

- Extensive sustainable development initiatives throughout the NCP;
- Significant downstream drainage constraints;
- Two main servicing catchment areas defined by topography; and
- Until recently, limited existing servicing due to the rural nature of previous land uses.

Since large portions of the original East Clayton NCP have been developed or are currently being developed, some of the servicing upgrades have been completed and present servicing opportunities for this North Extension.

Servicing Profile

As a critical first step in the planning/servicing design of the East Clayton North Extension area, the storm and sanitary sewer servicing catchment boundaries were established using updated topographic mapping and a review of downstream capacity and servicing profiles. Profiles along 188 Street, 192 Street and 194A Street (shown as figures 4.1.5, 4.1.6 and 4.1.7) were used to define the northern limit of servicing depicted in Figure 1.3. The objective was to maximize the area and extend these gravity services as far north as possible. Council has received delegations from residents north of the servicing boundary that want the area extended further north. Unfortunately, this is not possible due to topography.

Sanitary Sewer

The East Clayton North Extension area is to be serviced by two distinct sanitary sewer systems.

- The study area, west of 192 Street north of 72 Avenue is to be serviced by the existing sanitary sewer system on 188 Street and 68 Avenue and ultimately to an existing pump station located at 176 Street. Sewerage flows are pumped south via an existing forcemain from the pump station to the GVS&DD regional trunk sewer.
- The study area east of 192 Street is to be serviced by the proposed NCP sanitary sewers on 194A Street, 195 Street and 196 Street which eventually convey flows south of 64 Avenue at 196 Street to the existing GVS&DD regional trunk.

Ultimate and existing flows for the existing sanitary sewers in the area were calculated based upon current land use and actual build-out densities including the additional sewerage flows from the proposed extension areas north of 72 Avenue and west of 188 Street.

The reconstruction of existing local sewers on 194A Street from 72 Avenue to 70 Avenue is required to provide sufficiently deep sewers to accommodate the proposed catchment area north of 72 Avenue. The cost of this reconstruction is allowed for in the servicing costs for this NCP extension.

There will be no adverse impact on the original East Clayton NCP servicing concept or downstream infrastructure for sanitary sewers.

Drainage

The NCP extension area lies within the East (Catchment A) and West (Catchment B) catchments of the original East Clayton NCP. Catchment A slopes in a southerly direction to discharge at specific points into Langley near 68 Avenue and 64 Avenue (and eventually to Logan Creek) or into McLelland Creek at Fraser Highway or into existing and proposed trunks south of 64 Avenue. All of Catchment A is tributary to the Nicomekl River. Catchment B slopes in a west-by-south-westerly direction and drains to North Cloverdale Creek which is tributary to the Serpentine River via the Fry's Corner pump station.

Stormwater management is a cornerstone of the ecological sustainability strategy of the East Clayton NCP and this extension must meet the same objectives. The requirements for infiltration systems and landscaping are outlined in the “Green Infrastructure Performance Standards and Guidelines” provided in the original NCP. It is proposed that the same requirements be incorporated in this extension area.

The infiltration and low impact development strategies proposed in the NCP deal with small frequent rain events to protect ecological features but are not designed to deal with the large less frequent storms that lead to flooding. In order to meet our servicing requirements of protecting life and property for these less frequent larger events, a conventional conveyance and detention system is required. Some minor changes to the sub-catchment boundaries originally proposed in the 2003 East Clayton NCP are recommended in the current report based on the detailed development planning currently underway within East Clayton. Impacts to the recommended East Clayton Drainage System are detailed in the Engineering Servicing Plan, and involve changes to the proposed trunk system and increases in detention pond requirements. Total incremental drainage infrastructure costs associated with developing the extension area is provided in Table 1.

In some cases the required ponds are currently under construction or their lands are currently secured. The ultimate ponds must be completed before the extension can proceed. In cases where lands for the ultimate pond have been secured interim detention may be considered.

Water

Due to the high development rate in East Clayton, the existing Clayton Pump Station is near its full capacity (i.e., all pumps running without standby unit during summer months). A replacement pump station is scheduled to be complete in 2006.

Last year, in order to extend the servicing life of the existing station, we had made adjustment to our water system and were successful in reducing the demand on the station by 15%. This will allow the existing pump station be able to meet the demand in 2005 and 2006. We are continuing our effort to further reduce the demand on the station this summer; however, we will not know the result until this fall.

Therefore, there is some uncertainty of whether the existing pump station will be able to meet the demand in the summer of 2006, and still provide good water pressure to the higher elevation areas. The following outlines the different scenarios, and the likely consequence if the new pump station is not operational by summer 2006:

- If the summer in 2006 is very hot and dry – There will be reduced water pressure during sprinkling hours. There will be adequate fire flow for commercial and all residential zones. This scenario may cause some inconvenience to the residents during the two month period.
- In the rare occurrence that one of the pumps fails, since wider current demands all pumps in the station are required, the pump station will not be able to meet the peak demand when the failed pump is being repaired or the on-the-shelf pump is being installed (approximately two days). During that period, there will be reduce water pressure during sprinkling hours and part of the day. Adequate fire flow will be still available for commercial and residential areas.

