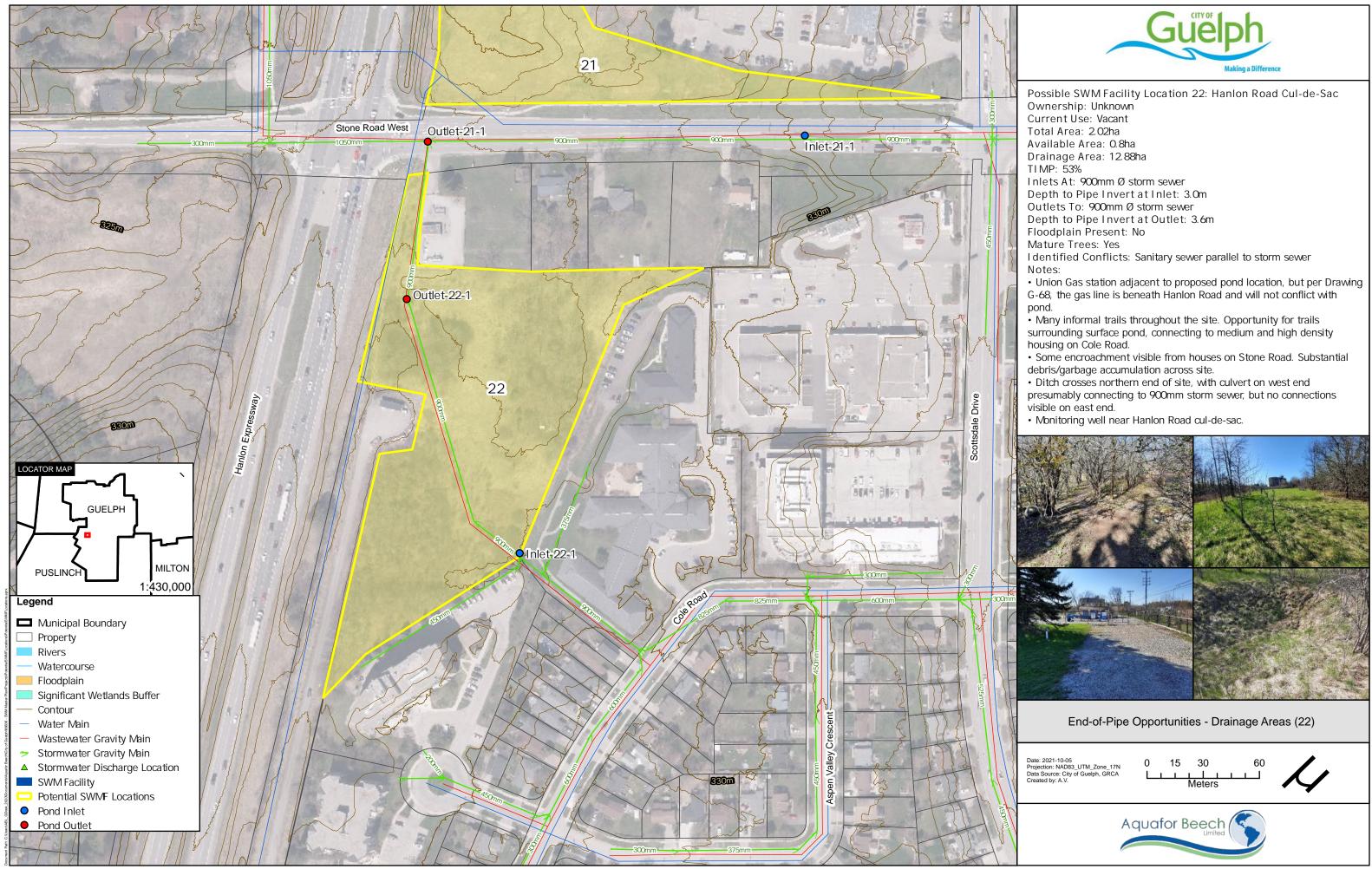




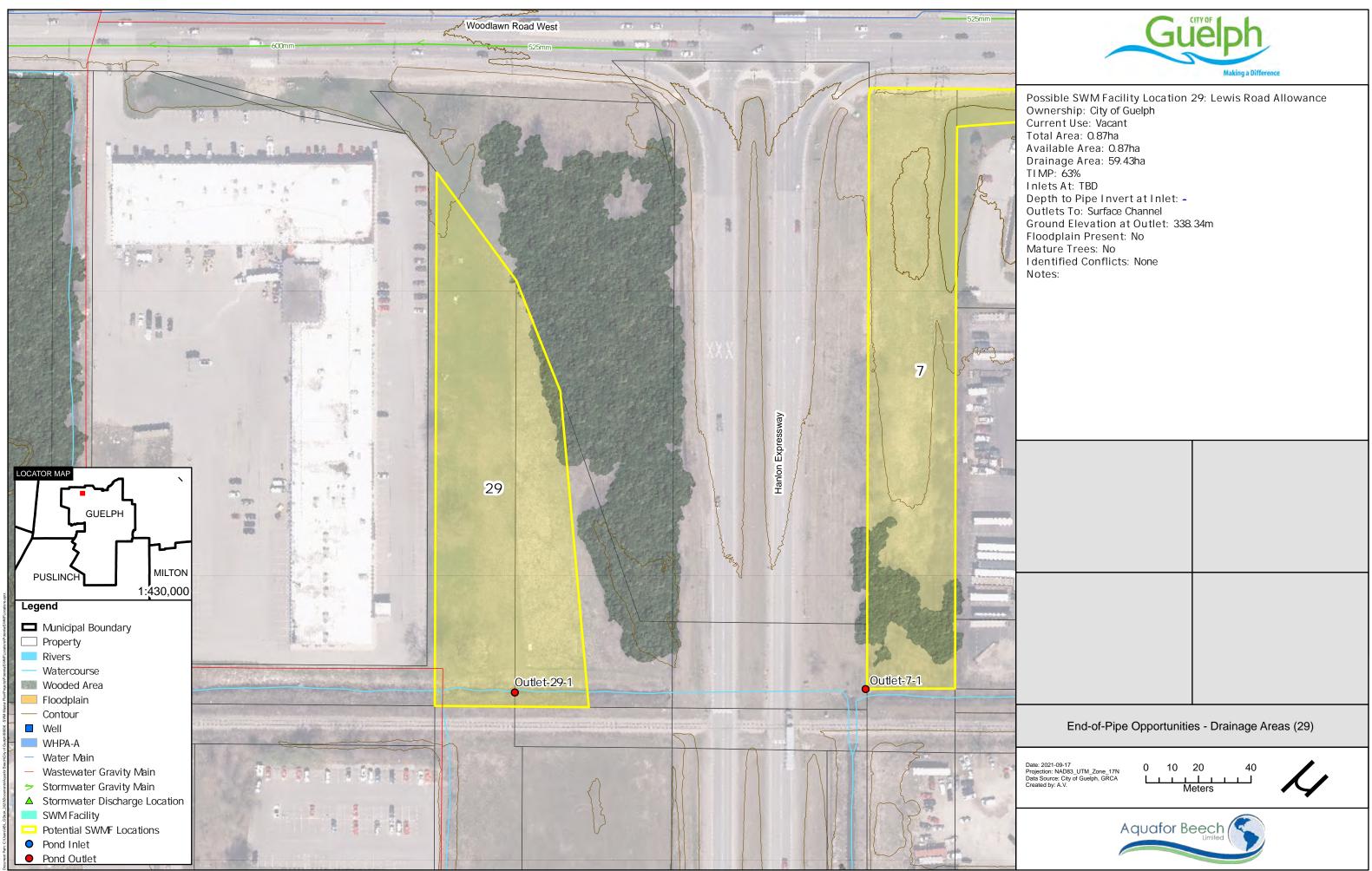








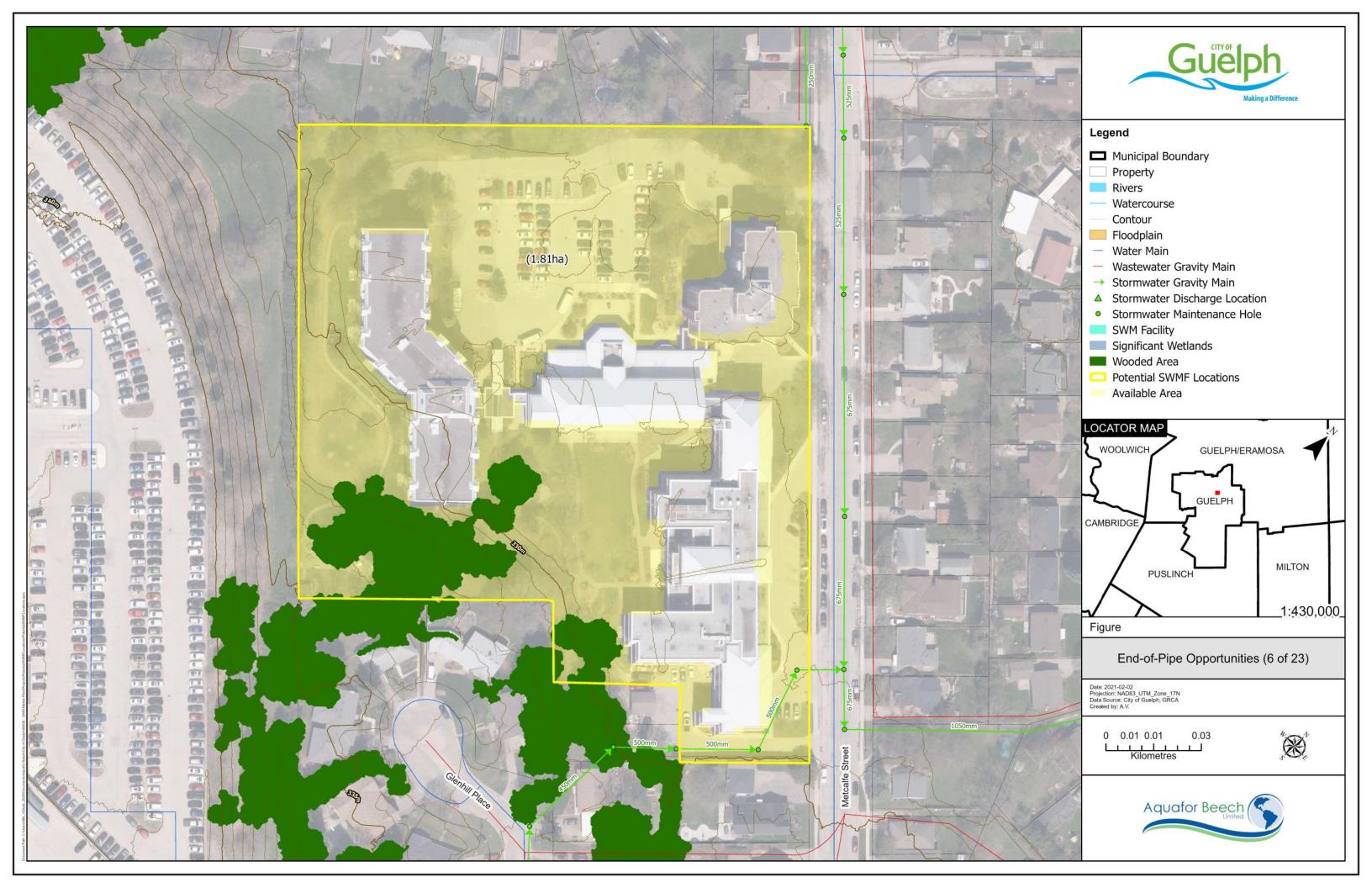


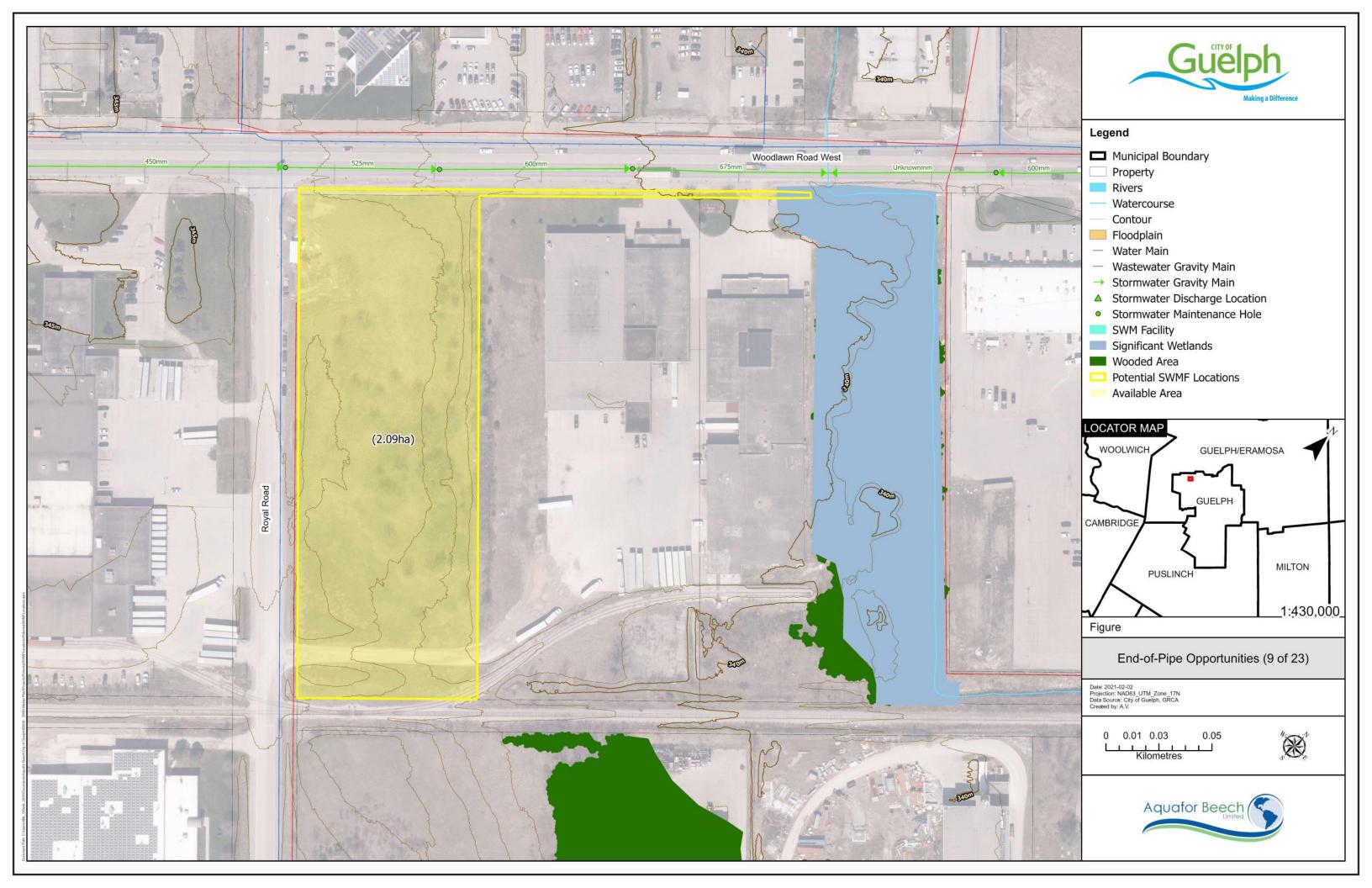


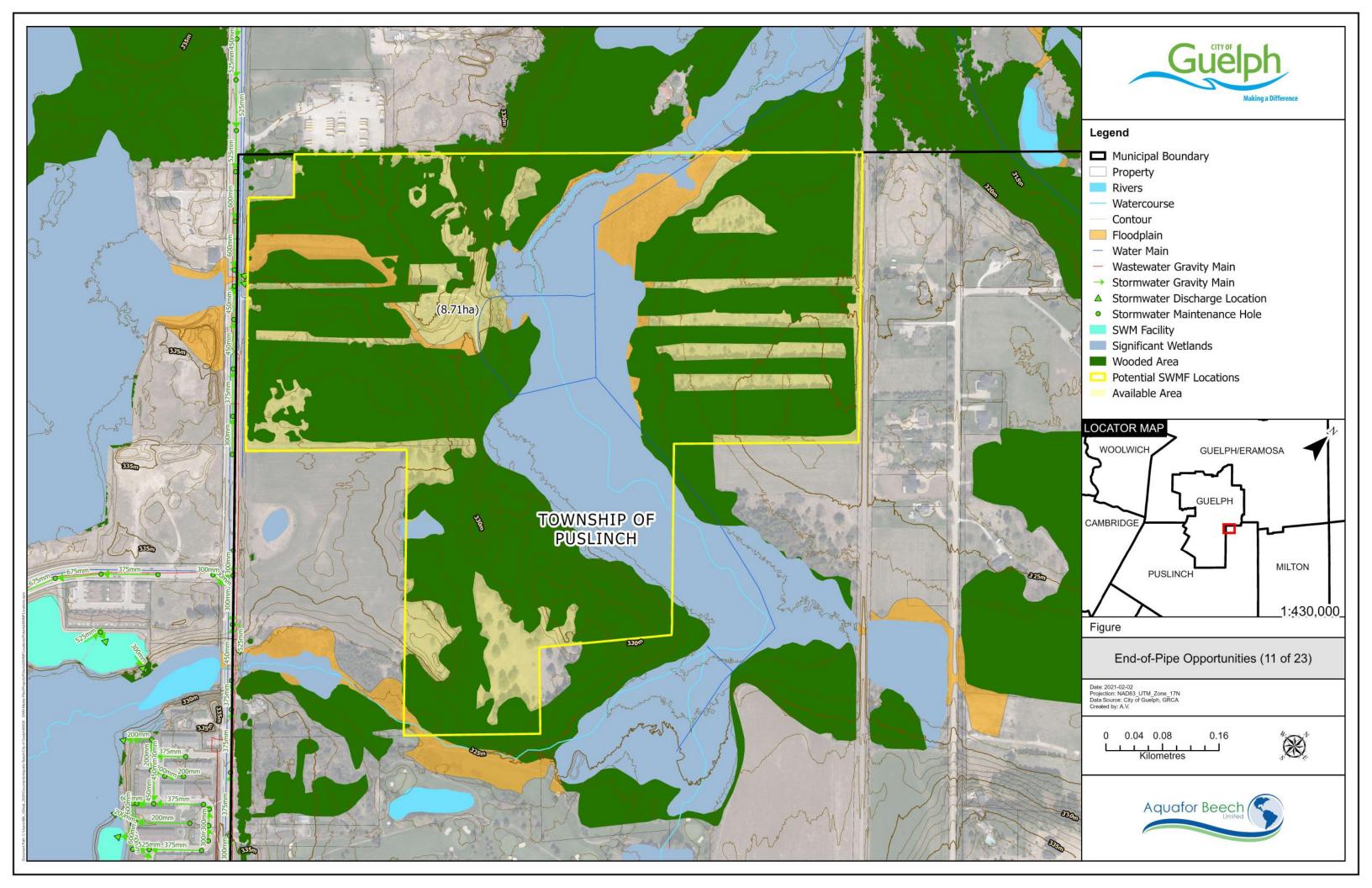


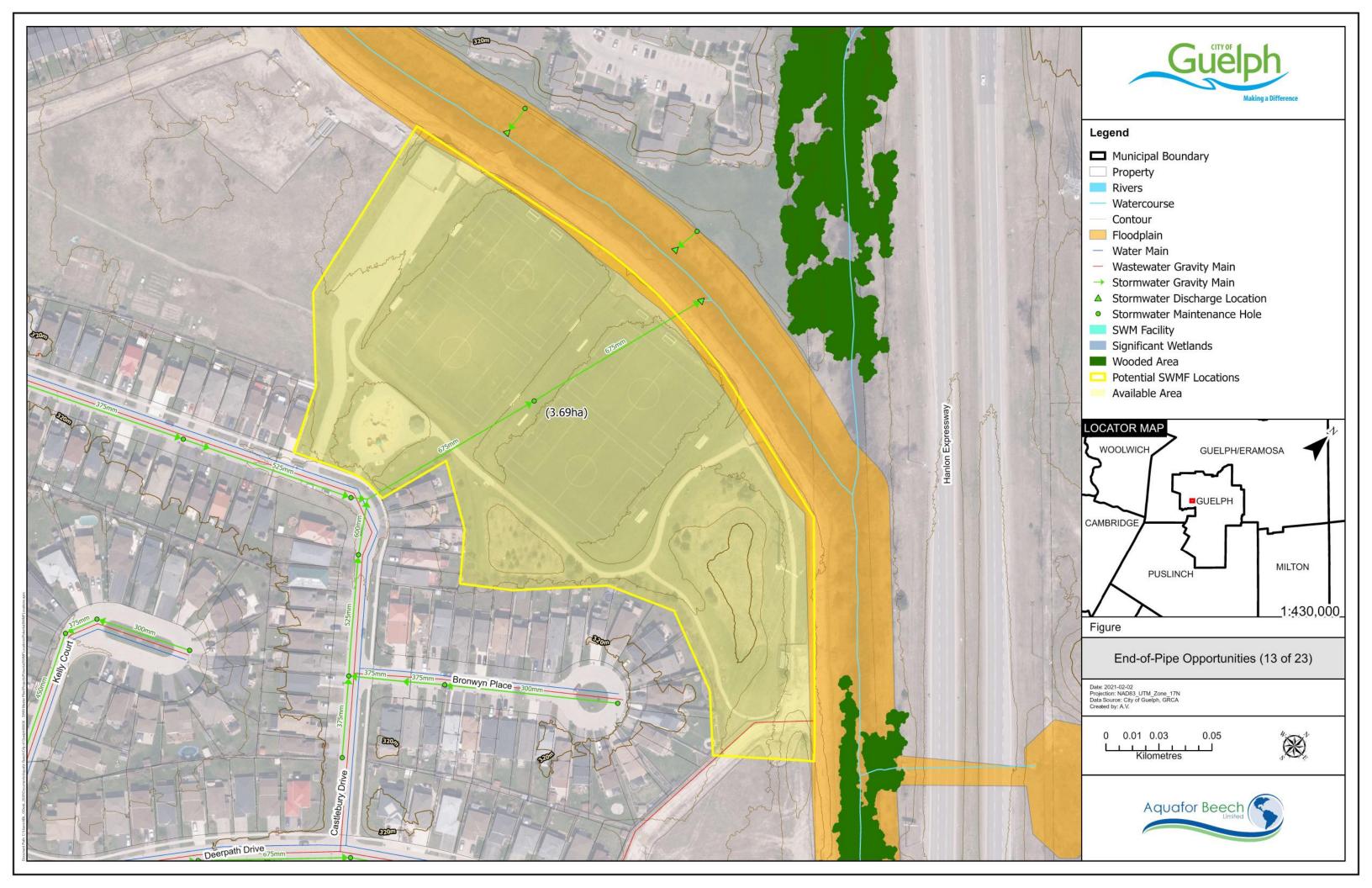


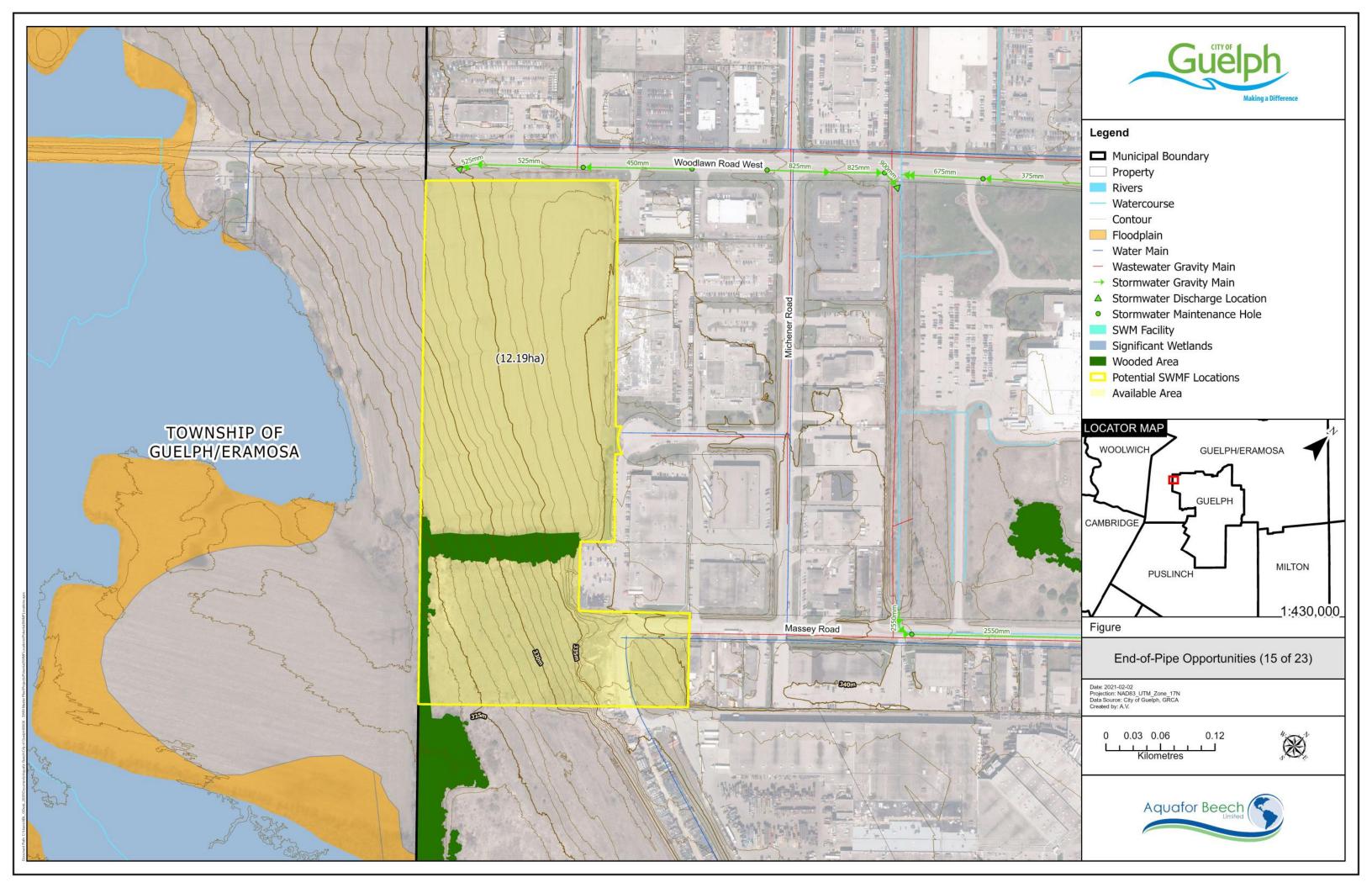


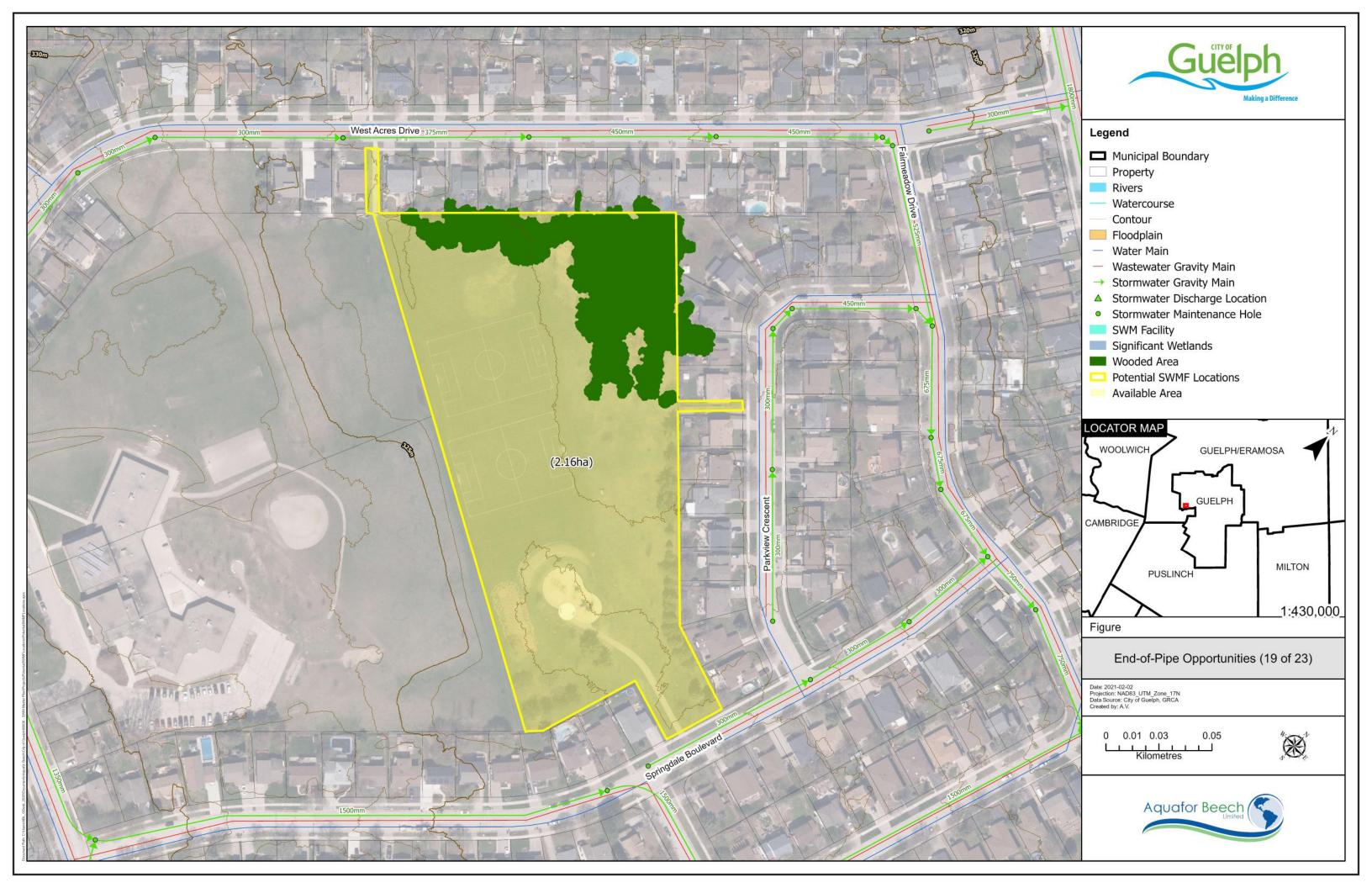


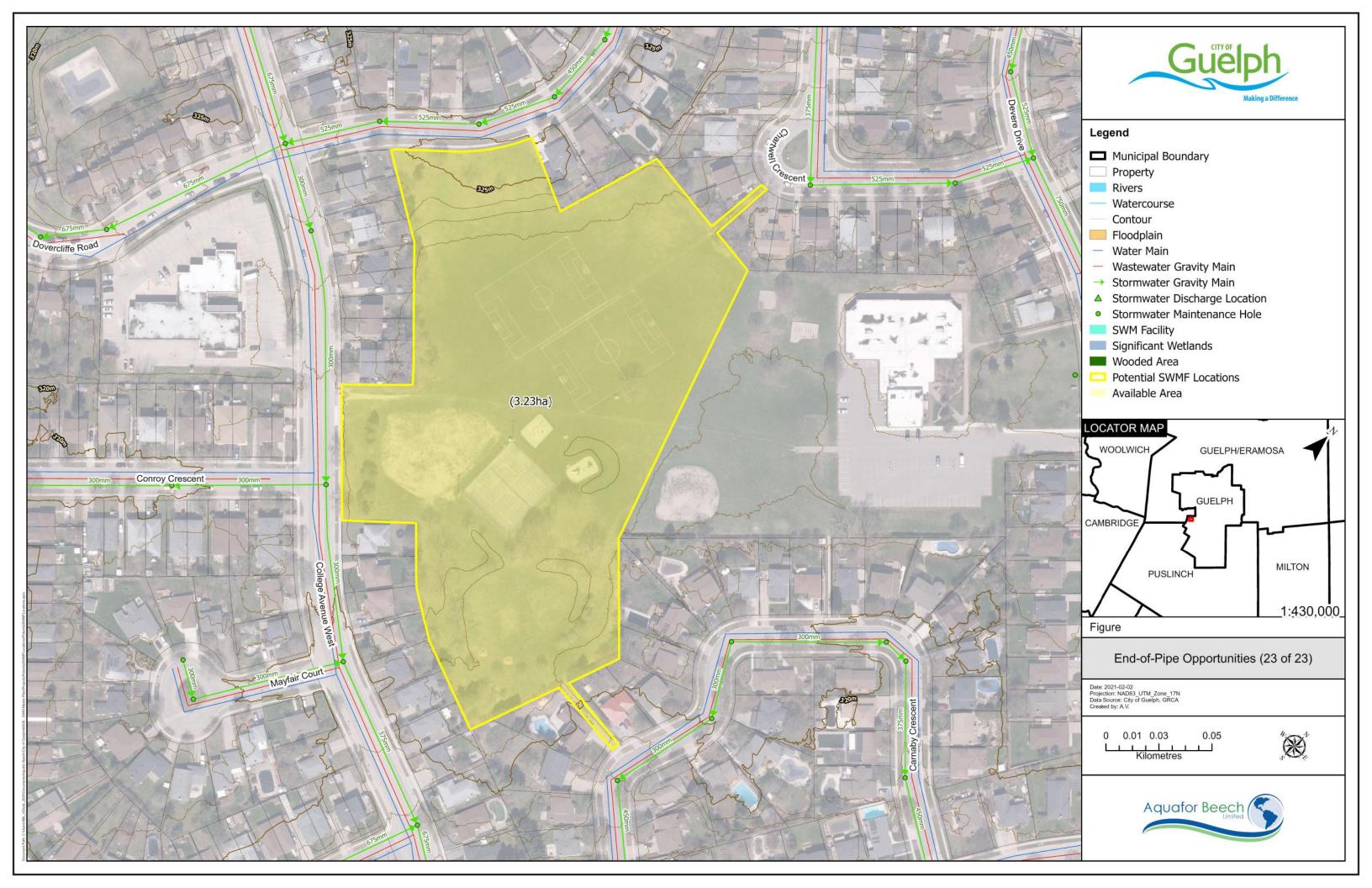


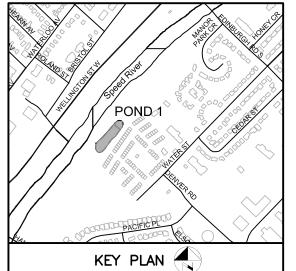




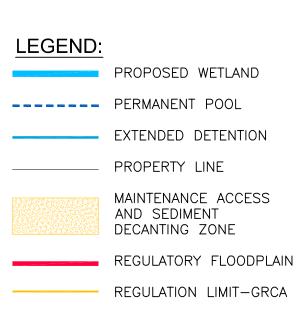






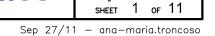


Retrofit Pond No.1 Wet	land
Drainage Area to Outfall	30.74 ha
