

APPENDIX 8

Wastewater Infrastructure Summary



1.0 INGERSOLL WWTS

Subcomponent	Description
Sewage Pumping Stations (SPS)	<ul style="list-style-type: none"> • A 900 mm diameter inlet sewer to the influent pumping station wet well and a 900 mm diameter emergency overflow to the outfall sewer. • One (1) 4.6 m x 4.6 m x 9.6 m SWD wetwell partitioned into two cells, equipped with a coarse manually cleaned inlet bar screen and four (4) submersible pumps of capacity 70 L/s, 74 L/s, 145 L/s and 126 L/s; connection for a mobile generator for emergency stand-by power for the pumps;
Primary Treatment	<ol style="list-style-type: none"> 1. Headworks: <ul style="list-style-type: none"> • Aerated raw sewage channel from the flow splitting chamber to the New Plant. • One (1) comminutor of 355 L/s capacity along with one (1) manually raked bar screen for comminutor bypass; • One (1) 3.63 m x 7.62 m x 3.81 m SWD aerated grit tank; • Flow splitting chamber with slide gates and raw sewage channels to the 1947 and 1974 2. Primary Clarifiers: <ul style="list-style-type: none"> • Two (2) 24.8 m x 5.6 m x 3.5 m SWD primary clarifiers equipped with scum and sludge removal mechanisms; • Two (2) raw sludge pumps (one standby for both raw sludge and scum), each rated at 7 L/s; and • One (1) scum pump.
Secondary Treatment	<ul style="list-style-type: none"> • Two (2) 32.9 m x 6.6 m x 5.5 m SWD aeration tanks equipped with fine bubble aeration system; • Three (3) blowers (one standby) each rated at 1,500 m³/d at 65 kPa.
Secondary Clarification	<ul style="list-style-type: none"> • Four (4) 26 m x 6.5m x 4 m SWD secondary clarifiers each equipped with scum and sludge removal mechanisms; • Three (3) activated sludge pumps (one standby), each rated at 70 L/s and two duty pumps equipped with VFD; and • One (1) scum pump rated at 40 L/s at 7.4 m TDH.

Subcomponent	Description
Disinfection System	<ul style="list-style-type: none"> • Two (2) UV disinfection channels equipped with two (2) banks of UV lamp modules, each bank with a peak flow rate of 23,328 m³/day. • Connection for mobile generator for emergency stand-by power for the UV disinfection system
Chemical System	<ul style="list-style-type: none"> • One (1) 24,000 L phosphorus removal chemical storage tank; • Two (2) chemical metering pumps, each rated at 21 L/h at 330 kPa; • Two (2) chemical metering pumps for the New Plant, each rated at 42 L/h at 330 kPa;
Waste Activated Sludge	<ul style="list-style-type: none"> • One (1) waste activated sludge floc tank equipped with paddle mixer; • Two (2) waste activated sludge feed pumps (one standby), each Rated at 9 L/s and equipped with VFD; • Two (2) rotary drum thickeners (one standby), each rated at 125 kg/h dry solids; • One (1) thickened waste activated sludge storage tank; • Two (2) thickened waste activated sludge pumps (one standby), each Rated at 6 L/s and equipped with one (1) 13.72 m diameter x 8.00 m SWD primary anaerobic digester; • One (1) 13.72m diameter x 6.92 m SWD secondary anaerobic digester; • One (1) primary digester recirculation pump rated at 11 .4 L/s at 9.1 m TDH; • One (1) secondary sludge loading pump rated at 15 L/s at 13.4 m TDH; • One (1) standby secondary sludge loading pump/primary digester recirculation pump rated at 15 L/s at 11.3 m TDH; • One (1) in-line grinder; • Two (2) centrifuge feed pumps, each rated at 4.4 L/s at 14 m TDH equipped with VFD; • One (1) dewatering centrifuge rated at 16.3 m /h; • One (1) polymer make-up unit and two (2) polymer pumps each with a capacity range of 0.9 L/min to 7.0 L/min; • Six (6) 6.1 m x 23 m dewatered sludge drying beds with an under drain system;

