

TO: Committee of the Whole, District of Oak Bay

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DATE: February 15, 2016

SUBJECT: Uplands Combined Sewer Separation Project – Supplementary Information

A special Committee of the Whole (COW) was held on February 2 at the Monterey Centre and the agenda was dedicated to the Uplands Combined Sewer Separation Project.

Project consultants presented both a technical update and a summary of the public engagement activities including the results of the public opinion survey. The consultants shared residents' feedback on the six options categorized into themes for Council's consideration and responded to Council's questions. Also on the agenda was a presentation from the Uplands Neighbourhood Association (the Association). Representatives from the Association shared with Council a PowerPoint that articulated perspectives of the residents highlighting key project elements and concerns. After the conclusion of the formal agenda, residents were invited to speak directly with Council to raise concerns, and to ask questions of the project consultants. In response to issues raised during the Committee of the Whole and by the public, Council directed staff to seek additional information. What follows is an overview of the concern or question raised and an update:

Uplands Trees

This concern was raised: *The mature tree canopy plays an important role in managing stormwater. What is the existing health of the mature trees, and will this project impact their health?*

In consultation with the District's Manager of Parks Services, the following observations were captured:

The boulevard and street trees in the Uplands grow in a largely man-made environment and is considered "green infrastructure". Most are medium to large shade trees consisting of Elm, Maple, Linden, Garry Oak and London Plane. All boulevard trees on public land could be considered mature - some being more mature than others. Most of the boulevard trees are in good health with the exception of some of the Maples that grow on the Lansdowne boulevard. These Maple trees grow in a somewhat modified environment and compete with various underground services which can contribute to relatively high management costs.

Uplands trees that grow in a "more natural" environment include trees on private land and backyard easements. The general health of these tree species is good with far less conflict with municipal services. These trees generally include more native ornamental trees and understory vegetation. Management costs for trees in easements are relatively low, while conservation values are high. From an arboriculture perspective, the expansion or upgrade of the Uplands sewer system could have a negative impact on both public and private trees. Loss of topsoil and the potential for root damage and disturbance due to excavation could prejudice tree health. The urban forest ecosystems are considered important "natural capital".

Environmental Impact of Combined Sewer Overflows

This concern was raised: *During heavy rains, the volume of stormwater overwhelms the Humber and Rutland pump stations causing a mixture of stormwater and raw sewage to be discharged into the sea. What is the environmental impact of this discharge?*

The CRD monitors discharges from stormwater drains throughout the core area. Results are published annually in a report entitled 'Core Area Stormwater Quality (Year) Annual Report. The latest report is for 2014 and is available on the CRD web site. Included in the locations are the outfalls at Humber Road and Rutland Road. Unfortunately, in the period reported (2011 – 2014) no samples were taken during overflow events at these locations. Fecal coliforms have been detected in storm drain outfalls in other parts of Oak Bay and in the Cadboro Bay area of Saanich. There is no information on the environmental impact of the combined sewer overflows at Humber and Rutland.

Impermeable Surfaces

This concern was raised: *Hard, impermeable surfaces challenge stormwater management as there is no opportunity for absorption into the ground. Have the consultants looked at stormwater management solutions that address the stormwater flows on roadways? If the District improved its stormwater management practises on the streets, would this address the issue of stormwater surging and reduce overflows?*

Buildings: 127,814 square metres (m²)

Roads: 95,449 m²

Driveways: 60,400 m²

Total impermeable area: 283,713 m²

Assuming fifty percent of driveways discharge on to the roadways and fifty percent to the combined sewer:

Buildings plus driveways: 158,014 (56%)

Roads plus driveways: 125,699 (44%)

A previous analysis undertaken by Kerr Wood Leidal in 2008 concluded that to eliminate combined sewer overflows (CSOs) it would be necessary to remove drainage from eighty per cent of the roads in both the Humber and Rutland catchments. This could be accomplished by constructing a shallow storm sewer. A shallow storm sewer would also be able to service homes (roofs, driveways and perimeter drains) situated above the sewer elevation. Sump pumps would be required for roof drains, driveways and perimeter drains and driveways below the storm sewer elevation. In this case the existing pipe would be used as the sanitary sewer.