Impervious Percentage to Outfall	30%
Required Permanent Pool	1037 m3
Required Extended Detention	1230 m3
Actual Permanent Pool Volume	951 m3
Actual Extended Detention Volume	1021 m3
Rated Treatment Capacity	25.53 ha
Facility Surface Area	3250 m2





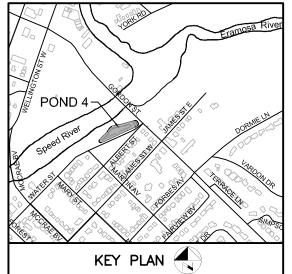
STORMWATER MANAGEMENT	PRELIMI
MASTER PLAN	F
CITY OF GUELPH	



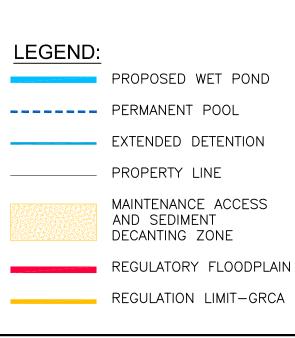
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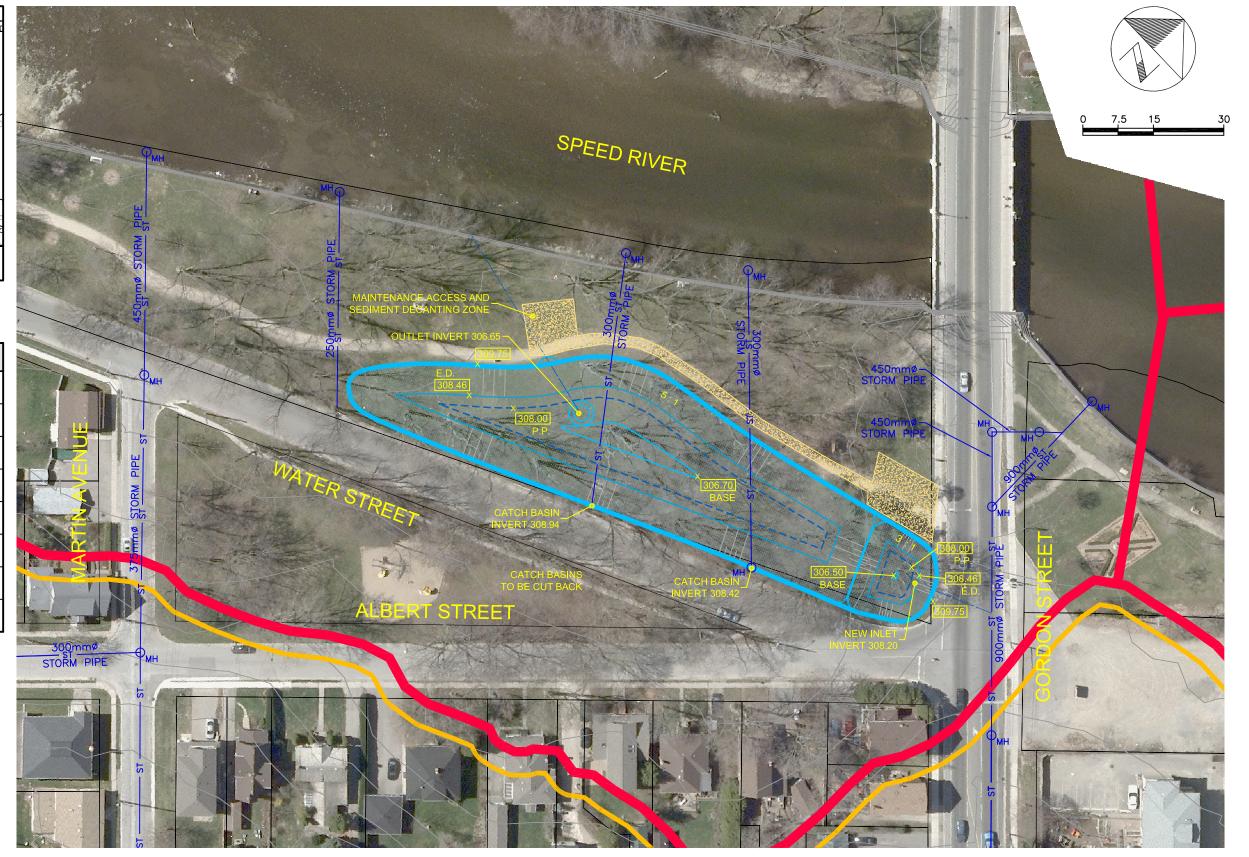
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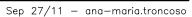


