Tottenham Secondary Plan

Water and Wastewater Servicing Master Plan Update

MacViro

CORPORATION OF THE TOWN OF NEW TECUMSETH

January 2008

MacViro
Engineering and Environmental Science

5226

January 30, 2008

Mr. Richard Vatri, C.E.T.
Manager of Engineering
The Town of New Tecumseth
P.O. Box 910
10 Wellington Street East
Alliston, ON L9R 1A1

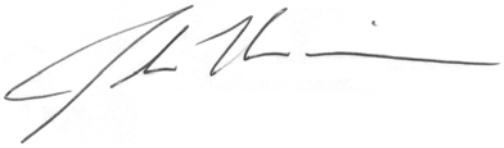
Re: Water and Wastewater Servicing Master Plan Update
Tottenham Secondary Plan
Town of New Tecumseth

Dear Mr. Vatri:

We are pleased to present to the Town of New Tecumseth our Final Tottenham Secondary Plan Master Plan Update for water and wastewater servicing.

We trust that our report submission meets your requirements. Please do not hesitate to contact me at (905) 475-7270 ext. 277, should you have any concerns or comments.

Yours truly,
MacViro Consultants Inc.



John Himanen, P.Eng.
Project Manager

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1. Introduction

1.1 Problem Identification

The Town of New Tecumseth's Official Plan provides for growth in the Community of Tottenham that will require both expansion of the Town's water and wastewater systems and upgrades to existing municipal services. To outline a framework for future infrastructure works, the Tottenham Secondary Plan Class Environmental Assessment, Stormwater Management and Municipal Servicing Master Plan was completed in July 1997 by Philips Planning and Engineering Limited. The Master Plan was prepared for three blocks of land, which collectively define the expansion of the Urban Boundary for the Community of Tottenham. These lands, which comprise the Secondary Plan Area (SPA), are generally located south and to the east of the existing limits of the Community of Tottenham (refer to Figure 1.1) as follows:

- Six Nights Developments, located north of Mill Street and east of the CPR railway line, consisting of approximately 45 ha;
- Nordstar Developments (previously identified as 976349 Ontario Inc.), located south of Mill Street and east of the CPR railway line, consisting of approximately 30 ha;
- LRG Tottenham Developments (previously identified as Mod-Aire Homes Limited & Inter Phase Developments Inc.), located north of Third Line and West of the CPR railway, consisting of approximately 38 ha.

The Master Plan identified key components for the recommended municipal servicing solutions including stormwater management, water and wastewater servicing. In accordance with the requirements described in the Municipal Engineers Association's *Municipal Class Environmental Assessment* document (June 2000), the Town is now proceeding with an update of the water and wastewater servicing components of the Master Plan. It requires the following to be completed: definition of the problem, identification and assessment of alternative water and wastewater servicing solutions, and selection of the preferred servicing alternative. Previous work undertaken under the 1997 Master Plan will be reviewed, validated and amended where required for the development of this Update.

1.2 Rationale for Master Plan Update

A Master Plan is a long-range plan that integrates infrastructure requirements for existing and future land use with environmental assessment planning principles. It is an effective tool for assessing the Community of Tottenham's municipal infrastructure system in order to outline a framework for planning of future infrastructure and development works. Given that the five-year life of the 1997 Master Plan has been exceeded, an update of the Plan is now required to facilitate municipal water and wastewater servicing requirements and infrastructure improvements within the SPA as well as to ensure that the Town's infrastructure program remains consistent with the changing needs of the community.

1.3 Reference Reports and Studies

The 1997 Tottenham Secondary Plan Class Environmental Assessment was based on a review of a number of previous reports and studies, including:

- Preliminary Geotechnical and Hydrogeological Evaluation - East Tottenham Secondary Plan, Town of New Tecumseth (Community of Tottenham) prepared by Terraprobe Limited, March 1996.

This study, prepared for Six Nights Development Limited and Arvida Development Corporation (976349 Ontario Inc.) provided a baseline inventory of hydrogeologic and geotechnical conditions for the 90 ha area adjacent to the east boundary of the Community of Tottenham. The report provided the 1997 Master Plan with a preliminary assessment of the soil and groundwater conditions at the site, geotechnical constraints with respect to development of services and housing, and guidance with respect to development within the Oak Ridges Moraine area.

- Tottenham East Development, Town of Tottenham - Preliminary Environmental Impact Report prepared by Dougan & Associates and G Portt & Associates, December, 1995.

This study identified and evaluated environmental constraints related to fisheries and terrestrial resources within the study area. The constraints outlined in the foregoing study were implemented into the 1997 Master Plan as areas of protection/enhancement wherever possible.

- Amberglen Developments Inc. and Ellsbirch/Mountell Investment Lands Tottenham, Development Re: Oak Ridges Moraine Impact Assessment - Implementation Guidelines prepared by Gore and Storrie Limited, October 1995.

This study, prepared for Amberglen Developments Inc. and Ellsbirch/Mountell Investment, provided supporting documentation for the residential designation and development of lands south of the existing developed Community of Tottenham. The report provided the 1997 Master Plan with guidance as to how the development of the foregoing lands can proceed in compliance with the Oak Ridges Moraine Implementation.

- Stormwater Management Study for Amberglen and Ellsbirch/Mountell Development, Tottenham, Town of New Tecumseth prepared by A. M. Candaras Associates, May 1995.

This report provided some of the hydrologic parameters for the Amberglen and Ellsbirch/Mountell (Mod-Aire Homes et. al.) development area used in the regional hydrologic analysis in the 1997 Master Plan. One primary stormwater management constraint identified in this study was the limited capacity of an existing 900 mm diameter culvert passing under the CNR line east of the site. The limited culvert capacity creates potential for flooding within the development area, which led to a recommendation by Candaras for a water quantity control facility upstream of the railway.

- Hydrogeologic and Geotechnical Assessment Proposed Residential Subdivision, Part Lot 6, Conc. 3 Town of New Tecumseth prepared by Terraprobe Limited, April 1995.

This study, prepared for Mod-Aire et al (formerly Amberglen Developments Inc. and Ellisbirch/Mountell), provided a baseline inventory of geotechnical and hydrogeologic conditions, as well as management objectives for the 18 ha area immediately south of the existing developed Community of Tottenham.

- Preliminary Stormwater Management Report, Arvida-Tottenham Limited 43T-89042, Amalgamated Municipalities of Alliston, Beeton, Tecumseth and Tottenham, prepared by G. M. Sernas Associates Ltd., January, 1992.

This study provided some of the hydrologic parameters for the Arvida-Tottenham development area used in the regional hydrologic analysis for the 1997 Master Plan study. The area identified in this study is located in the Community of Tottenham, north of Mill Street and East of the Canadian Pacific Railway. Drainage from this area has been proposed to be treated as external drainage to the Six Nights Developments lands.

- Town of New Tecumseth, Community of Tottenham, Preliminary Servicing Study for Proposed Tottenham (East) Secondary Plan prepared by Urban Ecosystems Limited, (undated)

This report, prepared for Six Nights Developments Inc. and 976349 Ontario Inc., illustrates the serviceability of lands to the east of the existing developed Community of Tottenham, immediately north and south of Mill Street.

In addition to the foregoing studies, the following documents were also used in the 1997 study.

- Town of New Tecumseth Master Servicing Report for Area Sewage Works - Environmental Study Report prepared by CC Tatham and Associates, December 1995.

This study provided water quality and sanitary servicing baseline information, which has been used to guide the development of a stormwater management plan for the Secondary Planning area.

- Nottawasaga Valley Watershed Management Plan, Nottawasaga Valley Conservation Authority (NVCA), January 1996.

This document provided by the NVCA during the course of the Master Plan consultation phase provided background on environmental goals and objectives.

- Stormwater Management Practices Planning and Design Manual, MOE, 1994.

This MOE publication was used as a technical resource and basis for water quality requirements for the Tottenham Secondary Plan Area.

- Watershed Hydrology Study for Nottawasaga, Pretty and Batteaux River, Black Ash, Silver, and Sturgeon Creeks prepared by MacLaren Plansearch for the Nottawasaga Valley Conservation Authority, 1988.

This study provided a base hydrologic model, which was further discretized and updated to represent the Tottenham Secondary Plan Area.

- Guidelines for the Design of: Sanitary Sewage Works; Water Distribution systems, MOE, 1994.

This MOE publication was used as a technical resource.

- Town of New Tecumseth Engineering Design Standard Specifications and Drawings, 1993.

This document was obtained from the Town and used as a technical and design reference.

- Town of New Tecumseth (Tottenham Area) Proposed Residential Development Water Servicing, prepared by Ainley & Associates Limited, 1997.

This report outlines the effects of the proposed developments on the existing water distribution system.

- Town of New Tecumseth Hydraulic Performance Analysis of the Tottenham Water Works System, prepared by Ainley & Associates, 1994.

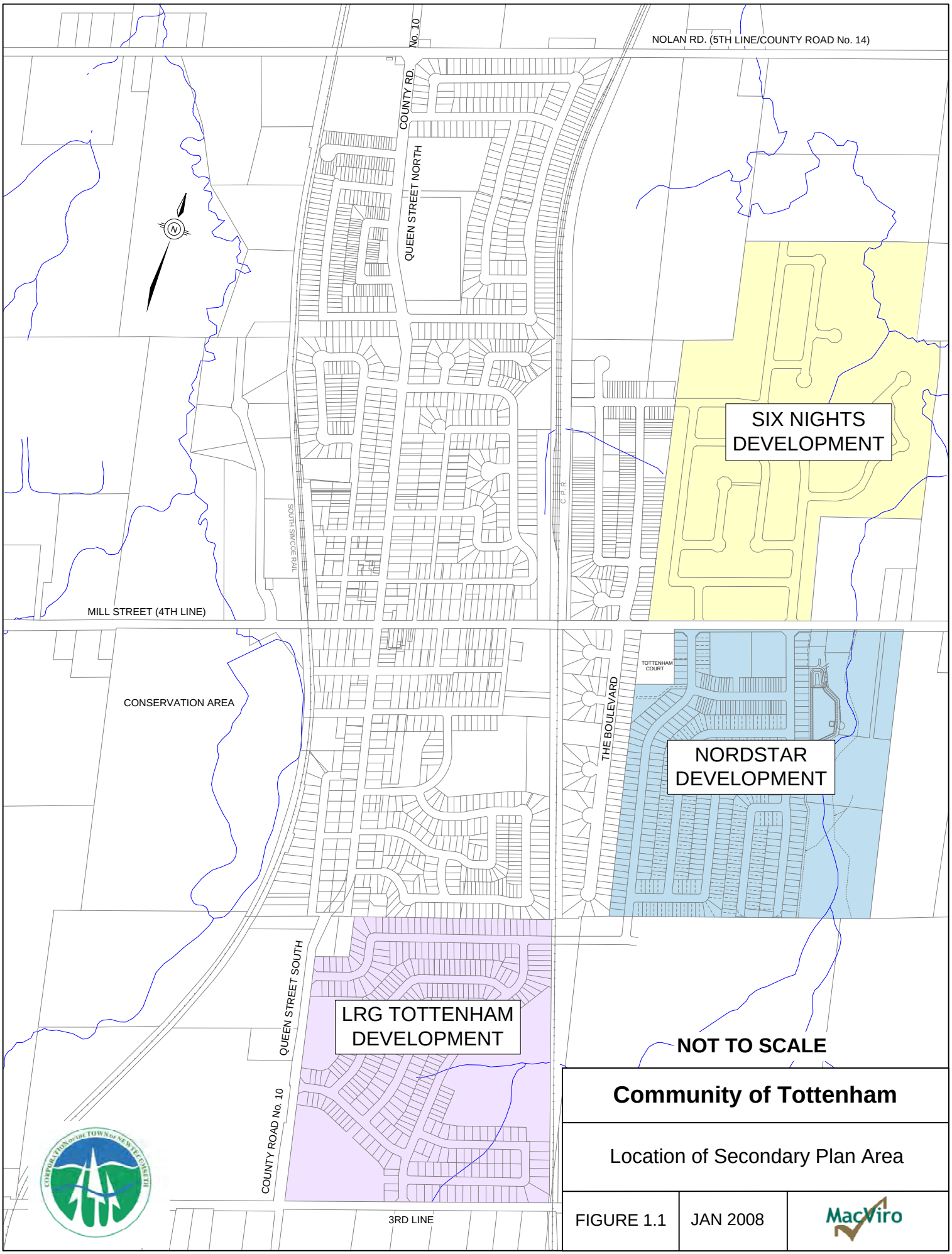
This report was used as a basis for evaluating the 1997 Ainley water servicing report.

- Town of New Tecumseth (Tottenham) Municipal Assistance Program No. 53-0117-01 Water Works Expansion, February 1996 and Addendum to Design Brief, June 1996, prepared by Ainley & Associates.

These reports were used as a basis for evaluating the 1997 Ainley water servicing report.

- Town of New Tecumseth Master Servicing Plan for Area Sewage Treatment Works - Environmental Study Report; December 1995, prepared by C.C. Tatham & Associates.

This report was used to obtain information on the current sanitary sewer infrastructure, and proposed future enhancements.



Community of Tottenham

Location of Secondary Plan Area

FIGURE 1.1	JAN 2008	MacViro

2. Study Objectives

The objectives of the Master Plan Update are as following:

Provide Water and Wastewater Systems to Support Growth Effectively

It is an objective of the Master Plan Update to define the water and wastewater infrastructure required to service anticipated growth in the Community of Tottenham in an efficient and cost-effective manner. While population and employment forecasts provide the guidelines to calculate water and wastewater capacity and servicing requirements, careful staging and phasing of the infrastructure program is required to accommodate growth in a timely manner while avoiding over-commitment of expensive capital works.

Protect the Environment

The Master Plan Update will help ensure that the existing natural environment is capable of meeting the needs of the present without compromising the ability of future generations to meet their own needs. In developing the Master Plan, the Town must be sensitive to the environment and must meet or exceed all relevant guidelines, policies and standards, including those pertaining to groundwater resources and the Oak Ridges Moraine.

Cost Stability and Minimization

The Master Plan Update must evaluate and select the servicing solutions, which maintain cost stability throughout the implementation of the projects. Minimizing cost and optimizing delivery of works to correspond to the anticipated population and employment growth will help to ensure this objective is achieved.

3. Existing Conditions

3.1 Study Area

The previous Town of Tottenham was incorporated in 1884. In January 1991, The Town of New Tecumseth was created incorporating Tottenham and other former municipalities including Alliston, Beeton, and Tecumseth Township. The Community of Tottenham is located at the southwest portion of the Town of New Tecumseth.

3.2 Population and Employment

Population and employment data from the May 15, 2001 Statistics Canada Census of Population are a key data source for estimating water and wastewater servicing requirements. The 2001 census indicated a population of 4,829 for the Community of Tottenham.

3.3 Existing Water and Wastewater Infrastructure

3.3.1 Wastewater Infrastructure

The existing sanitary infrastructure within and adjacent to the SPA is shown on Figure 3.1. Currently, there is no wastewater servicing of the Secondary Plan Area. Sanitary sewers have however been constructed to the existing limits of the Community of Tottenham urban boundary in anticipation of future connections being installed.

The Boulevard Pumping Station (previously identified as the Eastgate Pumping Station) is located at the intersection of The Boulevard and Mill Street, adjacent to the Six Nights Developments and Nordstar Developments. Sanitary flows from homes constructed in The Boulevard subdivision, as well as from Tottenham Court, discharge into this facility. A 100 mm forcemain discharges sewage to a manhole located at the intersection of Mill and Keogh Streets, where it is then directed to the Industrial Road pumping station via a series of gravity sewers. The Boulevard Pumping Station is currently working at, or near, capacity. This is generally due to a large amount of inflow/infiltration into the sanitary sewer system in this area. During high rainfall events, surcharging of the sanitary sewer running along Eastern Avenue, resulting in basement flooding, does periodically occur. Sanitary flows discharging into this sewer from the Boulevard Pumping Station have been identified to be a significant contributor to the surcharging events.

At the south limit of the existing residential area, adjacent to the LRG Tottenham Developments, sanitary sewers of 200 mm diameter have been constructed on Queen Street to Brown Street, and along Brown Street.

The entire sanitary sewer system eventually discharges to the Industrial Road Pumping Station. From this point, sewage is pumped west via a 350 mm diameter forcemain to the Tottenham Wastewater Treatment Plant (WWTP). As documented in the "Town of New Tecumseth Master Servicing Plan for Area Sewage Treatment Works - Environmental Study Report" (C.C. Tatham & Associates, December 1995), the WWTP is an extended

aeration plant, which incorporates the existing lagoons as sludge storage and effluent polishing facilities. Treated effluent is ultimately discharged to the Beeton Creek.

Works are ongoing at the Tottenham WWTP to increase its approved capacity up to 4,082 m^3/day. A Certificate of Approval Amendment to allow growth up to the expanded capacity has however not yet been issued. The increase in plant capacity, once approved, will allow for the servicing of a population equivalent of approximately 5,000 additional persons. The upgraded plant will include effluent filtration and ultraviolet disinfection equipment. The existing Industrial Road sewage pumping station is also being upgraded as part of the WWTP expansion.

Tottenham WWTP

The Arvida Tottenham subdivision has also been developed. Sanitary flows from this subdivision are serviced by the temporary Arvida Pumping Station.

3.3.2 Water Infrastructure

The existing water distribution infrastructure adjacent to the SPA is shown on Figure 3.2. Watermains have been constructed to the limits of the Community of Tottenham urban area, however, the SPA (study area) itself is not serviced.

A 200 mm watermain has been constructed on Mill Street to service The Boulevard and the Tottenham Court. A 250 mm watermain has also been constructed along Queen Street, from the elevated reservoir at the south limit of the existing urban boundary.

Tottenham's current water supply system consists of four wells and four storage facilities. The 2004 flow data indicate that the wells produce a maximum daily output of approximately 3,907 cubic metres, while the storage facilities provide a storage volume of 5,814 cubic metres.

A new water tower was commissioned in June of 1997. The existing water supply system has sufficient capacity to service a population of approximately 9,600 people.

3.4 Natural Environment

A review of the existing condition of the natural environment was undertaken, based primarily on a review of existing data sources, to define what environmental features may be affected by the water supply and wastewater servicing alternatives, and to

identify major constraint areas. Since the Master Plan addresses strategic water supply and wastewater servicing issues, site-specific environmental details are not provided. Further details on specific issues will be identified and assessed, where required, during the subsequent implementation of individual Class Environmental Assessments.

3.4.1 Physical Setting

The following summary of geologic and hydrogeologic information and analysis has been extracted from two reports (April, 1995 and March, 1996) prepared by Terraprobe Limited.

Physiography

The lands within the Secondary Plan Area generally exhibit relatively flat to gently rolling topography with slopes ranging from 0.5 to 5.0%. Topographic relief for the area is generally directed to the north and east towards the east branch of the Beeton Creek.

Nordstar Development

The LRG Tottenham lands, located at the north limit of the Oak Ridges Moraine, exhibit more steeply rolling terrain with maximum topographic relief of 15 metres.

LRG Tottenham Developments

Soils

Soils within the Six Nights and Nordstar Development lands are primarily Schomberg silty clay loam (Hydrologic Soil Group C - moderate runoff potential), with soils within

the LRG Tottenham lands consisting of a mix of Schomberg silty clay loam, Smithfield silty clay loam (also Hydrologic Soil Group C) and Bondhead sandy loam (Hydrologic Soil Group AB - low runoff potential).

Quaternary Geology

The Community of Tottenham is underlain by glacial Lake Algonquin glaciolacustrine shallow and deep water deposits comprised of sand to silt and clay. The area to the south of the developed portion of the Community of Tottenham (LRG Tottenham lands) is underlain by Kettleby Till which consists primarily of silt to clayey silt till. The area to the east of the Community of Tottenham (Six Nights and Nordstar Development) is within the Schomberg Clay Plain. Schomberg sediments are typically varved clay with annual layers 50 mm to 100 mm thick. Mechanical analysis has indicated that the sediments are 50% clay and 40% silt however the behaviour of the soil is consistent with that of a silt rather than that of a clay.

Bedrock Geology

Bedrock under the study area is primarily shale of the Georgian Bay formation. Bedrock is found at depths of 100 m in this area based on available well records.

3.4.2 Terrestrial Resources

Terrestrial resources were documented on the basis of a review of background documents, agency contacts, and field studies.

Existing Conditions

The study area consists of three parcels of land located north and south of Mill Street. Forest cover has been virtually eliminated by agricultural land uses, except within the valley of Beeton Creek where some natural cover has persisted. As indicated in the 1997 Master Plan, no environmentally sensitive areas, classified wetlands or other sensitivity issues were identified within the study area or its immediate vicinity.

North of Mill Street

A total of 33 vegetation units have been identified north of Mill Street, with 86 plant species documented. Communities represented included forests associated with the Beeton Creek corridor, a wet meadow (fed by groundwater seepage), a small woodlot remnant, and hedgerow connections. No significant species were encountered.

South of Mill Street

The study area immediately south of Mill Street is actively cultivated with limited natural vegetation cover, including meadow, seasonal swales with marsh cover, and hedgerows. Of 55 plant species documented, none were of significant status. The floodplain area associated with Tributary A offers the potential for re-vegetation as a secondary habitat corridor.

The LRG Tottenham lands are also predominantly under cultivation. Small pockets of meadow, marsh, shrub thicket, and hedgerows were identified. A total of 58 plant species were documented; none are considered significant.

East Branch of Beeton Creek

The valley of the east branch of Beeton Creek is the only significant vegetated corridor in the study area. A habitat node of approximately 2.5 ha, made up of slope forest, shrub swamp and floodplain communities are located in the northeast corner of the overall study area.

Assessment

The study area consists of a range of upland and valley features which were highly fragmented by past agricultural land uses. No terrestrial resources of particular significance were noted, although the valley of the east branch of Beeton Creek has the capability to support significant flora and fauna, which were not evident during the early winter field survey.

Primary sensitivity features identified are associated with the steep slopes and groundwater discharge zones along Beeton Creek and its tributaries. To protect these features, buffer zones should be established to conserve the groundwater feature and prevent degradation from urban uses, which may result in erosion.

A wetland located on the LRG Tottenham lands was rated as a moderate constraint, and should be retained or integrated with the stormwater management facility for this area.

3.4.3 Socio-economic and Cultural Environment

Tottenham is an agriculture and industry-based community with urban neighbourhoods both long established and new. The socio-economic and cultural environment has been reviewed to ensure community impacts are considered in a local context in the development and evaluation of alternatives.

3.4.4 Cultural Heritage

The Community of Tottenham has a rich cultural heritage. Initially settled by Irish immigrant farmers, Tottenham's history includes events such as the great fire of 1895 and arrivals of both the Canadian Pacific and Hamilton and Northwest railways to the area. The area's rich history is reflected in the heritage streetscape of the downtown area as well as other resources such as the Tottenham Pond (where the original 1865 Avoca Mill and dam are located) and the South Simcoe Railway (part of the original Hamilton and Northwest Railroad). Guidelines and criteria established by the Ministry of Culture, Tourism and Recreation are used to identify, interpret and preserve the features, structures, and archaeological resources relevant and significant to the area's cultural heritage.

3.4.5 Agricultural

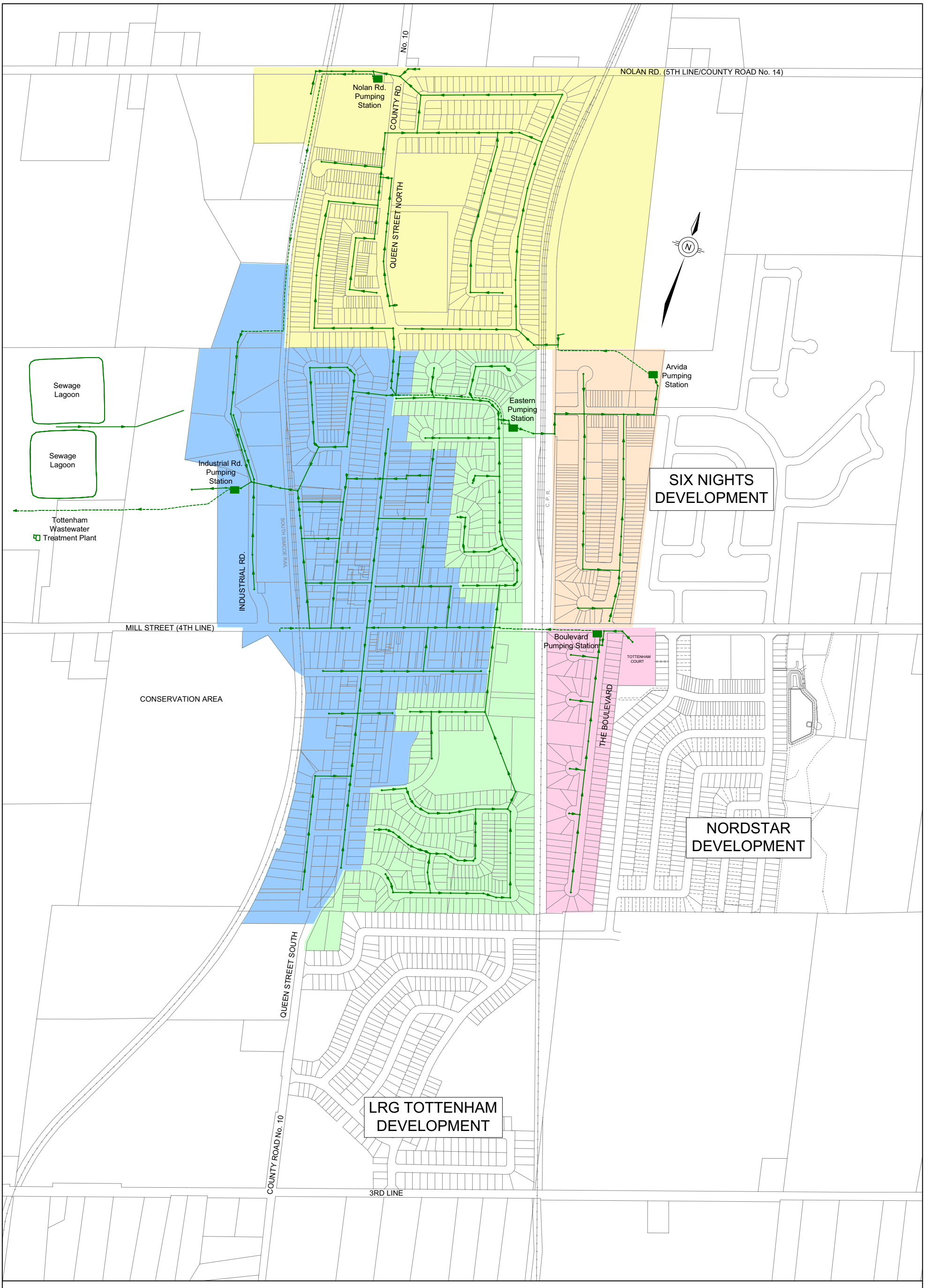
Agriculture is an important part of the area economy, providing jobs and agricultural products. The SPA consists of previous agricultural lands. Although some of the existing farmland will be required to accommodate growth anticipated for this area, it is important to protect the remaining farmland in the rural portions because of their importance to the local economy and as a source of food products.

3.4.6 Rural

The study area is originally rural in nature. However, as indicated in the 1997 Master Plan, no significant areas of environmental significance have been identified within the SPA. Small settlement areas are found throughout the surrounding area. In general, development is limited within the rural areas to avoid the loss of the Community's character.

3.4.7 Estate Residential Development

Estate residential development is generally intended to provide an alternative form of housing to what is typically found in more urbanized or built-up areas. Although these developments have high assessment yield, the total cost and concerns over the long term are also potentially high. It is intended that estate residential housing will constitute a limited portion of the total housing stock within this study area. Estate residential development is typically permitted only if it retains the rural character of the area, preserves the natural environment and minimizes the impact on existing or potential agricultural operations. Because of the large lot size, exclusivity of housing and the secluded nature of these types of developments, the number of this type of developments is typically limited, and it is usually preceded with private water and wastewater servicing.



