TO: Committee of the Whole, District of Oak Bay

FROM: J. A. (Jack) Hull, HJA Water Management Consulting

DATE: February 2, 2016

SUBJECT: Uplands Combined Sewer Separation Project – Pre-design

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INTRODUCTION

The Uplands neighbourhood currently has a single pipe system to convey both sanitary sewage and stormwater flows. During heavy rainfall events, the volume of stormwater exceeds the capacity of the system and a combination of stormwater and raw sewage overflows into the ocean at the Rutland and Humber pumping stations. Overflows at the Humber and Rutland pump stations typically occur during rainfall events in the winter months. The number of overflows is monitored and recorded by the Capital Regional District (CRD). The records for the past three years are presented in Attachment 1. Humber overflowed 18 times in 2015 and 12 times in each of 2014 and 2013. Rutland overflowed 26 times in 2015, 13 times in 2014 and 12 times in 2013. These overflows result in temporary no swimming or wading advisories at local beaches. With the projected increased incidence of more intense rainfall events, it is expected that the overflows will occur more frequently.

The provincial government's Municipal Wastewater Regulation (MWR) requires all BC municipalities to have separate stormwater and sanitary sewer systems to eliminate combined sewer overflows. Compliance is mandatory for the District of Oak Bay (the District) as it is for other jurisdictions in the province. Separation of the District's combined sewers is a condition of the approval of the CRD's Core Area Liquid Waste Management Plan (CALWMP), specifically, 'On or before March 31, 2008, complete cost/benefit studies and an implementation schedule directed at the elimination of combined sewers in Oak Bay to be consistent with the Municipal Sewage Regulation.' Compliance with the CALWMP is a legal obligation of the CRD and member municipalities.

BACKGROUND

Councils have grappled for well over a decade with finding the appropriate solution to separate the combined stormwater and sanitary sewer in the Uplands subdivision. Balancing the often competing desires and values of taxpaying residents directly impacted by this project with those desires and values of Oak Bay taxpayers living in neighbourhoods outside the impacted area has been and continues to be a daunting task. In January 2010 Council decided not to proceed with a low pressure sewer system for the Uplands neighbourhood despite having access to a federal grant. The Council motion of January 11, 2010 reads "a solution needs to be found that everyone can live with." Subsequent to 2010, the District explored options previously considered, and also revisited with the provincial government the necessity of the requirement. In 2013, the Ministry of Environment directed the District to proceed under the provincial government's MWR. Compliance with the provincial regulation is mandatory for the District of Oak Bay.

In May 2015 the District retained McElhanney Consulting Services Ltd (Consultant) to undertake a pre-design study of six options for sewer separation in the Uplands neighbourhood.

ASSUMPTIONS

In the terms of reference for the pre-design study, the consultant was asked to study six options. At the commencement of the study, a number of assumptions were made including:

1. The goal of the project is to eliminate (separate) the combined sewers in Oak Bay (the Minister of Environment's condition for approval of the CALWMP) to eliminate overflows in compliance with of the MWR (Section 42).
2. A second pipe would not be installed in the existing easements;
3. The lining of the existing pipe was not part of this project (from the grant funding perspective);
4. The existing pipe would continue to be utilized for either sanitary sewer or stormwater conveyance.
5. A maximum practical trench depth was considered to be five metres;
6. Trenchless technology, specifically directional drilling, is not viable for the installation of the new pipe;
7. The District would be responsible for compliance with the Heritage Conservation Act on District property;
8. Property owners would be responsible for compliance with the Heritage Conservation Act on private property;
9. Given the limitation on trench depth, sanitary and/or stormwater pumps would factor in all options.
10. Stormwater would not be treated (decontaminated) prior to discharge to the sea;
11. Based on the statistics on the duration of power outages, the use of pumps on private property is viable.
12. On-site stormwater management would not be an alternative to a storm sewer connection;
13. In the absence of detailed geotechnical information, assumptions would be made on the occurrence of rock in generating cost estimates;
14. The cost estimates developed for private property are the average of the total cost to all property owners, that is, cost estimates were not developed on a site specific basis; and,
15. At this stage, pre-design, operation and maintenance costs estimates are based on a percentage of the capital costs.