Retrofit Pond No.4 Wet	Pond
Drainage Area to Outfall	14.50 ha
Impervious Percentage to Outfall	40%
Required Permanent Pool	1631 m3
Required Extended Detention	580 m3
Actual Permanent Pool Volume	984 m3
Actual Extended Detention Volume	573 m3
Rated Treatment Capacity	8.74 ha
Facility Surface Area	2973 m2





STORMWATER MANAGEMENT MASTER PLAN	PRELIM
CITY OF GUELPH	



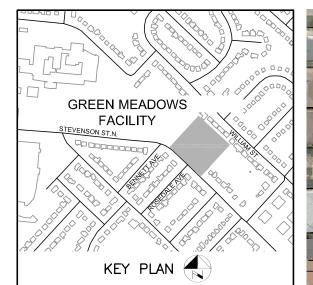
MINARY CONCEPT DESIGN RETROFIT POND 4



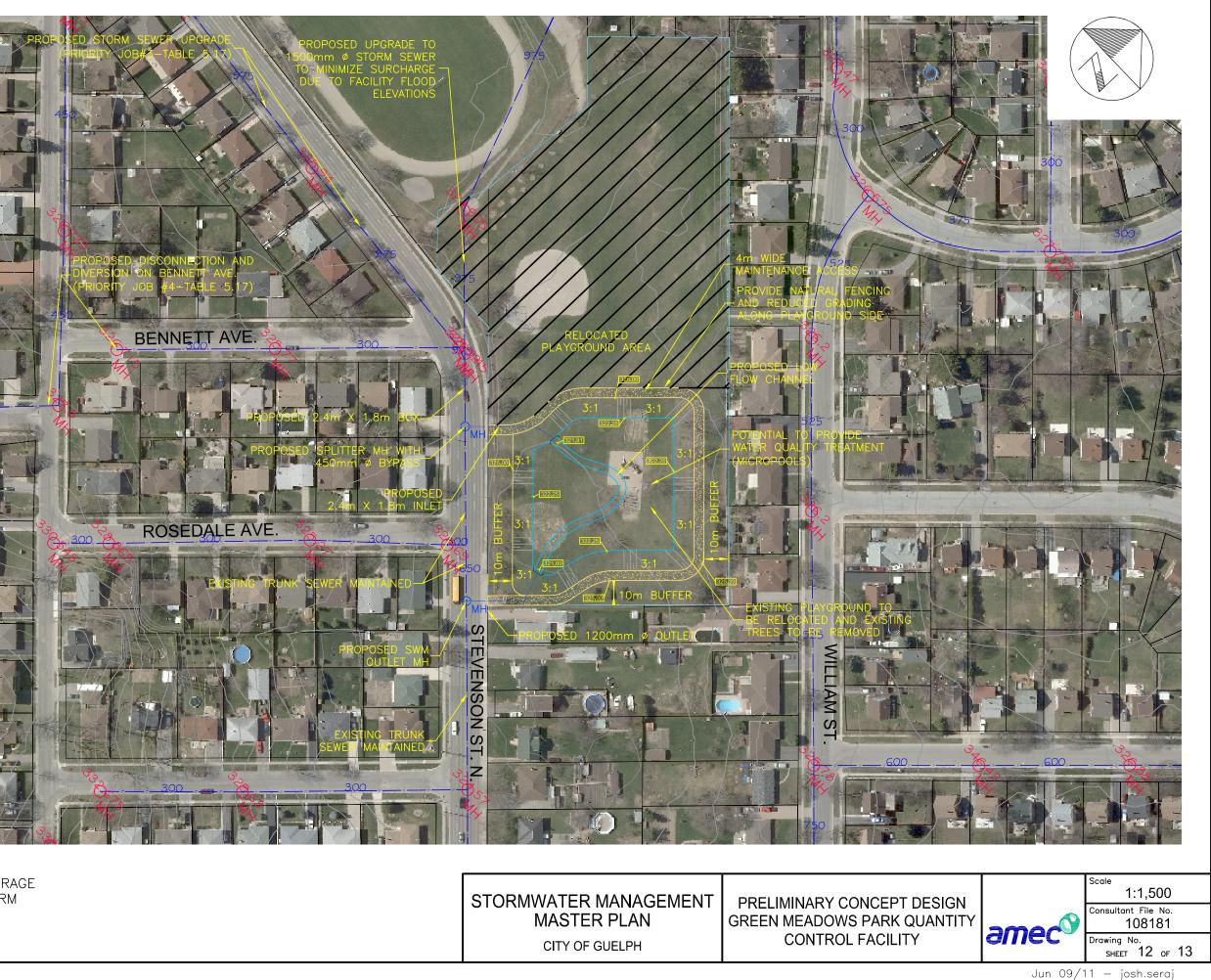
Appendix C: Preliminary Water Quality Performance Assessment

						Enhanced Permanent Pool			Enhand	Enhanced Permanent Pool Enhanced Wet Pond								
Site ID	Location Name	DA (ha)	New TIMP	TIMP (%)	Pipe Depth	Wet Pond	Wetland	Hybrid	Wet Pond	Wetland	Hybrid	Required	Required	Avilable	Avail Area	Erosion Control	Ex Det Vol	Perm Pool
						(m^3/ha)	(m^3/ha)	(m^3/ha)	(m^3)	(m^3)	(m^3)	Area (m^2)	Area (ha)	Area (ha)	Check	Vol (m^3)	(m^3)	Volume (m^3)
1	Golfview Park	46.8	0.4152585	42	4.6	157	88	124	7,366	4115	5795	4910	0.49	1.37	yes	4859	1,872	5,494
2	Waverley Park	7.3	0.4070274	41	2.8	156	87	122	1,136	635	894	757	0.08	2.3	yes	743	292	844
3	Victoria Road Recreation Cent	17.6	0.44	44	1.6	163	91	128	2,867	1599	2254	1911	0.19	0.89	yes	1936	704	2,163
4	Green Meadows Park	81.5	0.47	47	3.6	170	94	133	13,819	7693	10853	9213	0.92	2.09	yes	9576	3,260	10,559
5	Bailey Park	23.8	0.43	43	5.9	161	90	126	3,824	2134	3007	2549	0.25	4.8	yes	2559	952	2,872
6	The Elliott Community	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	Silvercreek / Woodlawn	59.4	0.63	63	2.3	205	113	160	12,185	6731	9533	8124	0.81	1	yes	9356	2,376	9,809
8	Exhibition Park	39.6	0.44	44	1.0	163	91	128	6,450	3598	5071	4300	0.43	0.86	yes	4356	1,584	4,866
9	Royal / Woodlawn	4.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	Speedvale / Hanlon	8.9	0.69	69	2.9	218	120	171	1,944	1072	1520	1296	0.13	1	yes	1535	356	1,588
11	Victoria / Owens	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	Speedvale / Elmira	95.2	0.55	55	8.3	187	104	147	17,836	9887	13978	11890	1.19	2.98	yes	13090	3,808	14,028
13	Castlebury Park	3.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	Dunhill Place Park	9.9	0.47	47	4.3	170	94	133	1,679	935	1318	1119	0.11	0.7	yes	1163	396	1,283
15	Woodlawn / Governors	2.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16	Margaret Greene Park	85.8	0.45	45	4.8	165	92	130	14,167	7896	11133	9444	0.94	11.1	yes	9653	3,432	10,735
17	Deerpath Park	9.4	0.52	52	2.5	181	100	142	1,698	943	1332	1132	0.11	0.33	yes	1222	376	1,322
18	Centennial Park	15.7	0.44	44	3	163	91	128	2,557	1426	2010	1705	0.17	2.7	yes	1727	628	1,929
19	Springdale Park	0.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20	W.E. Hamilton Park	241.87	0.48	48	9.9	172	96	135	41,549	23117	32622	27700	2.77	1.9		29024	9,675	31,874
21	Stone / Hanlon	28.5	0.74	74	3.8	230	126	179	6,544	3600	5109	4362	0.44	1.34	yes	5273	1,140	5,404
22	Hanlon Road Cul-de-Sac	12.9	0.53	53	3.4	183	101	143	2,359	1309	1850	1573	0.16	0.8	yes	1709	516	1,843
23	Dovercliffe Park	3.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24	L-1 Water Street	19.68	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25	L-4(a) Gordon Street	13.96	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26	L-13 Windsor Park	105.9	0.39	39	3.2	152	85	120	16,072	8995	12655	10715	1.07	0.48		10325	4,236	11,836
27	Stevenson / Guelph Junction R	177.9	0.42	42	1.1	158	88	125	28,187	15741	22171	18791	1.88	1.27		18680	7,116	21,071
28	Dawn Avenue	8.63	0.31	31	0	134	75	106	1,156	651	913	771	0.08	0.3	yes	669	345	811
29	Lewis Road Allowance	59.4	0.63	63	2.3	205	113	160	12,185	6731	9533	8124	0.81	0.87	yes	9356	2,376	9,809
30	Massey Road	5.1	0.72	72	0	225	124	176	1,148	632	897	766	0.08	0.53	yes	918	204	944
31	Springdale Park	31.74	0.41	41	4.8	157	88	124	4,992	2789	3927	3328	0.33	2.16	yes	3291	1,270	3,723
32	Oak Street Park	29.65	0.39	39	3.87	152	85	120	4,500	2518	3543	3000	0.30	0.7	yes	2891	1,186	3,314
33	Franchetto Park	44.42	0.43	43	3.37	161	90	126	7,137	3983	5612	4758	0.48	3.14	yes	4775	1,777	5,360
34	End of Industrial Street	229.16	0.4406	44	2	163	91	128	37,358	20835	29366	24905	2.49	3.46	yes	25242	9,166	28,192

Appendix D: Preliminary Pond Designs from Previous Studies



Green Meadows Park Quant	ity Control
Facility	
Proposed Drainage Area to Facility	116.50 Ha
Approximate Impervious Percentage to Facility	40%
2 Year Storage	1,900m³
2 Year Max Operating Level @ 0.5m Depth (Base of Slope)	322.75m
5 Year Storage	5,100m³
5 Year Max Operating Level @ 1.35m Depth (Base of Slope)	323.60m
Base Facility Surface Area	3,100m²

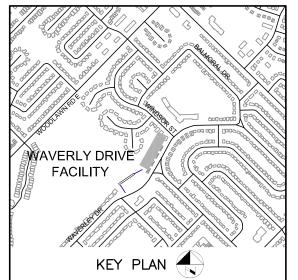


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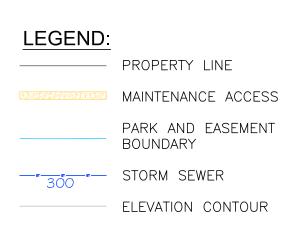
PROPERTY LINE MAINTENANCE ACCESS PARK BOUNDARY STORM SEWER 300 ELEVATION CONTOUR POTENTIAL ADDITIONAL STORAGE AREA FOR 100-YEAR STORM (LOWER TO $324.50m \pm$)

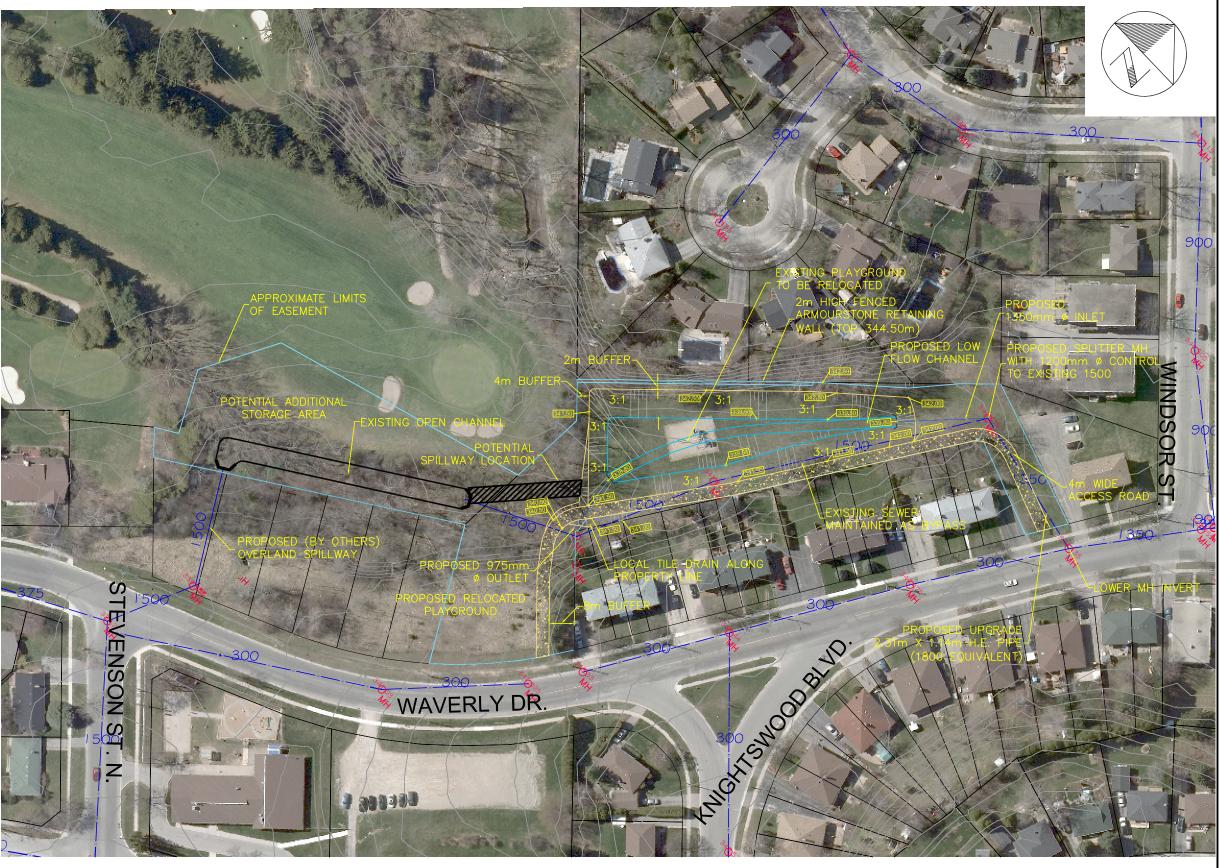
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Waverly Drive Quantity Cont	rol Facility
Proposed Drainage Area to Facility	111.50 ha
Approximate Impervious Percentage to Facility	40%
2 Year Storage	600m³
2 Year Max Operating Level @ 0.34m Depth (Base of Slope)	339.84m
5 Year Storage	2,000m³
5 Year Max Operating Level @ 1.29m Depth (Base of Slope)	340.79m
Base Facility Surface Area	1,100m²



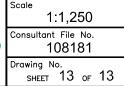


STORMWATER MANAGEMENT MASTER PLAN CITY OF GUELPH

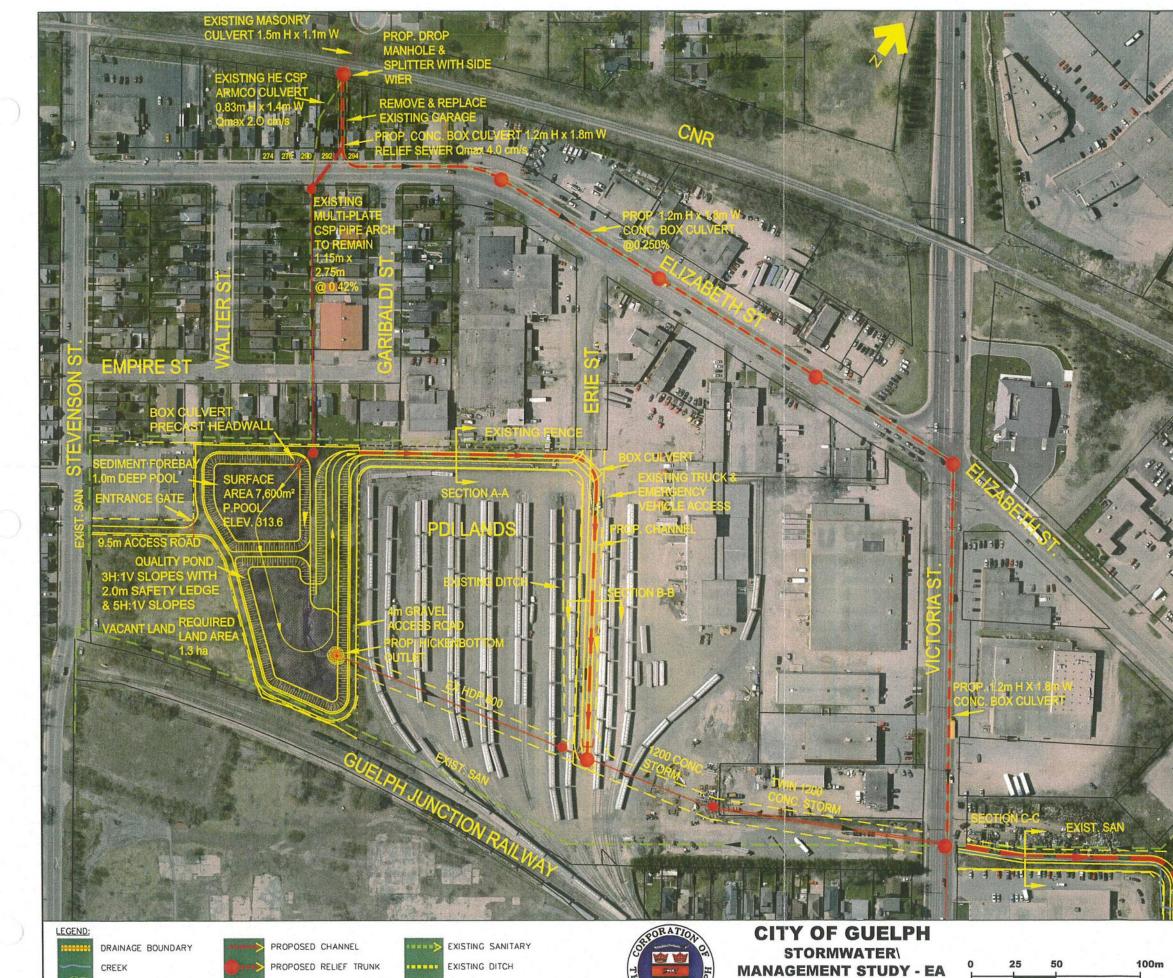
PRELIMINARY CONCEPT DESIGN WAVERLY DRIVE QUANTITY CONTROL FACILITY



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PROPOSED QUALITY POND

PROPOSED HEADWALL

EXISTING STORM SYSTEM



ALTERNATIVE C PREFERRED SHEET 1 OF 2



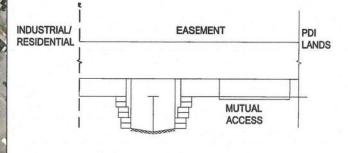
SHEET 1 OF 2

WEST OF VICTORIA STREET

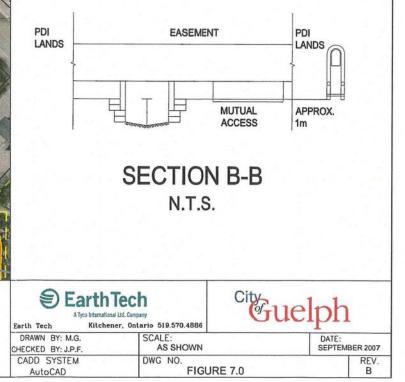
BOX CULVERT AND DROP STRUCTURE CNR TO ELIZABETH EMPIRE STREET PIPE ARCH OUTFALL REMAINS WITH WET CELL FOR WATER QUALITY IMPROVEMENTS (OPTIONAL) ELIZABETH SPLITTER MODIFIED ELIZABETH STREET BOX CULVERT RELIEF TRUNK TO VICTORIA STREET AND SOUTH TO SPITTER