2.0 TILLSONBURG WWTS

Subcomponent	Description
Sewage Pumping Stations (SPS)	John Pound Road Sewage <ul style="list-style-type: none"> • Comminutor with one (1) 140 L/sec capacity channel grinder; • Three (3) dry-pit submersible pumps each with a rated capacity of 80.1 L/sec @ 8.1 m TDH and with firm station rated capacity of 109 L/sec @ 10 m TDH when two pumps are operating, (two duty, one standby).
Preliminary Treatment System	<ul style="list-style-type: none"> • (3) 600 mm wide screening channels complete with (2) mechanically cleaned 6 mm openings step screens and (1) manual bar screen each having a Peak Instantaneous Flow Rate of 36,810 m³/day; • Three (3) channels (1 duty/1 standby / 1 bypass); • Six (6) actuated slide gates installed in the screening channels; • Two (2) screening washer/compactors and (1) conveyor; • One (1) vortex degritter having a peak capacity of 36,810 m³/d; • Two (2) grit slurry transfer pumps rated for 16 l/s at TDH of 9 m; and • One (1) grit classifier with hydrocyclone
Primary Treatment	<ul style="list-style-type: none"> • Two (2) rectangular clarifiers having approximate dimensions of 22.65 x 5 x 4.5 m at a capacity of 4,090 m³/d ; • Three (3) positive displacement sludge pumps (2 duty / 1 standby) rated for 9 l/s at a TDH of 7 m with motorized valves; • One(1) submersible scum pump rated for 8 l/s at a TDH of 6 m; and • One(1) scum collection chamber
Secondary Treatment	<ol style="list-style-type: none"> 1. Biological Treatment <ul style="list-style-type: none"> • One (1) 100 hp VFD control blower rated supply air at 58 m³/min; • Four (4) dissolved oxygen probes and transmitters located in aeration tanks 2. Secondary Sedimentation <ul style="list-style-type: none"> • One (1) circular secondary clarifier having 24.5 m diameter x 4.5 m SWD and a capacity of 8,180 m³/d ; • Primary scum chamber and scum collection system;

Subcomponent	Description
	<ul style="list-style-type: none"> • One (1) submersible scum pump rated for 12 l/s at a TDH of 7 m; • One (1) secondary sludge pumping station, housing two(2) new RAS pumps each rated for 48 l/s at a TDH of 6 m complete with VFD; • One (1) submersible WAS pump rated for 20 l/s at a TDH of 10 m; and • One (1) magnetic flow meter and one(1) density meter on installed on the discharge header
Sludge Management System	<p>Thickening Building</p> <ul style="list-style-type: none"> • Two (2) inclined disc thickeners complete with a flocculation tank for each, having a hydraulic loading rated of 33.3 m³/hr; • Two (2) liquid polymer dilution systems each consisting of one (1) liquid polymer mixing chamber and one (1) progressive cavity pump used to convey polymer, complete with flowmeter, inline static mixer and valves; • One(1) 6500 L alum chemical storage tank with two(2) alum dosing pumps; and • Two(2) thicken waste activated sludge screw transfer pumps (duty/standby) conveying TWAS

3.0 WOODSTOCK WWTS

Subcomponent	Description
Raw Sewage Pumping Station	<p>A raw sewage pumping station located at the Woodstock Wastewater Treatment Plant and consisting of a 3 m x 10 m wet well equipped with one (1) duty and one (1) standby dry pit sewage pumps in a dry well/wet well configuration, each rated at 323 L/s at a TDH of 14 m.</p>
Headworks	<ol style="list-style-type: none"> 1. Grit Removal One (1) 24.43 m long x 6.40 m wide x 4.85 m deep aerated grit chamber together with air spargers. 2. Screening Three (3) screening channels, each equipped with dual clog rack guided climber type with 20 mm clear bar spacing (991 mm channel width, 610 mm screening width, 1,981 mm channel depth).