NOT TO SCALE

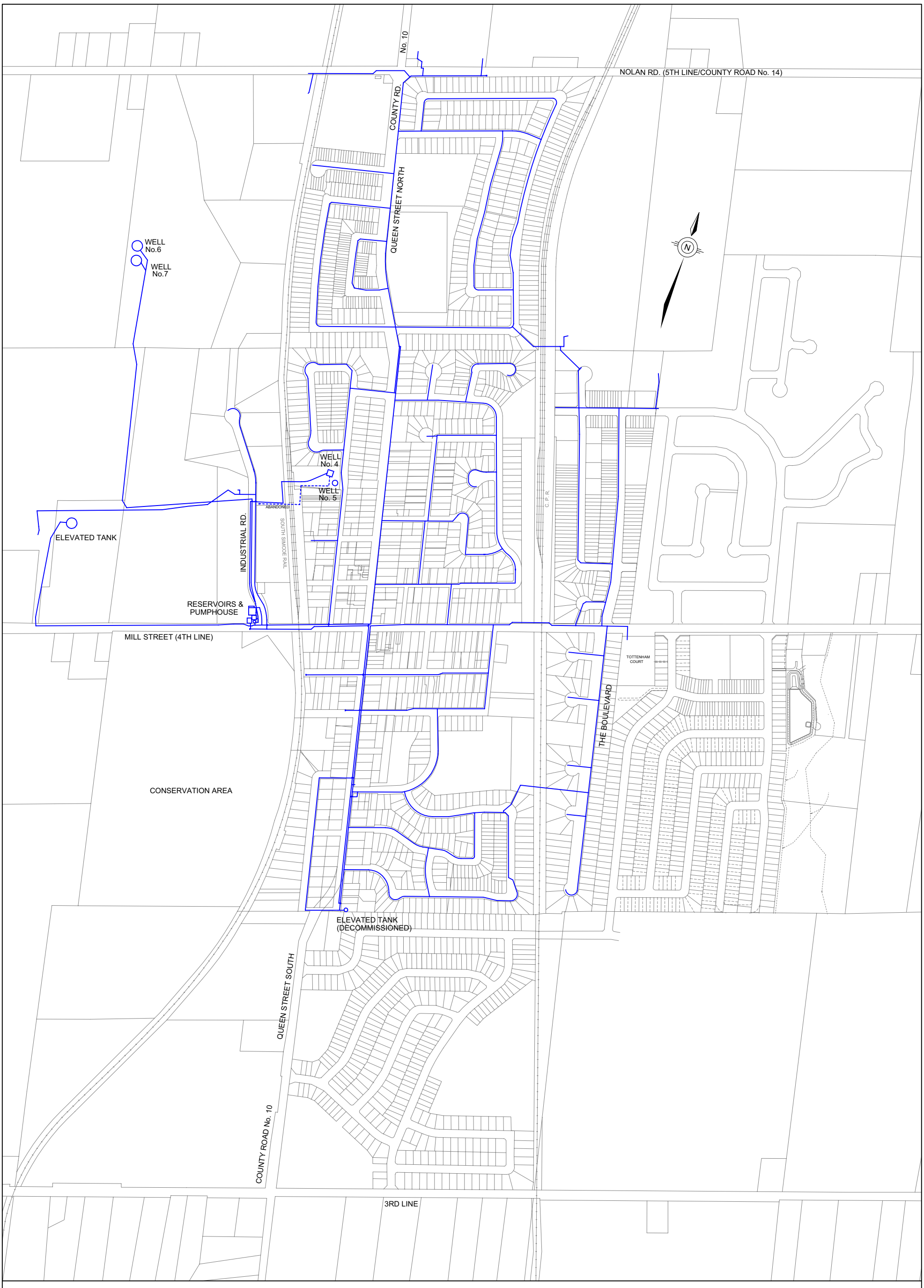
LEGEND

- Existing Gravity Sanitary Sewers
- Existing Sanitary Forcemains
- Nolan Road Pumping Station Drainage Area
- Industrial Rd. Pumping Station Drainage Area
- Arvida Pumping Station Drainage Area
- Boulevard Pumping Station Drainage Area
- Eastern Pumping Station Drainage Area

Community of Tottenham

Existing Wastewater System

FIGURE 3.1	JAN. 2008	MacViro



LEGEND

Existing Watermains

NOT TO SCALE

Community of Tottenham

Existing Water System

FIGURE 3.2	JAN. 2008	MacViro

4. Population Growth, Water Demand and Wastewater Flow

4.1 Methodology

The methodology adopted for developing the wastewater flow projections utilizes unit consumption rates and peaking factors based on the design criteria specified in the 1997 Master Plan.

The water demand projection is also calculated by applying unit consumption rates and peaking factors with reference to historical statistics. This water demand projection will be confirmed based on the results of the Water Distribution and Storage Master Plan for the Town of New Tecumseth currently being developed by MacViro.

4.2 Population Growth Forecast

Population growth in the Tottenham area as defined by the Town of New Tecumseth – Growth Management Study is indicated in the following Table 4.1:

Table 4.1 Projected Populations of the Community of Tottenham

Year	2001	2006	2011	2016	2021	2026	2031
Population	5,000	5,900	7,000	8,100	9,200	10,200	11,300

Source: Town of New Tecumseth - Growth Management Study, March 13, 2002

These projected populations are being used to designate settlement and land use boundaries, to determine future transportation requirements, to calculate sewer and water capacity needs, to determine housing needs and associated land requirements, to estimate the need for social programs and new schools and to provide a basis for other service and program planning in the area and by industry and business for investment decisions.

4.3 Wastewater Flowrate and Water Demand Projections

The 1997 Master Plan indicated that the existing supply and storage capacity within the Town has been assumed to be sufficient to accommodate growth within the Tottenham SPA.

A wastewater flow projection for the Tottenham Secondary Plan Area and associated areas to be serviced by the pumping station proposed for the SPA, has been developed as indicated in Appendix A. It is estimated that the firm capacity of the SPA pumping station will be approximately 175 L/s. This wastewater flow projection is based on the above population forecast, up-to-date SPA development draft plans, and flow estimation from the existing population. The wastewater flow projection is approximated only for the purpose of confirming the wastewater serving needs (and comparison of capital costs) at a master planning level. This projection will be confirmed as part of the required Schedule B, Class EA for the pumping station works.

5. Water and Wastewater System Requirements

This section documents the requirements for water and wastewater servicing, including water pressure, water distribution system, water and wastewater pumping stations, and treatment or supply capacity.

5.1 Design Criteria

5.1.1 Treatment and Supply

Treatment and supply facilities are typically designed to satisfy maximum day demands, with peak demands (maximum hour) satisfied from system storage. Supply and treatment facilities are constructed in stages to coordinate increases in capacity with anticipated water demand or wastewater generation. Under certain circumstances, surplus storage can be used to offset supply requirements and vice versa.

5.1.2 Water Storage Facilities

The total required water storage capacity of a pressure district or water service area is the sum of Fire Storage, Equalization Storage and Emergency Storage. The storage requirement criteria are as indicated in Table 5.1 below:

Table 5.1 Water Storage Design Criteria

Storage Component	Design Criteria
Fire Storage (A)	Large districts: 17,000 L/min for 3.5 hours Small districts: 10,000 L/min for 2 hours
Equalization Storage (B)	25% of the district maximum day demand (MOE guideline)
Emergency Storage (C)	25% of (A) + (B) (MOE guideline)

5.1.3 Pumping Stations

Pumping stations will be designed with a capacity equal to the maximum day capacity. Firm capacity of each facility will be based on maintaining one pumping unit as a standby pump. If an area is serviced by more than one pumping station, the firm capacity will be evaluated on a system basis, i.e. considering the largest pump in the group of stations as a standby unit. Although the system generally has sufficient online floating storage, it is recommended that standby power be provided for all pumping stations, in accordance with standard design procedures. Surge control, if required, can be provided through control valves and/or surge control tanks.

Pumping stations are typically constructed and expanded in increments of capacity to coincide with anticipated flows. The building and services would be initially to house the pumps, motors and other equipment for the ultimate capacity but only equipped for the initial capacity required.

5.1.4 Water Transmission and Distribution

As indicated in the Table 5.2 below, the minimum allowable pressure in any of the water service areas is 275 kPa (40 psi) with the minimum peak pressure range at 400 to 450 kPa. The maximum allowable pressure is 700 kPa (100 psi). Under fire flow conditions, system pressure may fall below the minimum standard. The maximum allowable velocity in watermains is 1.5 m/s. Although this guideline is appropriate for new watermains, pressure requirements usually govern the system.

The Ministry of Environment, "Guidelines for the Design of Water Distribution Systems" and the Town of New Tecumseth "Engineering Design Standard Specifications and Drawings" have established the following design criteria:

Table 5.2 Water Distribution System Design Criteria

Average Domestic Consumption	450 L/capita/day
Fire Flow Requirements [1] (Single Family Detached)	67 – 83 L/sec
3 Story Apartment Building [1]	117 L/sec
Operating Pressure for Maximum Daily Flow	350 kPa - 550 kPa
Maximum Pressure	700 kPa
Minimum Operating Pressure For Maximum Hourly Demand	275 kPa
Minimum Operating Pressure for Simultaneous Maximum Day and Fire Flow Demands	140 kPa
Maximum Hydrant Spacing	100 m
Minimum Fire Flow (Residential)	38 L/sec
Minimum Fire Flow (Industrial)	75 L/sec
1. Reference "Fire Underwriters Survey, 1996"	

5.1.5 Sanitary Sewer

The Ministry of Environment "Guidelines for the Design of Sanitary Sewage Works" and the Town of New Tecumseth "Engineering Design Standard Specifications and drawings" have established sanitary sewer design criteria. The criteria used in this assessment are as follows:

Table 5.3 Sanitary Sewer Design Criteria

Per Capita Wastewater Generation	450 L/capita/day
Commercial Design Flows	40 m^3/ha/day
Infiltration / Inflow Allowance	0.23 L/sec/gross ha.
Residential Peaking Factor	Harmon Formula

Main Capacity Calculation	Manning's Formula
Roughness Coefficient (n)	0.013
Minimum Sewer Size	200 mm diameter
Minimum Flow Velocity	0.6 m/s
Minimum Sewer Grade	0.5%, except for the first leg of a run, which shall have a grade between 1.0% and 2.0%
Single Family Unit Density	3.2 persons/unit
Apartment Unit Density	2.0 persons/unit

5.2 Hydraulic Model and Computation Development

As indicated previously, the 1997 Master Plan had identified that there will be sufficient water supply and storage capacity to accommodate growth within the Tottenham SPA. MacViro has completed modelling the water supply for the entire Town of New Tecumseth using WaterCAD hydraulic modeling software. The water supply capacity and proposed upgrades for the Tottenham SPA were verified with the modelling results.

The wastewater flow for the Community of Tottenham, including flows from the proposed SPA, has been computed based on the above population projections. Draft sanitary servicing layouts for Nordstar and LRG Tottenham Developments were obtained from A.M. Candaras and Richardson Foster. The existing and proposed overall sanitary servicing map, complete with additional information such as manhole inverts, is required for modeling. Hydraulic modeling of the sanitary collection system using software such as SewerCAD may be generated at the detailed design stage once a complete sanitary servicing map is available.

6. Wastewater System Alternative Solutions

6.1 Wastewater Servicing Considerations

Based on discussions with Town staff, and in view of the existing sanitary sewer infrastructure layout, the following factors have been considered in the development of the wastewater servicing alternatives:

- There will be, within the Secondary Plan Area, a requirement for at least one sanitary pumping station, to direct sanitary sewerage to the existing wastewater treatment plant.
- It is the preference of the Town to minimize future maintenance requirements by having the Secondary Plan Area serviced by a minimum number of pumping stations.
- The existing pumping station located at Mill Street and The Boulevard, and the sanitary sewer system on The Boulevard is currently at or near capacity due to infiltration problems. As a result, directing flows from the SPA to The Boulevard, even on a temporary basis, is not a viable option.
- The Town would prefer that the existing sanitary pumping station servicing The Boulevard subdivision be decommissioned as Secondary Plan Area development comes on line. Flows from The Boulevard and from Tottenham Court would then be directed to the sanitary sewer infrastructure, which will be constructed to service the SPA.
- The Town has also indicated its preference for the decommissioning of the temporary Arvida Pumping Station (servicing the new Arvida Tottenham subdivision) and the Eastern Pumping Station (servicing the urban area along Eastern Avenue, north and south of Mill Street and west of the CP Railway).
- The forcemain from the proposed sanitary pumping station to service the Secondary Plan Area will discharge to the Industrial Road PS from which point, the sewage flow will be conveyed to the Tottenham WWTP utilizing the existing forcemain.
- There is an existing 200 mm diameter sanitary sewer on Queen Street at the south limit of the existing urban boundary. Downstream capacity constraints preclude the use of this sewer in developing servicing options for the LRG Tottenham lands, however.
- While not part of the Secondary Plan Area, it is assumed that sanitary flows from the Arvida Tottenham Development will be directed to the proposed SPA pumping station.

The Tottenham wastewater servicing sewershed boundaries including the proposed servicing for the SPA are as indicated in Figure 3.1 and Appendix A.

The natural topography of the Secondary Plan Area precludes the possibility of servicing the area through a gravity sewer to the Tottenham WWTP. The natural drainage pattern of Tottenham is generally to the east and west, with the existing urban area forming the highest elevation area. The elevations of the Tottenham WWTP and the existing Industrial Road Pumping Station are both significantly higher than the

invert of the collector sewer draining the Six Nights Development north of Mill Street. Construction of a pumping station will therefore be necessary to service the SPA.

6.2 Wastewater Servicing Alternatives

The 1997 Master Plan determined that a minimum of one pumping station would be required to service the Tottenham SPA. This current Master Plan Update will therefore include a review and validation of the pumping station alternatives as well as an evaluation of alternatives for decommissioning of the Arvida, Eastern, and Boulevard pumping stations.

It is also noted in the 1997 Master Plan that the north end of Six Nights Development (cul-de-sac of Street "I") has been allocated for a stormwater management facility. However, this does not match the development's August 1996 Draft Plan (based on available information at the time of this update). Providing sanitary servicing for this low area will require pumping. It is therefore assumed that the existing draft plan of the Six Nights Development, which indicates a few units at this location, will be revised accordingly.

6.3 Pumping Station Alternatives

Five alternatives have been identified for the proposed sanitary pumping station to service the Tottenham SPA.

6.3.1 Alternative 1 – One Pumping Station at Mill Street

The alternative of constructing a sanitary pumping station at Mill Street provides for a facility centrally located within the Secondary Plan Area. This facility would be easily accessed by the Town for maintenance. In addition, the total length of forcemain to be constructed would be minimized.

Based on preliminary road layouts, this pumping station could be located on a commercial block, within the Six Nights lands, thus eliminating the loss of residential lots for development purposes. The latest information obtained from the developers and the Town indicates that the pumping station would be located at the Nordstar lands south of Mill Street. Figure 6.1 denotes the proposed pumping station location.

Under this scenario, sanitary sewage from the LRG Tottenham lands would be directed to the Nordstar Development via the vacant lands south and east of the Secondary Plan Area. This would entail construction of a gravity sewer under the CPR tracks and creating an easement through the adjacent property, to the south limit of the Nordstar lands.

Some sewers in the Nordstar lands would have to be oversized to accommodate the flows from the LRG Tottenham Development. However, due to the nature of the existing topography, sanitary sewers in the Nordstar lands would not have to be constructed any deeper to accommodate the additional flows.

A pumping station in this location would result in an excessively deep wet well however. The invert of the inlet sewer from the Six Nights Development would be

approximately 12 metres below road grade. Wet well storage requirements would be approximately 5.5 metres. Thus, the excavation required to construct this facility would be in excess of 18 metres. Geotechnical investigations previously carried out have indicated that excavations below a depth of three metres are likely to encounter significant groundwater flows.

6.3.2 Alternative 2 – One Pumping Station adjacent to Six Nights Stormwater Management Facility

This concept would require the construction of a sewage pumping station in the northeast quadrant of the Six Nights lands. Based on preliminary draft plans, it would be located at the end of a long cul-de-sac, adjacent to the east branch of the Beeton Creek.

Figure 6.2 denotes the proposed pumping station location. This pumping station would be sized to accommodate the sanitary sewage flows from the entire Secondary Plan Area, including the LRG Tottenham lands and the Arvida Tottenham Development north of Mill Street and east of the Canadian Pacific Railway right-of-way.

As was the case in Alternative 1, servicing of the LRG Tottenham property would necessitate the construction of a gravity sewer from these lands under the CPR tracks and through the vacant lands adjacent to the Nordstar Development.

This arrangement would result in the oversizing of some of the sanitary sewers within the Six Nights property to accommodate sanitary flows from the LRG Tottenham and Nordstar lands. Under this alternative, the infrastructure for the Six Nights subdivision would have to be in place prior to the development of any of the other lands within the Secondary Plan Area.

The depth of the wet well would be considered more reasonable from a construction perspective. The invert of the inlet sewer would be approximately seven metres below road grade. With a wet well storage requirement of approximately 5.5 metres, the total excavation required to build this facility would be about 13 metres. However, when compared to locating the pumping station at Mill Street (Alternative 1), the length of force main would increase by approximately 750 metres.

A drawback to this alternative is that several prime lots adjacent to the east branch of the Beeton Creek would be lost to development. However, based on the shallower depth of sewers and pump station wet well, this alternative would merit further consideration assuming the required staging of the developments could be achieved.

6.3.3 Alternative 3 – Two Pumping Stations: One at Mill Street and One adjacent to Six Nights Stormwater Management Facility

The alternative of providing two pumping station facilities within the Secondary Plan Area has also been investigated. By constructing one facility at Mill Street and another adjacent to the Six Nights stormwater management facility, the depth of the wet well at Mill Street would be decreased by approximately five metres, as compared to constructing a single facility at that location. At the same time, it would allow for more flexibility in the development schedule by allowing the owners of the LRG Tottenham

and Nordstar properties to develop independent of Six Nights. Figure 6.3 denotes the general servicing arrangement proposed using this approach.

Under this alternative, the pumping station adjacent to the Six Nights Stormwater Management facility would be sized to accommodate flows from the Arvida Tottenham subdivision and the Six Nights Development. The sizing and arrangement of the Mill Street pumping station would be dependent on the timing of the developments involved.

If the landowners proceeded at the same time, the following three options would be available for the Mill Street facility:

A. The forcemain from the cul-de-sac pumping station could discharge into the Mill Street wet well, and the Mill Street pumping station could be sized to handle the ultimate flows from the Secondary Plan Area. Since the gravity sewers in the Six Nights lands would not be as deep as those required under Alternative 1, the Mill Street wet well would be less deep.

B. The Mill Street pumping station could be designed only for the sanitary flows from Nordstar and LRG Tottenham. The upstream facility and the Mill Street facility could then discharge into a single forcemain on Mill Street, which would then discharge to the WWTP. In this case, both pumping stations would have to be designed to function in parallel.

C. The separate forcemains from each pumping station could discharge directly to the WWTP.

If either one of the developers decided to proceed before the other, then Options B or C as noted above, would apply. The decision as to which alternative would be more efficient would be subject to the future detailed design.

The inlet elevation to the wet well adjacent to the Six Nights stormwater management facility would be approximately 6 metres below finished grade, while the invert to the wet well at Mill Street would be approximately 5 metres below finished grade. Storage in accordance with MOE guidelines would be approximately 2.5 metres and 5.5 metres, respectively, assuming the use of Option A, as noted above.

Notwithstanding the cost of providing two pump station facilities, including standby power, this alternative would merit further consideration on the basis of more shallow sewers and the additional flexibility in development timing.

6.3.4 Alternative 4 – Modified Two Pumping Station Approach: One at Mill Street and One Smaller Pumping Station Adjacent to the Six Nights Stormwater Management Facility

In the assessment of Alternatives 1, 2 and 3, it was assumed that due to the high water table in the development area, capital cost savings would be attained through minimizing the depth of pump station wet wells and trunk sewers, and thereby minimizing the excavation and dewatering costs.

However, based on a study carried out by Terraprobe (reference *"Preliminary Geotechnical Assessment and Cost Analysis of Sanitary Pumping Station Alternatives* -

Tottenham Secondary Plan" – December 12, 1996, Appendix D), it was determined that excessive dewatering costs would only be realized on sewers deeper than 10 metres (i.e. sheet piling required). For wet well construction, dewatering was still considered a major issue for the relatively shallow 10.5 and 8.5 metre pump stations however.

An alternative approach was investigated, in which the sanitary drainage area (and correspondingly, the wet well depth) to the pumping station adjacent to the stormwater management facilities in Six Nights was minimized. Flows from 39 units in the vicinity of the cul-de-sac would be directed to the cul-de-sac pump station. All other sanitary flows would be directed to the Mill Street pump station. Under these flow conditions, the design population for the cul-de-sac is (39 units x 3.2 per unit) 125 persons, and the peaked design flow is 3.36 litres/sec, including infiltration. The wet well depth, including storage requirements, would be 4.6 metres. As a result, minimum sized pumps and generators would be required at this location. Figure 6.4 denotes the general servicing arrangement proposed using this approach.

Under Alternative 3, the deepest sewers in the infrastructure system would be approximately six metres below finished grade, while under Alternative 1; the deepest sewers would be approximately 13 metres below finished grade. With the modified two-station approach, sewers would range in depth from 3.3 to 5.5 metres. Only a short run of sewer, outletting to the pump station, would be between 5.5 and 8.4 metres below grade. While this is deeper than the sewer in Alternative 3, it is still above the 10-metre level, where sheet piling would be required for dewatering. The depth of the modified Mill Street pumping station including storage requirements would be approximately 14.0 metres below finished grade.

6.3.5 Alternative 5 – Service the LRG Tottenham Lands Independently of the Remainder of the SPA

This alternative was reviewed to address the issue of independence between the various landowners involved in the development of the Secondary Plan Area. Figure 6.5 denotes the general servicing arrangement proposed using this approach. This alternative would require that sanitary flows from the LRG Tottenham lands be directed to one of three possible locations:

A. A sanitary sewer would have to be constructed across the CPR right of way, north to The Boulevard. An easement would have to be created through one of the existing properties, and a connection made to the existing 200 mm sanitary sewer on The Boulevard.

This alternative has not been carried forward, since the existing sanitary sewer and pumping station on The Boulevard is currently at or near capacity.

B. A sanitary sewer would have to be constructed to the existing 200 mm diameter on Queen Street. Due to grading constraints on the LRG Tottenham lands, a pumping station would be necessary to direct sanitary flows back to the northwest corner of the LRG Tottenham property.

This alternative has not been carried forward since consultation with Town staff has indicated that there is not sufficient downstream capacity in the existing sewer infrastructure to handle additional flows from these lands.

C. A stand-alone pumping station could be constructed within the LRG Tottenham lands. This would require a forcemain to be constructed to Mill Street in order to direct sewage flows to the WWTP. This forcemain could be constructed adjacent to the abandoned railway right-of-way, west of Queen Street. Pumping station(s) as described under Alternatives 1, 2, 3 and 4, would still be required to service the remaining lands in the SPA however.

This alternative has some merit in that the development of these properties is not dependent on the construction of the infrastructure within the remainder of the Secondary Plan Area. However, costs could be prohibitive. Depending on the location of the pumping station, and where the connection is made to the existing infrastructure, the length of forcemain could be anywhere between 1,800 and 2,700 metres long.

6.3.6 Alternative Pumping Station Locations

Alternative pumping station locations will be identified and assessed as part of the required Schedule B, Class EA for the pumping station works. Based on initial site inspections conducted in February 2005 and review of existing servicing maps and drawings, preferred sites appear to be as follows:

- South of Mill Street along the eastern boundary of the Nordstar Development
- North of Mill Street along the eastern boundary of the Six Nights Development

6.3.7 Alternative Forcemain Alignments

Alternative forcemain alignments will be identified and assessed as part of the required Schedule B, Class EA for the forcemain works. Initial investigation for the proposed forcemain alignment alternatives was however carried out by a site inspection in February 2005 and review of existing servicing maps and drawings. The preferred route for the forcemain appears to be along Mill Street from the proposed pumping station going west towards the existing Tottenham urban area. Alternative routings for the forcemain through the existing development areas may include:

- along Mill Street to Industrial Road to connect with the Industrial Pumping Station
- along Mill and Richmond Streets
- along Mill and Wilson Streets

Detailed review of existing underground utility information, available corridors within existing right-of-ways and the feasibility of obtaining easements will be key factors in finalizing the forcemain alignment.

Looking easterly on Mill St. at Queen St.

Looking easterly on Richmond St.

Looking easterly on Wilson St. & Queen St.

6.4 Pumping Station Decommissioning

The decommissioning of the existing Boulevard Pumping Station was addressed in the 1997 Master Plan. The Town has also indicated their preference for the decommissioning of the existing Arvida and Eastern Pumping Stations. Decommissioning alternatives for these three pumping stations are shown in Figure 6.6.

6.4.1 Boulevard Pumping Station

As indicated previously, the Boulevard Pumping Station is currently operating at or near capacity due to stormwater infiltration into the adjacent sanitary sewer system. The Town has also determined that the Boulevard Pumping Station is a significant factor in causing surcharging of the sanitary sewer running along Eastern Avenue together with basement flooding during high rainfall events.

Decommissioning of the Boulevard Pumping Station will result in significant savings in operations and maintenance costs over the remaining life of the station. In addition, the capital cost of replacing the facility at the end of its service life can be avoided. Decommissioning of the pumping station will however require the construction of new gravity sewer running easterly along Mill Street to the proposed SPA. Pumping Station. Field measurement of the inlet's invert of the pumping station is approximately at 248.32 metres and invert of the existing sewer at the end of McCurdy Drive as shown

on the as-built drawing is at 248.28 metres. Possible alternative approaches that will facilitate the decommissioning of the Boulevard Pumping Station, such as installation of a connection to the Arvida Tottenham subdivision sewer system, will be further investigated as part of the required Schedule B, Class EA for the Boulevard Pumping Station decommissioning works.