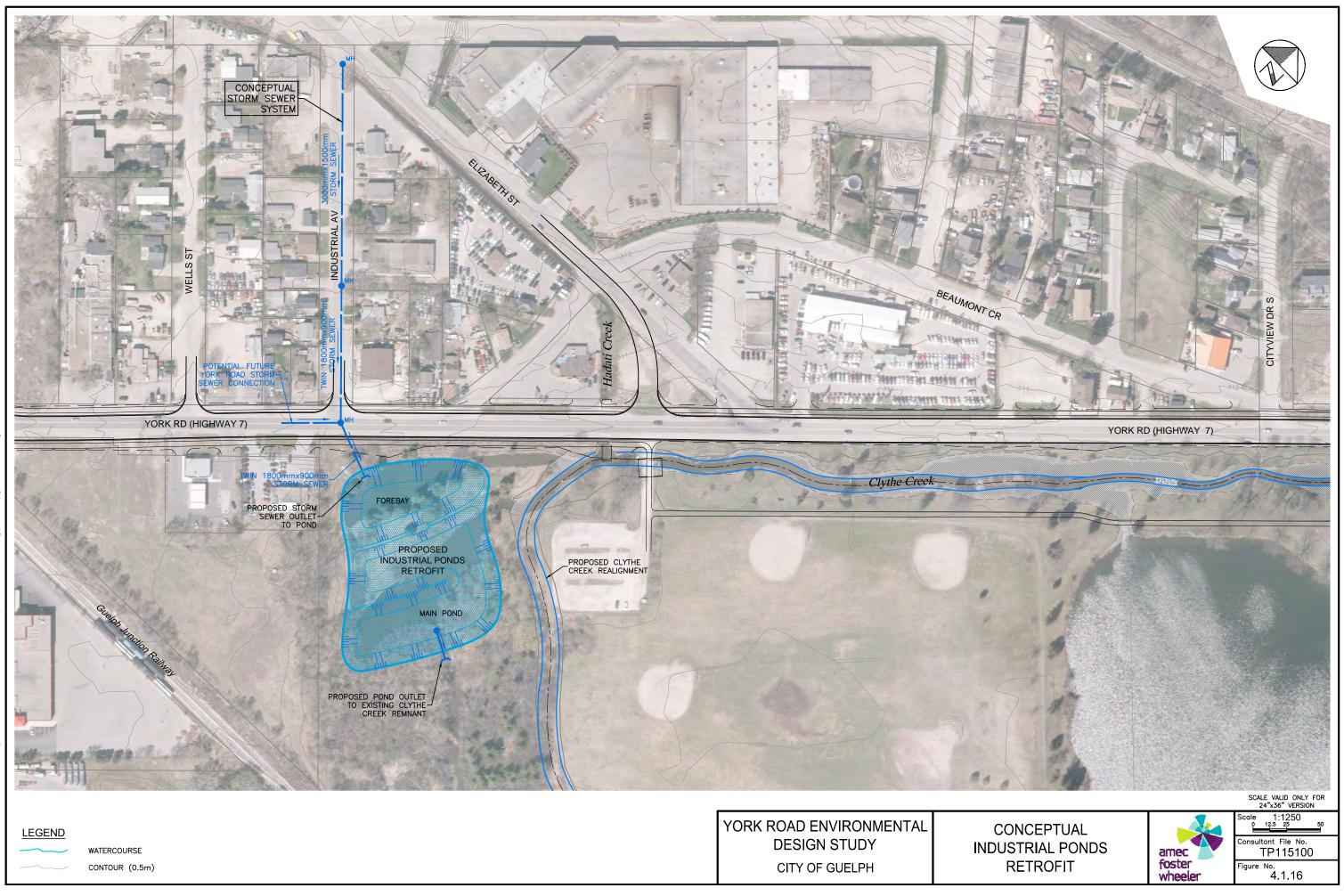
CONSTRUCTION WITHIN ELIZABETH AND VICTORIA R.O.W. EASEMENTS FOR EXISTING DITCH AND SEWERS OVER PDI FOR CITY MAINTENANCE AND ACCESS RIGHTS

OPEN CHANNEL X-SECTIONS

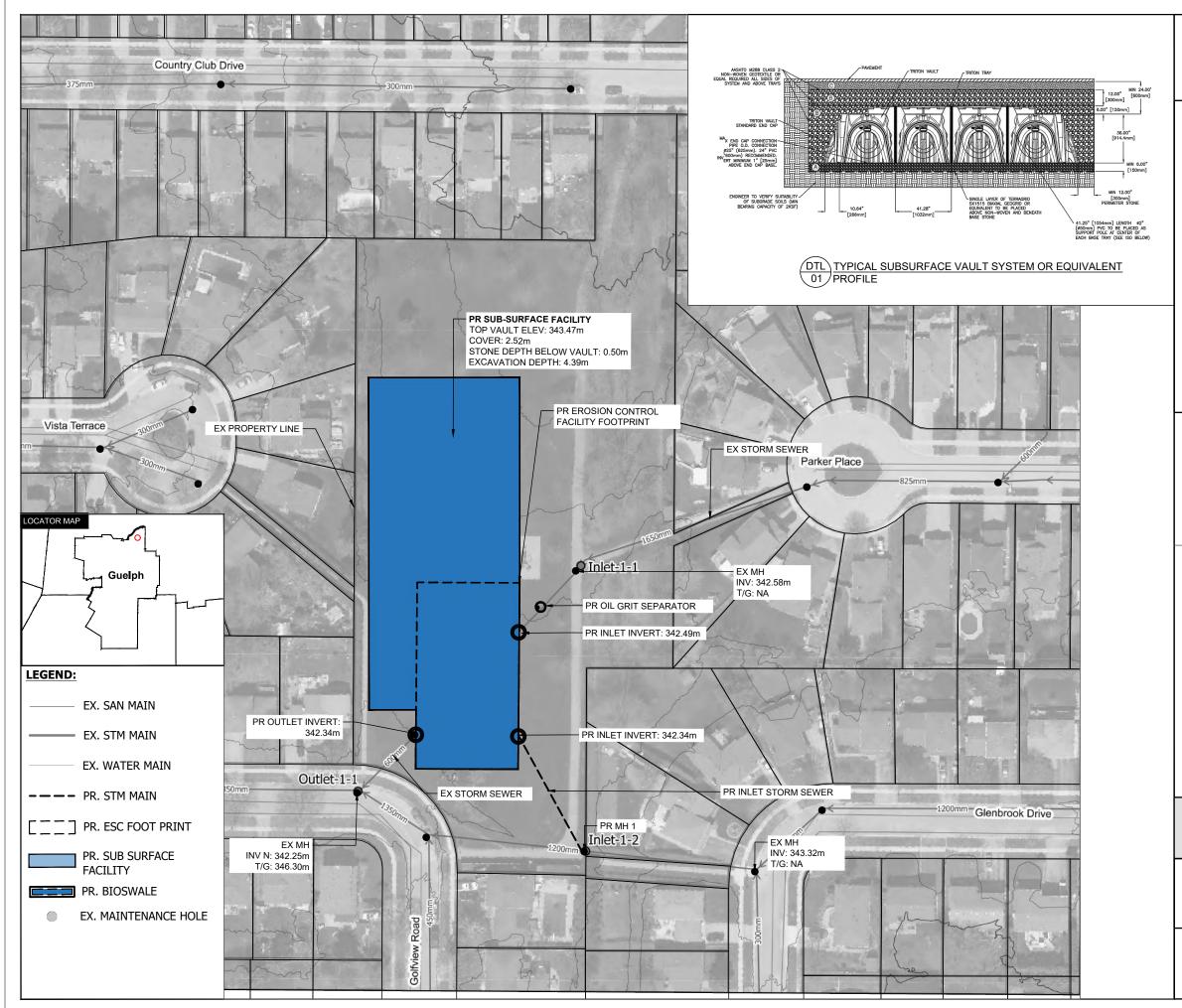


SECTION A-A N.T.S.





Appendix E: Concept Designs





Park Ownership: City of Guelph Current Use: Park Total Area: 1.37ha Available Area: 1.4ha Drainage Area: 1) 5.25ha; 2) 41.51ha TIMP: 46%; 41% Inlets At: 1) 1650mm Ø storm sewer; 2) 1200mm Ø storm sewer Outlets To: 1350mm Ø storm sewer Depth to Pipe Invert at Inlet: 1) 4.6m; 2) 4.1m Depth to Pipe Invert at Outlet: 3.4m Floodplain Present: No Mature Trees: Yes Identified Conflicts: Hydro pole at ice rink Notes: Playground and basketball hoop present on site with a community • ice rink installed in winter

- Scattered mature trees in northern half of park
- Site has good access and potential for a surface pond
- Existing pathway system present

PROPOSED CONDITIONS:

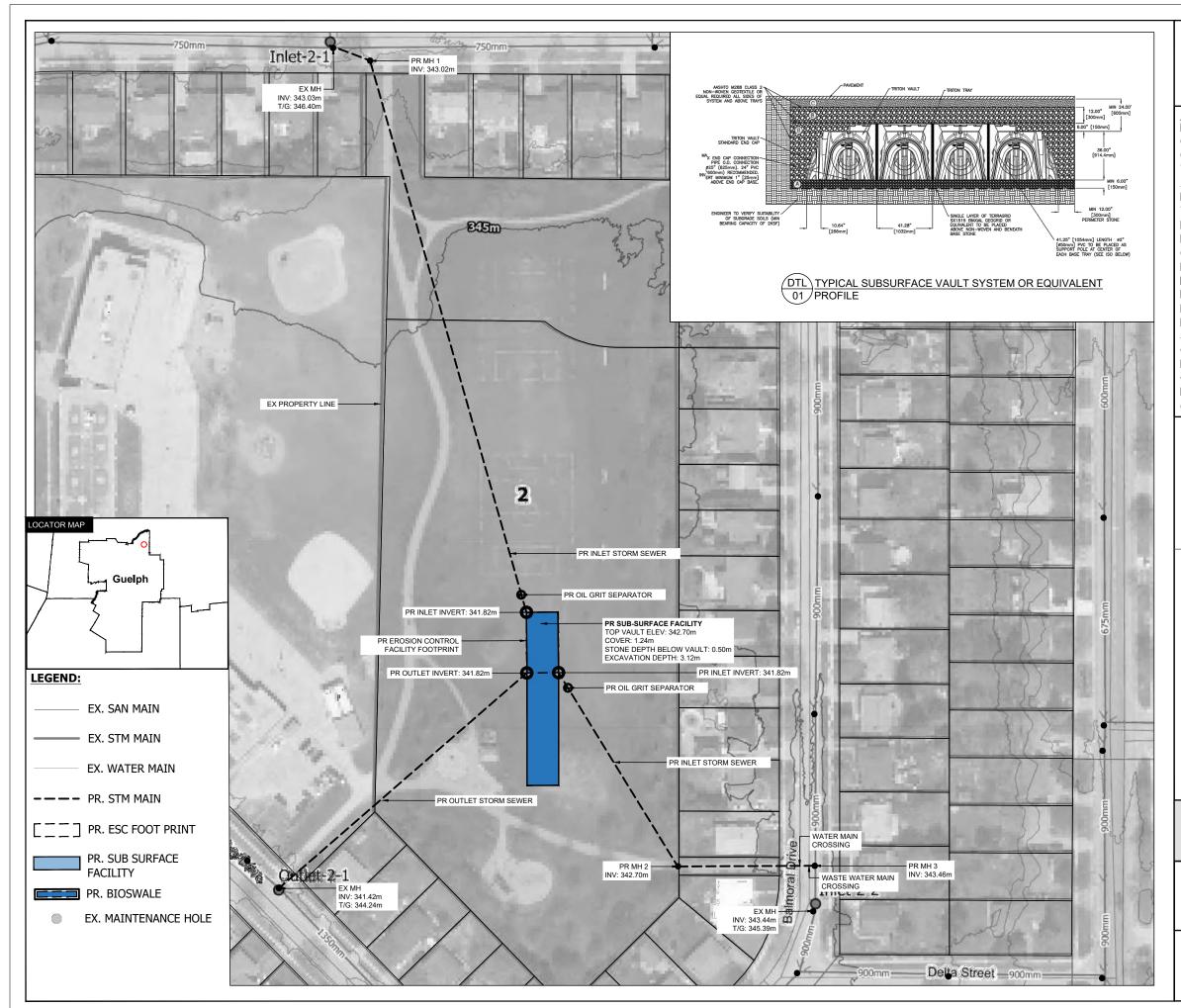
System: Subsurface Infiltration/Storage Facility Facility Footprint: 3981.16m² Total Facility Storage: 5494m³ Total Required Storage (enhanced water quality): 5494m³ Volume Reduction (%): 100%

NOTES:

- Multiple inlets may be required to bring flow into proposed vault system
- WHPA Vulnerability Score: 8

Location 1: Golfview End-of-Pipe Concept Design

Date: 2021-10-05 Projection: NAD83_UTM_Zone_17N Data Source: City of Guelph, GRCA Created by: A.V.





Possible SWM Facility Location 2: Waverley Park Ownership: City of Guelph Current Use: Park Total Area: 2.59ha Available Area: 2.3ha Drainage Area: 1) 5.48ha; 2) 1.81ha TIMP: 1) 42%; 2) 37% Inlets At: 1) 750mm Ø storm sewer; 2) 900mm Ø storm sewer Depth to Pipe Invert at Inlet: 1) 2.8m; 2) 1.4m Outlets To: 1350mm Ø storm sewer Depth to Pipe Invert at Outlet: 2.3m Floodplain Present: No Mature Trees: Yes Identified Conflicts: Hydro Notes: Splash pad, playground and ice rink at southern end of park. Soccer fields at northern end. Trails connect Balmoral Drive and Waverley Drive to Waverley Drive Public School. Easement would be required for outlet from park to Waverley Drive. Larger catchment is from Inlet #1, but would require long distance of piping to reach outlet.

PROPOSED CONDITIONS:

System: Subsurface Infiltration/Storage Facility Facility Footprint: 611.59m² Total Facility Storage: 844m³ Total Required Storage (enhanced water quality): 844m³ Volume Reduction (%): 100%

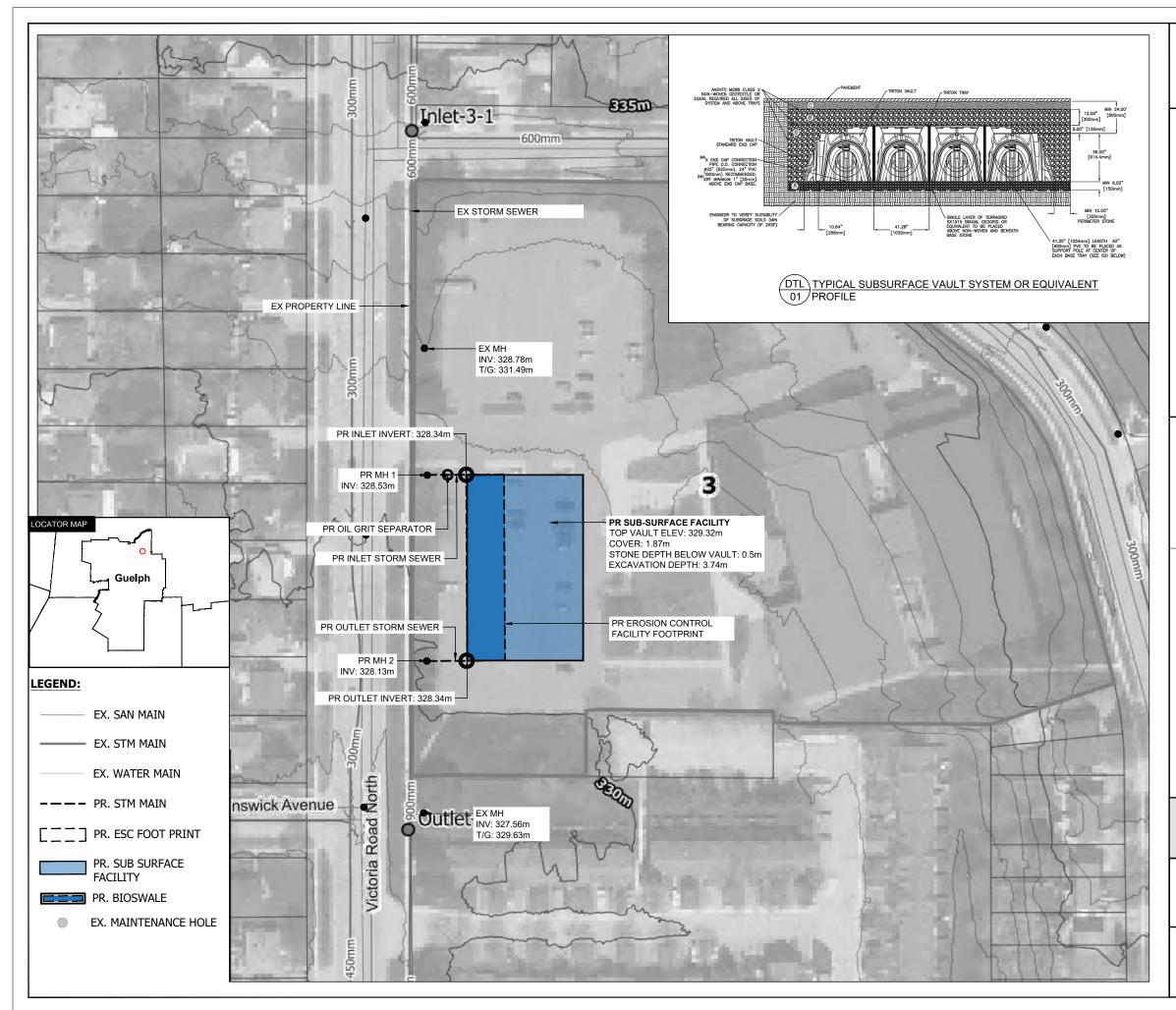
NOTES:

- Multiple inlets may be required to bring flow into proposed vault system
- WHPA Vulnerability Score: 8

Location 2: Waverley Park

End-of-Pipe Concept Design

Date: 2021-10-05 Projection: NAD83_UTM_Zone_17N Data Source: City of Guelph, GRCA Created by: A.V.