Subcomponent	Description
<p>Primary Treatment</p>	<p>1. East Primary Clarifier One (1) 26.22 m long with three passes (each 4.9 m wide), 3.66 m SWD rectangular gravity primary clarifier, equipped with sludge and scum removal facilities.</p> <p>2. West Primary Clarifier One (1) 37.6 m long x 12.2 m wide x 2.74 m SWD rectangular gravity primary clarifier, equipped with sludge and scum removal facilities</p>
<p>Secondary Treatment</p>	<p>1. Plant No. 2 A plug flow type plant configuration consisting of the following:</p> <ul style="list-style-type: none"> • Aeration tanks equipped with a fine bubble diffusers aeration system including: <ul style="list-style-type: none"> ➤ four (4) pre-aeration cells, 3 measuring 4.27 m long by 8.84 m wide, and one measuring 4.27 m by 4.27 m; ➤ seven (7) aeration cells (1 of 2) measuring 21.34 m long by 4.27 m wide; and ➤ seven (7) aeration cells (2 of 2) measuring 21.34 m by 4.27 m wide. • Two (2) circular secondary clarifiers, each equipped with sludge removal facilities (Secondary Clarifier No. 1; 18.6 m diameter, 3.66 m SWD now being modified per Proposed Works, and Secondary Clarifier No. 2; 24.7 m diameter, 3.66 m SWD); and • Two (2) RAS and two (2) WAS submersible pumps; <p>2. Plant No. 3 An activated sludge process type of plant consisting of the following:</p> <ul style="list-style-type: none"> • Four (4) 47.24 m long x 12.2 m wide x 5.5 m SWD aeration tanks equipped with fine bubble diffused aeration system; • Two (2) three-pass folded gould secondary clarifiers, one inlet and two outlet passes, each pass equipped with sludge removal facilities (pass dimensions: 23.47 m long x 8.09 m wide x 3.66 m SWD); • Three (3) variable speed controlled return activated sludge (RAS) pumps, one duty for each clarifier, one shared standby pump, each rated at 7,620 L/min at 2.13 m TDH; and • Two (2) dedicated centrifugal waste activated sludge

Subcomponent	Description
	<p>(WAS) pumps.</p> <p>3. Scum Collection System for Plants No. 2 and 3</p> <ul style="list-style-type: none"> • A common scum collection system for Plants No. 2 and 3 located ahead of the chlorine contact tank equipped with scum removal facilities.
Air Blowers	<p>Installation of three (3) new blowers with positive displacement, three-lobe rotors and internal pulsation cancellation</p>
Phosphorous Removal	<p>A phosphorous removal system comprising a 24.5 m³ chemical storage tank and two (2) chemical feed pumps, one (1) duty one (1) standby, each rated at 101 L/hour.</p>
Disinfection	<p>Liquid sodium hypochlorite disinfection system consisting of:</p> <ul style="list-style-type: none"> • A 9.1 m³ chemical storage tank and two (2) chemical feed pumps, one duty one standby, each rated at 60 L/hour at 1,000 kPa; and • One (1) three (3) pass serpentine chlorine contact tank measuring 21.3 m x 11.9 m x 3.05 m SWD. <p>Sodium bisulphite feed system complete with two (2) pumps, one (1) local control panel, two (2) flow monitors, two (2) pressure relief valves, one (1) back pressure valve, a calibration column, and a pulsation dampener.</p>
Sludge Handling	<p>1. Primary Digestion</p> <ul style="list-style-type: none"> • Two (2) 19.8 m diameter x 7.30 m SWD circular primary digesters providing a total volume of approximately 2,506 m³; and • Two (2) sludge pumps for transferring sludge to the secondary digesters, each rated at 9.72 L/s at a TDH of 15m. <p>2. Secondary Digestion</p> <ul style="list-style-type: none"> • Two (2) 16.76 m diameter x 8.08 m SWD circular secondary digesters providing a total volume of approximately 1,739 m³; and • Two (2) sludge pumps, one (1) duty one (1) standby, each rated at 6.3 L/s for transferring sludge. <p>3. Sludge Dewatering</p> <ul style="list-style-type: none"> • Sludge Feed Pumps <ul style="list-style-type: none"> ➤ Three (3) positive displacement sludge feed pumps,

Subcomponent	Description
	<p>one (1) duty per centrifuge with a common standby, each rated at 4.4 L/s at a TDH of 28.1 m; and</p> <ul style="list-style-type: none"> ➤ Two (2) in-line grinders, one dedicated to each centrifuge, each rated at 16 L/s. ➤ A polymer addition system. <ul style="list-style-type: none"> • Sludge Dewatering <ul style="list-style-type: none"> ➤ two (2) dewatering centrifuges, each rated to handle a minimum solid loading rate 325 kg/hr at a feed concentration of 2% w/w basis; and ➤ Polymer Addition System consisting of a polymer make-up unit, three (3) new polymer pumps and six (6) polymer addition fittings (three (3) per centrifuge). • Sludge Transfer System <p>Two (2) Centrifuge Discharge Conveyors (shaftless screw type) which transport dewatered cake from each centrifuge (dedicated) to the common Sludge Bin Conveyor (shaftless screw type)</p> <p>4. Digester Gas System: A digester gas flare system</p> <p>5. Dewatering Facility Building: Biosolids structure; a two-storey dewatering section (8.90 m by 13.15 m) and an attached load-out section (9.40 m by 4.50 m).</p>
Standby Power	<p>The Thames Valley Lift Station is equipped with standby power in the form of a mobile generator.</p>