Boulevard Pumping Station

6.4.2 Arvida Pumping Station

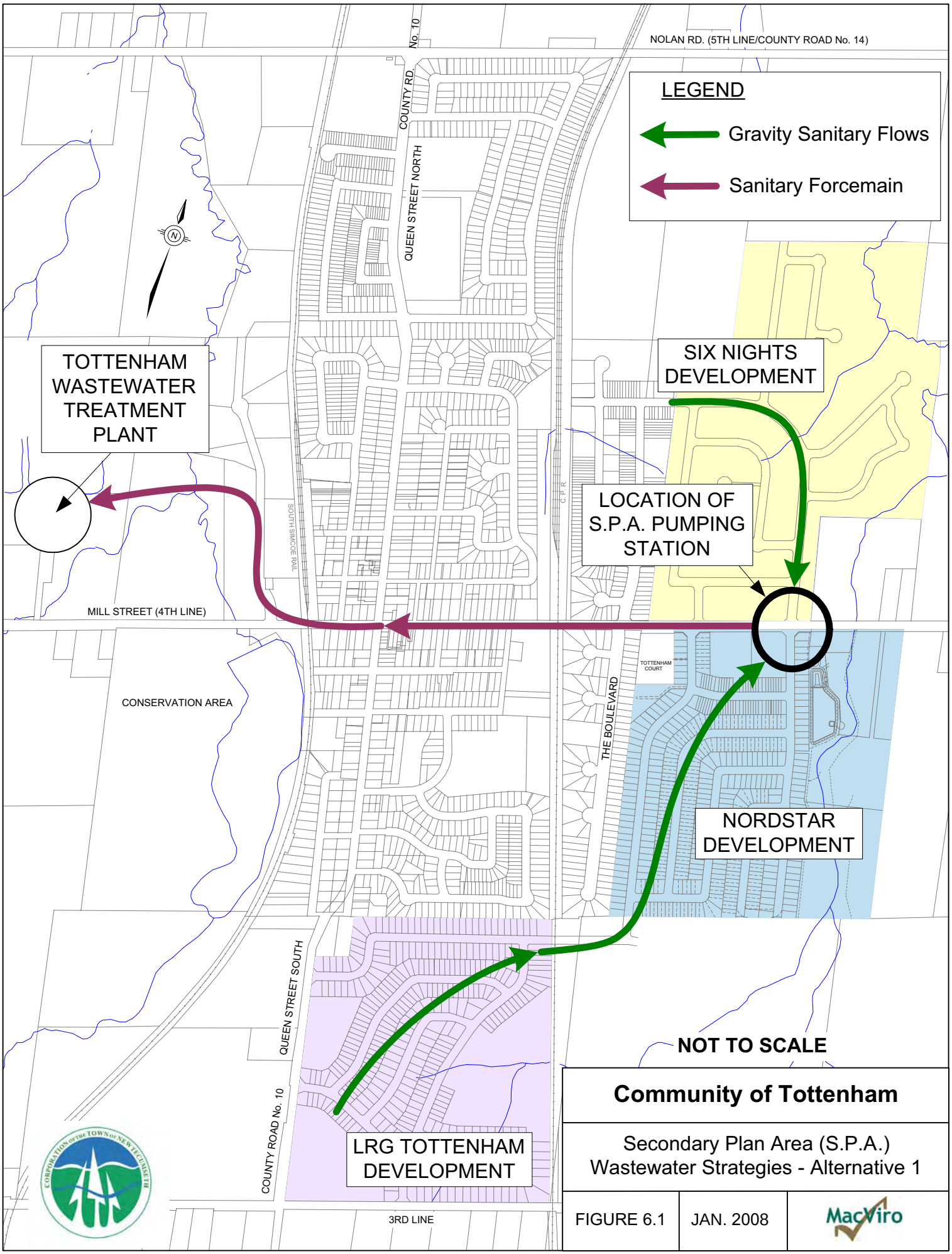
The Arvida Pumping Station can be decommissioned by connecting the sanitary sewer at the east end of McGahey Street to the proposed sanitary trunk sewer within the Six Nights Development. Discussions with Urban Ecosystems Limited, consultants for the Arvida-Tottenham Development, indicate that the sanitary servicing for the development was designed to be directed to the Six Nights Development in the future. The as-built drawings of the Arvida Tottenham subdivision indicate that the Arvida Pumping Station is a temporary facility. The decommissioning of the Arvida Pumping Station could be carried out once the sewer system in the Six Nights Development is available to accept flows from the subdivision. Based on the as-built drawings of the existing sewer along McGahey Street, the invert of the sewer at the end manhole is at 243.56 metres. The invert elevation of the sanitary sewer within the Six Nights Development along Street "A" was shown at approximately 244.50 metres (at its most upstream point). The future sanitary sewer to run along Street "A" in the Six Nights development will be designed at a sufficiently deep profile to discharge flows from the existing sewer along McGahey Street. This will require coordination with the Six Nights Development sanitary design, in particular to confirm adequate capacity to handle flows from the McGahey Street sewer. Significant savings in operations and maintenance costs (over the 20-30 year life of the station) may be achieved at a fairly small initial capital investment.

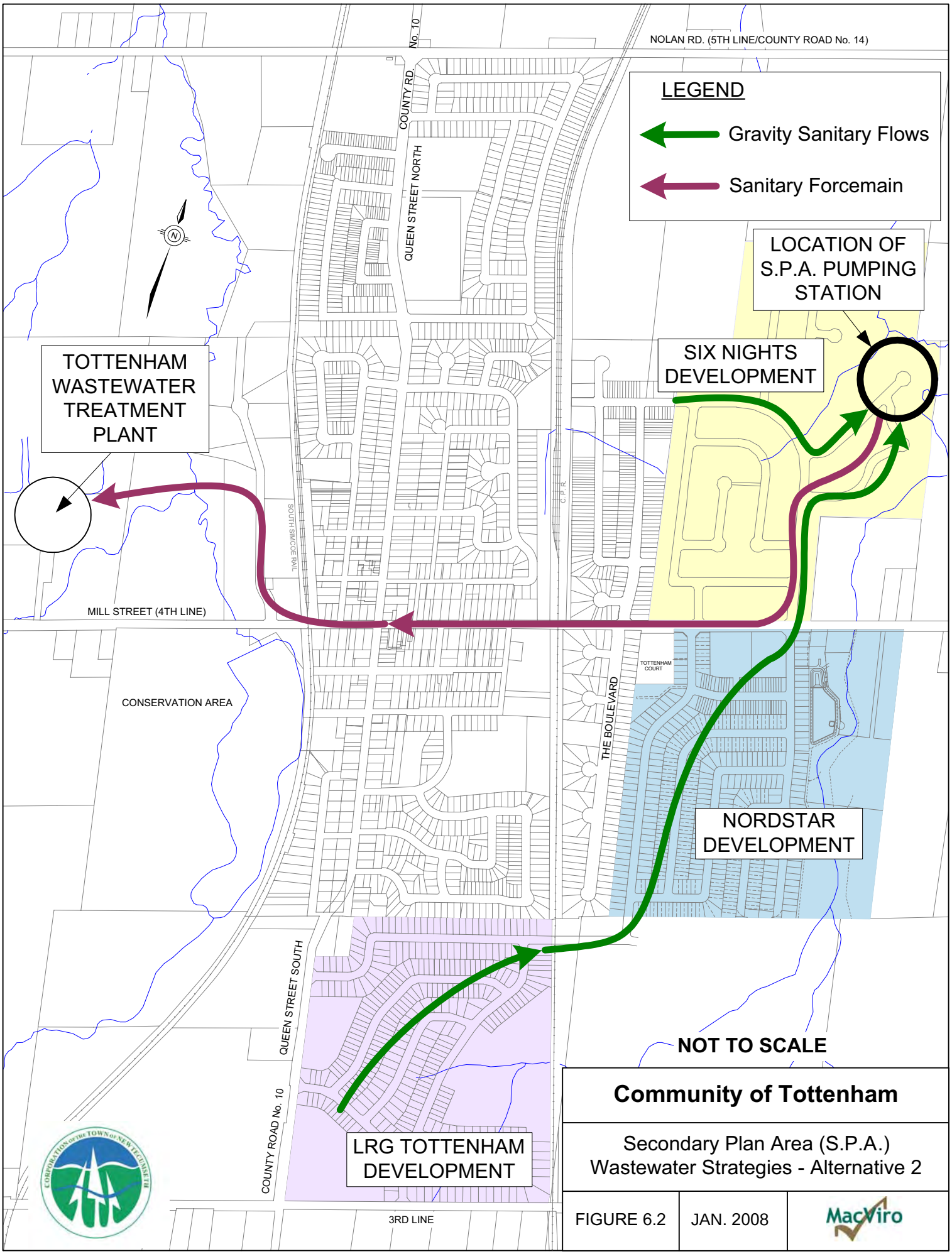
Arvida Pumping Station

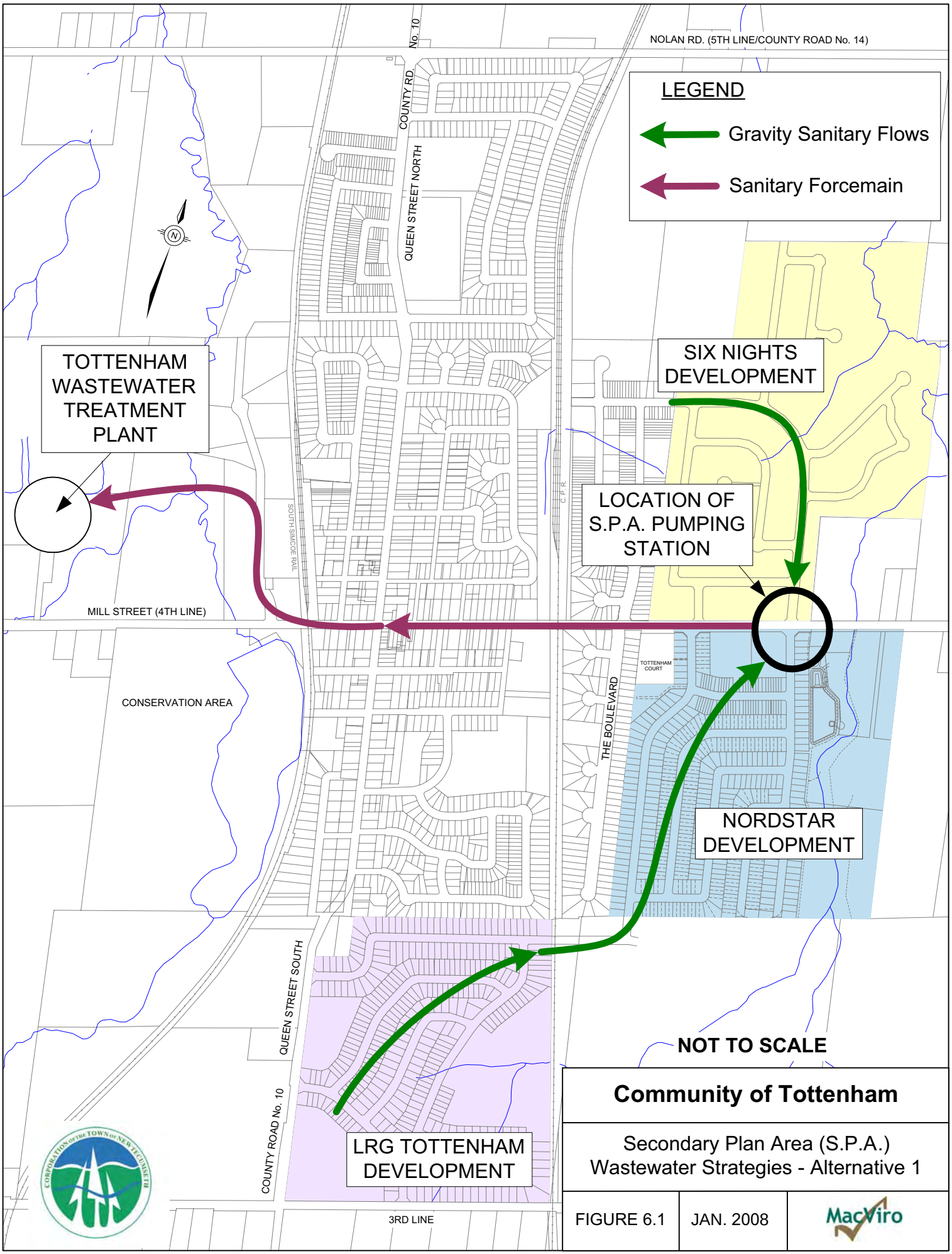
6.4.3 Eastern Pumping Station

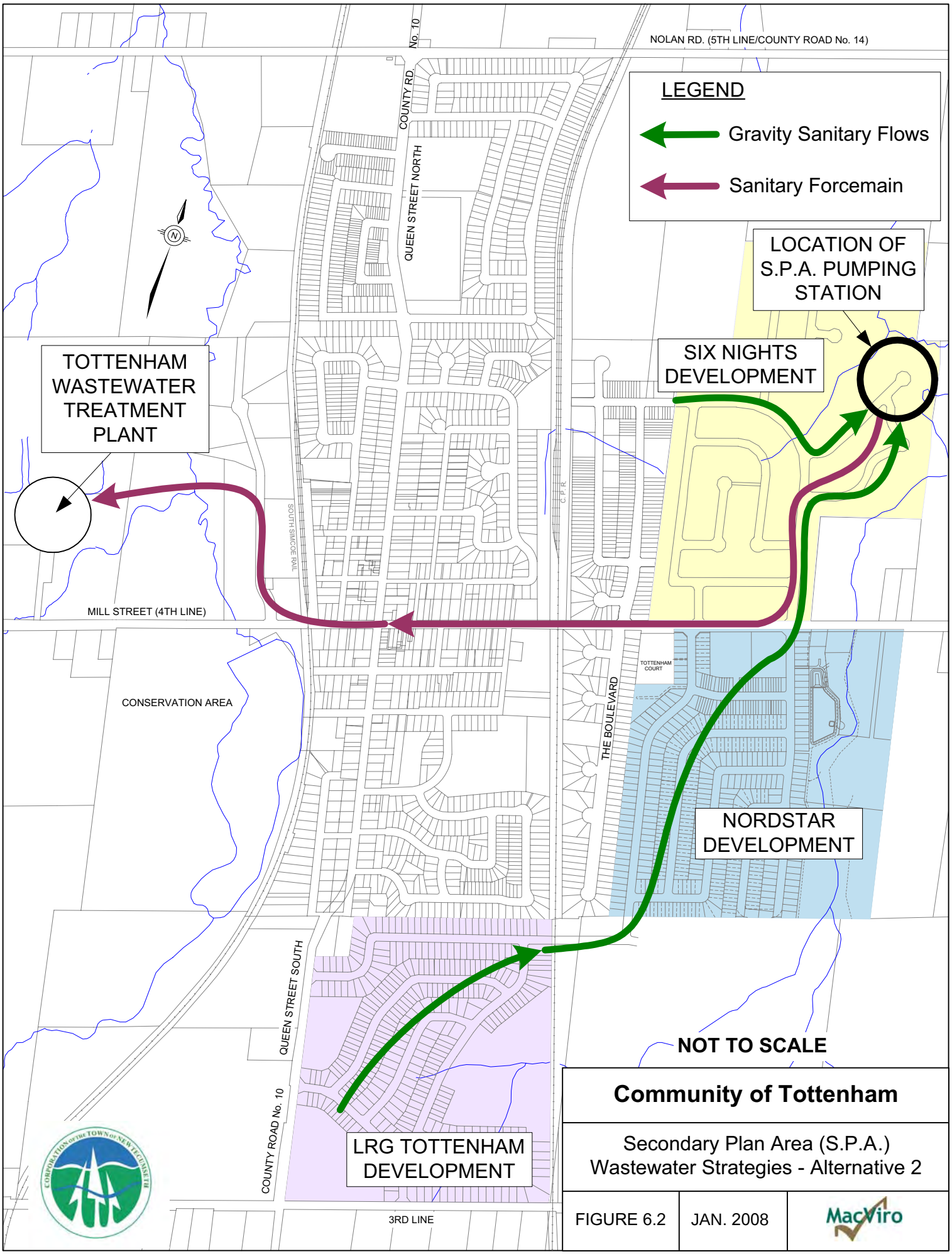
Based on as-built drawings of the Arvida Tottenham subdivision, there is a 300 mm diameter sanitary sewer crossing the CP Railway. A discussion with the Urban Ecosystems Limited indicates that the existing 300 mm sanitary sewer has been sized to handle flows from the Eastern Pumping Station, which indeed has been confirmed by our initial assessments. The Town Operations staff indicated that currently the 300 mm sewer is used as an overflow bypass during the storm and high flow conditions. A submersible pump had been installed in the manhole immediately upstream of the wetwell, which pumps sewage to the manhole west of the CP Railway. The sewers connected to the manhole west of the CP Railway have approximate invert elevations of 247.28 metres. Field measurement of the invert of the wet well inlet pipe is approximated at 247.00 metres. The inlet sewer exiting the last manhole along Eastern Avenue is at an indicated invert elevation of 248.34 metres. It will be possible to connect the manhole west of CP Railway with the last manhole at Eastern Avenue with an approximately 120 metre long sewer to bypass the pumping station. The peak flow from the Eastern Pumping Station and the downstream capacity of the sewer along McGahey Street will be confirmed and finalized as part of the required Schedule B, Class EA for the Eastern Pumping Station decommissioning works.

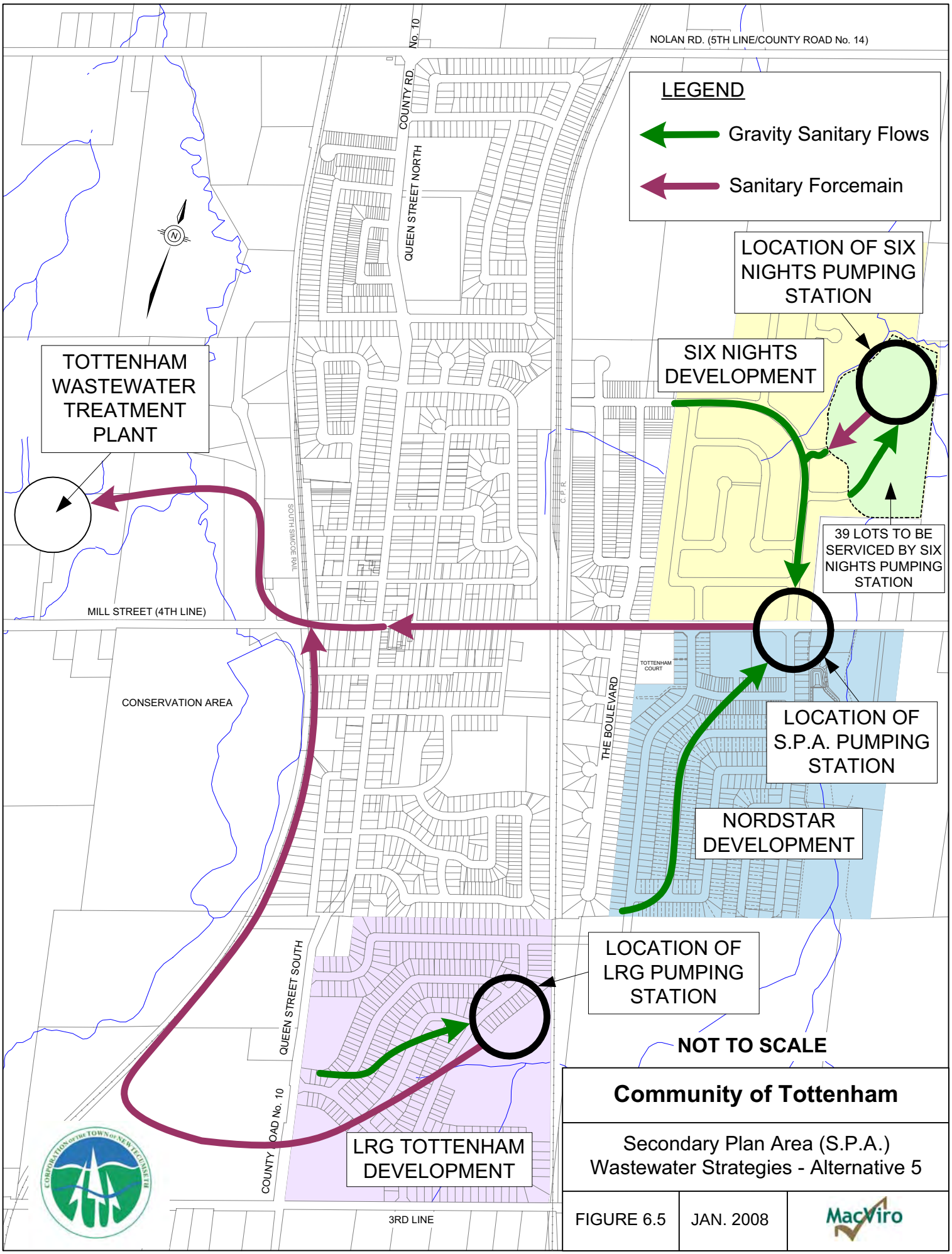
Eastern Pumping Station

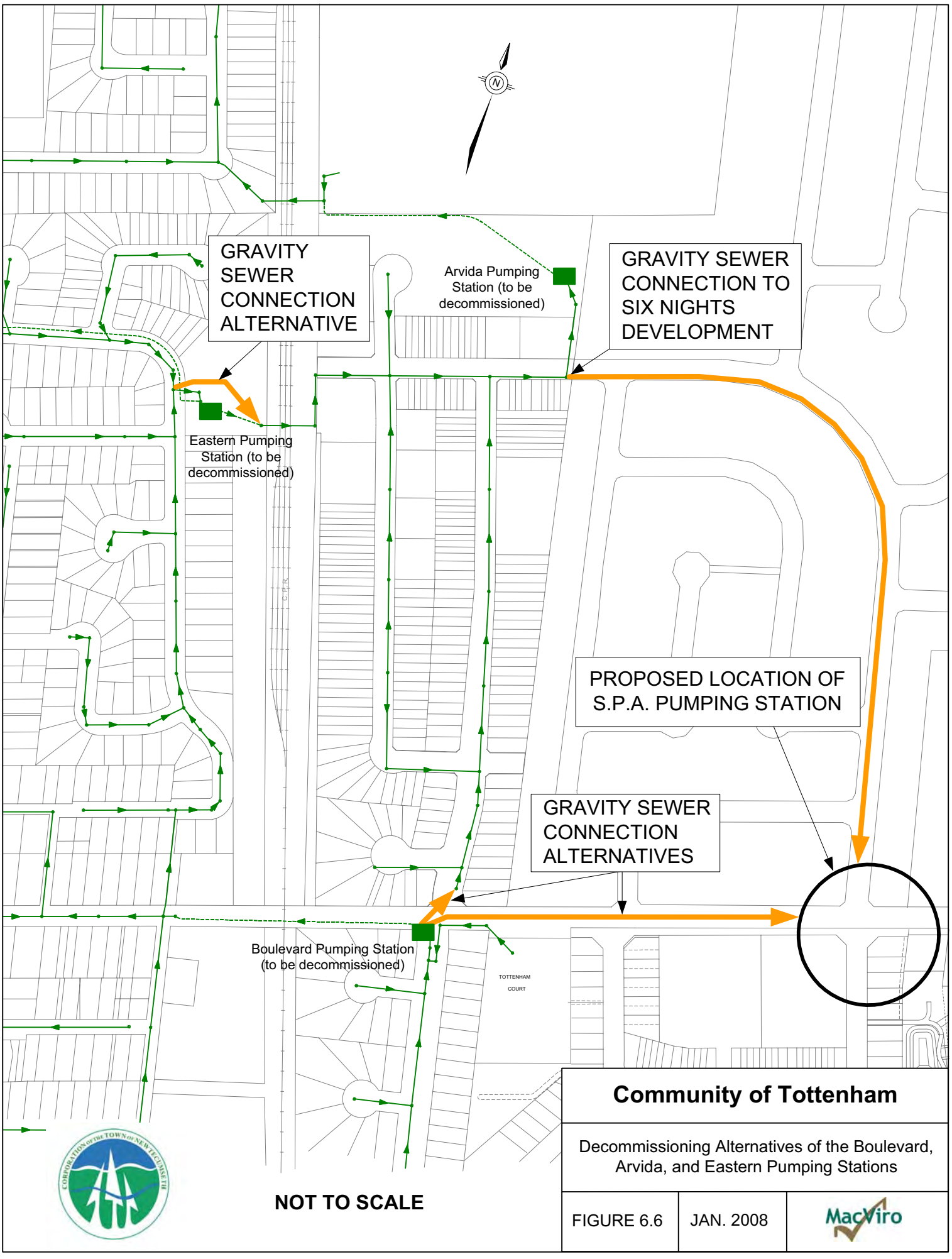

NOLAN RD. (5TH LINE/COUNTY ROAD No. 14)
COUNTY RD. No. 10
QUEEN STREET NORTH
LEGEND
Gravity Sanitary Flows
Sanitary Forcemain
TOTTENHAM WASTEWATER TREATMENT PLANT
SIX NIGHTS DEVELOPMENT
LOCATION OF S.P.A. PUMPING STATION
SOUTH SIMCOE RAIL
C.P.R.
MILL STREET (4TH LINE)
CONSERVATION AREA
TOTTENHAM COURT
THE BOULEVARD
NORDSTAR DEVELOPMENT
QUEEN STREET SOUTH
COUNTY ROAD No. 10
LRG TOTTENHAM DEVELOPMENT
3RD LINE
NOT TO SCALE
Community of Tottenham
Secondary Plan Area (S.P.A.)
Wastewater Strategies - Alternative 1
FIGURE 6.1
JAN. 2008
MacViro


NOLAN RD. (5TH LINE/COUNTY ROAD No. 14)
No. 10
COUNTY RD.
QUEEN STREET NORTH
LEGEND
Gravity Sanitary Flows
Sanitary Forcemain
LOCATION OF S.P.A. PUMPING STATION
SIX NIGHTS DEVELOPMENT
TOTTENHAM WASTEWATER TREATMENT PLANT
SOUTH SIMCOE RAIL
C.P.R.
MILL STREET (4TH LINE)
CONSERVATION AREA
TOTTENHAM COURT
THE BOULEVARD
NORDSTAR DEVELOPMENT
QUEEN STREET SOUTH
COUNTY ROAD No. 10
LRG TOTTENHAM DEVELOPMENT
3RD LINE
NOT TO SCALE
Community of Tottenham
Secondary Plan Area (S.P.A.)
Wastewater Strategies - Alternative 2
FIGURE 6.2
JAN. 2008
MacViro


NOLAN RD. (5TH LINE/COUNTY ROAD No. 14)
COUNTY RD. No. 10
QUEEN STREET NORTH
LEGEND
Gravity Sanitary Flows
Sanitary Forcemain
TOTTENHAM WASTEWATER TREATMENT PLANT
SIX NIGHTS DEVELOPMENT
LOCATION OF S.P.A. PUMPING STATION
SOUTH SIMCOE RAIL
C.P.R.
MILL STREET (4TH LINE)
CONSERVATION AREA
TOTTENHAM COURT
THE BOULEVARD
NORDSTAR DEVELOPMENT
QUEEN STREET SOUTH
COUNTY ROAD No. 10
LRG TOTTENHAM DEVELOPMENT
3RD LINE
NOT TO SCALE
Community of Tottenham
Secondary Plan Area (S.P.A.)
Wastewater Strategies - Alternative 1
FIGURE 6.1
JAN. 2008
MacViro


NOLAN RD. (5TH LINE/COUNTY ROAD No. 14)
No. 10
COUNTY RD.
QUEEN STREET NORTH
LEGEND
Gravity Sanitary Flows
Sanitary Forcemain
LOCATION OF S.P.A. PUMPING STATION
SIX NIGHTS DEVELOPMENT
TOTTENHAM WASTEWATER TREATMENT PLANT
SOUTH SIMCOE RAIL
C.P.R.
MILL STREET (4TH LINE)
CONSERVATION AREA
TOTTENHAM COURT
THE BOULEVARD
NORDSTAR DEVELOPMENT
QUEEN STREET SOUTH
COUNTY ROAD No. 10
LRG TOTTENHAM DEVELOPMENT
3RD LINE
NOT TO SCALE
Community of Tottenham
Secondary Plan Area (S.P.A.)
Wastewater Strategies - Alternative 2
FIGURE 6.2
JAN. 2008
MacViro


NOLAN RD. (5TH LINE/COUNTY ROAD No. 14)
No. 10
COUNTY RD.
QUEEN STREET NORTH
LEGEND
Gravity Sanitary Flows
Sanitary Forcemain
LOCATION OF SIX NIGHTS PUMPING STATION
SIX NIGHTS DEVELOPMENT
TOTTENHAM WASTEWATER TREATMENT PLANT
39 LOTS TO BE SERVICED BY SIX NIGHTS PUMPING STATION
SOUTH SIMCOE RAIL
C.P.R.
MILL STREET (4TH LINE)
CONSERVATION AREA
TOTTENHAM COURT
THE BOULEVARD
LOCATION OF S.P.A. PUMPING STATION
NORDSTAR DEVELOPMENT
LOCATION OF LRG PUMPING STATION
QUEEN STREET SOUTH
COUNTY ROAD No. 10
LRG TOTTENHAM DEVELOPMENT
3RD LINE
NOT TO SCALE
Community of Tottenham
Secondary Plan Area (S.P.A.)
Wastewater Strategies - Alternative 5
FIGURE 6.5
JAN. 2008
MacViro



Community of Tottenham

Decommissioning Alternatives of the Boulevard, Arvida, and Eastern Pumping Stations

FIGURE 6.6	JAN. 2008	MacViro

7. Water System Alternative Solutions

Alternative solutions identified to respond to the growth requirements for water servicing within the Secondary Plan Area were addressed in the 1997 Master Plan. It was indicated that there would be sufficient supply and storage capacity within the Town to accommodate growth within the SPA. No additional works or revisions to the alternative solutions for water servicing previously identified in the 1997 Master Plan have therefore been developed as part of this update.