Possible SWM Facility Location 3: Victoria Road Recreation Centre Ownership: City of Guelph Current Use: Community Centre, Arena and Pool Total Area: 2.33ha Available Area: 0.9ha Drainage Area: 17.59ha TIMP: 44% Inlets At: 600mm Ø storm sewer Depth to Pipe Invert at Inlet: 1.6m Outlets To: 900mm Ø storm sewer Depth to Pipe Invert at Outlet: 1.6m Floodplain Present: No Mature Trees: Yes Identified Conflicts: None Notes:

• Opportunity for subsurface facility beneath the parking lot. Parking lot appears to have been recently repaved, so recommend installing facility at time of parking lot renewal

PROPOSED CONDITIONS:

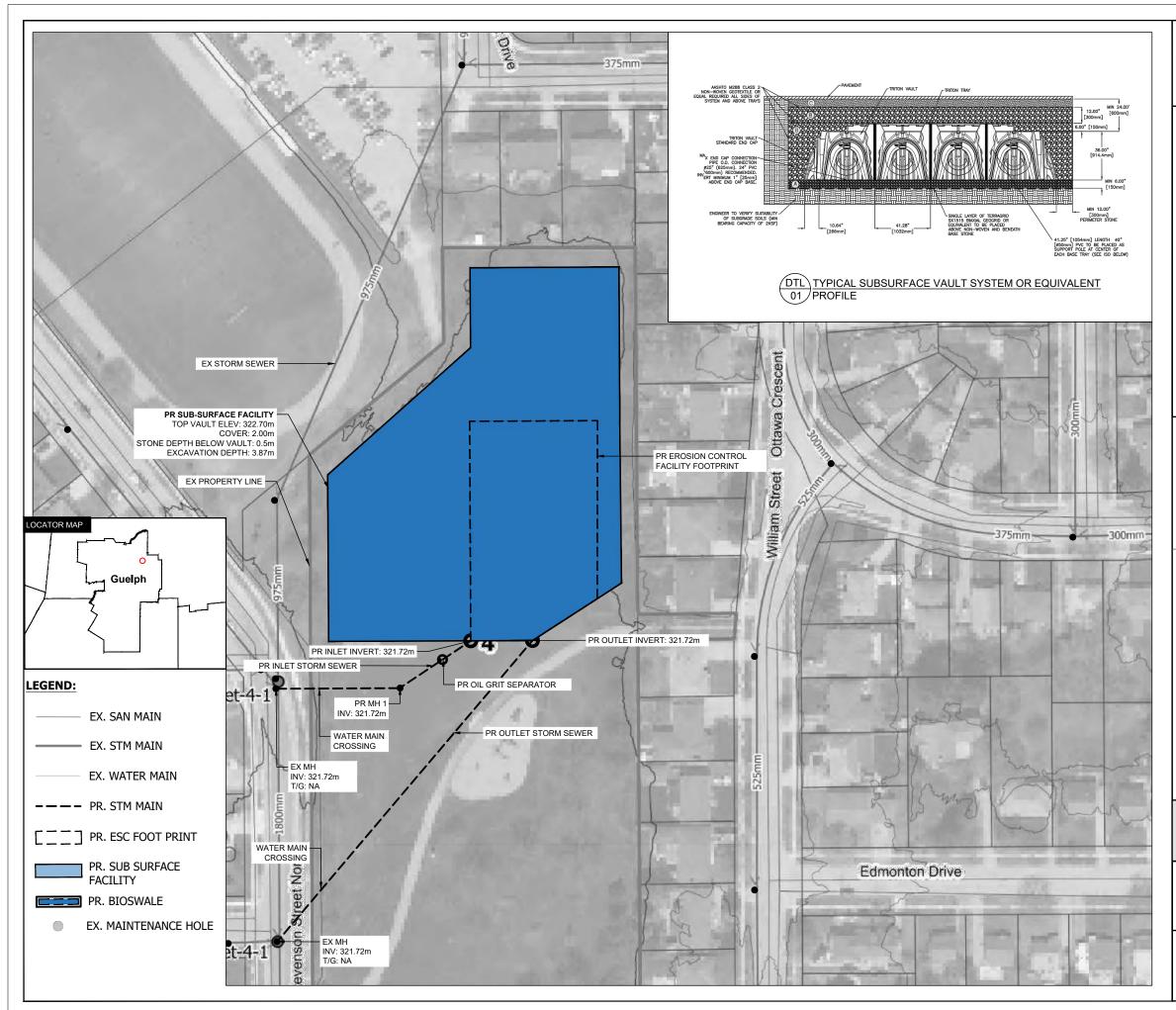
System: Subsurface Infiltration/Storage Facility Facility Footprint: 1567.39m² Total Facility Storage: 2163m³ Total Required Storage (enhanced water quality): 2163m³ Volume Reduction (%): 100%

NOTES:

- Multiple inlets may be required to bring flow into proposed vault system
- WHPA Vulnerability Score: 8

Location 3: Victoria Road Recreation Centre End-of-Pipe Concept Design

Date: 2021-10-05 Projection:
NAD83_UTM_Zone_17N
Data Source: City of Guelph, GRCA
Created by: A.V.





EXISTING CONDITIONS: Possible SWM Facility Location 4: Green Meadows Park Ownership: City of Guelph Current Use: Park Total Area: 2.1ha Available Area: 2.09ha Drainage Area: 81.53ha **TIMP:** 47% Inlets At: 975mm Ø storm sewer Depth to Pipe Invert at Inlet: 3.6m Outlets To: 1800mm Ø storm sewer Depth to Pipe Invert at Outlet: 2.5m Floodplain Present: No Mature Trees: Yes Identified Conflicts: None Notes: Mature trees along Stevenson Street North with parallel row of newly • planted trees. Playground, baseball diamond and soccer field on site, with trail connecting Stevenson Street and William Street. Playground can be moved to create space for a surface pond. Stevenson Street North currently under construction.

Park surface elevation is lower than road surface elevation

PROPOSED CONDITIONS:

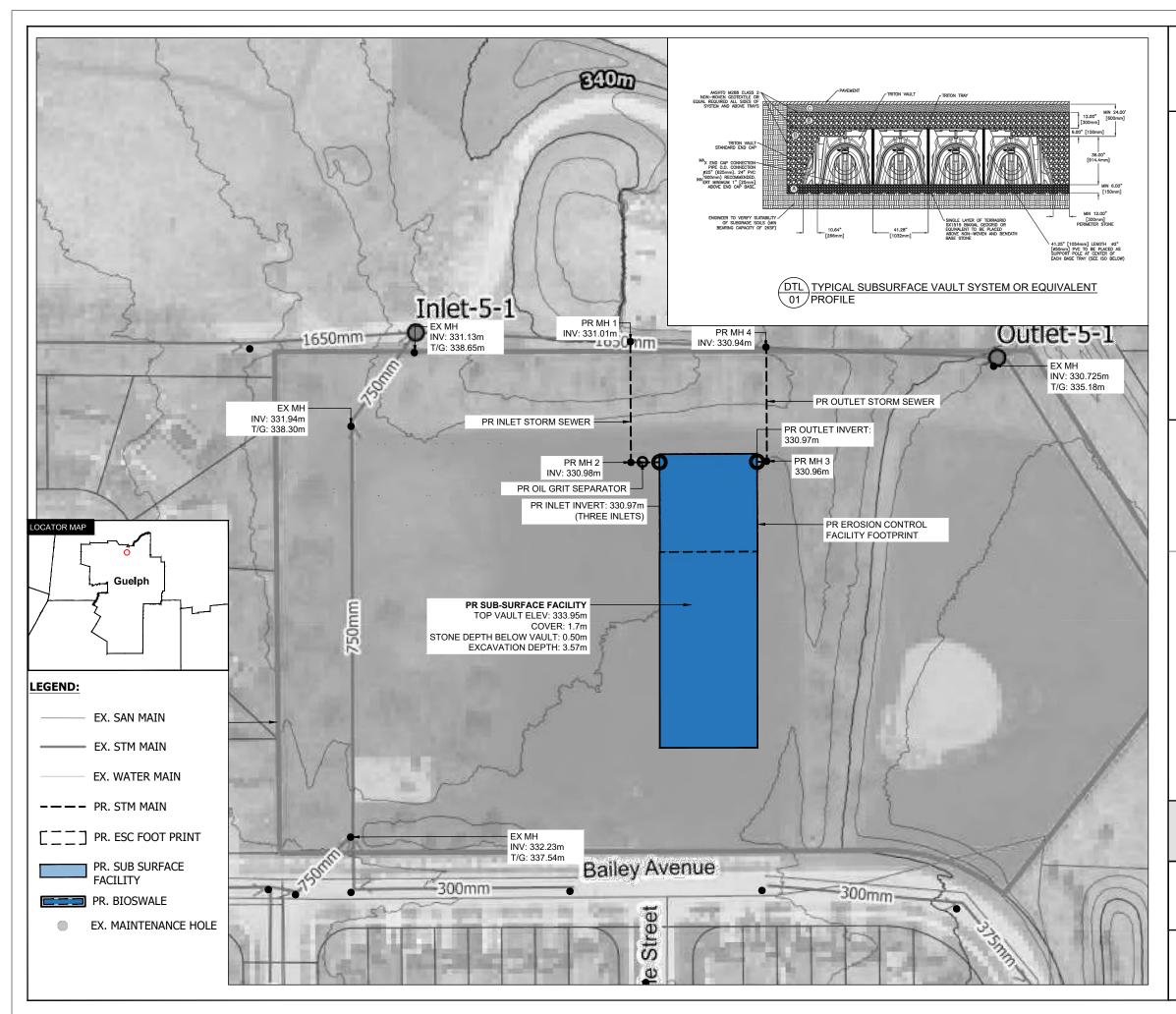
System: Subsurface Infiltration/Storage Facility Facility Footprint: 7651.45m² Total Facility Storage: 10559m³ Total Required Storage (enhanced water quality): 10559m³ Volume Reduction (%): 100%

NOTES:

- Multiple inlets may be required to bring flow into proposed vault system
- Proposed inverts based on high level contours. Storm sewer inverts must be confirmed prior to advancing to detailed design.
- WHPA Vulnerability Score: 10

Location 4: Green Meadows Park End-of-Pipe Concept Design

0 5 10 20





Possible SWM Facility Location 5: Bailey Park Ownership: City of Guelph Current Use: Park Total Area: 3.05ha Available Area: 3.05ha Drainage Area: 23.81ha TIMP: 43% Inlets At: 1650mm Ø storm sewer Depth to Pipe Invert at Inlet: 6.5m Outlets To: 1650mm Ø storm sewer Depth to Pipe Invert at Outlet: 1.1m Floodplain Present: No Mature Trees: Yes Identified Conflicts: None Notes: Western park includes playground and soccer field. Eastern park • is at lower elevation and is a baseball diamond. Informal trail along north side of park. Opportunity to tie into cemetery trails.

• Error within GIS identifies 300mm storm sewer along northern side of park. Drawing I-346 confirms this storm sewer is 1650mm

PROPOSED CONDITIONS:

System: Subsurface Infiltration/Storage Facility Facility Footprint:2081.16² Total Facility Storage: 2872m³ Total Required Storage (enhanced water quality): 2872m³ Volume Reduction (%): 100%

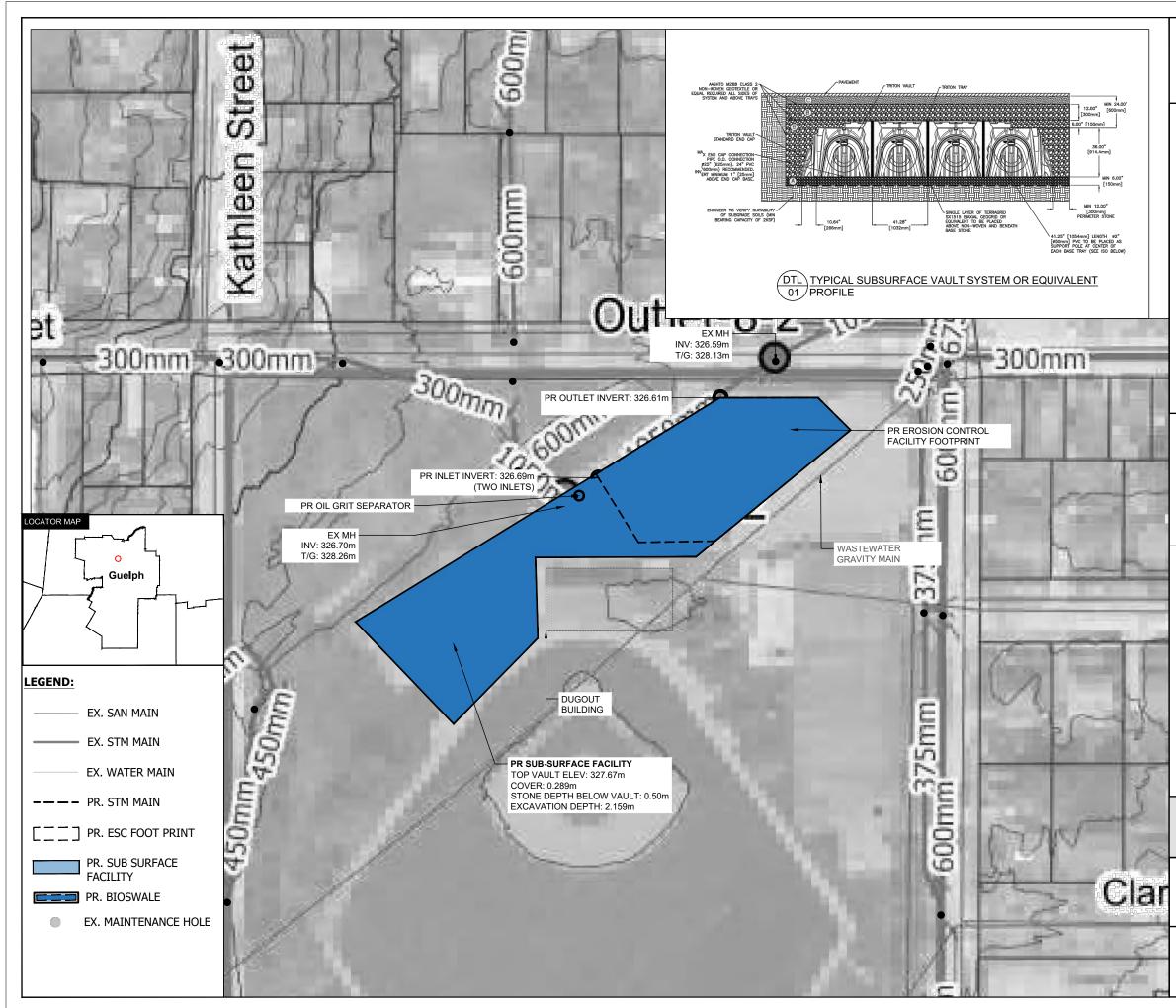
NOTES:

- Multiple inlets may be required to bring flow into proposed vault system
- Grading restrictions limit storm sewer slope to 0.1%
- WHPA Vulnerability Score: 8

Location 5: Bailey Park

End-of-Pipe Concept Design

Date: 2021-10-05 Projection: NAD83_UTM_Zone_17N Data Source: City of Guelph, GRCA Created by: A.V.





Possible SWM Facility Location 8: Exhibition Park Ownership: City of Guelph Current Use: Park and Arena Total Area: 13.55ha Available Area: 0.86ha Drainage Area: 39.57ha TIMP: 44% Inlets At: 1050mm Ø storm sewer Depth to Pipe Invert at Inlet: 1.0m Outlets To: 1050mm Ø storm sewer Depth to Pipe Invert at Outlet: 1.1m Floodplain Present: No Mature Trees: Yes Identified Conflicts: Sanitary Sewer Notes: • Known flooding issues in this area.

- Subsurface storage feasible beneath north parking lot.
- Limited available area in proximity to storm sewer. Storm sewer
- continues downstream along the CNR Spurline Trail, where superpipe

• storage may be an opportunity

PROPOSED CONDITIONS:

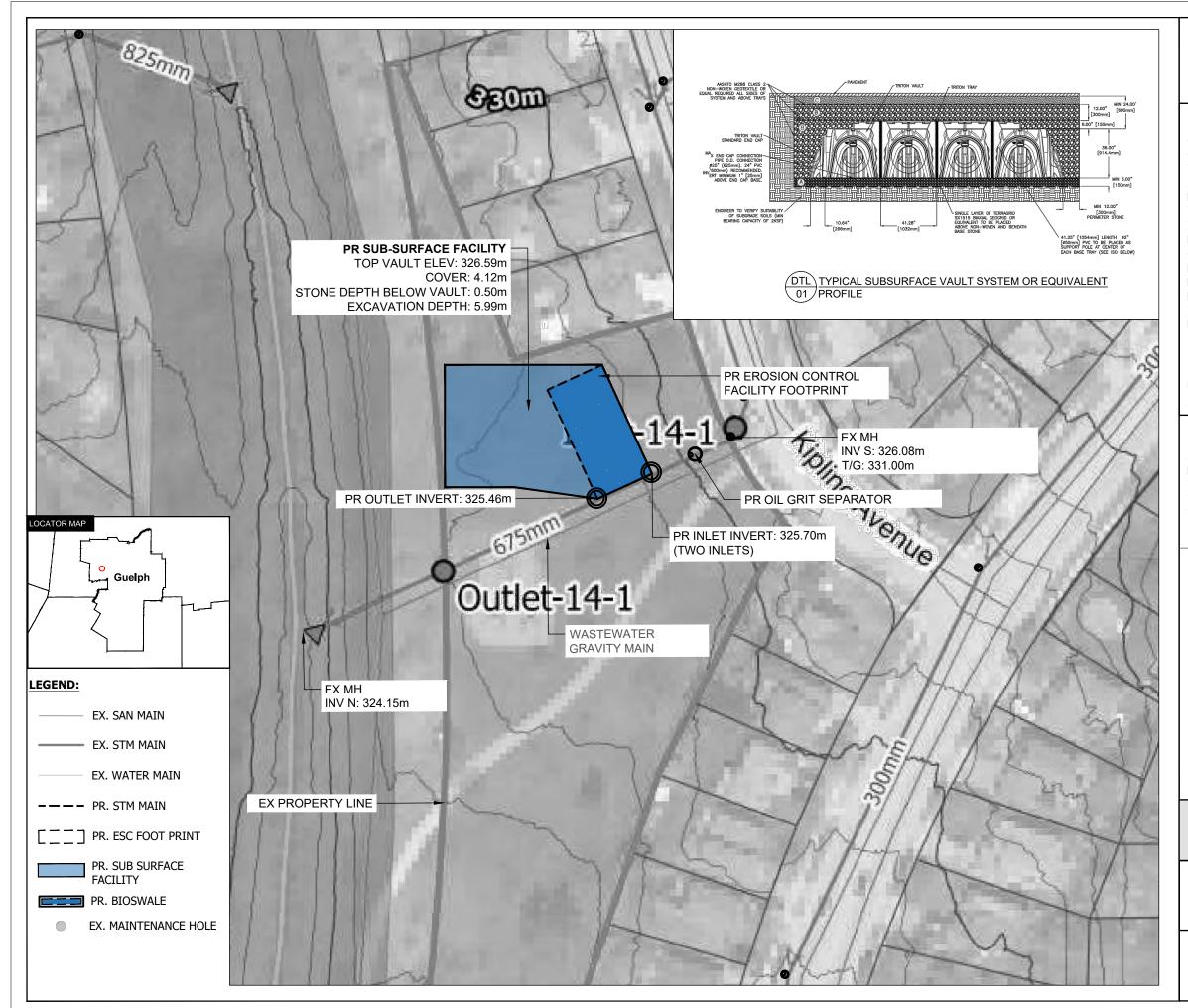
System: Subsurface Infiltration/Storage Facility Facility Footprint: 3530m² Total Facility Storage: 4866m³ Total Required Storage (enhanced water quality): 4866m³ Volume Reduction (%): 100%

NOTES:

- Multiple inlets may be required to bring flow into proposed vault system
- WHPA Vulnerability Score: 8
- Full footprint was not feasible due to constraints with existing sanitary sewer

Location 8: Exhibition Park End-of-Pipe Concept Design

Date: 2021-10-05 Projection: NAD83_UTM_Zone_17N Data Source: City of Guelph, GRCA Created by: A.V.