As analysis proceeded, and as a result of feedback from the public engagement process, some of these assumptions were reconsidered. These are discussed later in the report.

In arriving at a preferred option, there are technical and non-technical criteria that need to be considered. From a technical perspective, all of the options considered will achieve compliance with the MWR, however, as is evident from the public engagement process, there are other criteria that Council will have to consider in deciding on a preferred option. As a result of the public engagement process and receiving new information, some of the assumptions were re-evaluated and are discussed in the report, including 2, 4, 5, 6, 11 and 12.

There are, however, areas where direction from the Committee of the Whole (COW) is needed to arrive at a recommended option and these are identified in *bold italics* throughout the report.

THE OPTIONS FOR SEWER SEPARATION

The six options studied are:

Option 1 – New deeper gravity sewer system and existing combined sewer system to remain for stormwater conveyance.

In the Humber catchment, out of a total of one hundred and fifty (150) properties, twenty-nine (29) properties would require sanitary sewer pumps in addition to the ten (10) that already have a pump. In the Rutland catchment, out of the two hundred thirty-six (236) properties, thirty-nine (39) properties would require sanitary sewer pumps in addition to the seven (7) that already have a pump.

Option 2 – New deeper gravity storm drainage system and existing combined system to remain for sanitary conveyance.

In the Humber catchment, out of a total of one hundred and fifty (150) properties, thirty-two (32) properties would require stormwater pumps in addition to the seven (7) that already have a pump. In the Rutland catchment, out of a total of two hundred thirty-six (236) properties, forty (40) properties would require stormwater pumps in addition to the six (6) that already have a pump.

Option 3 –New pumped low pressure system for sanitary sewers collection and existing system to remain for stormwater conveyance.

Under this option all of the properties in both catchments would require sanitary sewage pumps.

Option 4 – A new shallow gravity stormwater system with localized areas requiring municipally owned stormwater pumping stations for roadway runoff.

The McElhanney proposal included a new pumped low pressure stormwater drainage system with the existing combined system to remain for sanitary sewer conveyance. However, it became clear that pumping stormwater from the whole catchment area would not be cost effective either initially or from a lifecycle perspective. Under a low pressure stormwater system, either a large number of pumping stations would be required to capture and convey road runoff, or a parallel shallow gravity network would need to be installed, with fewer, but larger municipally owned stormwater pumping stations. Consequently, this option was not considered further. Instead, a hybrid option was developed in which a relatively shallow new gravity stormwater system would be constructed with smaller, localized areas requiring municipally owned stormwater pumping stations for roadway runoff.

In the Humber catchment, sixty-five (65) properties would require a stormwater pump in addition to the seven (7) that already have a pump. In the Rutland catchment, one hundred and one (101) properties would require a stormwater pump in addition to the six (6) that already have a pump.

Option 5 – A hybrid of shallow gravity sanitary sewer system, pumped where necessary, and existing pipe as a stormwater conveyance.

This option would include a shallow depth gravity sanitary sewer system, with smaller, isolated areas of catchment serviced by municipal pressure sewers.

In the Humber catchment, sixty (60) properties would require a sanitary pump in addition to the ten (10) that already have a pump. In the Rutland catchment, one hundred and fourteen (114) properties would require a sanitary pump in addition to the seven (7) that already have a pump.

The initial capital cost to the municipality for both options 4 and 5 is lower than for options 2 and 1 respectively. However, the number of properties requiring pumps is greater.

Option 6 – A hybrid shallow gravity sanitary sewer system, with localized community sanitary pumping stations where necessary and the existing system as a storm drain.

In the Humber catchment, forty (40) properties would require a sanitary pump in addition to the ten (10) that already have a pump. In the Rutland catchment, ninety-six (96) properties would require a sanitary pump in addition to the seven (7) that already have a pump. This option is a variation of Option 5. More municipally owned pumping stations would be constructed in order to increase the number of dwelling units serviced by gravity sanitary sewer connections compared to Option 5.