7.1 Water Servicing Alternatives

Water demands for the Secondary Plan Area were investigated and modelled previously by Ainley & Associates Limited. Water demands were included with existing system modeling results and recommendations for system upgrades were presented in a letter report entitled "Proposed Residential Development Water Servicing", January 1997.

Servicing requirements recommended by Ainley for the proposed solution are as follows:

- Provide a 250 mm diameter watermain connection to the LRG Tottenham lands from the existing 250 mm watermain on Queen Street;

Queen Street South at LRG Tottenham Lands

- Provide a connection to the Six Nights and Nordstar Developments from the existing 200 mm watermain on Mill Street with a 350 mm diameter watermain;
- Loop the Six Nights Development through the Arvida Tottenham subdivision;
- Provide full twinning of watermains on Mill Street west of Queen Street via simple cross connections between existing watermains;
- Create a second pressure zone at the south end of the community, serviced by an inline booster pump;

Proposed Booster Pumping Station Alternative Site

- Provide a 150 mm watermain connecting Adeline Avenue/Brown Street and LRG Tottenham northeast corner to the south end of The Boulevard, and further to Nordstar Developments. A bi-directional pressure-sustaining valve on this watermain would be required, between the two pressure zones.

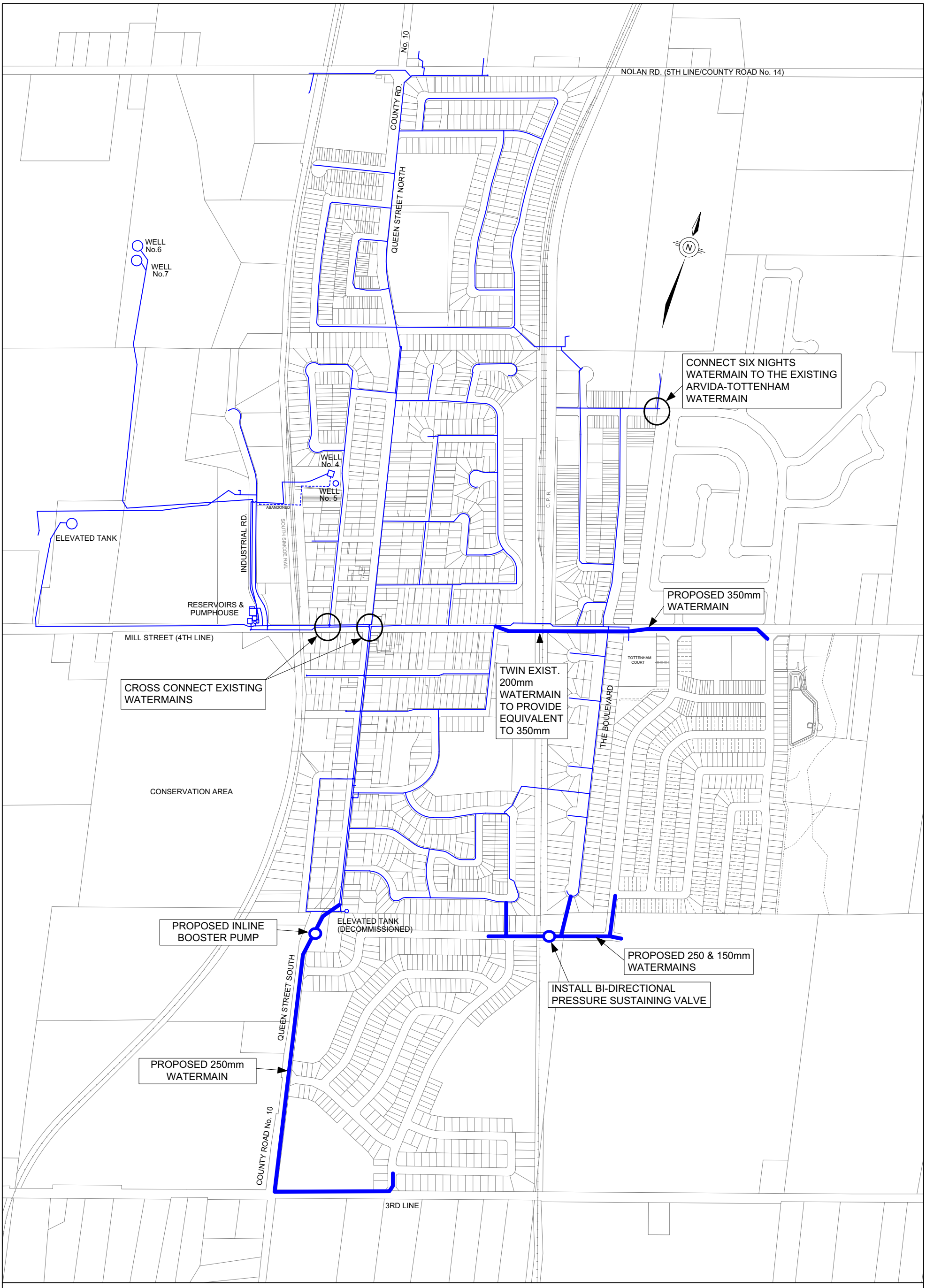
Minor roads within the three SPA subdivisions will be serviced by 150 mm diameter watermains.

Preliminary water modelling results were carried out as part of the Town of New Tecumseth Water Master Plan (MacViro 2005) including the additional estimated demands from the SPA. Results from these verifications indicate that the booster pumping station will be required only to provide sufficient pressures at locations where the elevations are above 270.0 metres. Only a small area along Queen Street South and within the LRG Tottenham Development will therefore be affected. It should be noted the existing watermains along Mill Street from the reservoir and pumping stations at Industrial Road to the proposed Nordstar Development also contribute to high headloss and pressure deficiencies throughout the entire system. However, if a 250mm diameter watermain is constructed between the LRG Tottenham and Nordstar Developments connecting the existing 250 watermain along Queen Street to the proposed water servicing for Mill Street to the east, sufficient pressures will be obtained from the "dual source" supply to the LRG Tottenham Lands to negate the requirement to the booster pumping station. Therefore, a 250mm connection between LRG Tottenham and Nordstar is proposed. The 250mm connection will require land in and outside the LRG Tottenham Development. The necessary land easement for the proposed watermain link outside of the LRG Tottenham Development is to be obtained by the developers.

Sanitary sewer flows from the LRG Tottenham lands will be conveyed north, passing through the Nordstar Development prior to discharge into the SPA pumping station. Based on this flow scenario, development of the LRG lands will not be able to proceed until the sanitary sewer through the Nordstar Development is constructed. Since water servicing for the Nordstar Development will be constructed at the same time as the sanitary sewers, this means that the "dual source" water servicing for the LRG Tottenham lands will be in place from Queen Street to the west and from the Nordstar Development to the east prior to any development of the site being undertaken. It is recommended therefore that installation of a booster pumping station and bi-directional pressure sustaining valve will not be required for the LRG Tottenham lands.

These water supply servicing recommendations will be confirmed based on results from the Town of New Tecumseth Water Distribution and Storage Master Plan completed April 2007.

The water servicing alternatives are shown on Figure 7.1.



LEGEND

Existing Watermains

Proposed Watermains

NOT TO SCALE

Community of Tottenham

Preferred Water Servicing Alternative for Tottenham S.P.A.

FIGURE 7.1	JAN. 2008	MacViro

8. Description of Preferred Solution

The following works are considered the preferred solutions:

8.1 Wastewater Servicing Alternatives

8.1.1 Secondary Plan Area Pumping Station Alternative 4 – Modified Two Pumping Stations (One Large Pumping Station at Mill Street and One Small Pumping Station at Six Nights Development)

The preferred wastewater servicing alternative is as shown in Figure 8.1. As indicated in summary Table 8.1 (with full details provided in Appendix B), a present value (PV) cost analysis (for a 25-year planning horizon) was conducted to provide a cost comparison between the 5 pumping station alternatives. Approximate costs presented in the 1997 Master Plan have been reviewed and updated based on similar projects completed, reference to supplier catalogues and average inflation rates. Alternative 4, the Modified Two Pumping Station approach resulted in the lowest PV total life cycle costs at approximately $5.6 million. It should be noted that this analysis was carried out for purposes of cost comparison at a planning level of accuracy. A more detailed life cycle cost estimate will be prepared as part of the required Schedule B, Class EA for the SPA pumping station works. Our summary assessment of the sanitary servicing strategies is presented in Table 8.2. The rationale for the proposed solution is as follows:

Timing/Phasing

It is assumed that the development rate within the Secondary Plan Area will be 200 units per year. It is further assumed that this development will be spread equally between the three landowners involved (i.e. approximately 66 units per year for each of the Six Nights, Nordstar, LRG Tottenham subdivisions).

Under the modified two pumping station alternative, the pumping station in the Six Nights lands will not have to be constructed until the 39 units in the vicinity of the cul-de-sac are developed. Assuming a maximum build out rate of approximately 66 units per development per year in the SPA (i.e. 200 units per year total), the time frame for construction of the second facility will be approximately eight years after development begins. Thus, phasing of individual developments could proceed in a more natural fashion, moving away from Mill Street, without triggering expensive infrastructure improvements.

However, at this planning stage, the cost analysis was carried out with the consideration that the Six Nights pumping station would be constructed at the beginning of the development.

Physical Environment

Under this option, shallower cuts will be required for the sanitary sewer infrastructure and for the individual pumping station wetwells.

Construction

Given the relatively high water table in the area, the shallower cuts associated with Alternative 4 should minimize the construction difficulties encountered.

Operations and Maintenance

Under this option, manholes, sewers, and the wet wells will be relatively shallow. Maintenance activities required for the infrastructure will be easier to carry out. The second pumping station would not come on line until approximately eight (8) years after development begins. For this time period, the Town would therefore only be responsible for the maintenance of one additional pump station. As indicated previously, the cost analysis was carried out with the consideration that the second pumping station would be on line at the beginning of the development.

Economics

Based on the smaller size of the individual pump station facilities, and the shallower depth of the collection sewers and wet wells, it is expected that the cost of constructing two pump stations will be less than the cost of building a single pumping station with a significantly deeper wet well.

Proposed SPA Pumping Station Site

8.1.2 Decommissioning of the Boulevard Pumping Station

As discussed previously, significant savings can be achieved in operating and maintenance and capital costs (for ultimate replacement) of the Boulevard Pumping Station by decommissioning the facility in conjunction with the construction of the proposed SPA pumping station. A present value cost analysis is presented in Appendix C providing a comparison of costs/savings between maintaining the pumping station in operation versus decommissioning (together with the construction of a sanitary sewer to the proposed SPA Pumping Station). Savings of $650,040.00 were estimated. The advantages/disadvantages of decommissioning the existing Boulevard Pumping Station can be summarized as follows:

- Savings of operation and maintenance costs incurred by the Town over the life of the facility;
- Savings of capital costs for facility asset and equipment renewal and replacement as the pumping station reaches the end of its service life;

- Removal of pumping station facility from undesirable location immediately adjacent to the busy Mill Street and The Boulevard intersection;
- Additional capital cost for construction of gravity sewer along Mill Street discharging to the proposed Mill Street Pumping Station;
- Additional capital cost for decommissioning/demolition of the pumping station.

8.1.3 Decommissioning of the Arvida Pumping Station

As discussed previously, savings can be achieved in operating and maintenance and capital costs (for ultimate replacement) of the Arvida Pumping Station by decommissioning the facility in conjunction with the development of the Six Nights subdivision and construction of the proposed SPA Pumping Station. A present value cost analysis is presented in Appendix C providing a comparison of costs/savings between maintaining the pumping station in operation versus decommissioning (together with the installation of a sewer connection to the Six Nights Developments collection system). Savings of $295,859.00 were estimated. The advantages/disadvantages of decommissioning the existing Arvida Pumping Station can be summarized as follows:

- Savings of operation and maintenance costs incurred by the Town over the life of the facility;
- Savings of capital costs for facility asset and equipment renewal and replacement as the pumping station reaches the end of its service life. It is recognized that the facility is relatively new, having been constructed as a temporary facility to service the Arvida Tottenham subdivision. Therefore replacement of the facility would likely not be required in the immediate future;
- Additional capital cost for construction of gravity sewer connection along McGahey Street to the proposed sanitary trunk sewer within the Six Nights Development;
- Additional capital cost for decommissioning/demolition of the pumping station.

McGahey Street

8.1.4 Decommissioning of the Eastern Pumping Station

Significant savings can be achieved in operating and maintenance and capital costs (for ultimate replacement) of the Eastern Pumping Station by decommissioning the facility

in conjunction with the development of the Six Nights subdivision and construction of the proposed SPA Pumping Station. A present value cost analysis is presented in Appendix C providing a comparison of costs/savings between maintaining the pumping station in operation versus decommissioning together with the establishment of a sewer connection underneath the CP Railway, connecting to the Arvida Tottenham subdivision sanitary collection system for eventual discharge through the Six Nights Developments to the proposed SPA Pumping Station. Savings of $812,540.00 were estimated. The advantages/disadvantages of decommissioning the existing Eastern Pumping Station can be summarized as follows:

- Savings of operation and maintenance costs incurred by the Town over the life of the facility;
- Savings of capital costs for facility asset and equipment renewal and replacement as the pumping station reaches the end of its service life;
- Additional capital cost for construction of gravity sewer connection from Eastern Avenue, bypassing the pumping station, and discharging underneath the CPR tracks to the Arvida Tottenham subdivision sanitary collection system;
- Additional capital cost for decommissioning/demolition of the pumping station.

8.2 Water Servicing Alternatives

Based on a review of previous reports prepared by the Town, the system upgrades identified previously in Section 7 are necessary to accommodate the population growth generated by the development of the Secondary Plan Area.

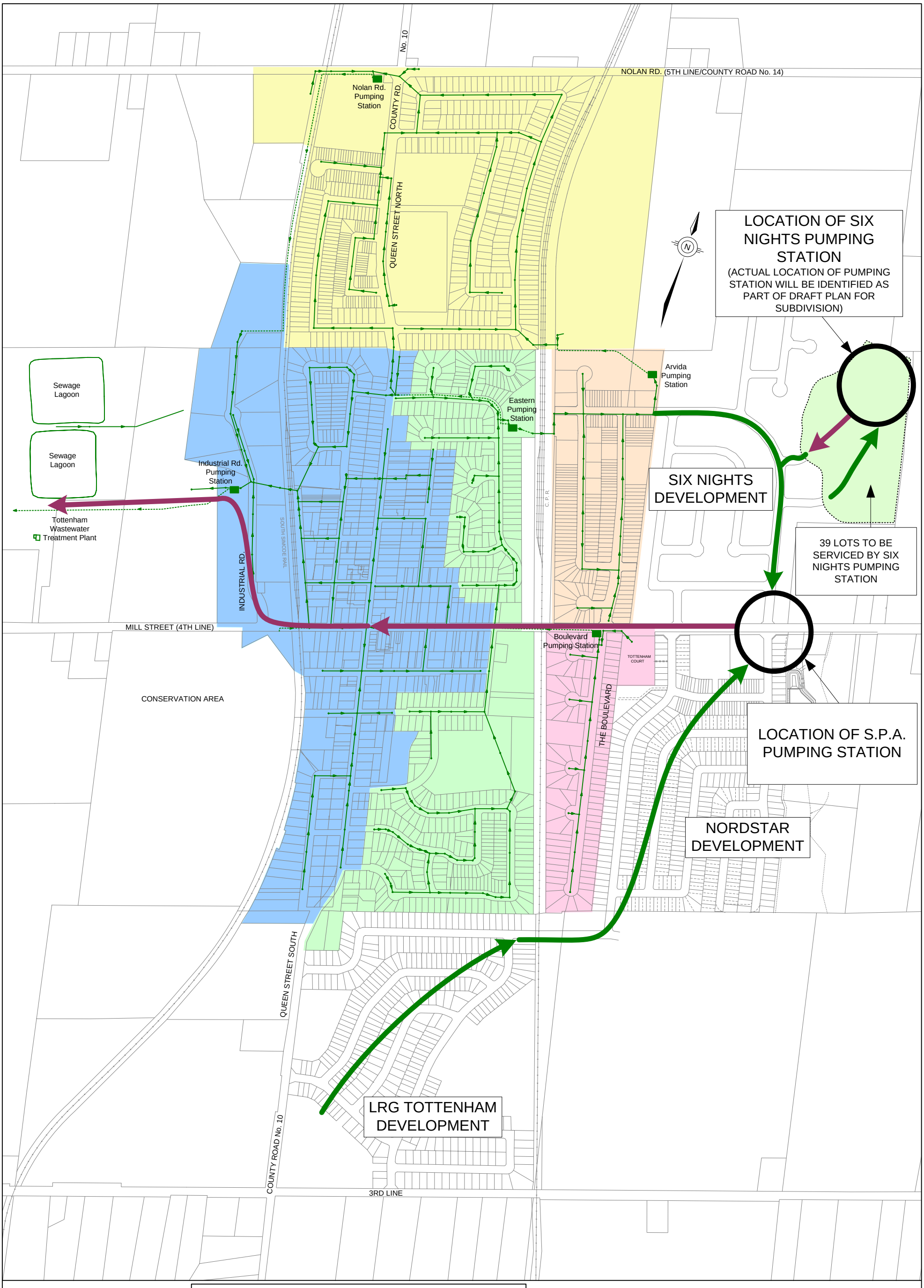
The Town of New Tecumseth
Master Plan Update
Water and Wastewater Improvements for the Tottenham Secondary Plan Area
Table 8.1 - Summary of Tottenham Secondary Plan Area Pumping Station Alternatives PV Cost Analysis

	Alternative 1: Single Pumping Station at Mill Street	Alternative 2: Single Pumping Station at Six Nights Development	Alternative 3: Pumping Station at Mill Street and Pumping Station at Six Nights Development	Alternative 4: Pumping Station at Mill Street and Small Pumping Station at Six Nights Development	Alternative 5: Pumping Stations at Mill Street, Six Nights, and LRG Developments
Mill Street Pumping Station					
Pumping Station including pumps, instrumentation & controls, generator,	$1,600,000		$1,200,000	$1,200,000	$1,200,000
Special Excavation	$465,000		$350,000	$400,000	$400,000
Dewatering Pumping Station and Sewer	$535,000		$200,000	$465,000	$465,000
Pumping Station Forcemain (2,500 m, approx. 450 mm diameter)	$1,750,000		$1,750,000	$1,750,000	$1,750,000
PV of Operating & Maintenance Costs	$527,407		$376,719	$376,719	$376,719
PV of Contingencies, Taxes and Engineering	$1,219,352		$969,180	$1,047,930	$1,047,930
Sub-total	$6,096,758		$4,845,899	$5,239,649	$5,239,649
Six Nights Pumping Station					
Pumping Station including pumps, instrumentation & controls, generator,		$1,600,000	$500,000	$100,000	$100,000
Special Excavation		$400,000	$0	$0	$0
Dewatering Pumping Station and Sewer		$450,000	$0	$0	$0
Pumping Station Forcemain		$2,275,000	$75,000	$40,000	$40,000
PV of Operating & Maintenance Costs		$527,407	$304,219	$152,109	$152,109
PV of Contingencies, Taxes and Engineering		$1,313,102	$219,805	$73,027	$73,027
Sub-total		$6,565,508	$1,099,023	$365,137	$365,137
LRG Pumping Station					
Pumping Station including pumps, instrumentation & controls, generator,					$350,000
Special Excavation					$0
Dewatering Pumping Station and Sewer					$0
Pumping Station Forcemain (2,700 m, approx. 200 mm diameter)					$900,000
PV of Operating & Maintenance Costs					$304,219
PV of Contingencies, Taxes and Engineering					$388,555
Sub-total					**$1,942,773**
PV Costs for Each Alternative	**$6,096,758**	**$6,565,508**	**$5,944,922**	**$5,604,785**	**$7,547,559**

The Town of New Tecumseth

Master Plan Update
Water and Wastewater Improvements for the Tottenham Secondary Plan Area
Table 8.2 - Assessment Summary of Tottenham Secondary Plan Area Pumping Station Alternatives

Alternative	Natural Environment			Economics			Timing/Phasing	Other
	Physical Setting	Terrestrial Resources	Socio-economic and Cultural Environment	Capital	Land	Maintenance		
1. Pump Station at Mill Street	Positive Potential • single pumping station site	Positive Potential • previous agriculture land use	Positive Potential • will allow for growth in the Community of Tottenham • infrastructure constructed will be aesthetically non-intrusive	Negative Potential • extra costs associated with deeper wet well	Positive Potential • residential lots are not taken out of development	Positive Potential • central location for maintenance • only one facility to maintain and operate	Positive Potential • allows Six Nights and Nordstar develop independent of each other	Positive Potential • more compatible with commercial land use • construction difficulties associated with deep cuts in high groundwater areas
2. Pump Station adjacent to Six Nights Stormwater Management Facility	Neutral • single pumping station site • however, located closer to natural water courses	Negative Potential • located closer to sensitive water course area	Positive Potential • will allow for growth in the Community of Tottenham • infrastructure constructed will be aesthetically non-intrusive	Positive Potential • wet well is shallower than Alternative 2 Negative Potential • forcemain is longer than Alternative 2	Negative Potential • facility is located on prime residential property	Neutral • facility is not centrally located	Negative Potential • all development is dependent on Six Nights	Positive Potential • fewer construction difficulties expected with shallower wet well and collection sewers
3. Dual Pump Stations: Mill Street and Stormwater Management Facility	Negative Potential • multiple pumping station sites	Negative Potential • multiple pumping station sites	Positive Potential • will allow for growth in the Community of Tottenham • infrastructure constructed will be aesthetically non-intrusive	Neutral • costs are approximately the same as Alternative 2	Negative Potential • additional land required for two facilities	Negative Potential • more than one facility for Town to maintain	Positive Potential • allows for some independence among land owners	Positive Potential • the wet well at Mill Street would not be as deep as for a single facility at Mill Street • fewer construction difficulties expected with shallower cuts
4. Dual Pump Stations: Minor Pump Station at Six Nights SWM Facility; Major Pump Station at Mill Street	Negative Potential • multiple pumping station sites	Negative Potential • multiple pumping station sites	Positive Potential • will allow for growth in the Community of Tottenham • infrastructure constructed will be aesthetically non-intrusive	Positive Potential • costs are significantly lower	Negative Potential • additional land required for two facilities	Neutral Potential • there are two facilities to maintain, but the second facility will not be required until well into the future	Positive Potential • allows for some independence among land owners • second pump station is not required immediately	Positive Potential • the wet well at Mill Street would not be as deep as for a single facility at Mill Street • fewer construction difficulties expected with shallower cuts
5. Service LRG Development independently	Negative Potential • multiple pumping station sites	Negative Potential • multiple pumping station sites	Positive Potential • will allow for growth in the Community of Tottenham • infrastructure constructed will be aesthetically non-intrusive	Negative Potential • relatively long forcemain • cost of an additional facility in the Secondary Plan Area	Negative Potential • loss of additional development land in the Secondary Plan Area	Negative Potential • requires two or more facilities to service the entire Secondary Plan Area	Positive Potential • allows for development independent of other owners	



NOT TO SCALE

LEGEND

- Existing Gravity Sanitary Sewers
- Existing Sanitary Forcemains
- Proposed Gravity Sanitary Flows
- Proposed Sanitary Forcemains
- Nolan Road Pumping Station Drainage Area
- Industrial Rd. Pumping Station Drainage Area
- Arvida Pumping Station Drainage Area
- Boulevard Pumping Station Drainage Area
- Eastern Pumping Station Drainage Area

Community of Tottenham

Preferred Wastewater Servicing Alternative for the Tottenham S.P.A.

FIGURE 8.1	JAN. 2008	MacViro

9. Public and Agency Consultation

9.1 General

Public and Agency Consultation is an important element of this Master Plan Update. The intent of the consultation program was to inform the public and relevant agencies of the Master Planning Study and to solicit their input at key points. The main components of the consultation program are:

- Notice of Study Commencement
- Public Information Centre
- Meetings with the Town's Engineers and Planners
- Notice of Completion

9.2 Notice of Study Commencement

The Notice of Study Commencement is consistent with the requirements of a Master Plan at the start of project and provides an opportunity for the public to be made aware of commencement of the study. The Notice described the purpose of the Master Plan as well as the need to identify and recommend water and wastewater infrastructure projects required to satisfy growth in the Tottenham Community to the year 2030. Interested parties were also invited to respond and have their names added to the study mailing list or to ask questions related to the project.

The Notice of Study Commencement and the Notice of Public Information Centre were posted together as follows:

- Alliston Herald, May 13th and May 26th, 2005
- Tottenham Times, May 18th and May 25th, 2005
- New Tecumseth Free Press online website for a two week period, May 12th to May 26th, 2005

9.3 Public Information Centre

The purpose of a Public Information Centre (PIC) in the Municipal Class EA process is to provide area residents and other stakeholder groups with an opportunity to provide comments regarding the study. In a Public Information Centre, study background information, analysis and evaluation of various alternatives and the identification of the preferred alternative is presented.

PIC No.1 was held on May 26th, 2005, at the Tottenham Community Centre in the Community of Tottenham. The PIC was organized as a drop-in centre where local stakeholders had the opportunity to review a series of display boards outlining the study and the Municipal Class EA process. The display boards also presented water and wastewater servicing alternatives for the study area. Staff from both the consultant team and the Town were available for discussions and/or to answer questions related to the study. Copies of the display boards are included in Appendix E. Also included in

Appendix E are meeting minutes, a sign in sheet for PIC No.1 as well as an information bulletin provided to all attendees.

9.4 Notice of Completion

The Notice of Completion was placed in local newspapers. This notice is consistent with the requirements of a Master Plan at the end of project and provides an opportunity for the public to be made aware and comment within two weeks on the recommendations identified in the study. A copy of the Notice of Completion is provided in Appendix G.

Date of issue for Notice of Completion: following Council Meeting of February 11th, 2008.

10. Recommendations

The following wastewater and water servicing recommendations will be confirmed based on the technical assessment and input received from the various stakeholders including staff from the Town, agencies, general public and land owners.

Wastewater Servicing

- Construction of a main pumping station located south of Mill Street along the eastern boundary of the Nordstar Development or north of Mill Street along the eastern boundary of the Six Nights Development. The facility will be designed to accommodate all sanitary flows from the Secondary Plan Area, the Arvida Tottenham subdivision and existing urban areas of Tottenham currently serviced by the Boulevard and Eastern Pumping Stations.
- Decommissioning of the Boulevard, Arvida and Eastern Pumping Stations with sewer connections or other new infrastructure constructed as part of the requirement to service the sanitary flows currently handled by the existing facilities.
- Construction of a second pump station adjacent to the Six Nights stormwater management facility, which is to be designed to accommodate sanitary flows from approximately 39 lots adjacent to the cul-de-sac.
- Ultimate drainage of sanitary flows from the LRG Tottenham lands through the Nordstar subdivision via an easement to be created in the vacant lands east of the CPR right-of-way.