Possible SWM Facility Location 14: Dunhill Place Park Ownership: City of Guelph Current Use: Park Total Area: 1.51ha Available Area: 0.7ha Drainage Area: 9.85ha TIMP: 47% Inlets At: 675mm Ø storm sewer Depth to Pipe Invert at Inlet: 4.3m Outlets To: 675mm Ø storm sewer Depth to Pipe Invert at Outlet: 3.8m Floodplain Present: No Mature Trees: Yes Identified Conflicts: Sanitary sewer parallel to storm sewer Notes: Playground located next to storm sewer and raised maintenance hole. Storm sewer discharges into adjacent watercourse. Trail located along top bank of watercourse.

• Play structure appears new, with young trees planted between playground and Kipling Avenue.

Ditch inlet catch basin accepts runoff from the park and discharges it directly to watercourse

PROPOSED CONDITIONS:

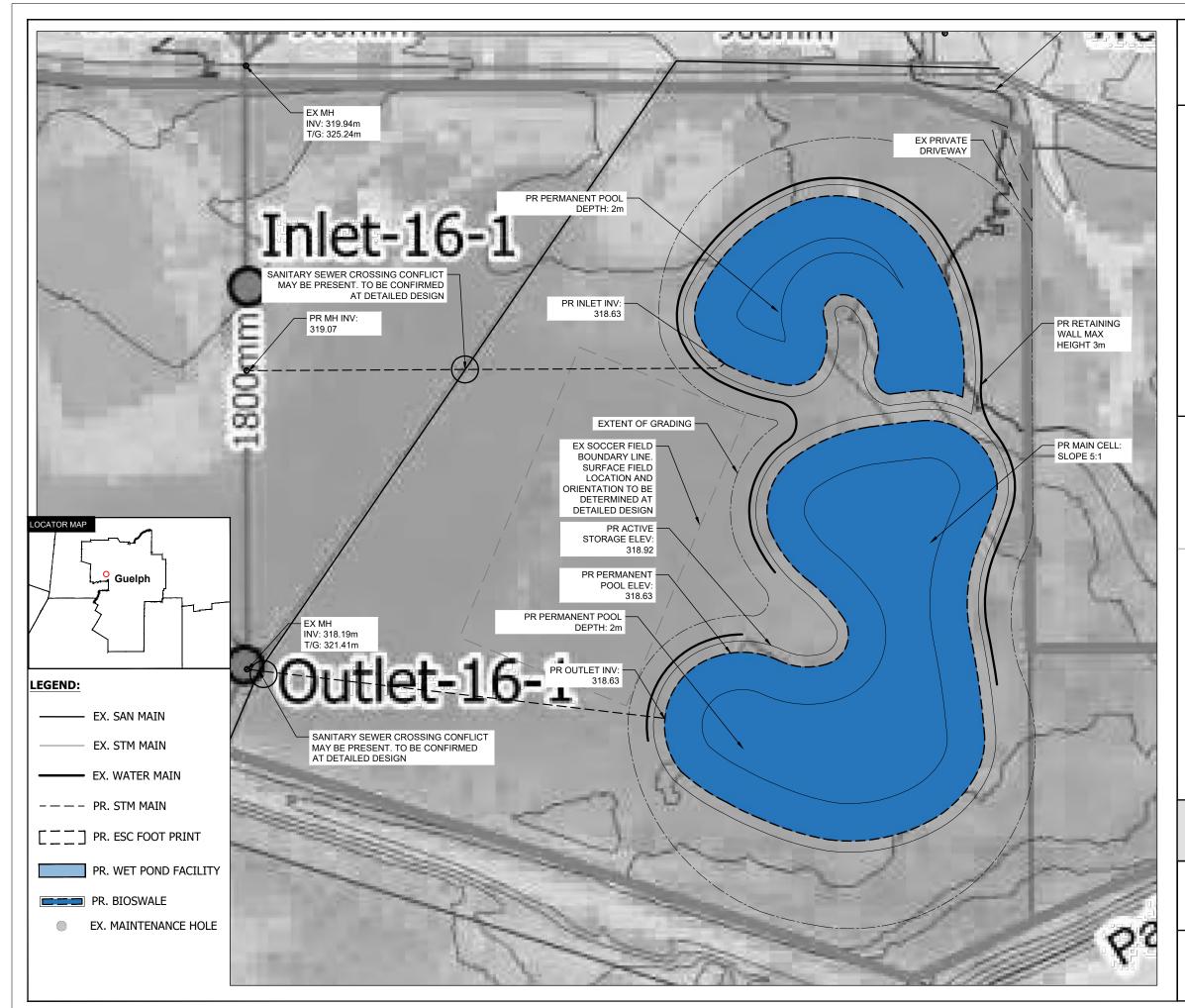
System: Subsurface Infiltration/Storage Facility Facility Footprint: 929.71m² Total Facility Storage: 1283m³ Total Required Storage (enhanced water quality): 1283m³ Volume Reduction (%): 100%

NOTES:

- Multiple inlets may be required to bring flow into proposed vault system
- WHPA Vulnerability Score: 10

Location 14: Dunhill Place Park End-of-Pipe Concept Design

Date: 2021-10-05 Projection: NAD83_UTM_Zone_17N Data Source: City of Guelph, GRCA Created by: A.V.



Guelph

CURRENT CONDITIONS:

Ownership: City of Guelph Current Use: Park Total Area: 18.18ha Available Area: 11.1ha Drainage Area: 85.78ha TIMP: 45% Inlets At: 1800mm Ø storm sewer Depth to Pipe Invert at Inlet: 4.8m Outlets To: 2100mm Ø storm sewer Depth to Pipe Invert at Outlet: 4.3m Floodplain Present: No Mature Trees: Yes Identified Conflicts: Two sanitary sewers meet near proposed outlet. Hydro connected to tennis courts. Notes: Park includes soccer fields, baseball diamonds, playground, washrooms, tennis courts, and parking. Tennis courts recently reinstalled; aerial photo does not have new image. Rail line and watercourse parallel southern park boundary. Outlet will be beneath train track. Very active local community recently prevented Metrolinx from constructing traction power substation in the park.

PROPOSED CONDITIONS:

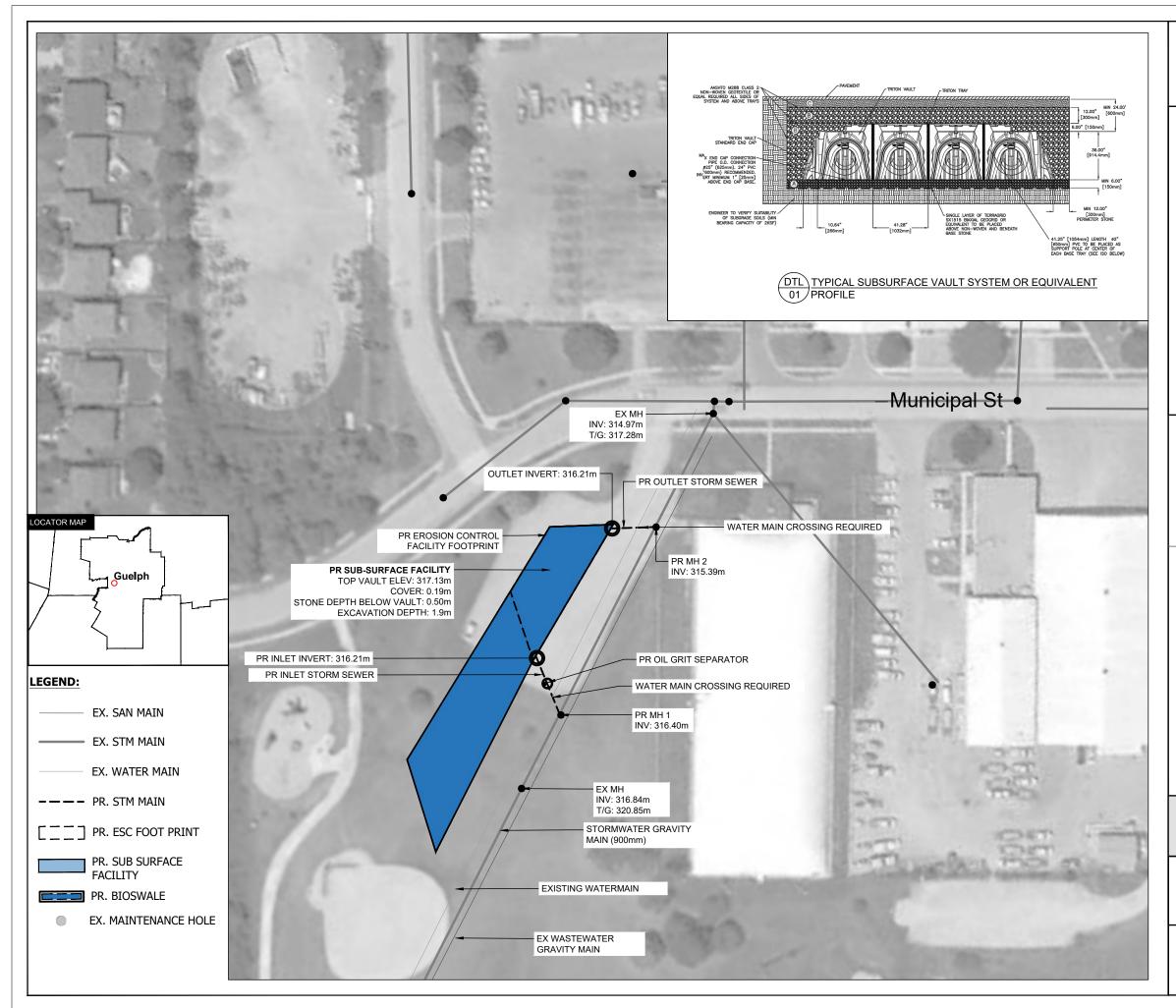
System: Wet Pond Facility Total Water Quality Storage: 14167m³ Total Required Water Quality Storage: 14167m³ Water Quality Active Storage: 3432m³ Permanent Pool Storage: 10735m³

NOTES:

• WHPA Vulnerability Score: 8-10

Location 16: Margaret Green Park End-of-Pipe Concept Design

Date: 2021-10-05 Projection: NAD83_UTM_Zone_17N Data Source: City of Guelph, GRCA Created by: A.V.





Possible SWM Facility Location 18: Centennial Park Ownership: City of Guelph Current Use: Park Total Area: 21.67ha Available Area: 2.7ha Drainage Area: 15.73ha TIMP: 44% Inlets At: 900mm Ø storm sewer Depth to Pipe Invert at Inlet: 3.0m Outlets To: 1050mm Ø storm sewer Depth to Pipe Invert at Outlet: 2.0m Floodplain Present: No Mature Trees: Yes Identified Conflicts: Water and sanitary lines parallel to storm sewer Notes: Extremely well-used tobogganing hill located adjacent to storm • sewer. Ball diamonds, soccer fields, and playground also on site. Gravel parking lot is a current source of sediment in runoff to

• Gravel parking lot is a current source of sediment in runoif to Municipal Street. Opportunity to install subsurface storage beneath newly reconstructed parking lot

PROPOSED CONDITIONS:

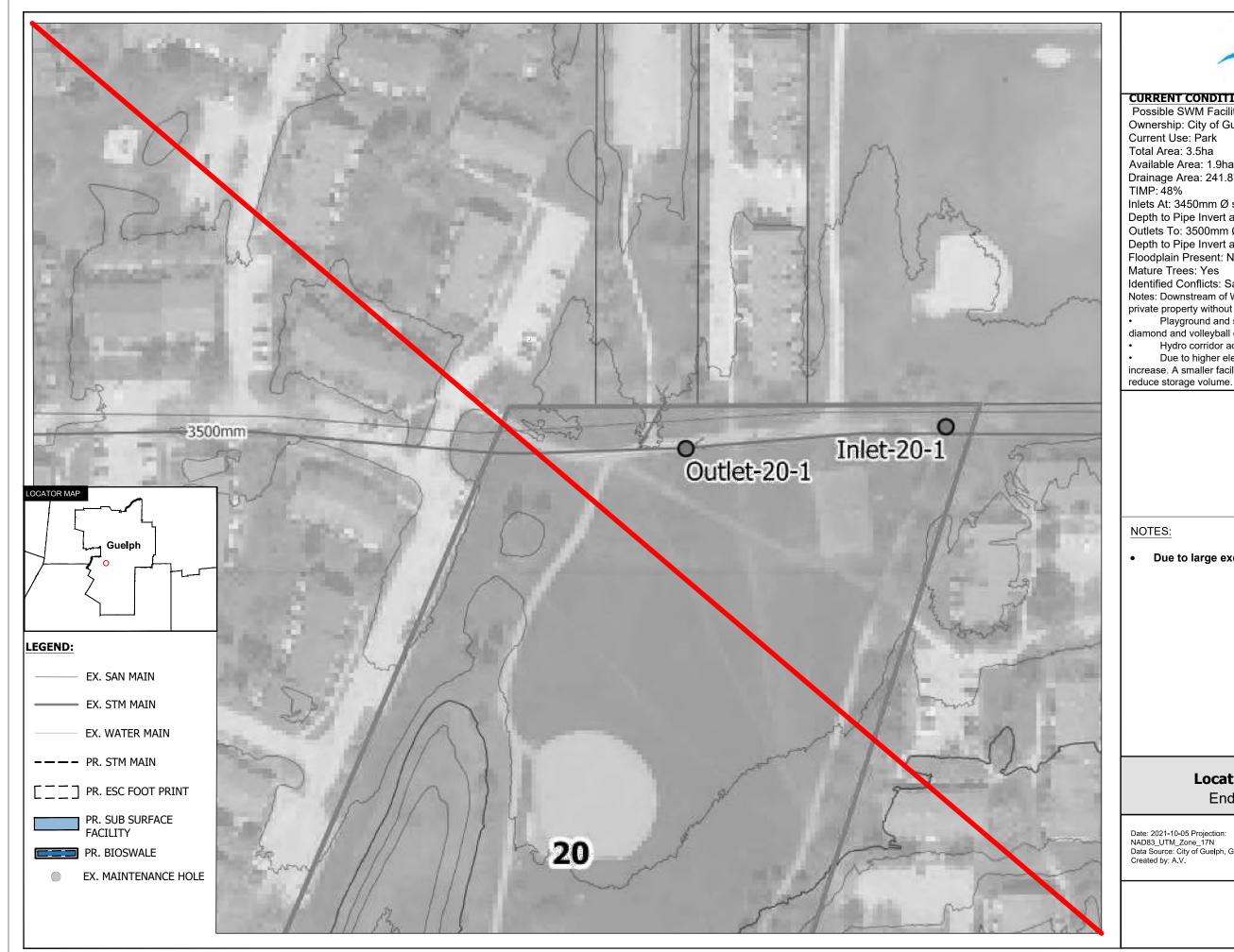
System: Subsurface Infiltration/Storage Facility Facility Footprint: 1397.83m² Total Facility Storage: 1929m³ Total Required Storage (enhanced water quality): 1929m³ Volume Reduction (%): 100%

NOTES:

- Multiple inlets may be required to bring flow into proposed vault system
- WHPA Vulnerability Score: 8-10

Location 18: Centennial Park End-of-Pipe Concept Design

Date: 2021-10-05 Projection: NAD83_UTM_Zone_17N Data Source: City of Guelph, GRCA Created by: A.V.





Possible SWM Facility Location 20: W.E. Hamilton Park Ownership: City of Guelph Current Use: Park Total Area: 3.5ha Available Area: 1.9ha Drainage Area: 241.87ha TIMP: 48% Inlets At: 3450mm Ø storm sewer Depth to Pipe Invert at Inlet: 9.9m Outlets To: 3500mm Ø storm sewer Depth to Pipe Invert at Outlet: 9.4m Floodplain Present: No Mature Trees: Yes Identified Conflicts: Sanitary sewer parallel to storm sewer. Notes: Downstream of W.E. Hamilton Park, this storm sewer passes beneath private property without an easement. Playground and south half of park at higher elevation than baseball diamond and volleyball court. Hydro corridor adjacent to west side of park. • • Due to higher elevation at south end of park, excavation costs will increase. A smaller facility would reduce excavation costs, but also

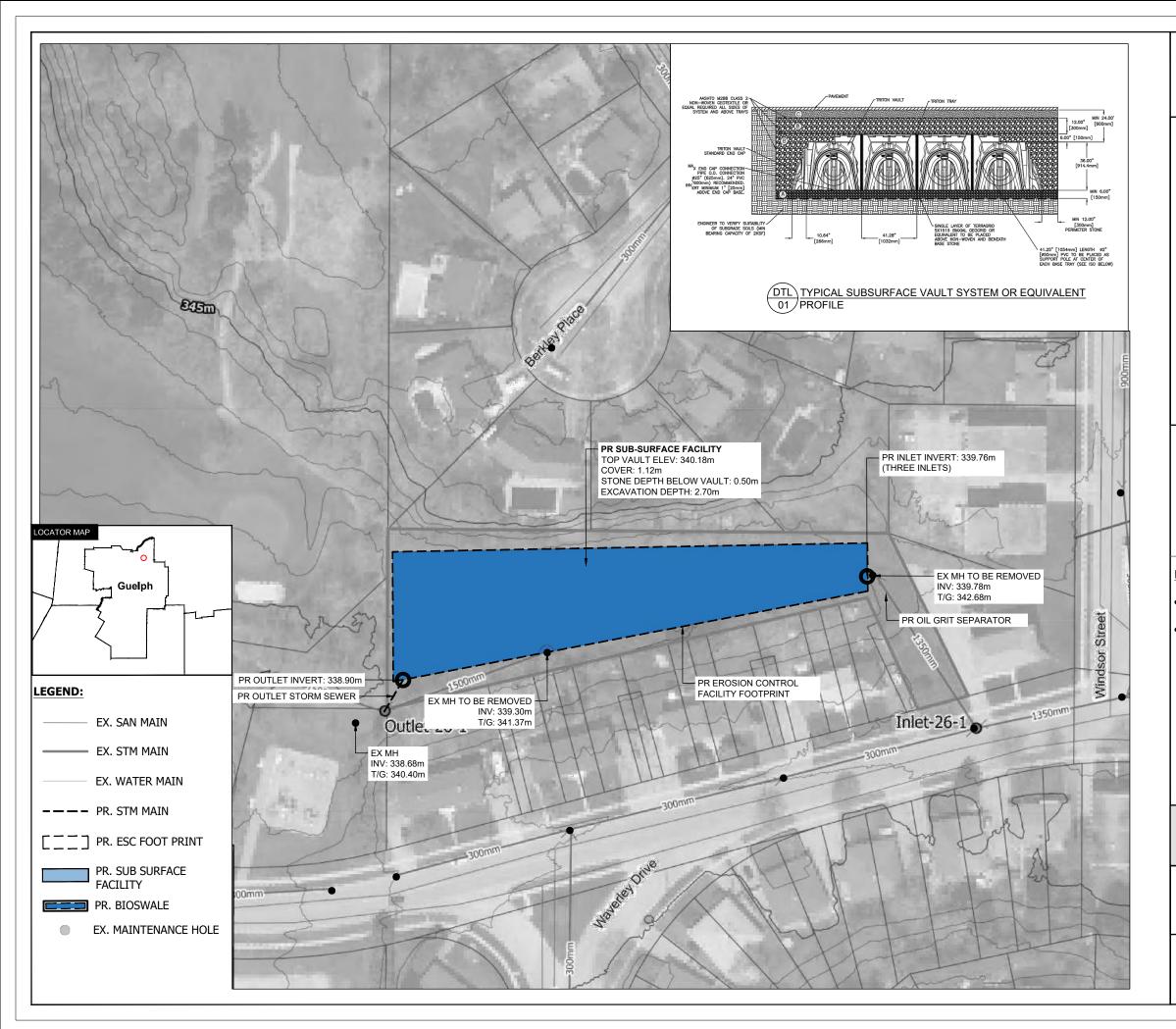
NOTES:

• Due to large excavation depth site is not feasible

Location 20: Hamilton Park End-of-Pipe Concept Design

Date: 2021-10-05 Projection: NAD83_UTM_Zone_17N Data Source: City of Guelph, GRCA Created by: A.V.