4.0 DRUMBO-PRINCETON WWTS

Subcomponent	Description
Screening Building	<ul style="list-style-type: none"> • One (1) 150 mm diameter influent flowmeter • Two (2) drum screening units with emergency overflow to sump tank • Two (2) wash press compactor units from screening units including discharge tubes and continuous baggers into storage bins(s)
Primary Treatment	<ul style="list-style-type: none"> • One (1) influent flowmeter • One (1) 12.2 m x 1.5 m x 2.4 m SWD primary settling Trash Tank with coarse bubble diffusers, effluent pipe to Transfer Tank and overflow to sump tank
Secondary Treatment	<ul style="list-style-type: none"> • Two (2) 6.1 m x 6.1 m x 2.78 m SWD bioreactor, each bioreactor is equipped with fine bubble diffuser aeration system • One (1) 30 m³ WAS storage tank with coarse bubble diffusers
Post-Secondary Treatment	<ul style="list-style-type: none"> • Two (2) 2.13 m x 2.9 m x 4.43 m Membrane Bioreactor (MBR) tank each equipped with membrane cassettes that supply process air and provide membrane for tertiary filtration • Two (2) RAS pumps (one per MBR tank) conveying sludge from MBR tank to a common RAS/WAS header to distribute activated sludge to the bioreactors and WAS storage tank. Each RAS pump rated 9.53 L/s at 10.7 m TDH • Two (2) permeate pump each rated at 25.5 l/s at 63.3 m TDH • Two (2) turbidity analyzer system to monitor effluent from each MBR tank • One (1) backflush tank with 4.5 m³ of effluent water storage • Three (3) air blowers (one lead, lag and one standby) for MBR tanks each blower rated at 61 l/s
Supplementary Treatment System	<ol style="list-style-type: none"> 1. Citric Feed System <ul style="list-style-type: none"> • One (1) 0.19 m³ citric acid storage drum • Two (2) citric acid metering pumps to membrane cassettes, each rated 271 L/h at 71.4 TDH 2. Sodium Hypochlorite <ul style="list-style-type: none"> • One (1) 0.19 m³ sodium hypochlorite storage drum • Two (2) sodium hypochlorite metering pumps to membrane cassettes each rated at 271 L/h at 71.4 TDH 3. Alum Dosing <ul style="list-style-type: none"> • One (1) 1.36 m³ aluminium sulfate (alum) storage tank

Subcomponent	Description
	<ul style="list-style-type: none"> Two (2) metering pumps conveying alum to bioreactors
Disinfection System	<ul style="list-style-type: none"> One (1) 150 mm diameter ultra-violet (UV) disinfection module equipped with 8 UV lamps rated at 2,203 m³/day and designed to produce min 30 mJ/ cm² with 65% UV transmittance One (1) recirculation pump for the UV system rated 3.2 L/s at 4.6 m TDH
Effluent Outfall	<ul style="list-style-type: none"> 910 m length, 150 mm diameter PVC effluent forcemain from MBR building to drop structure on Wilmont Street (Oxford Road 3) 265 m length, 150 mm diameter PVC effluent gravity pipe from drop structure to culvert crossing on Wilmont Street
Effluent Service Water System	<ul style="list-style-type: none"> Two (2) process water pumps (one duty, one standby) each rated 5.2 l/s at 56.3 m TDH One (1) 0.4 m³ hydropneumatic tank rated at 56.3 m operating pressure
Sludge Management System	Biosolids Storage and Disposal <ul style="list-style-type: none"> Sludge to hauled offsite to Woodstock Wastewater or other approved sewage treatment facilities
Sump Tank	<ul style="list-style-type: none"> One (1) 27.0 m³ sump tank containing two (2) sump pumps which convey wastewater upstream of the screens. Each sump pump is rated 6.9 L/s at 6.1 m TDH One (1) 200 mm emergency overflow pipe from Sump Tank to existing WWTP outfall