Water Distribution System:

- Provide a 250 mm diameter watermain connection to the LRG Tottenham lands from the existing 250 mm watermain on Queen Street;
- Provide a connection to the Six Nights and Nordstar Developments from the existing 200 mm watermain on Mill Street with a 350 mm diameter watermain;
- Loop the Six Nights Development through the proposed Arvida Tottenham subdivision;
- Provide full twinning of watermains on Mill Street west of Queen Street via simple cross connections between existing watermains (future upgrading of these watermains may be required);
- Provide a 250 mm watermain connecting LRG Tottenham and Nordstar Developments under the CP Railway. Provide 150 mm connections from Adeline Avenue/Brown Street to the south end of The Boulevard to the 250 mm watermain.

Appendix A

Wastewater Flow Projections

The Town of New Tecumseth
Master Plan Update
Water and Wastewater Improvements for the Tottenham Secondary Plan Area
Appendix A - Approximate Wastewater Flow Projections

Blocks	Units	Persons/ Unit	Persons	Peak Factor (Harmon)	Area (ha)	Total Flow (L/day)	Subtotal Flow (L/day)	m^3/day	L/s
1 ***Nordstar Development***									
Single Family	200	3.2	640	3.92		1,128,000			
Duplex	232	3.2	742.4	3.88		1,296,128			
Townhouses	60	3.2	192	4.15		358,944			
Commercial					0.89	46,725			
Apartment	112	2.0	224	4.13	1.11	416,273	**3,246,070**	**3,246**	**38**
2 ***Six Nights Development***									
Single Family	366	3.2	1171.2	3.75		1,978,878			
Townhouses	85	2.0	170	4.17		319,230			
Commercial					0.91	47,775			
Institutional					2.30	120,750			
Apartment	108	2.0	216	4.14		401,987	**2,868,620**	**2,869**	**33**
3 ***The Boulevard***									
Single Family	86	3.2	275.2	4.09		507,026	**507,026**	**507**	**6**
4 ***Tottenham Court***									
Apartment Condo	100	2.0	200	4.15		373,323	**373,323**	**373**	**4**
5 ***Arvida-Tottenham***									
Single Family	180	3.2	576	3.94		1,021,722			
Townhouses	50	2.0	100	4.24		190,961	**1,212,682**	**1,213**	**14**
6 ***Sub-Area for Eastern PS***									
Single Family	390	3.2	1248	3.74		2,098,084			
Commercial									
Institutional									
Apartment							**2,098,084**	**2,098**	**24**
7 ***LRG Development***									
Single Family	448	3.2	1433.6	3.69		2,382,874			
Townhouses	41	2.0	82	4.27		157,422			
Commercial					0.89	46,725			
Institutional					3.83	201,075			
Apartment	143	2.0	286	4.09		526,028	**3,314,124**	**3,314**	**38**
Total Wastewater Flows to Secondary Plan Area							**13,619,929**	**13,620**	**160**

Notes:

1) The total flows calculated are based on existing residential area and estimated housing units except for cases where draft future development plans are available to determine various land use and units.
2) The Boulevard, Arvida-Tottenham, and Sub-Area to Eastern Pumping Station are existing developed areas which will be serviced by the future SPA Pumping Station.

Appendix B

Tottenham Secondary Plan Area Pumping Station Alternatives PV Cost Analysis

The Town of New Tecumseth
Master Plan Update
Water and Wastewater Improvements for the Tottenham Secondary Plan Area
Appendix B - Tottenham Secondary Plan Area Pumping Station Alternatives PV Cost Analysis

Inflation Rate	2.00%	(assumed)
Interest Rate	6.00%	(assumed)
ENR Cost Index 1997 to 2006	1.113	(assumed)

Alternative 1: Single Pumping Station at Mill Street

	Estimated PV of Costs Year 2006	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Mill Street PS																										
Pumping Station including pumps, instrumentation & controls, generator, mechanical equipment, HVAC, structures, building and siteworks	**$1,600,000**	$1,600,000																								
Special Excavation (to 18 m depth)	**$465,000**	$465,000																								
Dewatering Pumping Station and Sewer	**$535,000**	$535,000																								
Pumping Station Forcemain (2,500 m, 450 mm diameter)	**$1,750,000**	$1,750,000																								
Operating & Maintenance Costs	**$527,407**	*$0* $0	*$35,000* $33,019	*$35,700* $31,773	*$36,414* $30,574	*$37,142* $29,420	*$37,885* $28,310	*$38,643* $27,242	*$39,416* $26,214	*$40,204* $25,224	*$41,008* $24,273	*$41,828* $23,357	*$42,665* $22,475	*$43,518* $21,627	*$44,388* $20,811	*$45,276* $20,026	*$46,182* $19,270	*$47,105* $18,543	*$48,047* $17,843	*$49,008* $17,170	*$49,989* $16,522	*$50,988* $15,898	*$52,008* $15,298	*$53,048* $14,721	*$54,109* $14,166	*$55,191* $13,631
Contingencies, Taxes and Engineering	**$1,219,352**	*$1,087,500* $1,087,500	*$8,750* $8,255	*$8,925* $7,943	*$9,104* $7,643	*$9,286* $7,355	*$9,471* $7,077	*$9,661* $6,810	*$9,854* $6,553	*$10,051* $6,306	*$10,252* $6,068	*$10,457* $5,839	*$10,666* $5,619	*$10,880* $5,407	*$11,097* $5,203	*$11,319* $5,006	*$11,545* $4,818	*$11,776* $4,636	*$12,012* $4,461	*$12,252* $4,292	*$12,497* $4,130	*$12,747* $3,975	*$13,002* $3,825	*$13,262* $3,680	*$13,527* $3,541	*$13,798* $3,408
PV Costs for Alternative 1	**$6,096,758**																									

Alternative 2: Single Pumping Station at Six Nights Development

	Estimated PV of Costs Year 2006	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Six Nights Pumping Station																										
Pumping Station including pumps, instrumentation & controls, generator, mechanical equipment, HVAC, structures, building and siteworks	**$1,600,000**	$1,600,000																								
Special Excavation (to 13 m depth)	**$400,000**	$400,000																								
Dewatering Pumping Station and Sewer	**$450,000**	$450,000																								
Pumping Station Forcemain (3,250 m, approx. 450 mm diameter)	**$2,275,000**	$2,275,000																								
Operating & Maintenance Costs	**$527,407**	*$0* $0	*$35,000* $33,019	*$35,700* $31,773	*$36,414* $30,574	*$37,142* $29,420	*$37,885* $28,310	*$38,643* $27,242	*$39,416* $26,214	*$40,204* $25,224	*$41,008* $24,273	*$41,828* $23,357	*$42,665* $22,475	*$43,518* $21,627	*$44,388* $20,811	*$45,276* $20,026	*$46,182* $19,270	*$47,105* $18,543	*$48,047* $17,843	*$49,008* $17,170	*$49,989* $16,522	*$50,988* $15,898	*$52,008* $15,298	*$53,048* $14,721	*$54,109* $14,166	*$55,191* $13,631
Contingencies, Taxes and Engineering	**$1,313,102**	*$1,181,250* $1,181,250	*$8,750* $8,255	*$8,925* $7,943	*$9,104* $7,643	*$9,286* $7,355	*$9,471* $7,077	*$9,661* $6,810	*$9,854* $6,553	*$10,051* $6,306	*$10,252* $6,068	*$10,457* $5,839	*$10,666* $5,619	*$10,880* $5,407	*$11,097* $5,203	*$11,319* $5,006	*$11,545* $4,818	*$11,776* $4,636	*$12,012* $4,461	*$12,252* $4,292	*$12,497* $4,130	*$12,747* $3,975	*$13,002* $3,825	*$13,262* $3,680	*$13,527* $3,541	*$13,798* $3,408
PV Costs for Alternative 2	**$6,565,508**																									

Note:
Values in blue and italic are estimated future and annual costs

The Town of New Tecumseth
Master Plan Update
Water and Wastewater Improvements for the Tottenham Secondary Plan Area
Appendix B - Tottenham Secondary Plan Area Pumping Station Alternatives PV Cost Analysis

Alternative 3: Pumping Station at Mill Street and Pumping Station at Six Nights Development

	Estimated PV of Costs Year 2006	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Mill Street PS																										
Pumping Station including pumps, instrumentation & controls, generator, mechanical equipment, HVAC, structures, building and siteworks	**$1,200,000**	$1,200,000																								
Special Excavation (to 10.5 m depth)	**$350,000**	$350,000																								
Dewatering Pumping Station and Sewer	**$200,000**	$200,000																								
Pumping Station Forcemain (2,500 m, approx. 450 mm diameter)	**$1,750,000**	$1,750,000																								
Operating & Maintenance Costs	**$376,719**	*$0* $0	*$25,000* $23,585	*$25,500* $22,695	*$26,010* $21,838	*$26,530* $21,014	*$27,061* $20,221	*$27,602* $19,458	*$28,154* $18,724	*$28,717* $18,017	*$29,291* $17,338	*$29,877* $16,683	*$30,475* $16,054	*$31,084* $15,448	*$31,706* $14,865	*$32,340* $14,304	*$32,987* $13,764	*$33,647* $13,245	*$34,320* $12,745	*$35,006* $12,264	*$35,706* $11,801	*$36,420* $11,356	*$37,149* $10,927	*$37,892* $10,515	*$38,649* $10,118	*$39,422* $9,737
Contingencies, Taxes and Engineering	**$969,180**	*$875,000* $875,000	*$6,250* $5,896	*$6,375* $5,674	*$6,503* $5,460	*$6,633* $5,254	*$6,765* $5,055	*$6,901* $4,865	*$7,039* $4,681	*$7,179* $4,504	*$7,323* $4,334	*$7,469* $4,171	*$7,619* $4,013	*$7,771* $3,862	*$7,927* $3,716	*$8,085* $3,576	*$8,247* $3,441	*$8,412* $3,311	*$8,580* $3,186	*$8,752* $3,066	*$8,927* $2,950	*$9,105* $2,839	*$9,287* $2,732	*$9,473* $2,629	*$9,662* $2,530	*$9,856* $2,434
Sub-total	**$4,845,899**																									

Six Nights Pumping Station																										
Pumping Station including pumps, instrumentation & controls, generator, mechanical equipment, HVAC, structures, building and siteworks	**$500,000**	$500,000																								
Excavation	**$0**	$0																								
Dewatering Pumping Station and Sewer	**$0**	$0																								
Pumping Station Forcemain (200 m, approx. 250 mm diameter)	**$75,000**	$75,000																								
Operating & Maintenance Costs	**$304,219**	*$0* $0	*$10,000* $10,000	*$10,200* $10,200	*$10,404* $10,404	*$10,612* $10,612	*$10,824* $10,824	*$11,041* $11,041	*$11,262* $11,262	*$11,487* $11,487	*$11,717* $11,717	*$11,951* $11,951	*$12,190* $12,190	*$12,434* $12,434	*$12,682* $12,682	*$12,936* $12,936	*$13,195* $13,195	*$13,459* $13,459	*$13,728* $13,728	*$14,002* $14,002	*$14,282* $14,282	*$14,568* $14,568	*$14,859* $14,859	*$15,157* $15,157	*$15,460* $15,460	*$15,769* $15,769
Contingencies, Taxes and Engineering	**$219,805**	*$143,750* $143,750	*$2,500* $2,500	*$2,550* $2,550	*$2,601* $2,601	*$2,653* $2,653	*$2,706* $2,706	*$2,760* $2,760	*$2,815* $2,815	*$2,872* $2,872	*$2,929* $2,929	*$2,988* $2,988	*$3,047* $3,047	*$3,108* $3,108	*$3,171* $3,171	*$3,234* $3,234	*$3,299* $3,299	*$3,365* $3,365	*$3,432* $3,432	*$3,501* $3,501	*$3,571* $3,571	*$3,642* $3,642	*$3,715* $3,715	*$3,789* $3,789	*$3,865* $3,865	*$3,942* $3,942
Sub-total	**$1,099,023**																									
PV Costs for Alternative 3	**$5,944,922**																									

Note:
Values in blue and italic are estimated future and annual costs

The Town of New Tecumseth
Master Plan Update
Water and Wastewater Improvements for the Tottenham Secondary Plan Area
Appendix B - Tottenham Secondary Plan Area Pumping Station Alternatives PV Cost Analysis

Alternative 4: Pumping Station at Mill Street and Small Pumping Station at Six Nights Development

	Estimated PV of Costs Year 2006	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Mill Street PS																										
Pumping Station including pumps, instrumentation & controls, generator, mechanical equipment, HVAC, structures, building and siteworks	**$1,200,000**	$1,200,000																								
Special Excavation (to 14 m depth)	**$400,000**	$400,000																								
Dewatering Pumping Station and Sewer	**$465,000**	$465,000																								
Pumping Station Forcemain (2,500 m, approx. 450 mm diameter)	**$1,750,000**	$1,750,000																								
Operating & Maintenance Costs		*$0*	*$25,000*	*$25,500*	*$26,010*	*$26,530*	*$27,061*	*$27,602*	*$28,154*	*$28,717*	*$29,291*	*$29,877*	*$30,475*	*$31,084*	*$31,706*	*$32,340*	*$32,987*	*$33,647*	*$34,320*	*$35,006*	*$35,706*	*$36,420*	*$37,149*	*$37,892*	*$38,649*	*$39,422*
	$376,719	$0	$23,585	$22,695	$21,838	$21,014	$20,221	$19,458	$18,724	$18,017	$17,338	$16,683	$16,054	$15,448	$14,865	$14,304	$13,764	$13,245	$12,745	$12,264	$11,801	$11,356	$10,927	$10,515	$10,118	$9,737
Contingencies, Taxes and Engineering		*$953,750*	*$6,250*	*$6,375*	*$6,503*	*$6,633*	*$6,765*	*$6,901*	*$7,039*	*$7,179*	*$7,323*	*$7,469*	*$7,619*	*$7,771*	*$7,927*	*$8,085*	*$8,247*	*$8,412*	*$8,580*	*$8,752*	*$8,927*	*$9,105*	*$9,287*	*$9,473*	*$9,662*	*$9,856*
	$1,047,930	$953,750	$5,896	$5,674	$5,460	$5,254	$5,055	$4,865	$4,681	$4,504	$4,334	$4,171	$4,013	$3,862	$3,716	$3,576	$3,441	$3,311	$3,186	$3,066	$2,950	$2,839	$2,732	$2,629	$2,530	$2,434
Sub-total	**$5,239,649**																									

Six Nights Pumping Station																										
Pumping Station including pumps, instrumentation & controls, generator, mechanical equipment, HVAC, structures, building and siteworks	**$100,000**	$100,000																								
Excavation	**$0**	$0																								
Dewatering Pumping Station and Sewer	**$0**	$0																								
Pumping Station Forcemain (200 m, approx.100 mm diameter)	**$40,000**	$40,000																								
Operating & Maintenance Costs		*$0*	*$5,000*	*$5,100*	*$5,202*	*$5,306*	*$5,412*	*$5,520*	*$5,631*	*$5,743*	*$5,858*	*$5,975*	*$6,095*	*$6,217*	*$6,341*	*$6,468*	*$6,597*	*$6,729*	*$6,864*	*$7,001*	*$7,141*	*$7,284*	*$7,430*	*$7,578*	*$7,730*	*$7,884*
	$152,109	$0	$5,000	$5,100	$5,202	$5,306	$5,412	$5,520	$5,631	$5,743	$5,858	$5,975	$6,095	$6,217	$6,341	$6,468	$6,597	$6,729	$6,864	$7,001	$7,141	$7,284	$7,430	$7,578	$7,730	$7,884
Contingencies, Taxes and Engineering		*$35,000*	*$1,250*	*$1,275*	*$1,301*	*$1,327*	*$1,353*	*$1,380*	*$1,408*	*$1,436*	*$1,465*	*$1,494*	*$1,524*	*$1,554*	*$1,585*	*$1,617*	*$1,649*	*$1,682*	*$1,716*	*$1,750*	*$1,785*	*$1,821*	*$1,857*	*$1,895*	*$1,932*	*$1,971*
	$73,027	$35,000	$1,250	$1,275	$1,301	$1,327	$1,353	$1,380	$1,408	$1,436	$1,465	$1,494	$1,524	$1,554	$1,585	$1,617	$1,649	$1,682	$1,716	$1,750	$1,785	$1,821	$1,857	$1,895	$1,932	$1,971
Sub-total	**$365,137**																									
PV Costs for Alternative 4	**$5,604,785**																									

Note:
Values in blue and italic are estimated future and annual costs

The Town of New Tecumseth
Master Plan Update
Water and Wastewater Improvements for the Tottenham Secondary Plan Area
Appendix B - Tottenham Secondary Plan Area Pumping Station Alternatives PV Cost Analysis

Alternative 5: Pumping Station at Mill Street, Pumping Stations at Six Nights and Mod-Aire Developments

	Estimated PV of Costs Year 2006	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Mill Street PS																										
Pumping Station including pumps, instrumentation & controls, generator, mechanical equipment, HVAC, structures, building and siteworks	**$1,200,000**	$1,200,000																								
Special Excavation (to 14 m depth)	**$400,000**	$400,000																								
Dewatering Pumping Station and Sewer	**$465,000**	$465,000																								
Pumping Station Forcemain (2,500 m, approx. 450 mm diameter)	**$1,750,000**	$1,750,000																								
Operating & Maintenance Costs		*$0*	*$25,000*	*$25,500*	*$26,010*	*$26,530*	*$27,061*	*$27,602*	*$28,154*	*$28,717*	*$29,291*	*$29,877*	*$30,475*	*$31,084*	*$31,706*	*$32,340*	*$32,987*	*$33,647*	*$34,320*	*$35,006*	*$35,706*	*$36,420*	*$37,149*	*$37,892*	*$38,649*	*$39,422*
	$376,719	$0	$23,585	$22,695	$21,838	$21,014	$20,221	$19,458	$18,724	$18,017	$17,338	$16,683	$16,054	$15,448	$14,865	$14,304	$13,764	$13,245	$12,745	$12,264	$11,801	$11,356	$10,927	$10,515	$10,118	$9,737
Contingencies, Taxes and Engineering		*$953,750*	*$6,250*	*$6,375*	*$6,503*	*$6,633*	*$6,765*	*$6,901*	*$7,039*	*$7,179*	*$7,323*	*$7,469*	*$7,619*	*$7,771*	*$7,927*	*$8,085*	*$8,247*	*$8,412*	*$8,580*	*$8,752*	*$8,927*	*$9,105*	*$9,287*	*$9,473*	*$9,662*	*$9,856*
	$1,047,930	$953,750	$5,896	$5,674	$5,460	$5,254	$5,055	$4,865	$4,681	$4,504	$4,334	$4,171	$4,013	$3,862	$3,716	$3,576	$3,441	$3,311	$3,186	$3,066	$2,950	$2,839	$2,732	$2,629	$2,530	$2,434
Sub-total	**$5,239,649**																									
Six Nights Pumping Station																										
Pumping Station including pumps, instrumentation & controls, generator, mechanical equipment, HVAC, structures, building and siteworks	**$100,000**	$100,000																								
Excavation	**$0**	$0																								
Dewatering Pumping Station and Sewer	**$0**	$0																								
Pumping Station Forcemain (200 m, approx.100 mm diameter)	**$40,000**	$40,000																								
Operating & Maintenance Costs		*$0*	*$5,000*	*$5,100*	*$5,202*	*$5,306*	*$5,412*	*$5,520*	*$5,631*	*$5,743*	*$5,858*	*$5,975*	*$6,095*	*$6,217*	*$6,341*	*$6,468*	*$6,597*	*$6,729*	*$6,864*	*$7,001*	*$7,141*	*$7,284*	*$7,430*	*$7,578*	*$7,730*	*$7,884*
	$152,109	$0	$5,000	$5,100	$5,202	$5,306	$5,412	$5,520	$5,631	$5,743	$5,858	$5,975	$6,095	$6,217	$6,341	$6,468	$6,597	$6,729	$6,864	$7,001	$7,141	$7,284	$7,430	$7,578	$7,730	$7,884
Contingencies, Taxes and Engineering		*$35,000*	*$1,250*	*$1,275*	*$1,301*	*$1,327*	*$1,353*	*$1,380*	*$1,408*	*$1,436*	*$1,465*	*$1,494*	*$1,524*	*$1,554*	*$1,585*	*$1,617*	*$1,649*	*$1,682*	*$1,716*	*$1,750*	*$1,785*	*$1,821*	*$1,857*	*$1,895*	*$1,932*	*$1,971*
	$73,027	$35,000	$1,250	$1,275	$1,301	$1,327	$1,353	$1,380	$1,408	$1,436	$1,465	$1,494	$1,524	$1,554	$1,585	$1,617	$1,649	$1,682	$1,716	$1,750	$1,785	$1,821	$1,857	$1,895	$1,932	$1,971
Sub-total	**$365,137**																									
LRG Pumping Station																										
Pumping Station including pumps, instrumentation & controls, generator, mechanical equipment, HVAC, structures, building and siteworks	**$350,000**	$350,000																								
Excavation	**$0**	$0																								
Dewatering Pumping Station and Sewer	**$0**	$0																								
Pumping Station Forcemain (2,700 m, approx. 200 mm diameter)	**$900,000**	$900,000																								
Operating & Maintenance Costs		*$0*	*$10,000*	*$10,200*	*$10,404*	*$10,612*	*$10,824*	*$11,041*	*$11,262*	*$11,487*	*$11,717*	*$11,951*	*$12,190*	*$12,434*	*$12,682*	*$12,936*	*$13,195*	*$13,459*	*$13,728*	*$14,002*	*$14,282*	*$14,568*	*$14,859*	*$15,157*	*$15,460*	*$15,769*
	$304,219	$0	$10,000	$10,200	$10,404	$10,612	$10,824	$11,041	$11,262	$11,487	$11,717	$11,951	$12,190	$12,434	$12,682	$12,936	$13,195	$13,459	$13,728	$14,002	$14,282	$14,568	$14,859	$15,157	$15,460	$15,769
Contingencies, Taxes and Engineering		*$312,500*	*$2,500*	*$2,550*	*$2,601*	*$2,653*	*$2,706*	*$2,760*	*$2,815*	*$2,872*	*$2,929*	*$2,988*	*$3,047*	*$3,108*	*$3,171*	*$3,234*	*$3,299*	*$3,365*	*$3,432*	*$3,501*	*$3,571*	*$3,642*	*$3,715*	*$3,789*	*$3,865*	*$3,942*
	$388,555	$312,500	$2,500	$2,550	$2,601	$2,653	$2,706	$2,760	$2,815	$2,872	$2,929	$2,988	$3,047	$3,108	$3,171	$3,234	$3,299	$3,365	$3,432	$3,501	$3,571	$3,642	$3,715	$3,789	$3,865	$3,942
Sub-total	**$1,942,773**																									
PV Costs for Alternative 5	**$7,547,559**																									

Note:
Values in blue and italic are estimated future and annual costs

Appendix C

Pumping Station Decommissioning PV Cost Analysis

The Town of New Tecumseth
Master Plan Update
Water and Wastewater Improvements for the Tottenham Secondary Plan Area
Appendix C - Pumping Station Decommissioning PV Cost Analysis

Inflation Rate	2.00%	(assumed)
Interest Rate	6.00%	(assumed)
ENR Cost Index 1997 to 2006	1.113	(assumed)

Decommissioning of Boulevard Pumping Station

	Estimated PV of Costs Year 2006	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Construction of new gravity sewer to the proposed SPA Pumping Station (550m of 200mm diameter)	**($250,000)**			*($280,900)* ($250,000)																						
Demolition/decommissioning of the existing pumping station	**($100,000)**			*($112,360)* ($100,000)																						
Contingencies, Taxes and Engineering for New Sewer and Decommissioning	**($87,500)**			*($98,315)* ($87,500)																						
Future Pumping Station Improvement Costs	**$105,000**						*$46,838* $35,000					*$62,680* $35,000					*$83,880* $35,000									
Future Pumping Station Replacement Costs	**$700,000**																									*$2,834,255* $700,000
Operating & Maintenance Costs	**$226,031**	*$0* $0	*$15,000* $14,151	*$15,300* $13,617	*$15,606* $13,103	*$15,918* $12,609	*$16,236* $12,133	*$16,561* $11,675	*$16,892* $11,234	*$17,230* $10,810	*$17,575* $10,403	*$17,926* $10,010	*$18,285* $9,632	*$18,651* $9,269	*$19,024* $8,919	*$19,404* $8,582	*$19,792* $8,259	*$20,188* $7,947	*$20,592* $7,647	*$21,004* $7,358	*$21,424* $7,081	*$21,852* $6,814	*$22,289* $6,556	*$22,735* $6,309	*$23,190* $6,071	*$23,653* $5,842
Contingencies, Taxes and Engineering for Maintaining Pumping Station	**$56,508**	*$0* $0	*$3,750* $3,538	*$3,825* $3,404	*$3,902* $3,276	*$3,980* $3,152	*$4,059* $3,033	*$4,140* $2,919	*$4,223* $2,809	*$4,308* $2,703	*$4,394* $2,601	*$4,482* $2,503	*$4,571* $2,408	*$4,663* $2,317	*$4,756* $2,230	*$4,851* $2,146	*$4,948* $2,065	*$5,047* $1,987	*$5,148* $1,912	*$5,251* $1,840	*$5,356* $1,770	*$5,463* $1,703	*$5,572* $1,639	*$5,684* $1,577	*$5,797* $1,518	*$5,913* $1,460
Estimated PV of Savings from Decommissioning Boulevard Pumping Station	**$650,040**																									

Decommissioning of Eastern Pumping Station

	Estimated PV of Costs Year 2006	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Construction of new gravity sewer between existing manholes (150m of 300mm diameter)	**($150,000)**			*($168,540)* ($150,000)																						
Demolition/decommissioning of the existing pumping station	**($150,000)**			*($168,540)* ($150,000)																						
Contingencies, Taxes and Engineering for New Sewer and Decommissioning	**($75,000)**			*($84,270)* ($75,000)																						
Future Pumping Station Improvement Costs	**$105,000**						*$46,838* $35,000					*$62,680* $35,000					*$83,880* $35,000									
Future Pumping Station Replacement Costs	**$800,000**																									*$3,239,148* $800,000
Operating & Maintenance Costs	**$226,031**	*$0* $0	*$15,000* $14,151	*$15,300* $13,617	*$15,606* $13,103	*$15,918* $12,609	*$16,236* $12,133	*$16,561* $11,675	*$16,892* $11,234	*$17,230* $10,810	*$17,575* $10,403	*$17,926* $10,010	*$18,285* $9,632	*$18,651* $9,269	*$19,024* $8,919	*$19,404* $8,582	*$19,792* $8,259	*$20,188* $7,947	*$20,592* $7,647	*$21,004* $7,358	*$21,424* $7,081	*$21,852* $6,814	*$22,289* $6,556	*$22,735* $6,309	*$23,190* $6,071	*$23,653* $5,842
Contingencies, Taxes and Engineering for Maintaining Pumping Station	**$56,508**	*$0* $0	*$3,750* $3,538	*$3,825* $3,404	*$3,902* $3,276	*$3,980* $3,152	*$4,059* $3,033	*$4,140* $2,919	*$4,223* $2,809	*$4,308* $2,703	*$4,394* $2,601	*$4,482* $2,503	*$4,571* $2,408	*$4,663* $2,317	*$4,756* $2,230	*$4,851* $2,146	*$4,948* $2,065	*$5,047* $1,987	*$5,148* $1,912	*$5,251* $1,840	*$5,356* $1,770	*$5,463* $1,703	*$5,572* $1,639	*$5,684* $1,577	*$5,797* $1,518	*$5,913* $1,460
Estimated PV of Savings from Decommissioning Eastern Pumping Station	**$812,540**																									

Note:
Values in blue and italic are estimated future and annual costs

The Town of New Tecumseth
Master Plan Update
Water and Wastewater Improvements for the Tottenham Secondary Plan Area
Appendix C - Pumping Station Decommissioning PV Cost Analysis

Decommissioning of Arvida Pumping Station																											
	Estimated PV of Costs Year 2006	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Connection to the Six Nights Development sewer	**($25,000)**			*($28,090)* ($25,000)																						
Demolition/decommissioning of the existing pumping station	**($85,000)**			*($95,506)* ($85,000)																						
Contingencies, Taxes and Engineering for New Sewer and Decommissioning	**($27,500)**			*($30,899)* ($27,500)																						
Future Pumping Station Improvement Costs	**$45,000**						*$20,073* $15,000					*$26,863* $15,000					*$35,948* $15,000									
Future Pumping Station Replacement Costs	**$200,000**																									*$809,787* $200,000
Operating & Maintenance Costs	**$150,688**	*$0* $0	*$10,000* $9,434	*$10,200* $9,078	*$10,404* $8,735	*$10,612* $8,406	*$10,824* $8,089	*$11,041* $7,783	*$11,262* $7,490	*$11,487* $7,207	*$11,717* $6,935	*$11,951* $6,673	*$12,190* $6,422	*$12,434* $6,179	*$12,682* $5,946	*$12,936* $5,722	*$13,195* $5,506	*$13,459* $5,298	*$13,728* $5,098	*$14,002* $4,906	*$14,282* $4,721	*$14,568* $4,542	*$14,859* $4,371	*$15,157* $4,206	*$15,460* $4,047	*$15,769* $3,895
Contingencies, Taxes and Engineering for Maintaining Pumping Station	**$37,672**	*$0* $0	*$2,500* $2,358	*$2,550* $2,269	*$2,601* $2,184	*$2,653* $2,101	*$2,706* $2,022	*$2,760* $1,946	*$2,815* $1,872	*$2,872* $1,802	*$2,929* $1,734	*$2,988* $1,668	*$3,047* $1,605	*$3,108* $1,545	*$3,171* $1,487	*$3,234* $1,430	*$3,299* $1,376	*$3,365* $1,324	*$3,432* $1,275	*$3,501* $1,226	*$3,571* $1,180	*$3,642* $1,136	*$3,715* $1,093	*$3,789* $1,052	*$3,865* $1,012	*$3,942* $974
Estimated PV of Savings from Decommissioning Arvida Pumping Station	**$295,859**																									

Note:
Values in blue and italic are estimated future and annual costs

Appendix D

Preliminary Geotechnical Assessment and Cost Analysis of Sanitary Pumping Station Alternatives – Terraprobe, December 12, 1996

Terraprobe
Consulting Geotechnical Engineers & Hydrogeologists
Construction & Materials Inspection & Testing

December 12, 1996

Our ref: 963004
Hamilton Office

John. B.
RBS.