Given the public dislike for pumps, additional analysis could be undertaken to differentiate the number of homes where the roof drains and driveways could be serviced with a shallow storm sewer and the number of homes that would require pumps to convey drainage from roofs, driveways and perimeter drains to the storm sewer. In other words, the primary stormwater

service would be by gravity. The flow from perimeter drains is significantly less than that from roof drains and driveways during storm events.

The analysis could also be used to determine the homes where sanitary sewerage service could be provided to the main floor and above by gravity (primary service) with a grinder pump required for a basement bathroom (secondary service). This would likely reduce the number of homes relying exclusively on grinder pumps, again mitigating the concern with power outages and dependence on pumps for the primary sanitary service. In this case the existing pipe would be used to convey stormwater.

Pump Power Requirement

This concern was raised: Concerns were raised over the requirement for homeowners to install pumps. Some residents perceive that pumps are unreliable and power outages prolonged during storms which is when the pumps are most needed. Pumps also add extra operating costs due to their reliance on electricity.

E/One grinder pumps, for example, use a one horsepower motor (750 watt) that operate intermittently for short periods of time. According to E/One, typical annual energy consumption is comparable to a 40-watt light bulb ($40 \times 24 \times 365 / 1000 = 350$ kilowatts) The annual electricity cost at the second BC Hydro tier rate of \$0.1195 = \$42.00.

Pump Installations in Oak Bay

This concern was raised: An inquiry was raised as to the number of homes with pumps in Oak Bay.

The District has been keeping records on pump installations for the past three years. The number of installations in Oak Bay for sanitary sewer (SS) and storm sewer (SD) replacements are as follows:

2013: 11 of 61 service permits for SS/SD replacement required pumps or 18%

2014: 18 of 75 service permits for SS/SD replacement required pumps or 24%

2015: 12 of 84 service permits for SS/SD replacement required pumps or 14%

Attenuation Tanks

This concern was raised: Has the District considered the use of attenuation tanks as a stormwater management solution? Attenuation tanks would provide flow management options to help manage the volume of water at the Humber and Rutland pump stations.

Attenuation tank(s) have been suggested as an alternative to separating the combined sewers. In answer to the question 'Does the MSR specifically preclude the use of storage tanks for combined sewer systems?', the Ministry of Environment stated "No, storage may be employed as an interim measure, providing the overflows are immediately reduced. Ultimately, full sewer separation is required to achieve the no overflow requirement."

Attenuation tanks are not an alternative to separation of the combined sewers. As an interim measure they would only add to the project cost. However, there are no suitable locations in the vicinity of the Humber and Rutland pump stations and outfalls.

Geotechnical

This concern was raised: *The cost estimates provided were based on assumptions regarding the geotechnical make up of the area. As costs to the property owners and to the District were determined to be the most important considerations, the estimates may not be appropriately informed.*

In preparing the cost estimates assumptions were made as to the occurrence of rock based on the sub-consultant's (Ryzuk Geotechnical) knowledge of geotechnical conditions in the area. Prior to or as part of the design phase it will be necessary to undertake a geotechnical investigation to confirm the presence of rock and at what depth. This will enable a more accurate cost estimate to be prepared and reduce the risk of claims from the contractor. This work could be undertaken prior to selection of the preferred option as the additional information would result in a higher confidence level in the cost estimates and may increase or decrease estimates.

A geotechnical investigation within the road rights of way is estimated to cost \$45,000, based on eight days of field work.

Given that a geotechnical investigation is necessary regardless of the option selected and that the information will improve the level of accuracy of the cost estimates it is recommended that the District proceed immediately with a geotechnical investigation.