5.0 PLATTSVILLE WWTS

Subcomponent	Description
Waste Stabilization Ponds	liquid depth in the cell of 2.19 m (0.3 m sludge storage, 1.89 m operating depth), with 0.75 m freeboard, and a final operating storage volume of 70,495 m ³ ;
Aeration Lagoon Cells	mechanical aerators in Aeration Cells #1 and #2, including suspended fine bubble diffusers, floating laterals, aeration headers, and three 11.25 kW positive displacement blowers.
Intermittent	Four 40 m by 50 m intermittent sand filter units; each with a surface area of 2000 m ² , for a total filtration area of 8,000 m ²

Subcomponent	Description
Sand Filters	
Filter feed pumping and control metering	<ul style="list-style-type: none"> • Equipped with three (3) submersible variable output filter feed pumps (each capable of delivering from 3.0 m³/min to 6.1 m³/min to the filters at 15.3 m TDH), and ability to bypass the filters and discharge effluent directly to the effluent outfall when effluent quality prior to the filters meets the effluent limits • 6.1 m x 4.0 m precast concrete control building to house the valves, flow meters and electrical • Control panels for the filter feed pumps; • 7.3 m by 6.1 m precast concrete control building to house the aeration blowers, valves, and electrical and control panels; and • Effluent flow measuring station consisting of a precast concrete chamber, an open channel flume, and an ultrasonic flow measuring device.

6.0 NORWICH LAGOONS

Subcomponent	Description
Sutton Street Pumping Station	<ul style="list-style-type: none"> • a building to approximately 11.63 m x 8.08 m. plan dimensions, • a wetwell, 2.4m diameter on plan, approximate effective volume 13.6cu.m., • two (2) aboveground sewage pumps (one as standby, Gorman Rupp Model # T8A3-BG), each having a rated capacity of • 67 L/s against 28.8 m T.D.H., • one (1) magnetic flowmeter on the discharge header, • one (1) 20,790L capacity alum storage tank with two (2) chemical feed and metering pumps, • one PLC panel and level controls, high water alarm, all electrical, mechanical and piping works.

<p>Sewage Treatment Plant</p>	<ul style="list-style-type: none"> • Two (2) facultative lagoons system, located in Lot 7, Concession 5 and a New Hamburg Process sewage treatment facility having a capacity of 1,530 m³/d annual average flow including: • One (1) control building equipped with two (2) lagoon effluent pumps (one as standby) each having a rated capacity of 119 L/s against 8.6 m T.D.H. • Four (4) intermittent sand filters, each having a total media depth of 1 m comprising 0.76 m of sand and 0.24 m of crushed stone, and an approximate surface area of 1,600 m², to be operated with two in parallel alternately; • together with miscellaneous pipeworks, electrical, mechanical, instrumentation and control works, all in accordance with the environmental study report, design brief (1995), final plans and specifications submitted by R.J. Burnside & Associates Limited, Consulting Engineers.
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7.0 MT. ELGIN WWTP

Subcomponent	Description
<p>Septic Tanks & Small Diameter Sanitary Sewers</p>	<p>4,500 L capacity (minimum) septic tank complete with an effluent filter on the outlet pipe, at each residential unit to provide pre-treatment of sewage, discharging to gravity sewers.</p> <p>Small diameter sanitary sewers (ranging from 75mm dia. To 125mm dia. High density PVC pipe) on Easement and Mount Elgin Road.</p>
<p>Effluent Pumping Station</p>	<p>Two (2) 2.4 m diameter precast concrete wet wells, located approx. 20 m N. of the easement, equipped with two (2) submersible pumps, each pump rated at 2.2 L/s at 8 m TDH, connected to a 50 mm diameter sanitary forcemain discharging to the recirculation chamber.</p>
<p>Sewage Treatment System</p>	<p>A sewage treatment system with a rated capacity of 381,000 L/d, in four (4) phases (sewage works constructed each phase capable of handling 95,250 L/d), each phase comprising of the following sewage works:</p> <ol style="list-style-type: none"> 1. Recirculation Tank <p>A 95,250 L capacity concrete tank complete with three (3) splitter valves, level controls and six (6) submersible pumps rated 2.4 L/s at 13.8 m TDH, connected to a 50 mm forcemain discharging to the recirculating sand filter, complete with a recirculating flow splitter valve to discharge up to 20 % of incoming flow from the sand filters to the pump chamber for subsurface disposal and up to 80 % of the incoming flow for recirculation back to the sand filters.</p> 2. Recirculation Sand filter <p>A 503 sq.m, sand filter (approx. 30.5m x 16.5 m) constructed in sixteen (16) zones, with a total of 48 PVC pipes 19 mm dia. having 3</p>