Philips Planning + Engineering Limited
3215 North Service Road,
Box 220,
Burlington, Ontario
L7R 3Y2

Attention: Mr. R. R. McLaughlin, P. Eng.

RE: PRELIMINARY GEOTECHNICAL ASSESSMENT AND COST ANALYSIS OF SANITARY PUMPING STATION ALTERNATIVES TOTTENHAM SECONDARY PLAN

Dear Sir;

This letter reports the results of a preliminary geotechnical engineering assessment and analysis of the relative costs of the two alternatives being considered for the conceptual design of the sanitary pumping station and collection gravity sewers required for the proposed residential developments included in the Tottenham Secondary Plan.

The following assessment is based primarily on background information and is intended only for use in comparing conceptual design alternatives and is not of sufficient scope for design purposes. A site specific geotechnical investigation will be required to provide information for design purposes.

1. BACKGROUND

It is understood that consideration is being given to a scheme with a single deep pumping station and an alternative scheme with two pumping stations requiring a lesser depth. The first scheme requires a pumping station located at Mill Street with an invert depth of some 18.5m below ground surface and 300m of gravity sewer with invert depths ranging from about 7.5 to 12.5m below the proposed finished grades. The alternative scheme requires two pumping stations, one located at Mill Street and the second located about 500m to the north, with invert depths of about

10.5m and 8.5m respectively. The gravity sewers for the second alternative would be about 500m in length with invert depths in the range of about 4.7 to 7.3m.

The results of preliminary subsurface investigation carried out in conjunction with the development of the Tottenham Secondary Plan were detailed in Terraprobe Limited Report No. 963003/963004 entitled "Preliminary Geotechnical and Hydrogeological Evaluation, East Tottenham Secondary Plan, Town of New Tecumseth", dated August, 1996.

The field work carried as part of the above evaluation included subsurface exploration to depths of 6 to 9 m below the existing ground surface in a series of widely spaced boreholes. The shallow subsurface conditions determined on the basis of the boreholes generally consisted of silt interlayered with silty clay and with a high groundwater level. Based on a review of MOEE water well records, it is considered that the silt deposit is extensive, and may be underlain by an intermediate aquifer. A well situated within the lands included in the proposed development (just south of Mill Street) is reported to have encountered an aquifer at a depth of about 18m with "flowing" or artesian conditions having been described. Similar conditions are reported for a nearby well to the east.

2. SIGNIFICANCE OF SUBSURFACE CONDITIONS

The subsurface soil and groundwater conditions inferred from the above information are considered difficult, especially at depth and will impact significantly on the design and construction of the sewers and other underground plant.

The overburden material predominant to the site is characteristically problematic particularly in view of the high groundwater levels. The material is very susceptible to disturbance and can potentially approach a liquified state under uncontrolled conditions. The impact of these conditions on the design and construction of underground plant will vary with the depth of cut required.

Relatively shallow cuts of 3 to 4 m or less, may be feasible using conventional open cut unsupported excavations with side slope inclinations of 1 horizontal to 1 vertical and flatter and groundwater controlled by means of a series of filtered sumps within the excavations.

Depending on the local conditions, cuts in the range of about 4 to 7m will probably necessitate dewatering by a system of filtered vacuum well points. The well points may only be marginally effective in the fine grained silts. The use of trench box liners will be required for the deeper cuts.

Excavation to depths below about 8m will require depressurization of the intermediate aquifer

by means of relief wells to maintain basal stability. Unsupported excavations below this depth will probably not be feasible due to the width of excavation required to maintain temporary side slopes. Use of steel sheet piling will probably be required for excavations of about 8m and deeper.

3. DISCUSSION OF ALTERNATIVES

Based on the above criteria, construction of the pumping stations under both schemes will be similar in concept. Both schemes would require depressurization of the intermediate aquifer and the means of support for the excavation would likely also be similar for both schemes. It should be noted that a detailed hydrogeological investigation will be required in order to support an application for an MOEE permit to take water for the pressure relief wells which would be required. The cost associated with this task has not been considered in the cost analysis, however it would be common to either scheme.

There are significant differences in the scope of work required to construct the gravity sewer to the pumping station or stations under the two alternatives. Based on the sewer inverts proposed for the single deep pumping station, depressurization of the intermediate aquifer and the use of well points will probably be required to achieve adequate control of the groundwater. The construction of the sewer could involve a two stage excavation with the upper part unsupported and the lower portion supported with trench box liners and/or sheeting. For the dual pumping station alternative, the invert depths are such that it may not be necessary to depressurize the intermediate aquifer over the entire length and the excavation and support requirements are likely to be less onerous.

It should be noted that much of the excavated material will be wet of the optimum water content for compaction and the potential for significant post construction settlements is inherent to the use of this material for backfill.

4. COST IMPLICATIONS

The following is a preliminary analysis of the relative costs associated with the two alternatives. The material cost of the infrastructure is not included in the analysis and engineering design, administration, and inspection costs have not been included. In addition the costs are based on conceptual design only. No specific design calculations have been carried out in support of the unit costs considered.

4.1 Deep Pumping Station Alternative

4.1.1 Pumping Station

For the purposes of preparing a cost estimate, it has been assumed that construction of the pumping station will require excavation to about 1m below the invert elevation or to a depth of about 20m. It has been assumed that the construction would involve driving steel sheet piling to a depth of about 3m below the bottom of the proposed excavation. Excavation to the required depth would be carried out using a crane equipped with a clam bucket. It has been considered that the sheeting would be driven in a 5m square footprint. Four pressure relief wells would be installed in such a manner as to provide some positive drainage to the overlying silt as well depressurizing the aquifer. The pumping station would have to be designed to resist uplift forces corresponding to full hydrostatic pressure. It has been considered that sheeting could be used to resist uplift and would be left in place for this reason.

- Pressure relief wells
  4 required including mobilization & demobilization of equipment, drilling, supply and place well casing and screen, equip with rental pump and control system, and construct discharge drain. . . . . .$30,000.

- Steel sheet piling
  Assuming 450 m² @ $215 per m² in place . . . . . .$97,000.
  Internal support system . . . . . .$5,000.
  Sub Total . . . . . .$102,000.

- Excavation
  Excavate, short haul, stockpile and/or spread.
  490 m³ @ $12.00 per m³ . . . . . $6000.

- Backfill & Restoration . . . . . $4000.

Total **$142,000.**

4.1.2 Gravity Sewer

Due to the depth of excavation required and the location of the gravity sewer, it has been considered that the construction would entail a staged excavation. The first stage consisting of

excavation to a depth of about 3m in conventional unsupported open cut, with the second stage consisting of excavation to the invert elevation utilizing trench box liners to support the lower excavation. It has been assumed that sheeting will be required for cuts of greater than about 10m. The feasibility of this method depends on the effective control of groundwater. For estimating purposes it has been considered that pressure relief wells would be installed a 30m intervals and that filtered vacuum well points would also be installed along the length of the trench.

The cost for excavation, laying pipe and backfilling has been based on the expected equipment and labour force required for an undertaking of this magnitude and complexity, together with a production rate consistent with the adverse conditions expected.

- Pressure Relief Wells
  Assuming temporary wells which will require proper abandonment after construction. Ten wells required.
  . . . . . $80,000.

- Well Point System
  300 lineal m @ $120. per m
  . . . . . $36,000.

- Excavate, lay pipe, backfill
  300 lineal m at a production rate of 20m per day and a daily cost of $8000.
  15 days @ $8000. Per day
  . . . . . $120,000.

- Sheeting
  Required where depth if cut exceeds 10m (approx. 50 lineal m of trench). Sheeting salvaged.
  1300m^2 @ 160.00 per m^2
  . . . . . $208,000.

Total **$444,000.**

Grand Total **$586,000.**

4.2 Dual Pumping Stations Alternative

4.2.1 Pumping Stations

Assuming that the deep aquifer exists at the site of both pumping stations, the scope of the dewatering/depressurizing requirements would be the same as considered previously.

- Pressure relief wells
  8 required including mobilization & demobilization of equipment, drilling, supply and place well casing and screen, equip with rental pump, and control system, and construct discharge drains. . . . . .$60,000.

- Steel sheet piling
  Assuming 290 m^2 @ $215 per m^2 in place . . . . . .$62,000.
  250 m^2 @ $215 per m^2 . . . . . $54,000.
  Internal support systems . . . . . .$10,000.
  Sub Total . . . . . .$126,000.

- Excavation
  Excavate, short haul, stockpile and/or spread.
  290 m^3 @ $12.00 per m^3 . . . . . $4000.
  240 m^3 @ $12.00 per m^3 . . . . . $3000.
  Sub Total . . . . . .$7000.

- Backfill & Restoration . . . . . $10,000.

Total **$203,000.**

4.2.2 Gravity Sewer

In this case, it has been considered that the range of depth for the gravity sewer is such that construction can be accomplished by dewatering and by a single stage excavation using trench liner boxes. For estimating purposes it has been assumed that well points will be provided along the entire 500m of trench and that the pressure relief wells installed at the pumping station sites would be in operation as required. The daily cost for this aspect of the work has been reduced and the production rate increased from that previously considered to reflect the relative degree of difficulty and complexity.

- Well Point System
  500 lineal m @ $120. per m
  . . . . . $60,000.

- Excavate, lay pipe, backfill
  500 lineal m at a production rate of 30m per day and a daily cost of $6000.
  17 days @ $6000. per day
  . . . . . $102,000.

Total **$162,000.**

Grand Total **$365,000.**

5. CONCLUSIONS

On the basis of this assessment, and from a geotechnical engineering perspective the degree of difficulty associated with the deep pumping station alternative is significantly greater, primarily due to the gravity sewer component. The cost analysis indicates that the first alternative construction costs could be in the order of about $590,000 compared to about $370,000 for the second alternative.

We trust that this letter is satisfactory for your present requirements. If there is any point which requires further clarification, please contact the undersigned.

Yours Truly,

Terraprobe Limited

J. G. Muckle P. Eng.
JGM

Appendix E

Public Information Centre No. 1

NOTICE OF STUDY COMMENCEMENT

The Town of New Tecumseth's Official Plan provides for growth in the Community of Tottenham that will require expansion of the Town's water and wastewater systems and upgrades to existing municipal services. To outline a framework for future infrastructure works, the Town completed the "Tottenham Secondary Plan Class Environmental Assessment, Stormwater Management and Municipal Servicing Master Plan" in 1997. To service the new development areas, the Master Plan recommends the construction of a new sewage pumping station and forcemain and various upgrades to the existing watermain and sewer networks. The recommended works also include the decommissioning of the existing Boulevard, Arvida, and Eastern sewage pumping station and installation of new sanitary sewers discharging into the proposed pumping station. In accordance with the requirements of the Municipal Class Environmental Assessment process, the Town is now proceeding with an update of the water and wastewater servicing components of the Master Plan.

The current update to the 1997 Master Plan study is being conducted in accordance with the requirements described in the Municipal Engineers Association's *Municipal Class Environmental Assessment* document (June 2000). It requires the following to be completed: definition of the problem, identification and assessment of alternative water and wastewater servicing solutions, and selection of the preferred servicing alternative. The study will be undertaken over the next several months. Consultation with and input from the public and government review agencies will be a vital component of the study.

As part of the consultation process, a mailing list for notification is currently being compiled. If you have any questions regarding the study or the environmental assessment process and wish to receive notification of the upcoming public consultations, please contact one of the following:

Mr. John Himanen, P.Eng.
Project Manager
MacViro Consultants Inc.
600 Cochrane Drive, Suite 500
Markham, Ontario L3R 5K3
Phone: (905) 475-7270 Ext. 277
Fax: (905) 475-5994
Email: jhimanen@macviro.com

Mr. Richard Vatri, C.E.T.
Development Co-ordinator
The Town of New Tecumseth
Administration Centre
P.O. Box 910
10 Wellington Street East
Alliston, Ontario L9R 1A1
Phone: (705) 435-3900 Ext. 253
Fax: (705) 435-0407
Email: rvatri@town.newtecumseth.on.ca

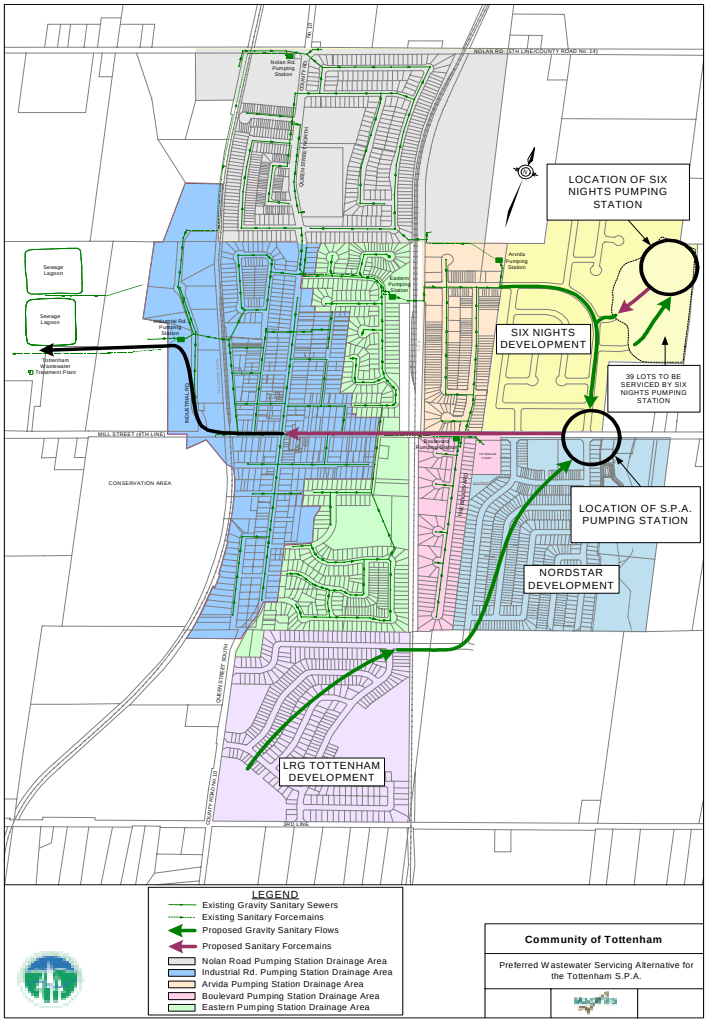
Thank you for your participation in this study.

INFORMATION BULLETIN
The Town of New Tecumseth
Tottenham Secondary Plan Area
Municipal Water and Wastewater Servicing Master Plan Update

Introduction

The Town of New Tecumseth's Official Plan provides for growth in the Community of Tottenham that will require expansion of the Town's water and wastewater systems and upgrades to existing municipal services. To outline a framework for future infrastructure works, the Town completed the "Tottenham Secondary Plan Class Environmental Assessment, Stormwater Management and Municipal Servicing Master Plan" in 1997. In accordance with the requirements of the Municipal Class Environmental Assessment process, the Town has proceeded with an update of the water and wastewater servicing components of the Master Plan. To service the new development areas, the Master Plan Update recommends the construction of a new sewage pumping station and forcemain and various upgrades to the existing watermain and sewer networks. The recommended works also include the decommissioning of the existing Boulevard, Arvida and Eastern sewage pumping stations and installation of new sanitary sewers discharging into the proposed new Secondary Plan Area (SPA) pumping station.

Wastewater System Preferred Solution

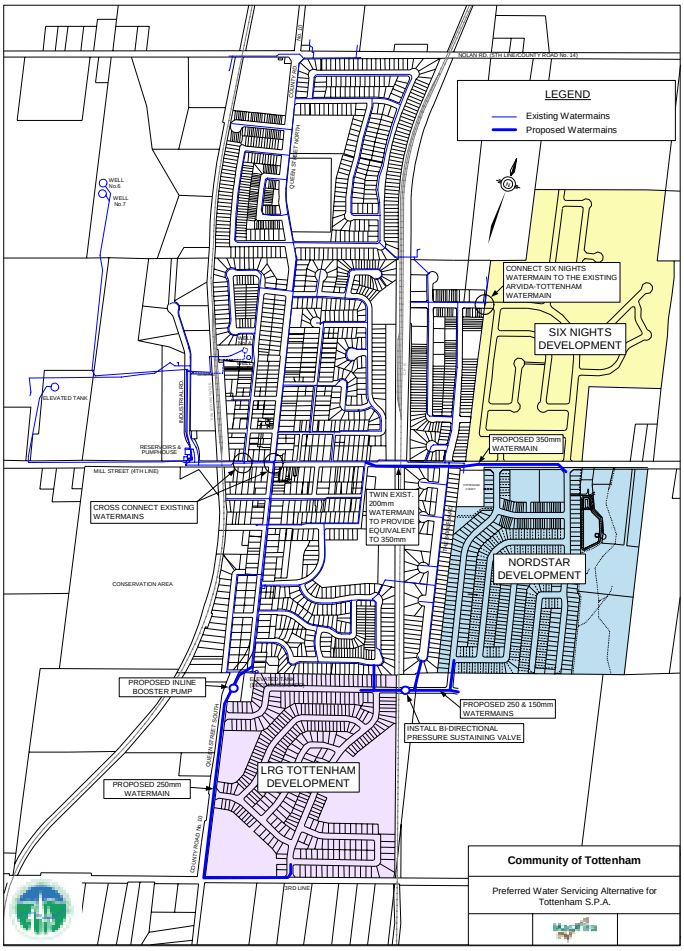


The preferred alternative for wastewater servicing of the Secondary Plan Area is as shown in the adjacent figure. The approach consists of the construction of one new pumping station at Mill Street, with a forcemain discharging to the existing Tottenham Wastewater Treatment Plant. A second smaller pumping station is proposed for the Six Nights Development to service 39 homes located along the east side of the new subdivision.

Decommissioning of the existing Boulevard, Arvida and Eastern sewage pumping stations, related connections to the existing wastewater collection system and installation of new sanitary sewers discharging into the proposed new SPA pumping station is also proposed, as indicated above.

Water System Preferred Solution

Alternative solutions identified to respond to the growth requirements for water servicing within the Secondary Plan Area have been also identified. Servicing requirements for the proposed solution are as follows:



- Provide a 250 mm diameter watermain connection to the LRG Tottenham lands from the existing 250 mm watermain on Queen Street;
- Provide a connection to the Six Nights and Nordstar Developments from the existing 200 mm watermain on Mill Street with a 350 mm diameter watermain;
- Loop the Six Nights Development through the Arvida Tottenham subdivision;
- Provide full twinning of watermains on Mill Street west of Queen Street via simple cross connections between existing watermains;
- Create a second pressure zone at the south end of the community, serviced by an inline booster pump;
- Provide a 150 mm watermain connecting Adeline Avenue to the south end of The Boulevard, and further to Nordstar Developments. A bi-directional pressure-sustaining valve on this watermain would be required, between the two pressure zones;
- Minor roads within the three SPA subdivisions will be serviced by 150 mm diameter watermains.

Please fax, mail, or email your comments to:

Mr. John Himanen, P.Eng.
Project Manager
MacViro Consultants Inc.
600 Cochrane Drive, Suite 500
Markham, Ontario L3R 5K3
Phone: (905) 475-7270 Ext. 277
Fax: (905) 475-5994
Email: jhimanen@macviro.com

Mr. Richard Vatri, C.E.T.
Development Co-ordinator
The Town of New Tecumseth
Administration Centre
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The Town of New Tecumseth
Tottenham Secondary Plan Area
Municipal Water and Wastewater Servicing Master Plan Update

NOTICE OF PUBLIC INFORMATION CENTRE

The Town of New Tecumseth is undertaking a Municipal Water and Wastewater Servicing Master Plan Update. To outline a framework for future infrastructure works, the Town completed the "Tottenham Secondary Plan Class Environmental Assessment, Stormwater Management and Municipal Servicing Master Plan" in 1997. To service the new development areas, the Master Plan recommends the following:

- Construction of a new sewage pumping station
- Construction of a sanitary forcemain discharging from the proposed pumping station to the Tottenham Wastewater Treatment Plant
- Decommissioning of Arvida, Eastern and Boulevard Pumping Stations
- Construction of an interim water booster pumping station
- Various upgrades to the existing watermain and sewer networks

The Town of New Tecumseth has retained MacViro Consultants Inc. to complete the study.

A Public Information Centre will be held to provide details on the study approach as well as to receive input and comment from interested parties. It will be held on:

Date:	**Thursday, May 26, 2005**
Time:	**2:00 pm to 4:00 pm** **(PowerPoint Presentation at 2:30 pm)** **7:00 pm to 9:00 pm** **(PowerPoint Presentation at 7:30 pm)**
Location:	**Tottenham Community Centre** **139 Queen Street North** **Tottenham, ON L0G 1W0**

For further information or if you are unable to attend the Information Centre and wish to provide your views, please contact:

Mr. John Himanen, P.Eng.
Project Manager
MacViro Consultants Inc.
600 Cochrane Drive, Suite 500
Markham, Ontario L3R 5K3
Phone: (905) 475-7270 Ext. 277
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Thank you for your participation in this study.

Town of New Tecumseth
Municipal Water and Wastewater Servicing Master Plan Update

Public Open House No. 1 - COMMENT SHEET *May 2005*

The Town of New Tecumseth is interested in hearing the community's comments, questions, concerns and suggestions regarding the Municipal Water and Wastewater Servicing Master Plan Update for the Tottenham Secondary Plan Area. Please take a few minutes to complete this brief comment sheet. All comments will be carefully considered in the Class EA Study.

1. Were you able to understand the information in the displays (Please Check one)?

YES NO

If No, please indicate what requires clarification

2. Do you have any comments, concerns or questions regarding the Master Plan Update?

3. Do you have any suggestions to offer at this stage?

4. How useful did you find the Public Information Centre? (please circle one)

Very Useful				Not Very Useful
1	2	3	4	5

5. How would you describe the nature of your interest in this study?

_____ Member of the General Public (including resident)

_____ Member of an Interest Group (Please specify: _____)

_____ Consultant

_____ Agency Representative (Please specify: _____)

_____ Other (Please specify: _____)

6. Please provide any other comments regarding the Public Information Centre (i.e., location, help received on understanding study and your concerns, opportunity provided to ask questions/comments/express concern).