Easements

This concern was raised: *One of the assumptions made at the outset was that the easements would not be used in any of the Options. Given that the easements were excluded from the Options, homes that are serviced off an easement would have to install a pump. The public requested that this assumption be reconsidered.*

As noted in the Report to Committee the original design made extensive use of easements. The existing ten-foot (three metre) wide easement does not provide sufficient space for the installation of a second pipe. There must be sufficient separation between the existing and new pipe to ensure that the existing pipe is not damaged given the age and vulnerability of vitreous clay pipe to damage. Vitreous clay pipes are brittle and easily damaged.

To expand the existing easements, the following steps would be required:

Confirm the condition and location of the existing pipe – The easements have been heavily vegetated since the pipe was installed. Consequently, the risk of root intrusions and damage is greater than the pipe installed under the roadway.

Confirm the location of the pipe within each easement – It is not known if the pipe is consistently in the centre of the easement or the alignment varies from one side to the other. This information is necessary to determine the location of the additional easement required to accommodate the second pipe.

Prepare plans showing the new easements – As easements would have to be expanded in order to accommodate a second pipe system, a plan would have to be developed to inform the necessary negotiations with property owners.

Engage a real estate consultant – Land negotiations are best left to the professionals who specialize in right of way valuation and negotiation. As there are several firms locally that specialize in land negotiations, this would entail developing a terms of reference and issuing a Request for Proposals.

Negotiation with Property Owners – Given the number of properties, negotiations to acquire easements can be expected to take several months. The District would need to establish parameters for the negotiator, for example, the extent to which the District would reinstate the vegetation, fences, walls driveways etc., on the existing easements.

Expropriation - If it becomes clear that property owners are unwilling to agree to the wider easement, the District has the option of expropriating the easement. However, the District would have to establish the necessity of acquiring the easements. Given all of the options available to the District that do not require the new easements this may be problematic.

To make an informed decision on the use of existing and expanded easements, a survey of property owners is suggested to include owners with an existing easement or from whom an easement might be required. The property owners need to know for example, the level of monetary compensation from the District, if any, and responsibility for restoration of the property following construction, the District or the property owner. All property owners on an easement would have to agree to the use of the easement for it to be used for pipe installation.

Mandatory or Voluntary Sewer Separation for Property Owners – Potential Bylaw Amendments

This concern was raised: *What other action could the District take to expedite the sewer separation on private property?*

The initial report to the Committee identified three alternate approaches with respect to amending Bylaw No. 3891:

1. Mandate separation on private property as the project proceeds;
2. Mandate separation on private property within one year of the municipal sewer being separated in each catchment; or
3. Rely on home replacements and renovations to achieve separation.

In response to a question from a member of the public, staff have confirmed that, in addition to the conditions mentioned under bullet 3, the requirement to separate the sewer could be triggered by a change of ownership in the property (e.g. sale of the property). The public sewer bylaw would need to be amended for this approach to be undertaken.

Planned BC Hydro Upgrades

This concern was raised: *Is the District aware any BC Hydro service upgrades planned in the Uplands neighbourhood?*

Given the public comments about prolonged power outages, a request for information on planned service improvements to the Uplands subdivision has been submitted to BC Hydro. No response had been received from BC Hydro at the time of writing the report.

Next Steps

In this supplementary memorandum we have attempted to address matters raised at the February 2 Committee meeting.

Moving forward, does Committee now have all the information it needs?

If not, what other information is needed for Committee to make a recommendation?

Are there further steps or presentations that may assist Committee to better understand the information presented? For example, presentations on pumps and directional could be arranged for a future Committee meeting.

Does the Committee wish to recommend follow up public consultation, and if so, on what matters/topics and in what form?

Is a further staff report to an upcoming meeting required and should staff be prepared to offer a recommended option? If so, what decision criteria should staff use given that all of the options presented are technically feasible? For example, should a new sanitary sewer be installed and the existing pipe be used to convey stormwater or vice versa? Either will ultimately result in compliance with the letter of the obligation to eliminate combined sewer overflows, however, constructing a new stormwater sewer will be more in keeping with the spirit of the regulation by progressively reducing the magnitude and frequency of combined sewer overflows.