A more cautious approach would be to stop all approvals of commercial and higher density residential land uses (fire flow higher than 120 l/s). However, the risk of having one of the pumps fail, and at the same time a fire event in a high density zone is low, and the City has never experienced such a situation before. We therefore propose to allow development to continue as we are in the process of purchasing a replacement unit to minimize the down time should one of the existing pumps fail.

The extension area is located in the 115 m pressure zone and is fed by the existing GVRD's Whalley/Clayton 900mm diameter water main on 72 Avenue, and the Clayton Reservoir and Pump Station located at 72 Avenue and 190 Street.

The water demand for the residential areas within the extension area have been calculated in accordance with the City's design criteria. The additional water demands are being added to the City's network model to confirm the capacity of the existing feeder water mains in the area.

The proposed feeder mains and distribution network are described in detail in the Engineering Servicing Plan. Based upon the 2003 East Clayton NCP engineering servicing report and pump station upgrade recommendations, the addition of the proposed extension area will create an extra water supply demand on the original system and require the installation of a new 72 Avenue major feeder main together with two 450 mm diameter feeder mains and an additional 300 mm diameter grid main. The additional demand attributed to the NCP extension accounts for approximately 12.5% of the new pump station costs.

Transportation

All roads in the area will require upgrading from the existing rural cross-sections to urban standards. The neighbourhood traffic analyses undertaken as part of this extension focused on impacts at the following locations and access provisions:

- Each of the road intersections with 72 Avenue and 192 Street along the site;
- 188 Street, 192 Street and 196 Street at 72 Avenue;
- 196 Street at 64 Avenue;
- 192 Street at Fraser Highway;
- 188 Street at Fraser Highway;
- 188 Street at 68 Avenue;
- 192 Street at 68 Avenue;
- 194 Street at 64 Avenue; and
- Fraser Highway at 64 Avenue.

In order to maintain a four-lane cross-section at Fraser Highway, the extension of 72 Avenue to Fraser Highway is recommended by 2016. 72 Avenue would also be a four-lane facility west of 192 Street. Detailed intersection and cross-section requirements corresponding to the 2016 recommendations are listed in the report and must be implemented as development progresses. These are consistent with the recommendations made in the original NCP. The proposed local road access to Arterials and Major Collectors are more frequent in East Clayton than that typically found in other more conventional suburban neighbourhoods in Surrey. Interconnectivity through grid network was one of the seven sustainability principles. This will continue the "Open" grid network concept established by the original 2003 East Clayton NCP to disperse traffic along multiple routes.

Traffic control issues such as intersection control, parking, driveway accesses, and traffic calming are addressed in the plan. Typical road cross-sections consistent with the original East Clayton NCP are also provided.

Financing

A detailed financial analysis is included in the engineering servicing report available in the Engineering Department. The following table summarizes the projected DCC revenues and construction costs for each engineering service at full build-out for the north extension. The DCC revenues in this table are based on the current DCC rates.

TABLE 1

Services	Projected DCC Revenues	Projected DCC Expenditures	Surplus/(Deficit) Balance (Extension)
Sanitary Sewer	\$666,000	\$80,000	\$586,000
Drainage	\$1,572,000	\$2,020,000	(\$448,000)
Water	\$777,000	\$781,000	(\$4,000)
Major Collector Rd	\$1,016,000	\$1,572,000	(\$556,000)

As illustrated by the above table, there are some surpluses and deficits in the different services for this extension. Although the developer-pay principle and requiring each NCP to be financially self-sufficient is not fully met, DCC's are collected on a city wide basis not an NCP basis, thus while a surplus or deficit is demonstrated in some services, these funds will either offset shortfalls elsewhere in the City or be offset by surpluses elsewhere depending on the service involved.

Development Phasing

Development has proceeded quickly to date in the East Clayton NCP. Development within this extension can progress as local infrastructure is provided by others or by the subject developers. Also, verification of major regional infrastructure (water supply and sanitary pump stations) will continue to ensure development does not out pace upgrades listed above. Ultimately, as in other NCP areas, the market will determine the actual development patterns and phasings.

CONCLUSION

A comprehensive servicing and financial plan has been developed for the North Extension to the East Clayton NCP. The report demonstrates that the NCP extension is not fully self funding. Development of the extension will help to offset DCC shortfalls in the rest of City for sanitary sewer and arterial roads while it will draw from surpluses for drainage and major collector roads. As a result of this Extension to the NCP, a number of modifications to the 10-year plan will be made. Based on this plan, development within the extension area can proceed in accordance with the overall objectives of the original East Clayton NCP.

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