_____

_____

_____

_____

_____

Your Signature: _____

Name: _____

Address: _____

_____

Telephone: _____

Fax: _____

E-mail: _____

You can fax, mail, or email your comments to:

Mr. John Himanen, P.Eng.
Project Manager
MacViro Consultants Inc.
600 Cochrane Drive, Suite 500
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Tottenham Secondary Plan Area
Municipal Water & Wastewater Servicing Master Plan Update

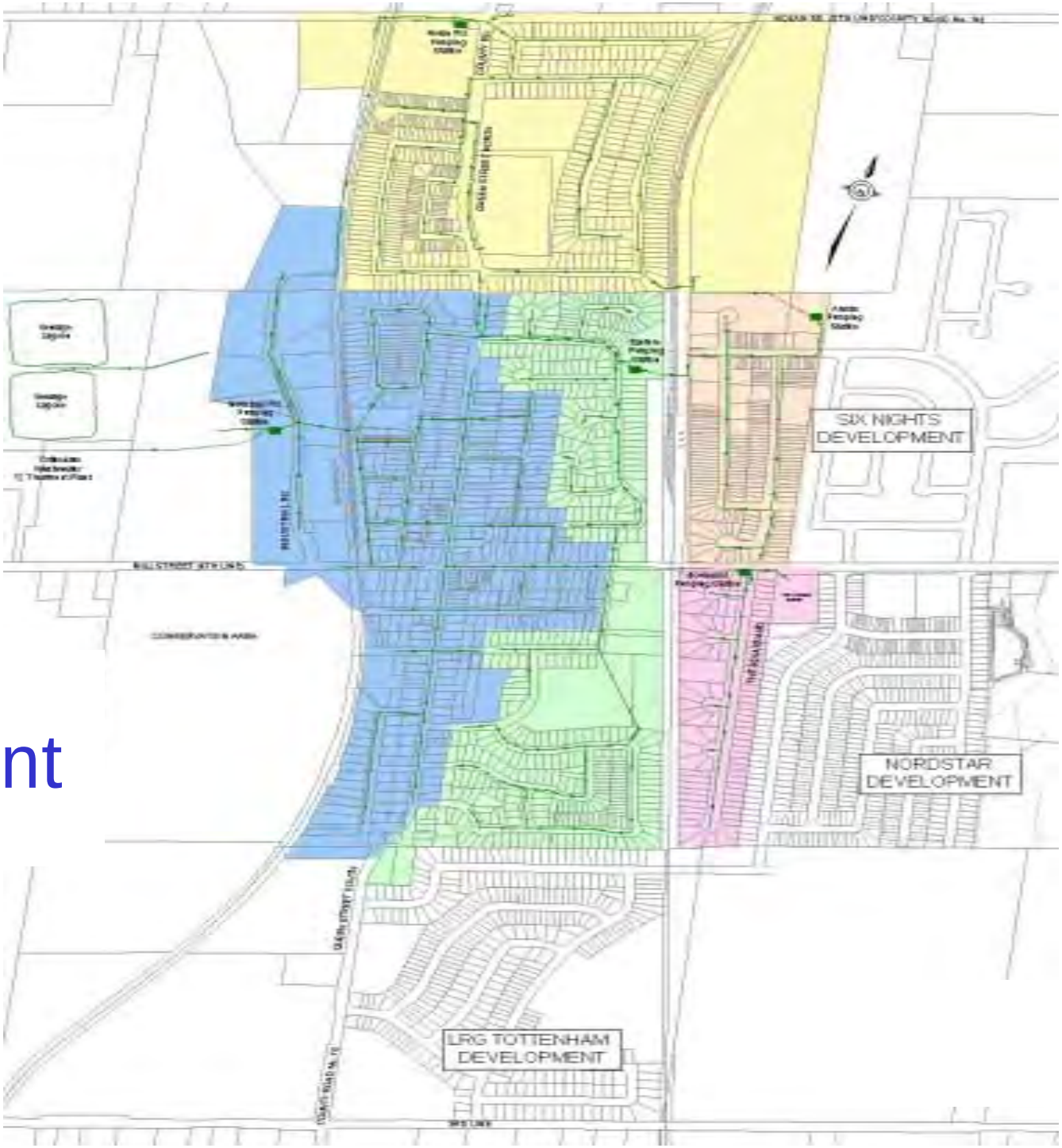
Public Information Centre
May 26, 2005

MacViro

Master Plan Update

- **Problems and Opportunities**
- **Servicing of New Developments**
- **Wastewater from the Secondary Plan Area**
- **Water to the Secondary Plan Area**

Existing Development Areas



Municipal Class Environmental Assessment Process (Master Plan)

- **Overview of all projects required**
- **Provides an overall picture of the system**
- **Class Environmental Assessment for each projects**

History of the Study for the Secondary Plan Area

- **1997 Master Plan includes water, wastewater and stormwater servicing**
- **2005 Master Plan Update deals with water and wastewater servicing only**

Key Aspects

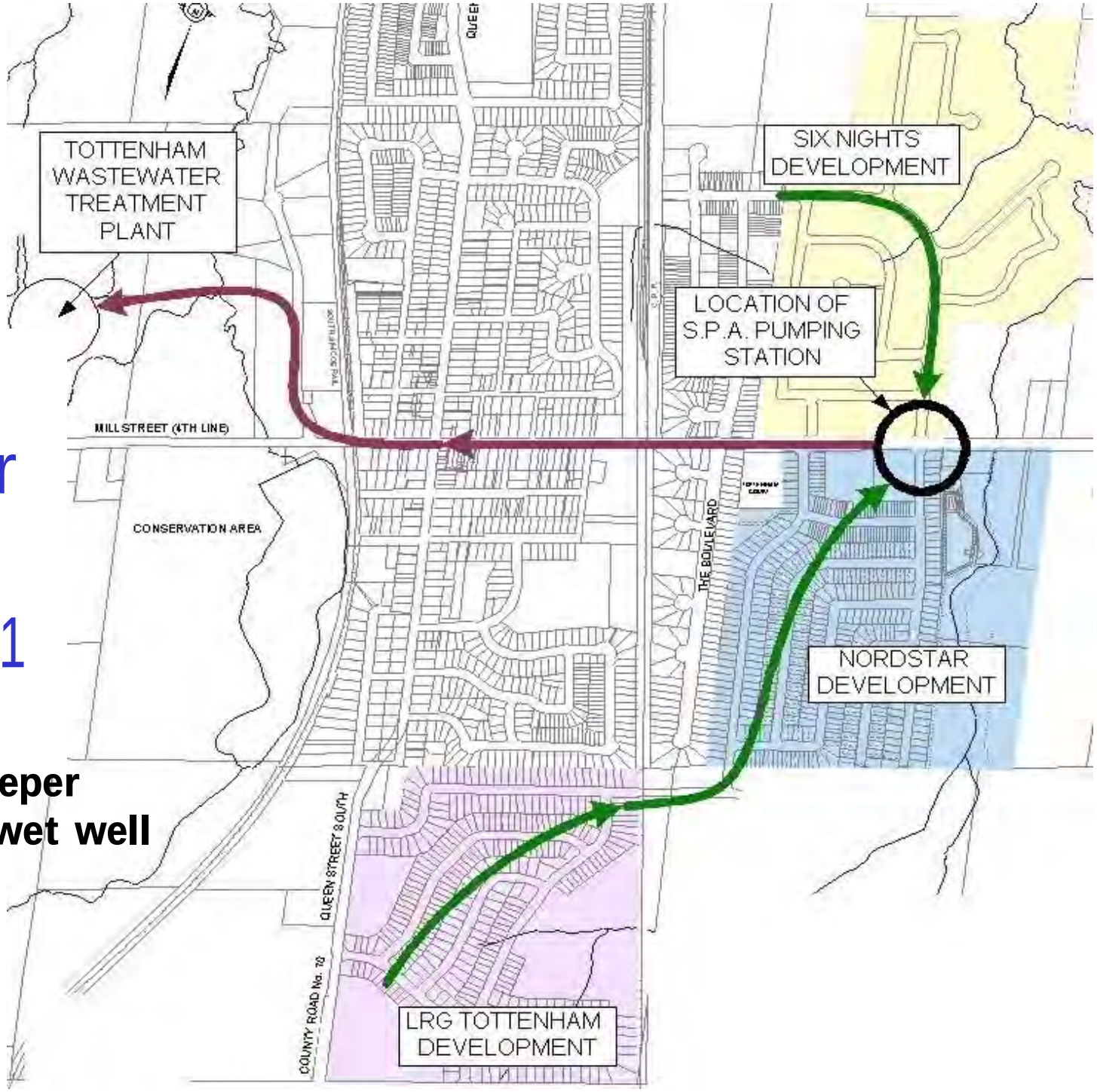
- **Sewage Pumping Station for Secondary Plan Area (SPA)**
- **Sewage Forcemain for SPA**
- **Decommissioning of Arvida, Eastern and Boulevard Sewage Pumping Stations**
- **Water servicing for SPA**

Wastewater Servicing

- **Proposed Secondary Plan Area Servicing Alternatives 1 to 5**

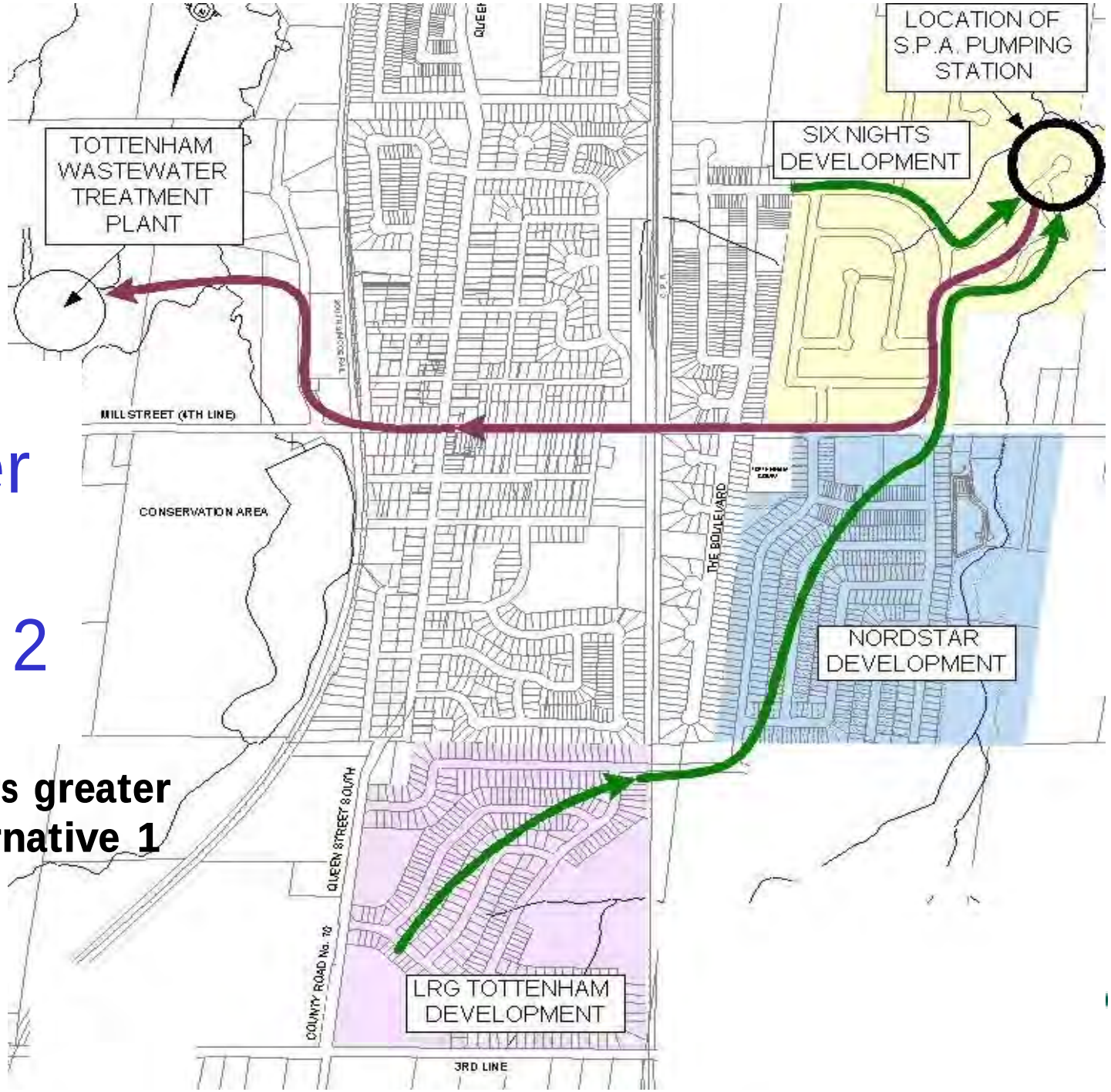
Wastewater Servicing Alternative 1

Disadvantage:
Capital cost of deeper Pumping Station wet well



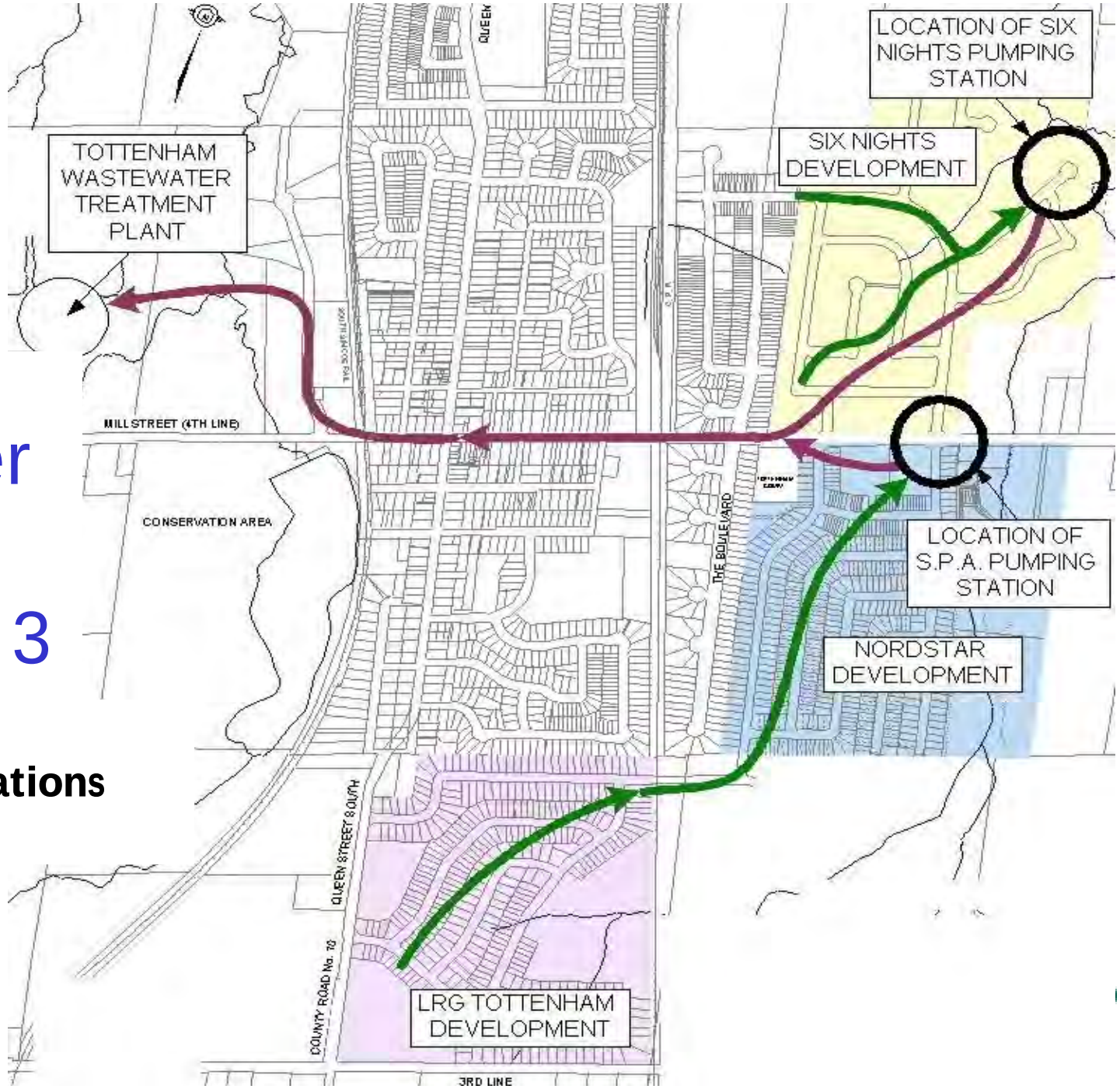
Wastewater Servicing Alternative 2

Disadvantage:
Forcemain/Sewers greater length than Alternative 1



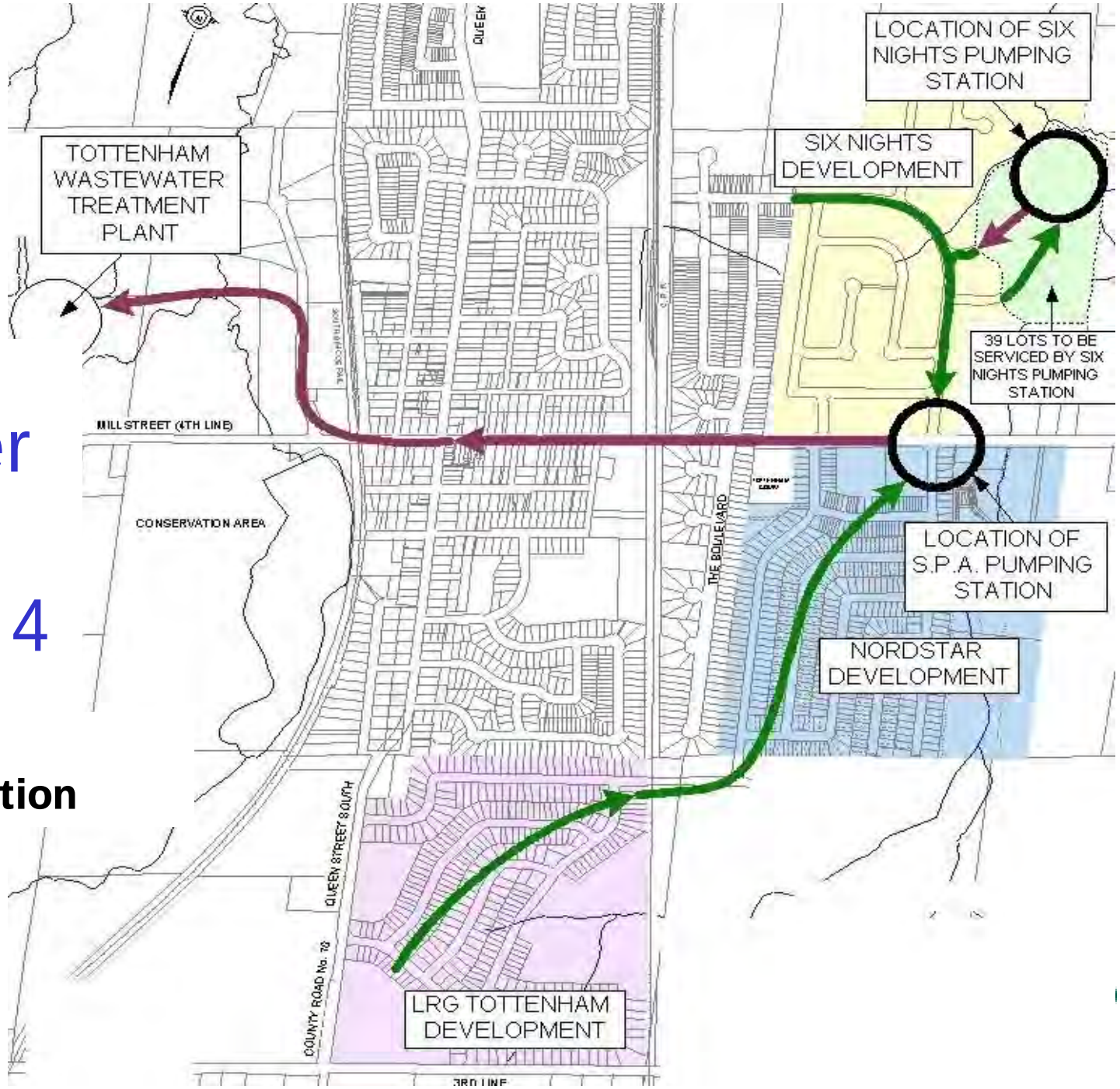
Wastewater Servicing Alternative 3

Disadvantage:
Two Pumping Stations required



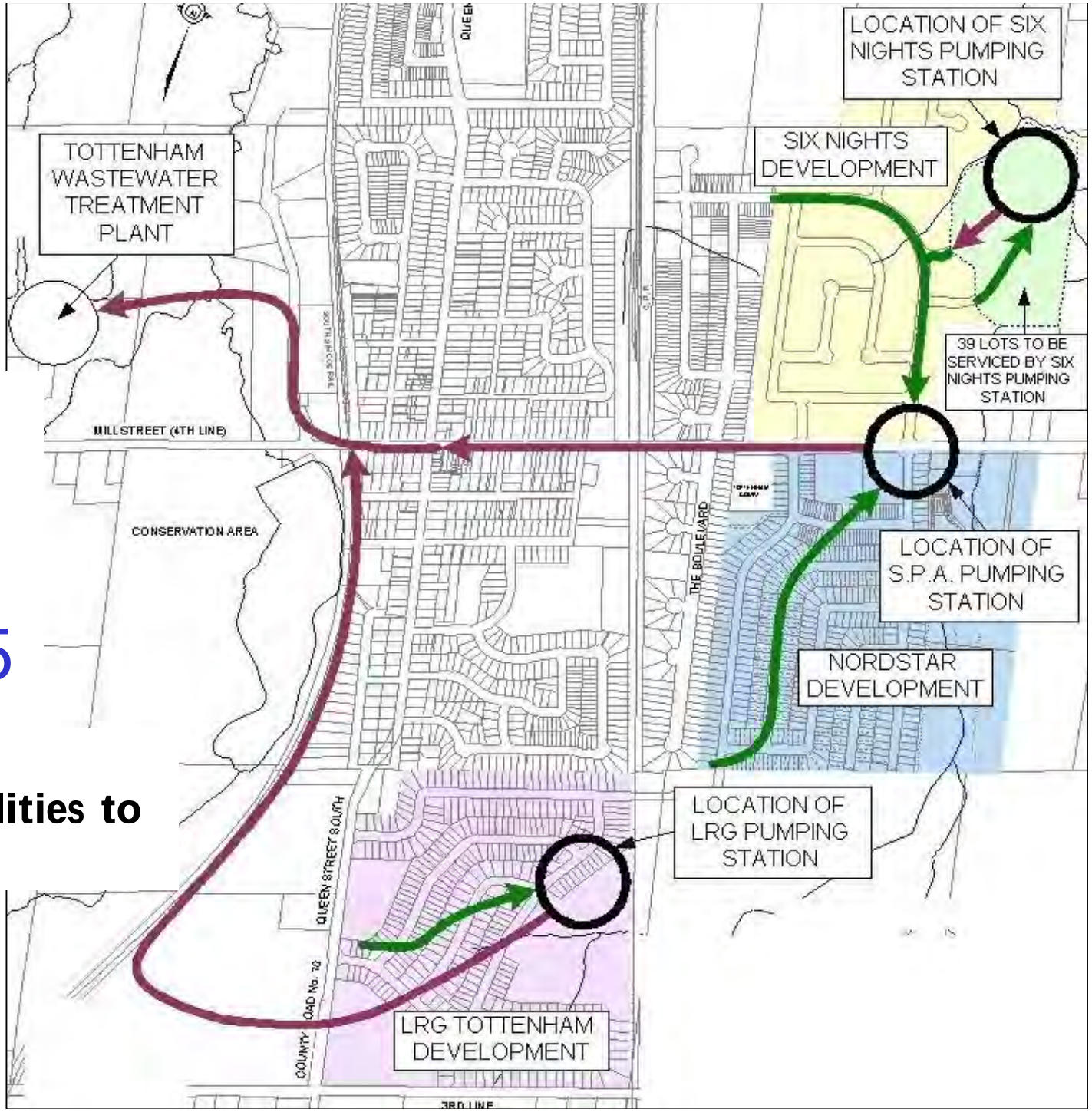
Wastewater Servicing Alternative 4

Advantage:
Shallower excavation



Wastewater Servicing Alternative 5

Disadvantage:
Requires three facilities to service SPA

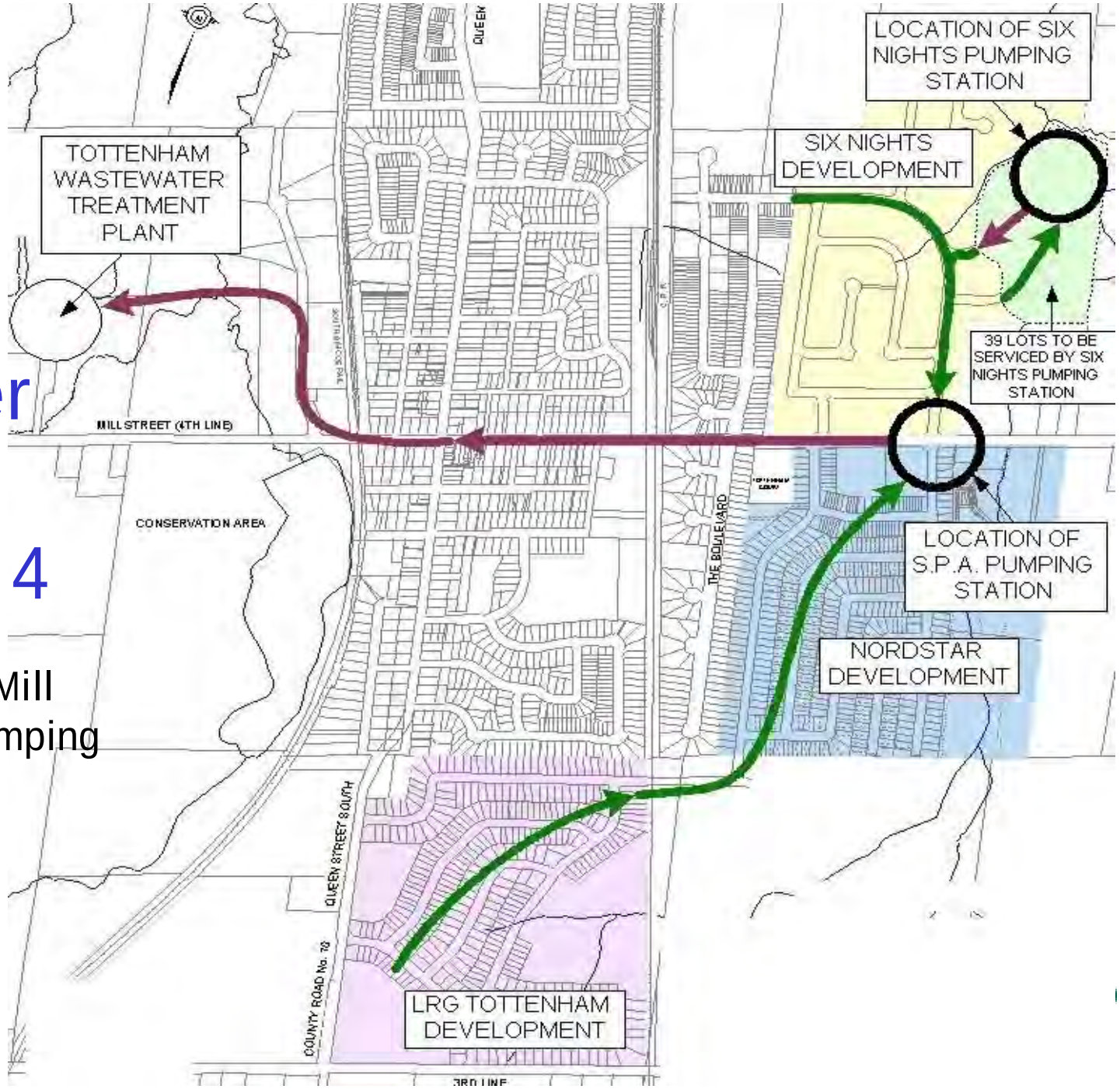


Summary of Wastewater Servicing Alternatives Present Value Cost Analysis

1 Single Pumping Station at Mill Street	2 Single Pumping Station at Six Nights Development	3 Pumping Station at Mill Street and Pumping Station at Six Nights Development	4 Pumping Station at Mill Street and Small Pumping Station at Six Nights Development	5 Pumping Stations at Mill Street, Six Nights, and LRG Developments
$6,100,000	$6,570,000	$5,945,000	$5,610,000	$7,550,000

Preferred Wastewater Servicing: Alternative 4

Pumping Station at Mill Street and Small Pumping Station at Six Nights Development

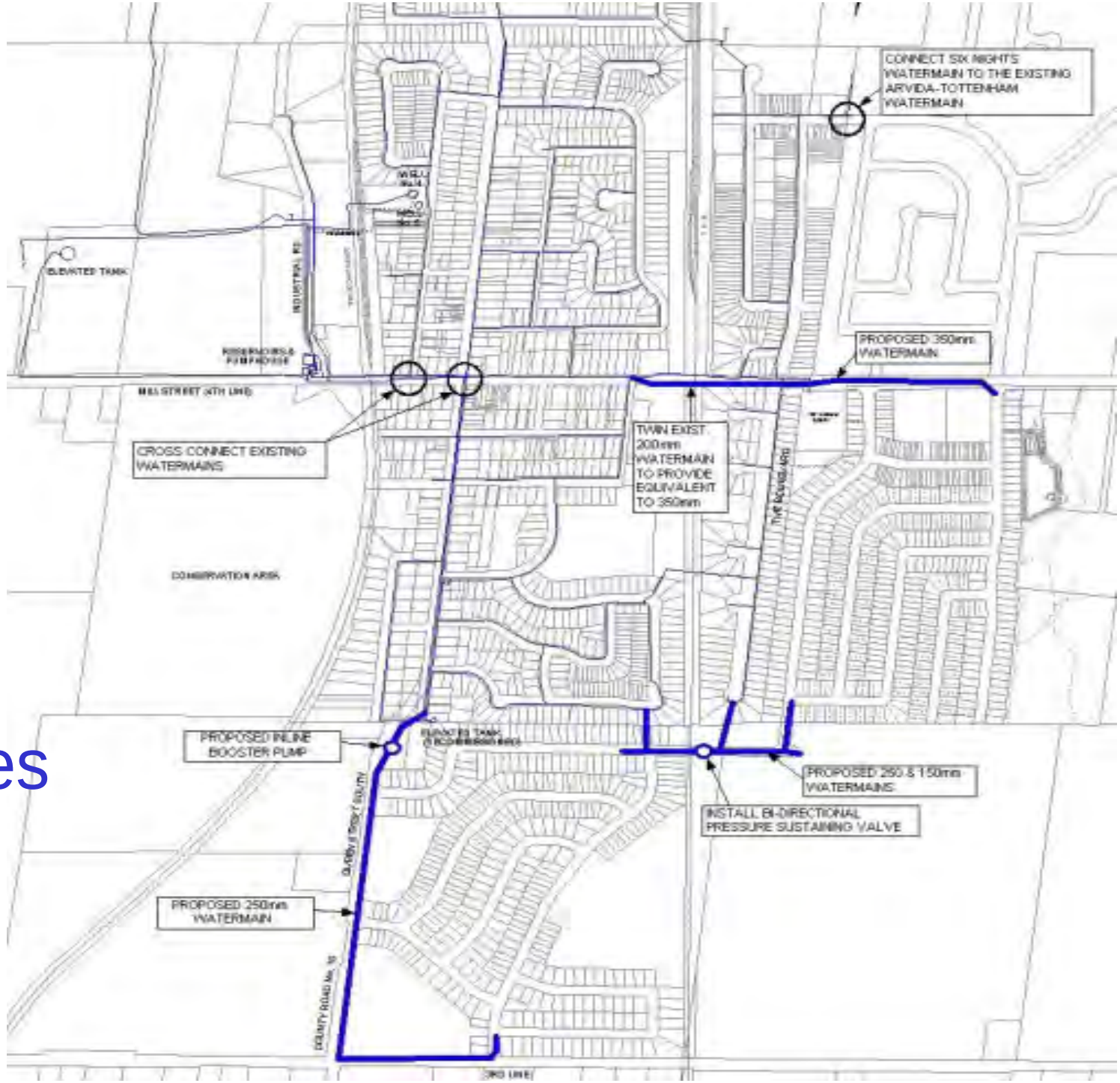


Decommissioning of Arvida, Eastern and Boulevard Sewage Pumping Stations

Water Servicing

- **Existing System**
- **Proposed Servicing Alternatives**

Preferred Water Servicing Alternatives



Closing and Next Steps

- **Incorporation of comments from this Public Consultation**
- **Finalize the Master Plan Update**
- **Notice of Completion & Review Period**
- **Initiate the Class EA**

Town of New Tecumseth
Municipal Water and Wastewater Servicing Master Plan Update
Public Information Centre #1

CONTACT LIST

SIGN IN SHEET
May 26, 2005

	Name	Address	Postal Code	Telephone #	Add to Mailing List	
1	STUART STARBUCK	14 REDCLIFF Rd	L0G 1W0	705-434-7346	Yes ☑	No ☐
2	BRYAN Richardson	4 Cedar Pointe Dr. Barrie,	L4M 5R7.	705/722 0009	Yes ☑	No ☐
3	Scott Rettie	1110 Sheppard Ave E Ste 507 WILLOWDALE ON	M2K 2W7	416-221-5888	Yes ☑	No ☐
4	David Engel	11	11	11	Yes ☑	No ☐
5	DAVID & TIFFANY BATEMAN	15 McCURDY DR.	L0G 1W0	905 936 9836	Yes ☑	No ☐
6					Yes ☐	No ☐
7					Yes ☐	No ☐
8					Yes ☐	No ☐
9					Yes ☐	No ☐
10					Yes ☐	No ☐

The Town of New Tecumseth
Class Environmental Assessment, Water and Wastewater Infrastructure Improvements for the Tottenham Secondary Plan Area

Date:	Thursday May 26, 2005	**Project:**	5226
Time:	2:00 p.m. to 4:00 p.m.	**Location:**	Tottenham Community Centre
	7:00 p.m. to 9:00 p.m.		