0 5 10 20 Meters





Possible SWM Facility Location 26: L-13 Windsor Park Ownership: City of Guelph Current Use: Park Total Area: 0.48ha Available Area: 0.48ha Drainage Area: 105.92ha TIMP: 39% Inlets At: 1500mm Ø storm sewer Depth to Pipe Invert at Inlet: 3.2m Outlets To: 1500mm Ø storm sewer Depth to Pipe Invert at Outlet: 1.5m Floodplain Present: No Mature Trees: Yes Identified Conflicts: None Notes:

- Two monitoring wells located at eastern end of parcel. •
- Recommended retrofit in 2012 SWM-MP as site L-13. Playground •
- relocated since 2012 and is no longer in proposed pond location.
- · Some dumping occurring in treed area at western end of parcel.

PROPOSED CONDITIONS:

- System: Subsurface Infiltration/Storage Facility
- Facility Footprint: 3070.14m²
- Total Facility Storage: 4236.80m³
- Total Required Storage (enhanced water quality): 11836m³
- Volume Reduction (%): 36%

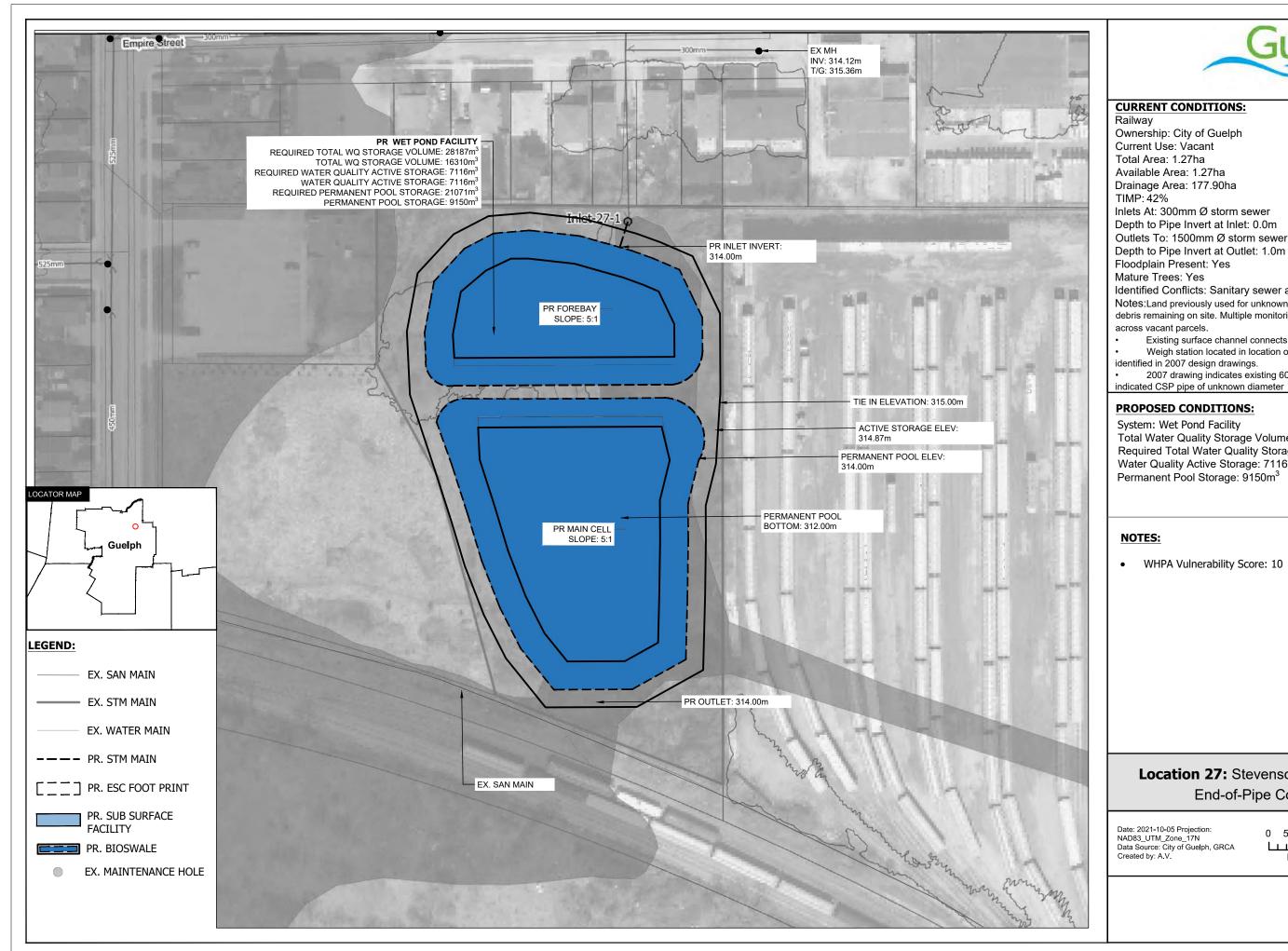
NOTES:

- Multiple inlets may be required to bring flow into proposed vault system WHPA Vulnerability Score: 8

Location 26: L-13 Windsor Park End-of-Pipe Concept Design

Date: 2021-10-05 Projection: NAD83_UTM_Zone_17N Data Source: City of Guelph, GRCA Created by: A.V.

0 5 10 20 Meters



Railway Ownership: City of Guelph Current Use: Vacant Total Area: 1.27ha Available Area: 1.27ha Drainage Area: 177.90ha TIMP: 42% Inlets At: 300mm Ø storm sewer Depth to Pipe Invert at Inlet: 0.0m Outlets To: 1500mm Ø storm sewer Depth to Pipe Invert at Outlet: 1.0m Floodplain Present: Yes Mature Trees: Yes Identified Conflicts: Sanitary sewer along southern Notes:Land previously used for unknown industrial purposes, with some debris remaining on site. Multiple monitoring wells recently installed across vacant parcels. Existing surface channel connects proposed pond inlet and outlet. Weigh station located in location of proposed channel relocation

2007 drawing indicates existing 600mm HDP outlet, but site visit

PROPOSED CONDITIONS:

System: Wet Pond Facility Total Water Quality Storage Volume: 16310m³ Required Total Water Quality Storage Volume: 28187m³ Water Quality Active Storage: 7116m³ Permanent Pool Storage: 9150m³

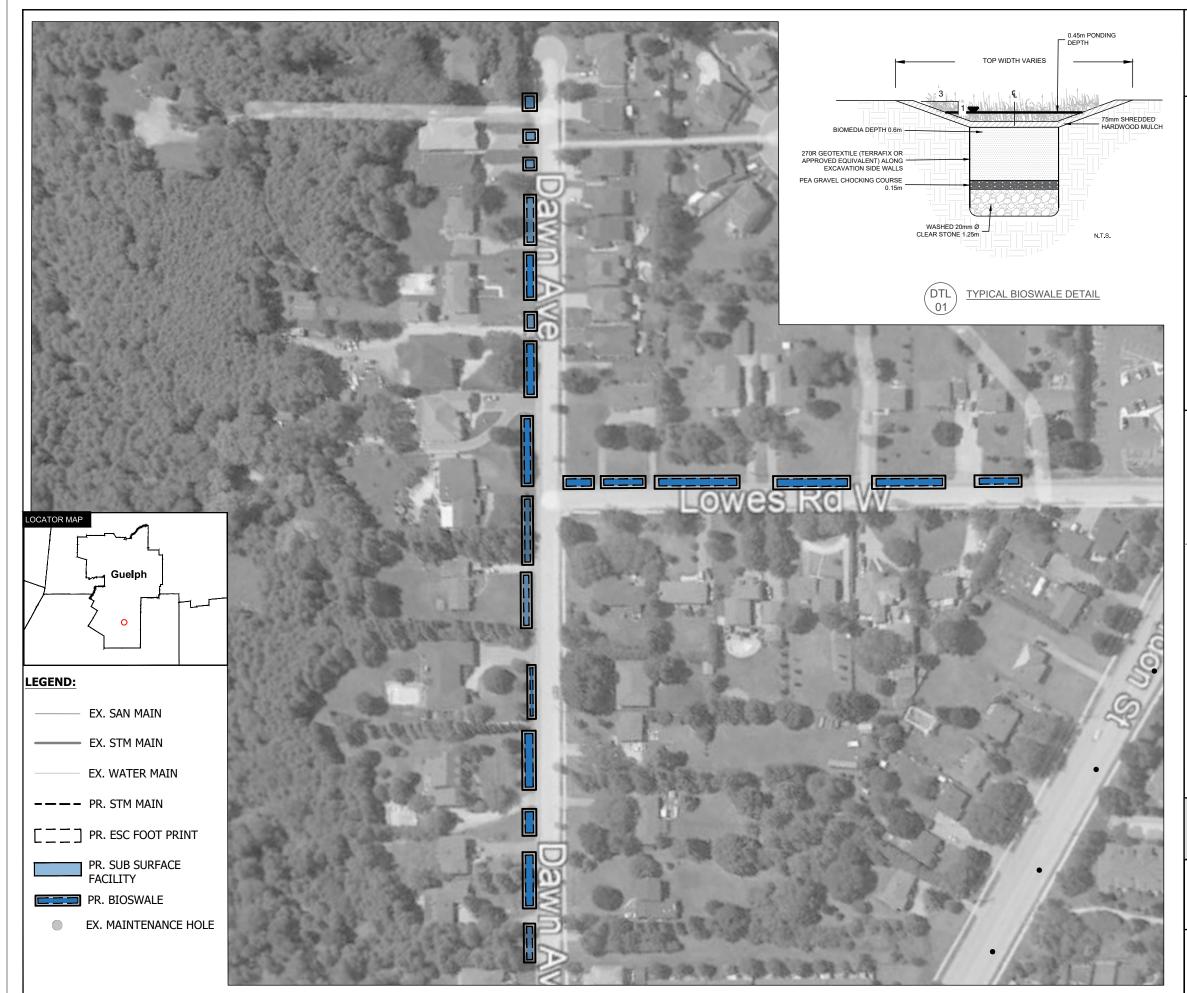
NOTES:

• WHPA Vulnerability Score: 10

Location 27: Stevenson / Guelph Junction End-of-Pipe Concept Design

Date: 2021-10-05 Projection: NAD83_UTM_Zone_17N Data Source: City of Guelph, GRCA Created by: A.V.

0 5 10 20 Meters





CURRENT CONDITIONS: Possible SWM Facility Location 28: End of Dawn Avenue Ownership: Grand River Conservation Authority Current Use: Vacant Total Area: 1.06ha Available Area: 0.064ha Drainage Area: 8.63ha TIMP: 31% Inlets At: Surface Channel Ground Elevation at Inlet: 329.92m Outlets To: Surface Channel Ground Elevation at Outlet: 329.67m Floodplain Present: No Mature Trees: Yes Identified Conflicts: None Notes:Significant sediment accumulation along Dawn Avenue due to poor erosion and sediment control practices at construction site on Lowes Road West. Two monitoring wells located at proposed location. Trail and interpretive sign present. Cul-de-sac at lower elevation than proposed location. Drainage pipe inlet present at end of cul-de-sac, but outlet location unknown.

PROPOSED CONDITIONS:

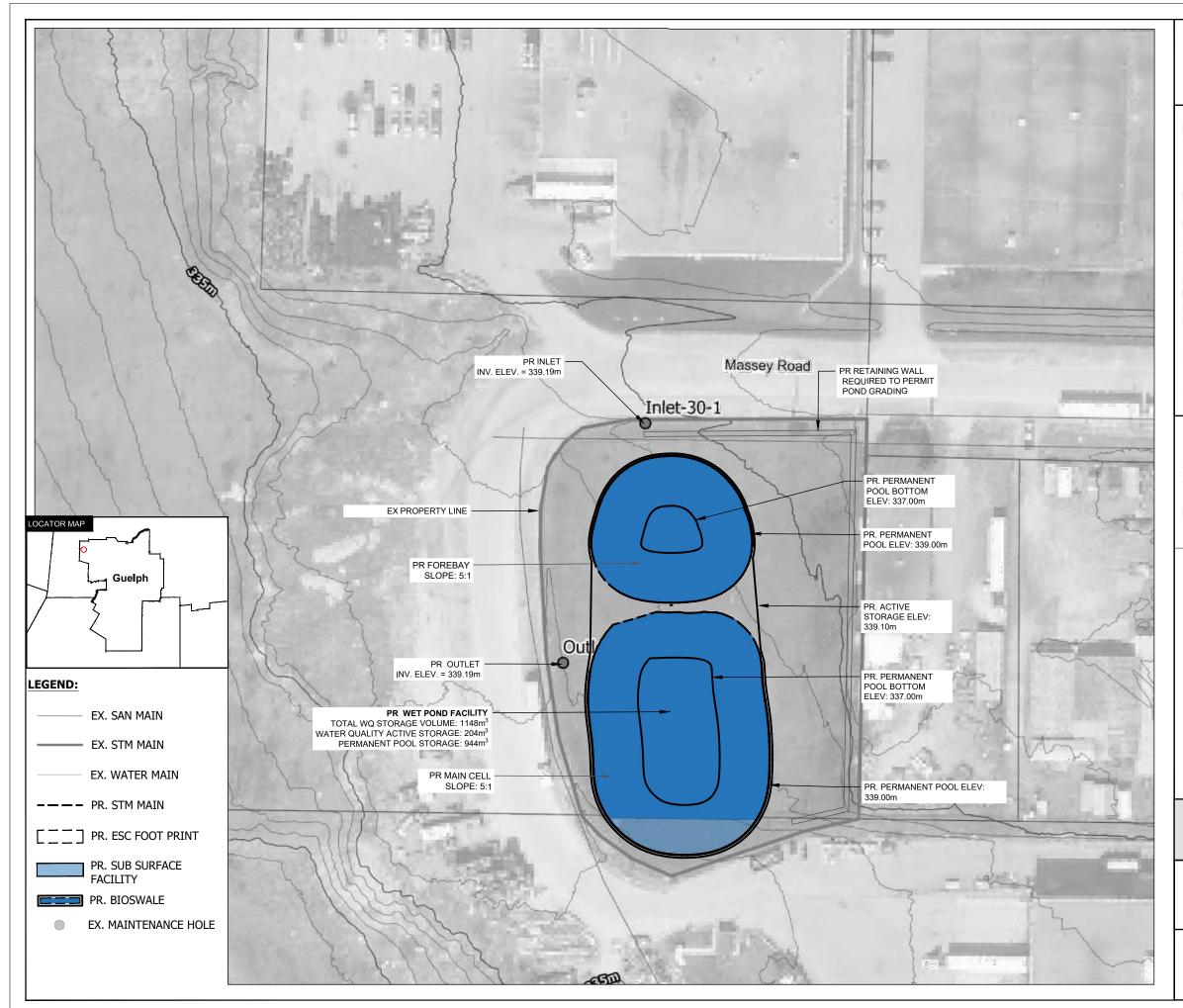
System: Total Facility Storage: 1006m³ Total Required Storage: 1639m³ (5 Year Storm Design) Volume Reduction (%): 61%

NOTES:

- Retrofit of existing ditch system along Dawn Avenue and Lowes Road to provide water quantity control
- WHPA Vulnerability Score: 8 ٠
- Power lines run along street •
- Bioswale locations along Lowes Road are dependent on final layout of new development, available storage volumes are based on existing conditions.

Location 28: End Of Dawn Avenue End-of-Pipe Concept Design

	0 5 10 20 LIIIIII Meters	Date: 2021-10-05 Projection: NAD83_UTM_Zone_17N Data Source: City of Guelph, GRCA Created by: A.V.
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Possible SWM Facility Location 30: 606 Massey Road Ownership: City of Guelph Current Use: Vacant Total Area: 0.53ha Available Area: 0.53ha Drainage Area: 5.1ha TIMP: 72% Inlets At: Surface Channel Ground Elevation at Inlet: 339.19m Outlets To: No Outlet Ground Elevation at Outlet: 337m Floodplain Present: No Mature Trees: No Identified Conflicts: None Notes: Cell tower located at northeast corner of site. •

- No visible outlet from site.
- Ditch on north side of Massey Road discharges uncontrolled to
- vacant land to the west. No evidence of channelization visible.
- West side of Massey Road used for storage.