Subcomponent	Description
	<p>mm dia. orifices and orifice shields spaced at 600 mm c/c located in the top 150 mm stone layer, underlain by a 625 mm layer of imported filter sand laid over pea gravel/stone base and an impervious PVC liner and underdrain collection system discharging to the recirculation tank.</p> <p>3. Pump Tank A 50,000 L capacity concrete pump tank equipped with four (4) effluent submersible pumps rated at 1.9 L/s at 8.3 m TDH located in a biotube vault assembly complete with an effluent filter on the outlet, discharging via a 50 mm dia. sanitary forcemain to the subsurface disposal system.</p> <p>4. Subsurface Disposal System A 4,275 sq.m, leaching bed comprising of a pressure tight distribution box and a shallow buried trench system made of four (4) cells with each cell having six (6) zones, with each zone having five (5) 21 m long runs of 25 mm diameter perforated distribution pipe (total length of 2520 m) placed 1.6 m apart and located within 0.45 m wide and 0.6 m deep trenches</p>

8.0 TAVISTOCK LAGOONS

Subcomponent	Description
Influent Sewers	<ul style="list-style-type: none"> • 250 mm diameter forcemain from the Wellington Street Sewage Pumping Station discharging to Chamber 3 or Chamber 4 via Valve Chamber 108; • 200 mm diameter forcemain from the Hope Street Sewage Pumping Station discharging to Chamber 3 or Chamber 4; • 250 mm diameter forcemain from the William Street Sewage Pumping Station discharging to Chamber 3 or Chamber 4;
Influent Flow Measurement and Sampling Point	<ul style="list-style-type: none"> • one (1) flow measurement device and one (1) automatic composite sampler at Chamber 3 for the raw influent flow to Cell 1; • one (1) flow measurement device at Chamber 4 for the raw influent flow to Cell 2, to be used when Cell 1 is closed for maintenance;
Bypass	<p>A Secondary Treatment Systems bypass channel for flow from Cells 1,2 and 3 that when it exceeds the secondary treatment capacity, discharges to Cell 4;</p>
Effluent Storage	<p>Cell 4 having a volume of approximately 159,000 m³ with inlet and outlet chambers, with an operating depth of approximately 3.9 m and a</p>

System	surface area of approximately 4.08 ha discharging to the intermediate pumping station via Manhole/Valve Chamber 110;
Secondary Equivalent Treatment System	<ul style="list-style-type: none"> • A continuous discharge waste stabilization lagoon with an approximate volume of 777,400 m³ providing a total retention time of approximately 265 days, with three (3) cells operated in series as follows: • Cell 1, having an operating depth of approximately 5.0 m, a surface area of approximately 4.60 ha and a volume of approximately 230,200 m³, with inlet, outlet and interconnecting chambers and equipped with a fine bubble aeration system, together with six (6) aspirating type floating mechanical surface aerators, complete with all mooring and anchoring mechanisms, discharging to Cell 2; • Cell 2, having an operating depth of approximately 5.0 m, a surface area of approximately 4.24 ha and a volume of approximately 212,200 m³ with inlet, outlet and interconnecting chambers and equipped with twenty four (24) MAT aerators, discharging to Cell 3; • Cell 3, having an operating depth of approximately 4.0 m, a surface area of approximately 8.38 ha and a volume of approximately 335,000 m³ with inlet, outlet and interconnecting chambers and equipped with forty three (43) MAT aerators, discharging to Hohner Drain via Manhole 8 or Cell 4; • Three (3) rotary positive displacement blowers (two duty, one standby) each rated at 23.75 m³/min of at a pressure of 58.7 kPa;
Intermediate Pumping Stations	<ul style="list-style-type: none"> • A 3.6 m diameter wet well type sewage pumping station equipped with three (3) submersible pumps (one standby) with variable frequency drives each rated at 80.5 L/s at a TDH of 24.3 m discharging via a 300 mm diameter forcemain to: • Intermittent sand filters for post-secondary treatment; • Cell 3 for effluent recirculation; or • Hohner Drain for direct discharge form the secondary equivalent treatment system;
Intermittent Sand Filters	Four (4) filter cells each with a peak hour flow rate of 238 m ³ /hr and a surface area of 4,200 m ² for a total surface area of 16,800 m ² , together with distribution piping and underdrain collection piping to be used as required discharging to Hohner Drain via manhole/valve chamber 103;
Supplementary Treatment Systems	<ol style="list-style-type: none"> 1. Phosphorus Removal <ul style="list-style-type: none"> • One (1) 27,000 L capacity phosphorus removal chemical storage tank and two (2) metering pumps (one standby) each rated at 0 to 79 L/h dosing to Cells 1 and 2; 2. pH Control <ul style="list-style-type: none"> • One (1) 1,000 L capacity portable chemical storage tank with