Attendees:		
	Rick Vatri	Town of New Tecumseth
	John Himanen	MacViro Consultants
	Pat Becker	MacViro Consultants
	Ari Abu Bakar	MacViro Consultants
	Yat Yee	MacViro Consultants
	Bryan Richardson	Richardson Foster Ltd.
	Scott Rettie	Six Nights Developer
	David Engel	Six Nights Developer
	David Bateman	Local Resident
	Tiffany Bateman	Local Resident
	Stuart Starbuck	Local Resident

Purpose: Public Information Centre #1

Distribution:

Prepared By: John Himanen

1. Public Information Centre (PIC)

The Public Information Centre (PIC) was held at Tottenham Community Centre from 2:00 p.m. to 4:00 p.m. and 7:00 p.m. to 9:00 p.m. on May 26, 2005.

No stakeholder objections to the project were raised during PIC No.1. The various developers (e.g. LRG, Six Nights) within the Town are the key stakeholders for this project however they will not have responsibility for approval of the various works to be undertaken.

2. Key Issues

- Representatives from LRG Developments indicated that a proposed connection for water servicing from Brown Street to the LRG lands could be achieved. One LRG lot has been "frozen" for the future siting of water and wastewater servicing and related facilities. LRG would therefore not object to the possibility of locating an easement on this "frozen" lot for the Brown Street watermain connection.
- Discussions were also held on whether the proposed watermain connection from the LRG lands to Brown Street could be eliminated in the event that the existing connection between the Boulevard and Adeline Avenue is expanded in the future. It

was noted that there is no existing right-of-way for the existing watermain and therefore, construction of an expanded water service would be difficult.

- Representatives from Six Nights Developments expressed some concern over the connection of the proposed gravity sewer connection between the existing Arvida Tottenham subdivision and the future Six Nights Development Area. The particular concern is that the future Six Nights gravity sewer will need to be sized to handle flows from both the existing and new development areas. Development cost charges paid by Six Nights Developments should be based on flows from the new subdivision areas only.
- Sanitary sewer flows from the LRG Tottenham Lands will be conveyed north, passing through the Nordstar Development prior to discharge into the SPA pumping station. Based on this flow scenario, development of the LRG lands will not be able to proceed until the sanitary sewer through the Nordstar Development is constructed. Since water servicing for the Nordstar Development will be constructed at the same time as the sanitary sewers, this means that the "dual source" water servicing for the LRG Tottenham lands will be in place from Queen Street to the west and from the Nordstar Development to the east prior to any development of the site being undertaken. It is recommended therefore that installation of a booster pumping station and bi-directional pressure sustaining valve will not be required for the LRG Tottenham lands.
- For the preferred wastewater servicing alternative (Alternative No.4), Six Nights Developments will be required to size the small Six Nights Pumping Station based on number of lots to be serviced by the station.
- Preliminary water servicing alternatives for the LRG Developments included the extension of the proposed 250 mm diameter watermain along Queen Street South to 3rd Line to ensure water supply to the LRG lands if work on the east protionof the lands preceded development to the west. It was noted that the LRG lands belong to a single owner and therfore timing of the development work will not be an issue. The need to extend the proposed 250 mm diameter watermain along Queen Street South as far as 3rd Line will be reviewed.
- The routing of the forcemain to the Tottenham WPCP, in particular the preferred method for connecting to the Industrial Road Pumping Station, will be confirmed.
- It was confirmed that there is an existing sanitary sewer connection running underneath the CPR right-of-way which will allow for the decommissioning of the Eastern Pumping Station and discharge of current sanitary flows from the station into the Arvida Tottenham Subdivision.
- Six Nights Developer will be forwarding to MacViro the digital drawings (AutoCAD and topographical) showing the proposed future location of the school and stormwater management pond.
- Water modelling currently being conducted as part of the water master for New Tecumseth will confirm reservoir requirements for emergency storage.

- Construction schedule for the works addressed under this Class Environmental Assessment, Water and Wastewater Infrastructure Improvements for the Tottenham Secondary Plan Area have not yet been confirmed.

Appendix F

Stakeholder Correspondence

MacViro
Engineering and Environmental Science

February 13, 2005

Mr. Winston Wong
Heritage Planner
Ministry of Culture
Heritage & Libraries Branch,
Heritage Operations Unit
400 University Ave, 4th Fl.
Toronto, ON M7A 2R9

Re: Class Environmental Assessment, Tottenham Secondary Plan Area Municipal Water and Wastewater Servicing Master Plan Update, Town of New Tecumseth, Simcoe County, Ministry File 43WT006

Dear Mr. Wong:

Thank you for your comments dated June 7, 2005 for the above noted project. It is also our concern that any impacts on culture heritage resources from the works related to the above Master Plan Update are clearly identified and mitigated.

Please find enclosed for your review a copy of the draft Tottenham Secondary Plan Master Plan Update for water and wastewater servicing in the Town of New Tecumseth. We are still awaiting comments from other key stakeholders before issuing a Notice of Completion.

Please do not hesitate to contact me at (905) 475-7270 ext. 277, should you have any concerns or comments.

Yours truly,
MacViro Consultants Inc.

John Himanen, P.Eng.
Project Manager

cc: Jackie Dolling

Transport Canada
Ontario Region
Programs and Divestiture

Transports Canada
Région de l'Ontario
Programmes et cession

4900 Yonge Street
North York, Ontario
M2N 6A5

May 3, 2005

Mr. John Himanen
MacViro Consultants Inc.
600 Cochrane Drive, Suite 500
Markham, ON
L3R 5K3

Re: Tottenham Secondary Plan Area – Municipal Water and Wastewater Servicing Master Plan Update

---

Dear Mr. Himanen:

Thank you for your Notice of Study Commencement regarding the opportunity to comment on the Tottenham Secondary Plan Area – Municipal Water and Wastewater Servicing Master Plan Update.

Since this study is at a very early, strategic planning stage, we are unable to predict whether a law list regulation, or other trigger under Section 5 (1) of the Canadian Environmental Assessment Act exists. We recommend that you proceed with the evaluation of water and wastewater servicing solutions and the identification of a preferred servicing strategy. Once a preferred alternative is known, we would be pleased to review the proposal to determine the extent of our involvement.

If you have any questions or require further information, please do not hesitate to contact me.

Yours truly,

Rebecca Earl
Environmental Officer
Tel.: (416) 952-0475
FAX: (416) 952-0514
earlr@tc.gc.ca

cc: Monique Mousseau, Regional Manager, Environment & Engineering, Transport Canada

Canada

Canadian Environmental Assessment Agency
55 St-Clair Avenue East
9th Floor, Room 907
Toronto, Ontario
M4T 1M2

Agence canadienne d'évaluation environnementale
55 Avenue St-Clair Est
9ième étage, pièce 907
Toronto, Ontario
M4T 1M2

May 19, 2005

Richard Vatri, C.E.T.
Development Coordinator
The Town of New Tecumseth
P.O. Box 901, 10 Wellington Street East
Alliston, ON L9R 1A1

Dear Mr. Vatri:

Re: Municipal Water and Wastewater Servicing Master Plan Update

Thank you for the Notice of Study Commencement concerning the Municipal Water and Wastewater Servicing Master Plan Update.

As you may be aware, the Canadian Environmental Assessment Agency (Agency) shares the responsibility for the administration of the *Canadian Environmental Assessment Act* with federal authorities. This legislation requires federal authorities to undertake environmental assessments of projects when they are proponents, or when they are proposing to take one of the following actions which would enable a project to proceed, in whole or in part:

- providing some form of financial assistance to the project;
- having the administration of federal lands and selling, leasing or otherwise disposing of those lands or any interest in those lands; or,
- issuing a permit, license, authorization or other regulatory approval listed on the *Law List Regulations*.

In the case of projects that are subject to the *Ontario Environmental Assessment Act,* if there is uncertainty as to whether the *Canadian Environmental Assessment Act* may also apply, the Agency can help proponents answer this question. For projects that are subject to the *Canadian Environmental Assessment Act*, the Agency will act as the federal environmental assessment coordinator and facilitate the involvement of the federal authorities in a co-ordinated assessment aimed at meeting all agencies' needs simultaneously.

.../2

In order for the Agency to undertake either of these roles, it must have a project description that can be distributed to various federal authorities to determine their interest in the project. It is recognized that at the early stages of the planning process, there may not be much detailed information to provide. However, proponents should try to provide some information on:

- the nature of the project and its location;
- federal issues relevant to the project, such as fisheries habitat, navigable waters, migratory birds, etc.
- whether federal funding is being contemplated or federal lands are required.

To better assist proponents, the Agency has developed an Operational Policy Statement, which provides guidance in preparing project descriptions. This is available on the Agency's website at: http://www.ceaa-acee.gc.ca/0011/0002/ops_ppd_e.htm.

If your purpose in sending us notification of your project is to identify any federal interests, please be aware that simple notification will not be sufficient. A project description will be required. If you have any questions regarding this matter, please contact the undersigned at 416-952-1574.

Sincerely,

for Louise Knox
Canadian Environmental Assessment Agency, Ontario Region

LK/mct

Cc: Mr. John Himanen, P.Eng., MacViro Consultants Inc.

Ontario

Ministry of Culture
400 University Ave, 4th Floor
Toronto, Ontario M7A 2R9

Ministère du Culture
4e étage, 400, avenue University
Toronto, Ontario M7A 2R9

FAX TRANSMISSION

DATE:	June 7, 2005	NUMBER OF PAGES (including this cover page):	2

TO:	John Himanen Mac Viro Consultants Phone: (905-475-7270 Fax: (905-475-5994	FROM:	Jackie Dalling MCL Phone: (416) 314-7132 Fax: (416) 314-7175

ACTION: ☐ Urgent ☐ A.S.A.P. ☐ Reply ASAP ☑ Per Your Request ☐ FYI

SUBJECT:	EA Town of New Tecumseth Water and Waste Servicing

MESSAGE:

Ministry of Culture
400 University Ave, 4th Fl.
Toronto, ON M7A 2R9

Ministère de la Culture
400 Ave. University, 4. étage
Toronto, ON M7A 2R9

Ontario

Heritage & Libraries Branch, Heritage Operations Unit

Tel :(416) 314-7132 Fax :(416) 314-7175

June 7, 2005

John Himanen, Project Manager
MacViro Consultants Inc.,
600 Cochrane Drive, Suite 500
Markham, ON L3R 5K3

Re: Class Environmental Assessment, Tottenham Secondary Plan Area Municipal Water and Wastwater Servicing Master Plan Update, Town of New Tecumseth, Simcoe County , Ministry File 43WT006

Thank-you for your notice received April 13, 2005 for the above noted project. A principal concern of this Ministry is the adverse effects that undertakings such as the above mentioned might have on cultural heritage resources. Cultural heritage resources include built heritage, cultural heritage landscapes and archaeological resources. If the preferred alternative is determined to have the potential to impact cultural heritage resources, then our office would recommend that a cultural heritage assessment be conducted as part of the EA prior to the initiation of any construction activities. If any significant heritage or archaeological resources are identified, then any negative impacts will have to be mitigated by either avoidance or documentation.

Consequently, this office wishes to continue to be involved in this project. In particular, when available detailed information and maps of the alternatives being considered, outlining the extent and type of land disturbance activities anticipated and the extent of previous land disturbance within the project area proposed to be impacted. With this information, we will be able to determine which portions of the project exhibit potential for impacting heritage resources, and therefore requiring an assessment to inventory all heritage resources present, and determine what mitigation, if any, is necessary.

We would appreciate the opportunity to comment on any information which you may be able to supply. Should you wish to discuss this matter further, please do not hesitate to contact me.

Sincerely,

Jackie Dolling

Jackie Dolling for
Winston Wong, Heritage Planner

RICHARDSON FOSTER LTD.
CONSULTING ENGINEERS

June 15, 2005

VIA FAX 905-475-5994

SH
CAE
AMC
5223

Mr. Stan C. Holden, P.Eng.
Project Manager
MacViro Consultants Inc.
600 Cochrane Drive, Ste. 500
Markham, ON L3R 5K3

Dear Sir:

RE: **Town of New Tecumseth**
Water Distribution and Storage Master Servicing Plan
Our Project No. 0351/EA2

The undersigned attended a Public Information Meeting for the Tottenham Secondary Plan Area Municipal Water and Wastewater Servicing Master Plan Update on May 26, 2005.

There have been previous discussions that a reservoir would possibly be required on the LRG Tottenham development within the parkland. When I raised this at the PIM I was advised to bring this to your attention as this is part of the Town of New Tecumseth Water Distribution and Storage Master Servicing Plan and not part of the Tottenham Secondary Plan Area Municipal Water and Wastewater Servicing Master Plan Update.

Please accept this letter as a request that, should such a reservoir be required, the investigation of the location of this reservoir is also to include locating this reservoir on the site of the (decommissioned) elevated water tower adjacent to the northeast corner of the LRG Tottenham development instead of placing it on the proposed LRG Tottenham park site.

Yours truly,

RICHARDSON FOSTER LTD.

Bryan Richardson, P.Eng.

BR/bjs

CC: LRG Tottenham Group

Unit L, 4 Cedar Pointe Drive, Barrie, Ontario, L4N 5R7 • Phone: (705) 728-0009 • Toll-Free (877) 220-2461 • Fax: (705) 727-7774

RICHARD CHI-POSTER LTD.
CONSULTING ENGINEERS

June 15, 2005

VIA FAX 905-475-5994

Mr. Ari Abu Bakar, P.Eng.
Project Engineer
Municipal Infrastructure
MacViro Consultants Inc.
600 Cochrane Drive, Ste. 500
Markham, ON L3R 5K3

Dear Ari:

RE: **Town of New Tecumseth**
Tottenham Secondary Plan Area
Municipal Water and Wastewater Servicing Master Plan Update
Our Project No. 0351/EA1

Reference is made to our discussions regarding the "preferred options" presented at the Public Information Meeting of May 26, 2005 in Tottenham.

1. We understand that the proposed in-line booster pumpstation shown on Queen Street S. near the northwest corner of the LRG Tottenham Development will no longer be required. Apparently this pumpstation was only required in the event the LRG Tottenham Development precedes the Nordstar Development. As discussed at the meeting, the LRG Tottenham Development will have its sanitary outfall through the Nordstar Development and at the same time that the sanitary outfall is installed a water connection will also be installed. This removes the need for the proposed in-line booster pump.

2. We confirmed that the LRG Tottenham Development is a single development and not two separate land holdings as at sometime in the past. As such, the proposed 250mm dia. watermain on County Road 10 and the 3rd Line to approximately the centre of the LRG Tottenham Development is not required to allow for the servicing of the previous separate eastern ownership. We understand that this watermain may still be required for pressure and supply reasons.

3. We have concerns regarding the proposed location of the link between the northeast corner of the LRG Tottenham Development and the existing watermain on Brown Street. While LRG Tottenham understands that an easement may be required through their lands from LRG Tottenham Street A to their northern boundary, LRG Tottenham is not to be responsible for acquiring or paying for any of the access from the LRG Tottenham northern boundary to Brown Street.

   We also advise that should this link be moved eastwards approximately two lots this would minimize the impact on the LRG Tottenham lands as one of the lots in this vicinity may not be serviceable for other reasons. LRG Tottenham would still not be responsible for paying for or helping acquire a route north of their property to Brown Street.

4. Three connecting links are shown in the northeast corner of the LRG Tottenham Development towards the north and northeast. These are the connection to Brown Street discussed under Item 3 above, the connection to the south end of "The Boulevard" and the connection to the Nordstar Development. The LRG Tottenham Development should not be dependent on either the first or second connection although it is understood that a connection would be required from LRG Tottenham to Nordstar for looping purposes.

5. We understand that a cost breakdown of the various options as well as more detailed costs of the preferred option are to be included in the report.

We would be grateful if the above could be addressed in the Master Plan Update.

Yours truly,

RICHARDSON FOSTER LTD.

Bryan Richardson, P.Eng.

BR/bjs

CC: LRG Tottenham Group

Unit L, 4 Cedar Pointe Drive, Barrie, Ontario, L4N 5R7 • Phone: (705) 728-0009 • Toll-Free (877) 220-2461 • Fax: (705) 727-7774

July 13, 2005

Mr. Ari Abu Bakar, M. Sc., P. Eng.
MacViro Consultants Inc.
600 Cochrane Drive
Suite 500
Markham, Ontario.
L3R 5K3

Dear Mr. Bakar:

Re: Class Environmental Assessment
Community of Tottenham
Wastewater Servicing

Thank you for circulating the proposal for the installation of a sanitary forcemain within the Community of Beeton to the Nottawasaga Valley Conservation Authority (NVCA) for our review and comments.

Based upon a review of the potential routes for the installation of the forcemain, the NVCA advises that multiple watercourse crossings will be required for either route selected. Aerial photographs indicate that the crossing of a watercourse will be required at the site for the S.P.A. Pumping Station. This crossing would be required regardless of the route which is selected.

The following comments are provided for the two potential routes identified:

Mill Street Route:

- the crossing of Beeton Creek at Mill Street would be required as well as the crossing of a tributary to Beeton Creek along the access road to the Wastewater Treatment Plant;

Industrial Park Route:

- the crossing of Beeton Creek would be required and potentially the crossing of the tributary to Beeton Creek, depending upon the specific location of the route;
- permission would be required from the Nottawasaga Valley Conservation Authority in order to cross through lands owned by the NVCA located between the Pumping Station and the Wastewater Treatment Plant.

A permit will be required from the Nottawasaga Valley Conservation Authority under the Authority's Fill, Construction and Alteration to Waterways Regulation (Ontario Regulation 164 R.R.O. 1990) for the alteration of grades and the crossing of any and all watercourses along the selected route for the sanitary forcemain.

Conserving our Healthy Waters

The NVCA will also consider the potential impact of the proposed work on fish and fish habitat in accordance with the Authority's Level 2 Agreement with Fisheries and Oceans Canada.

Please contact the undersigned at extension 236 if you have any questions regarding this matter.

Yours truly,

Beverley G. Booth
Senior Planner

C.c. Mr. Andrew Pearce, Manager of Engineering - Town of New Tecumseth
Mrs. Joan Sutherland - NVCA Representative
Mr. Bob Marrs - NVCA Representative

RICHARDSON FOSTER LTD.
CONSULTING ENGINEERS

December 1, 2005

MacViro Consultants Inc.
600 Cochrane Drive, Ste. 500
Markham, ON L3R 5K3

FAX: 905-475-5994

Attention: Mr. John Himanen, P.Eng.

Dear Sir:

RE: **Water and Wastewater Servicing Master Plan Update**
Tottenham Secondary Plan
Town of New Tecumseth
Our Project No. 0351/WWTP

We are in receipt of the above report dated November 25, 2005.

Could you please advise on the timeframe for review and forwarding of any comments we may have regarding the above report.

Yours truly,

RICHARDSON FOSTER LTD.

Bryan Richardson, P.Eng.

BR/bjs

CC: K. Judges
S. Rettie
J. Craig

Unit L, 4 Cedar Pointe Drive, Barrie, Ontario, L4N 5R7 • Phone: (705) 728-0009 • Toll-Free (877) 220-2461 • Fax: (705) 727-7774

~~AAD~~
JH
MY
File 5226-20

RICHARDSON FOSTER LTD.
CONSULTING ENGINEERS

January 6, 2006

MacViro Consultants Inc.
600 Cochrane Drive, Ste. 500
Markham, ON L3R 5K3

FAX: 905-475-5994

Attention: Mr. Ari Abu Bakar, P.Eng.
Mr. John Himanen, P.Eng.

Dear Sir:

RE: Water and Wastewater Servicing Class EA and Master Plan Update
Tottenham Secondary Plan
Town of New Tecumseth
Your Project No. 5226
Our Project No. 0351/EA

Reference is made to the above captioned document and your letter of December 5, 2005 advising that our comments should be forwarded to you by the first week of January 2006.

1. In Item 10, Recommendations, Water Distribution System, there is no connection from LRG Tottenham northeast corner to Brown Street. This is also not included in the description of the works in Section 7. This link should therefore be removed from Figure 7.1.

2. In the event that this proposed watermain link is required, it should be stated as part of the preferred solution of that:

   i) That portion of the proposed link that is outside of the LRG Tottenham Development should be the sole responsibility of the Town of New Tecumseth and that LRG Tottenham should have no responsibility in obtaining the land or easement for this link or for any costs associated with its installation.

   ii) Should this link be required as a condition of any part of the LRG Tottenham Development, it shall be the responsibility of the Town of New Tecumseth to obtain and install this link in such time so as not to negatively impact the LRG Tottenham development schedule.

Should you have any queries in this regard please do not hesitate to contact the undersigned.

Yours truly,

RICHARDSON FOSTER LTD.

Bryan Richardson, P.Eng.

BR/bjs

CC: Mr. Richard Vatri, C.E.T., Acting Manager of Engineering, Town of New Tecumseth
LRG Tottenham Inc.

Barrie Office
Unit L, 4 Cedar Pointe Drive, Barrie, Ontario, L4N 5R7
Phone: (705) 728-0009 • Toll-Free (877) 220-2461
Fax: (705) 727-7774

Hamilton Office
300 Fennell Ave, E, Suite 2C, Hamilton, Ontario, L9A 1T2
Phone: (905) 385-3442 • Toll-Free (866) 440-5543
Fax: (905) 385-9094

Appendix G

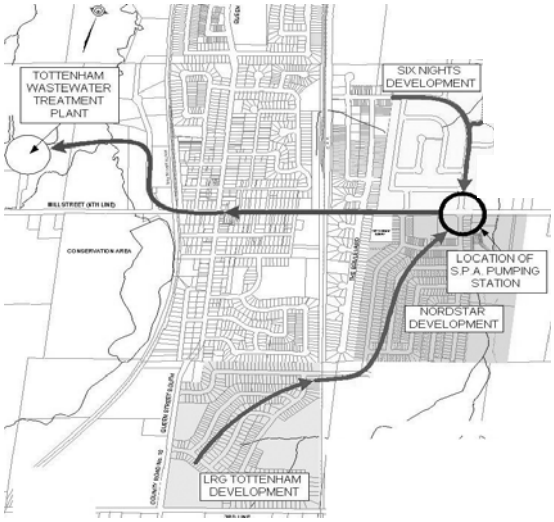
Notice of Completion

NOTICE OF COMPLETION

The Town of New Tecumseth has undertaken a Municipal Water and Wastewater Servicing Master Plan Update to outline a framework for future infrastructure works required for development in the Tottenham Secondary Plan Area. While the Master Plan addresses need and justification at a broad level, more detailed studies for each of the projects identified in the Master Plan will be required. These works will be conducted under a Municipal Class Environmental Assessment (EA) Study to follow.

KEY PROJECTS IDENTIFIED

- New watermain construction in various locations
- Decommissioning of Arvida, Eastern and Boulevard pumping stations
- Construction of a new Secondary Plan Area (SPA) sewage pumping station
- Construction of a sanitary forcemain to convey sewage flows from the proposed pumping station to the Tottenham Wastewater Treatment Plant



The Master Plan is available for review online on the Town of New Tecumseth official website http://www.town.newtecumseth.on.ca and at the following locations:

The Town of New Tecumseth
Administration Centre
10 Wellington Street East
Alliston, Ontario

Tottenham Branch Library
18 Queen Street North
Tottenham, Ontario

Please forward any comments to Mr. John Himanen of GENIVAR by _____ , 2008. Thereafter, the Master Plan will be reviewed and revised taking into consideration the comments which are received from the public. If no comments are received, the Town will proceed with the implementation of the identified capital projects.
For further information, please contact the following:

Mr. John Himanen, P.Eng.
Project Manager
GENIVAR Ontario Inc.
600 Cochrane Drive, Suite 500
Markham, Ontario L3R 5K3
Phone: (905) 475-7270 Ext. 277
Fax: (905) 475-5994
Email: john.himanen@genivar.com

Mr. Richard Vatri, C.E.T.
Manager of Engineering
The Town of New Tecumseth
Administration Centre
P.O. Box 910
10 Wellington Street East
Alliston, Ontario L9R 1A1
Phone: (705) 435-3900 Ext. 253
Fax: (705) 435-0407
Email: rvatri@town.newtecumseth.on.ca

Thank you for your participation in this study.

This Notice was issued on _____, 2008.