PROPOSED CONDITIONS:

System: Wet Pond Facility Total Water Quality Storage Volume: 1147m Total Required Water Quality Storage Volume: 1147m Water Quality Active Storage: 204m³ Permanent Pool Storage: 944m³

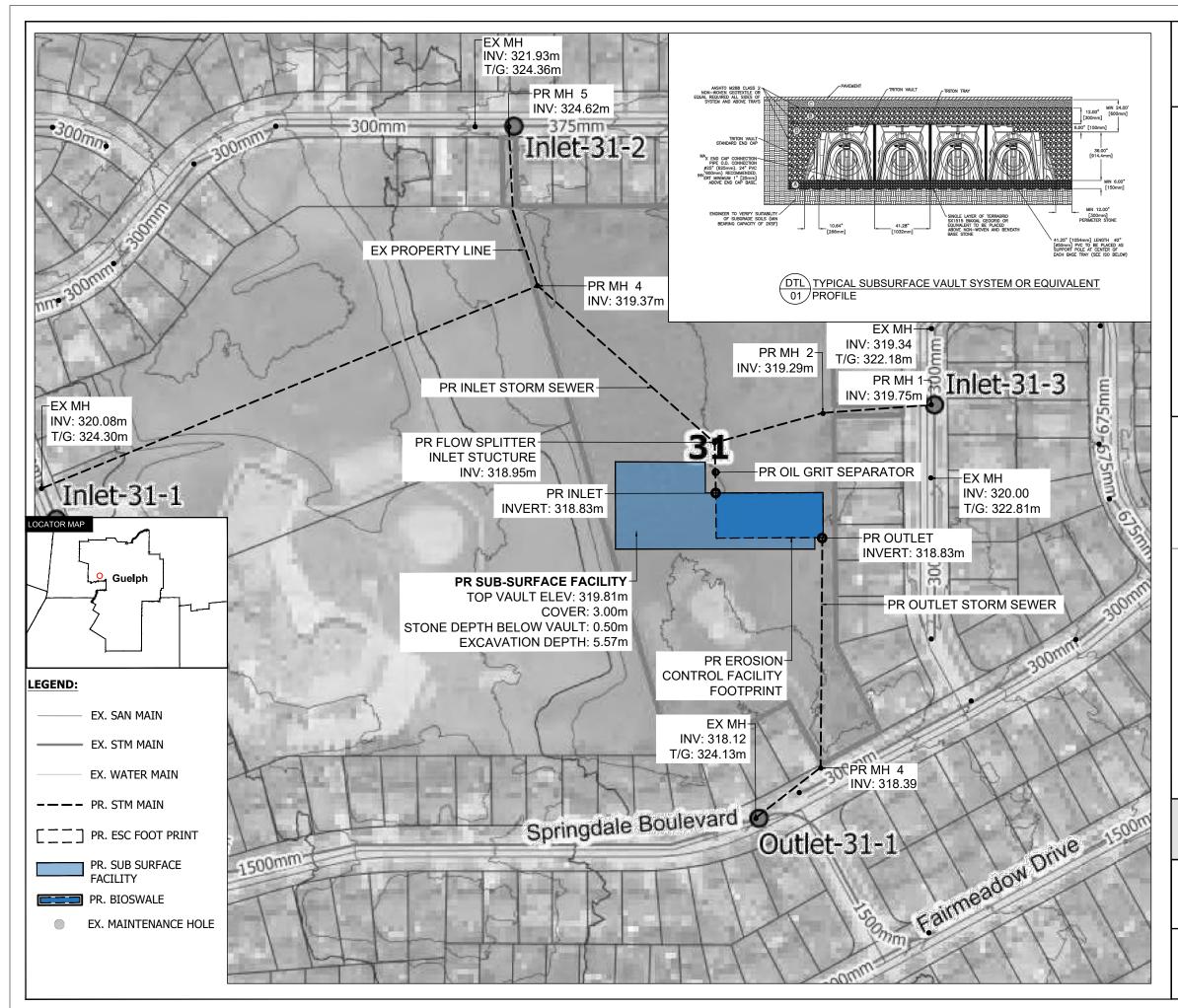
NOTES:

- WHPA Vulnerability Score: 8
- Retaining measures will be require along the north and east sides of the parcel

Location 30: 606 Massey Road

End-of-Pipe Concept Design

Date: 2021-10-05 Projection: NAD83_UTM_Zone_17N Data Source: City of Guelph, GRCA Created by: A.V.





- Possible SWM Facility Location 31: Springdale Park Ownership: City of Guelph Current Use: Park Total Area: 2.67ha Available Area: 2.16ha Drainage Area: 1) 29.82ha; 2) 0.87ha; 3) 1.05ha TIMP: 1) 41%; 2) 50%; 3) 48% Inlets At: 1) 1350mm Ø storm sewer; 2) 375 Ø storm sewer; 3) 300 Ø storm sewer Depth to Pipe Invert at Inlet: 1) 4.80m; 2) 1.71m; 3) 2.03m Outlets To: 1500mm Ø storm sewer Depth to Pipe Invert at Outlet: 5.98m Floodplain Present: No Mature Trees: Yes Identified Conflicts: None Notes:
- Playground and soccer field on site.
- Significant grade loss between school property and park.
- Inlet pipe will be required to pass beneath school property.

PROPOSED CONDITIONS:

System: Subsurface Infiltration/Storage Facility Facility Footprint: 2831.16m² Total Facility Storage: 3907m³ Total Required Storage (enhanced water quality): 3907m³ Volume Reduction (%): 100%

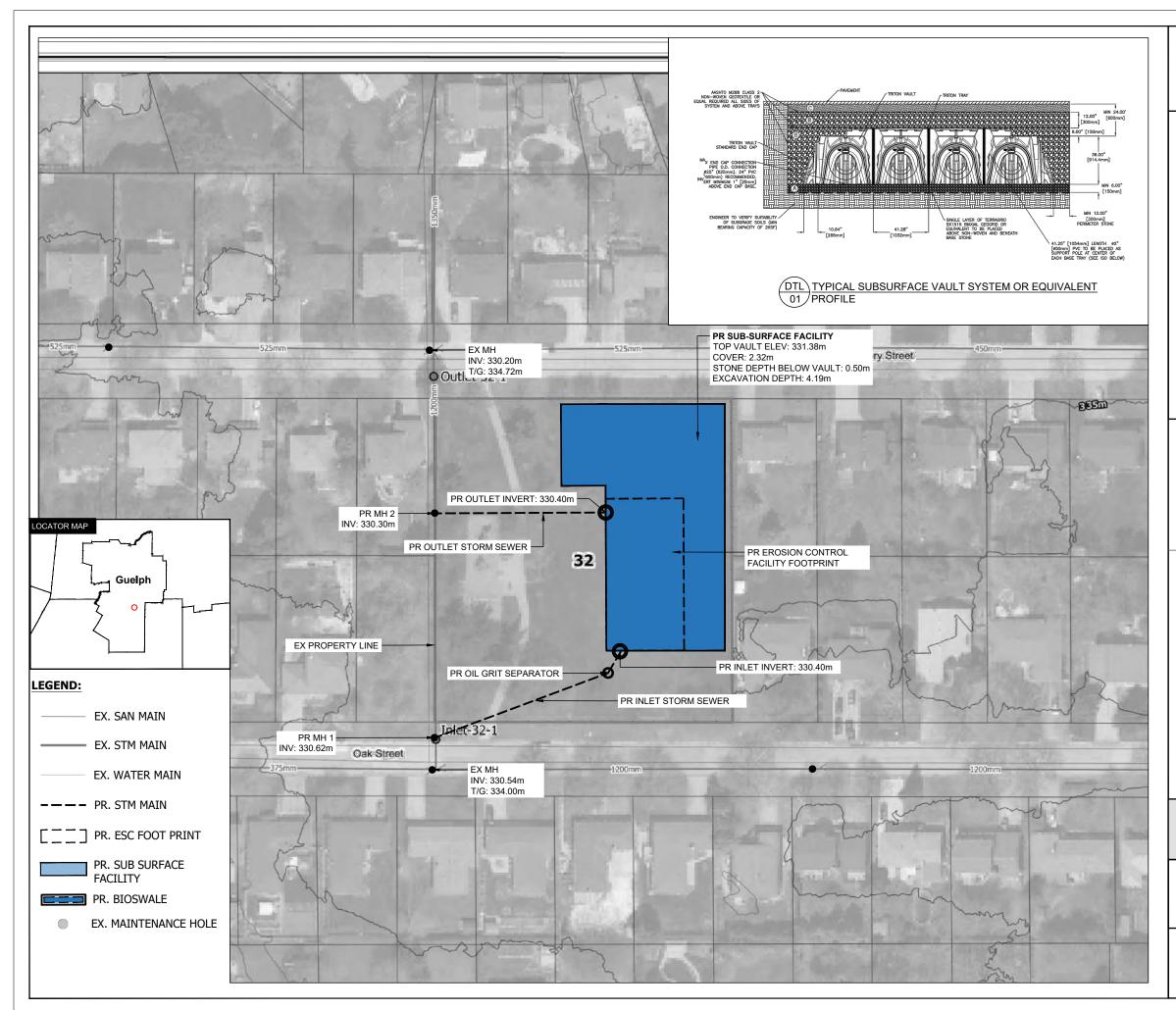
NOTES:

- Multiple inlets may be required to bring flow into proposed vault system
- WHPA Vulnerability Score: 10

Location 31:Springdale Park End-of-Pipe Concept Design

Date: 2021-10-05 Projection: NAD83_UTM_Zone_17N Data Source: City of Guelph, GRCA Created by: A.V.

0 5 10 20 Meters





Possible SWM Facility Location 32: Oak Street Park Ownership: City of Guelph Current Use: Park Total Area: 0.70ha Available Area: 0.70ha Drainage Area: 29.65ha TIMP: 39% Inlets At: 1200mm Ø storm sewer Depth to Pipe Invert at Inlet: 3.87m Outlets To: 1200mm Ø storm sewer Depth to Pipe Invert at Outlet: 4.20m Floodplain Present: No Mature Trees: No Identified Conflicts: Hydro Line Notes: Hydro line crosses park from east to west. Ice rink in park during winter. •

- •
- Playground and trail present

PROPOSED CONDITIONS:

System: Subsurface Infiltration/Storage Facility Facility Footprint: 2401.45m² Total Facility Storage: 3314m³ Total Required Storage (enhanced water quality): 3314m³ Volume Reduction (%): 100%

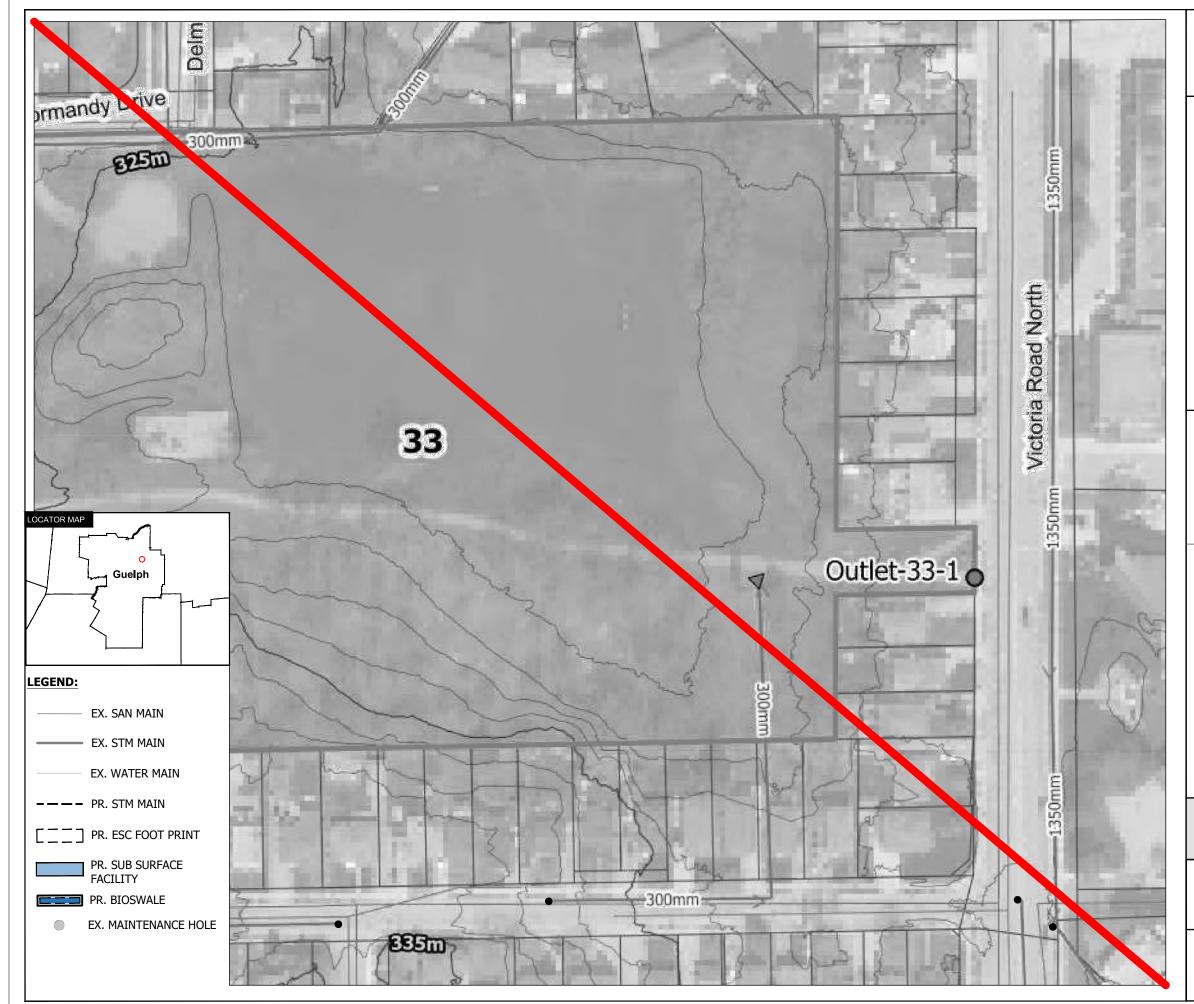
NOTES:

- Multiple inlets may be required to bring flow into proposed vault • system
- WHPA Vulnerability Score: 6 •

Location 32: Oak Street Park End-of-Pipe Concept Design

Date: 2021-10-05 Projection: NAD83_UTM_Zone_17N Data Source: City of Guelph, GRCA Created by: A.V.

0 5 10 20 Meters





Possible SWM Facility Location 33: Franchetto Park Ownership: City of Guelph Current Use: Park Total Area: 3.73ha Available Area: 3.14ha Drainage Area: 44.42ha **TIMP:** 43% Inlets At: 1350mm Ø storm sewer Depth to Pipe Invert at Inlet: 3.37m Outlets To: 1350mm Ø storm sewer Depth to Pipe Invert at Outlet: 3.36m Floodplain Present: No Mature Trees: Yes Identified Conflicts: None Notes: There are two options to connect the inlet to the proposed facility in • the park: new storm sewer can be installed along Delmar Boulevard and Kara Lee Court to enter the park through the same path as the sanitary and 300mm pipe (note there is no formal easement here), or it can be installed along the full length of Delmar Boulevard and enter the park at Normandy Drive, grades permitting.

- Soccer field, playground and trail present.
- Site would capture the drainage area of Site #3 at Victoria Road

Recreation Centre, and is therefore considered an alternative if Site #3 is not feasible.

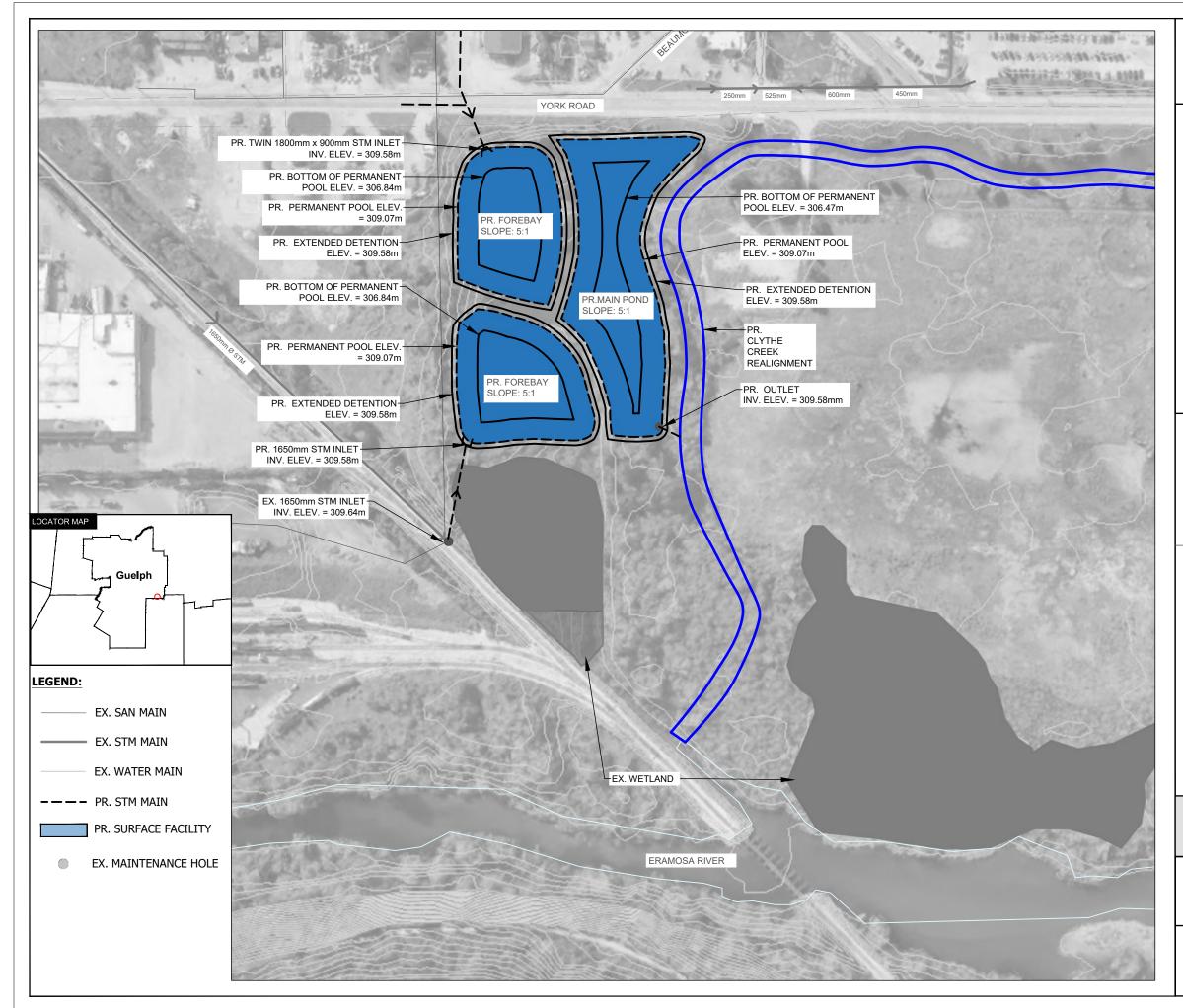
NOTES:

• Site not feasible due to grading constraints

Location 33: Franchetto Park

End-of-Pipe Concept Design

Date: 2021-10-05 Projection: NAD83_UTM_Zone_17N Data Source: City of Guelph, GRCA Created by: A.V.





CURRENT CONDITIONS: Possible SWM Facility Location 34: End of Industrial Street Ownership: City of Guelph (pending) Current Use: Natural Heritage Total Area: 3.46ha Available Area: 3.46ha Drainage Area: 229.16ha TIMP: 44.06% Inlets At: 1) Existing 1650mm Ø storm sewer; 2) Proposed twin 1800mm x 900mm storm sewer Depth to Pipe Invert at Inlet: 2m (assumed) Outlets To: Proposed Channel Depth to Pipe Invert at Outlet: N/A Floodplain Present: Yes Mature Trees: Yes Identified Conflicts: Sanitary Main Notes: • Informal trails present, with associated dumping Evidence of recent beaver activity • Two outfalls currently discharge into existing ponds. Evidence of historical control structures on watercourse between the two ponds. • Significant erosion noted associated with the Victoria Street Outfall along the Guelph Junction Railway · Potential wetlands at south end of parcel. If wetland presence confirmed, available area may be decreased pending GRCA direction. **PROPOSED CONDITIONS:**

System: Wet Pond Facility Total Required Water Quality Storage: 37358m³ Total Water Quality Storage Provided: 37404m³ Water Quality Active Storage Provided: 9171m³ Permanent Pool Storage: 28233m³

NOTES:

Additional storage above facility maybe feasible, but must be confirmed in detailed design.

Location 34: End of Industrial Street End-of-Pipe Concept Design

Date: 2021-10-05 Projection: NAD83_UTM_Zone_17N Data Source: City of Guelph, GRCA Created by: A.V.