	<p>containment;</p> <ul style="list-style-type: none"> Two (2) metering pumps with variable frequency drive each rated at 10 -200 mL/min, discharging to the intermediate pumping station on an emergency basis; <p>3. Final Effluent Flow Measurement and Sampling Point</p> <p>one (1) flow measurement device downstream of the intermediate pump station and intermittent sand filters;</p> <p>4. Final Effluent Disposal Facilities</p> <ul style="list-style-type: none"> 450 mm diameter effluent sewer from manhole/valve chamber 103 to manhole 8 approximately 300 m long) increasing to a 600 mm diameter effluent sewer discharging to Hohner Drain via manholes 109 and 8;
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9.0 THAMESFORD WWTS

Subcomponent	Description
<p>Sewage Pumping Stations (SPS)</p>	<ol style="list-style-type: none"> Stanley St. SPS <ul style="list-style-type: none"> 2.4m diameter wet well, equipped with one duty and one standby sewage submersible pumps, each rated at 6.2 L/s at 8.2 TDH. A 100 mm diameter sanitary forcemain from the SPS transports flow to an onsite valve chamber. Municipal SPS <ul style="list-style-type: none"> A 3.0 m diameter x 7.25 m deep wet well type, equipped with two (2) submersible pumps (one standby) with variable frequency drives, each rated at 60 L/s at a TDH of 9.4 m; A manually raked bar screen, with a Peak Instantaneous Flow Rate of 30 L/s An interconnection between manholes for overflow between pumping stations; Cold Spring SPS <ul style="list-style-type: none"> A 3.0 m diameter x 7.25 in deep wet well type, equipped with two (2) submersible pumps (one standby) with variable frequency drives, each rated at 60 Lis at a TDH of 9.4 m; An interconnection between manholes for overflow between pumping stations;
<p>Primary Treatment</p>	<p>114 m³ wet well equipped with two 18.9 L/s centrifugal pumps and one 23.5 L/s submersible pump.</p>

<p>Secondary Treatment</p>	<p>1. Existing:</p> <ul style="list-style-type: none"> • One 12.9m diameter x 6.95 m x 4.6m side water depth (SWD) reconfigured aeration tank; • One air blower rated at 2,654 m³/h at 40.8 kPa; • Two standby blowers rated at 5,100 m³/h at 55.2 kPa; and • One standby blower rated at 936 m³/h at 55.2 kPa. <p>2. Currently Offline:</p> <p>The complete mix aeration tank dimensions are 42.7 x 9.8 x 5.3m SWD and is equipped with a jet aeration system. The plug flow aeration tank dimensions are 42.7 x 6.7 x 5.3m SWD and is equipped with coarse bubble aeration system. Both aeration tanks are currently offline but will be operable after the upgrades are completed in 2023. Both are planned to be used once the flows exceed the capacity of the existing aeration tank.</p>
<p>Secondary Sedimentation</p>	<ul style="list-style-type: none"> • One 12m diameter x 3.6m SWD clarifier equipped with sludge and scum removal mechanisms; • One standby and one duty return activated sludge pumps, each rated at 19.9 L/s. Both discharge to the reconfigured aeration tank, with a provision to switch the flow to the large aeration tank; • One 3m x 2.5m x 4.75m deep well; and • One standby and one duty activated sludge pumps, each rated at 75 L/s at 4.4m TDH.