The greatest factors differentiating Options 1 and 2 from 4, 5 and 6 will likely be in the costs related to pipe depth (trench excavation and backfilling) and in the cost of additional on-site private pumping systems in the latter, shallower gravity pipe network options.

Copies of the information provided to the public on the key considerations for each option attached (Attachment 2) for information.

All of the options include pumps which under Bylaw 3891 Section14 (e) are considered to be an acceptable means of providing a service connection to a public sewer.

UPLANDS DESIGN AND SERVICING

The design layout of the Uplands is unique in Oak Bay. The topography slopes from the north west to the south east dropping from approximately 50 metres down to sea level. Unlike other parts of the District, the roads in Uplands run approximately parallel to the slope (contours). As a result of this design, in order to provide gravity service, it was necessary to install the combined sewer pipe in easements at the side, rear and in some cases across properties to get from one parallel road to the next (lower) one. In other parts of the District roads run approximately perpendicular and parallel to the slope making easements for services largely unnecessary as the roadways can be used to install services. As a consequence, providing gravity service to all homes in Uplands will either require the installation of a very deep sewer or re-use of the existing easements, both of which have significant financial and environmental implications. The implications are discussed later in the report.

ARCHAEOLOGY

The Uplands is within the Traditional Territories of the Songhees and the Esquimalt Nations, and the area includes documented heritage sites. The District has begun discussions with the Nations to establish better understanding and relationships of mutual respect, and to explore ways of working collaboratively. The project will involve consultations with both Nations.

To further support this project, the Consultant sub-contracted Golder Associates (Golder) to prepare an archaeological overview assessment. The archaeological consultant undertook a field reconnaissance to identify areas of archaeological potential, documented previously known sites,

and prepared a background report outlining the First Nations history of settlement in the area. A version of the report that does not include specific archaeological site location information is available to the public on the District's web site. Golder has also identified areas of archaeological potential within the project area and recommends an Archaeological Impact Assessment in areas with archaeological potential prior to the start of construction.

The District anticipates that project construction will reveal evidence of archeological sites in some areas. That being the case, the District is responsible for responding to any archeological evidence found on municipal property, and home owners are responsible for responding to any archeological evidence found on their property.

The Heritage Conservation Act

To learn more about the impacts of the Heritage Conservation Act (the Act) on this project, a meeting was held with the senior staff at Provincial Archaeological Branch responsible for administering the Heritage Conservation Act. Ministry staff recommended that a Section 14 Heritage Inspection "Blanket" permit is the best option for the District, as it allows for a number of proponents, in this case Oak Bay and private property owners, to be included in the permit. Property owners and the District would both be signatories to the blanket permit. A blanket permit does not absolve private property owners from full responsibility for protection of archaeological sites that may be present on their property. A Technical Memorandum from Golder entitled 'Uplands Combined Sewer Separation Project: Archaeological Guidelines' that provides details of responsibilities and procedures is available to the public on the District's web site.

The question of directional drilling of small diameter pipes (100mm or less), for pumped systems, within areas of archaeological potential, was posed to Archaeological Branch staff. In their response they indicated that they would in general not recommend archaeological monitoring for the alignment work within areas of archaeological potential. However, the requirements of the Heritage Act would have to be met for the entry and exit locations for the directional drill.

PUBLIC ENGAGEMENT

This is a complex and important project for all residents of Oak Bay, and ensuring that the public had access to clear and accurate information in a format that was accessible and easily understood was a priority for Council and for the project team. The District hosted five public open houses between November 7th and November 30th to provide residents of the District with an opportunity to be informed about the combined sewer separation project, to learn about the options for separation and to provide comments and suggestions for consideration by the District. More than 200 citizens from Oak Bay signed in at the Open House sessions, the majority of the attendees recorded addresses within the Uplands Combined Sewer Separation project catchment areas. In addition to the Open House sessions, the District's website provided online public access to all presentation materials available at the Open Houses along with an online Public Opinion Survey (Survey). The Open House sessions and Survey were advertised prominently in the Oak Bay News and promoted through social media from the District's twitter account. Two reports on the public engagement are attached, 'Uplands Combined Sewer Separation project: Public Engagement Overview', (Attachment 3) and 'Uplands Combined Sewer Separation Project - Report on Survey Research' by Strategic Initiatives Inc., (Attachment 4). A total of 117 completed responses were received, with the majority from Uplands property owners.

Respondents to the Survey were drawn heavily from property owners living in the Uplands neighbourhood, and the Survey findings must be interpreted within this context. Several conclusions, however, can be drawn from the data. The following summarizes the results of the public responses to the Survey:

In response to Q5, 'Council will be weighing a number of considerations as it determines how best to comply with the provincial government's mandatory Municipal Wastewater Regulation. Please rate the importance of each of the following considerations.' Respondents stated the most important considerations are:

- operation/maintenance costs to Uplands Property owners;
- most environmentally appropriate use of existing piping; and
- minimize capital cost to the Uplands property owners.

In response to Q6, 'Please indicate which 3 of the following considerations are the most important to you,' the most important were:

- minimize capital costs to Uplands property owners;
- minimize operations/maintenance costs to Uplands property owners; and
- minimize capital costs to the District.

In answer to Q8, 'Six options have been developed by engineering firm McElhanney Consulting Services Ltd., to separate the combined sewer in the Uplands. Please rank the six technical options in order of your preference,' the preferred options are:

- Option 1 (a new gravity sewer system) was the technical option preferred by the highest percentage of respondents;
- Option 3, (low pressure system) ranked the second; and
- Option 6 (shallow gravity sanitary sewer system, with localized community sanitary sewer pumping stations), third.

Overall there was a preference for a gravity system and negative feelings about pumps and generators. Other comments referenced on-site stormwater management, use of existing easements, trenchless technologies, climate change, the need to implement a long term solution, Uplands should be treated the same as the rest of Oak Bay and be provided with gravity sewers and the question about what is happening with other areas of Oak Bay that still have combined sewers.

OPTIONS PREFERRED BY THE PUBLIC

Option 1 was the most preferred among survey takers, with an average of 1.9. Uplands homeowners were significantly more likely than other Oak Bay homeowners to rank Option 1 and Option 2 as their most preferred of the six options (1.5 vs 3.3 and 3.2 vs 4.7 respectively). Other Oak bay homeowners were significantly more likely than Uplands homeowners to rank Option 3 as their most preferred technical option (mean ranking 2.4 vs 4.9). The difference between Uplands homeowners and other Oak Bay homeowners in their average rankings of the remaining technical options (Options 4, 5 and 6) were not significant. (Refer to the chart on Page 15 of Attachment 4)

These findings reflect the financial impact of this project on the respective property owners in Uplands and other parts of Oak Bay.

While property owners living in the Uplands project area preferred Option 1 (deep gravity), and property owners living outside of the project area preferred Option 3 (100 per cent pumps), the rankings of the second and third and fourth choices are very close. For both Uplands property owners and property owners living outside the Uplands, the rankings of preferred options (2 through 5) are separated by a factor 1 or less.

The majority of respondents indicated their preference for a new sanitary sewer system while noting the existing pipe leaks and is therefore more appropriate for stormwater. The comments also noted that a new stormwater management system may be the only solution that allows for a reduction in overflows (environmental impact) in a timely fashion.

The context of the small sample size and the fact that it is heavily weighted to reflect the opinions of property owners living in the project area should be considered when viewing these finding.

DISCUSSION AND ANALYSIS

Members of the public who participated in the public engagement process questioned some of the assumptions used in developing the options. In response, additional analyses were undertaken to reassess the assumptions and to provide more information. This is discussed in the following sections.

1. On Site Stormwater Management

Section 2.1 of Bylaw 3891 ‘A bylaw for the administration and regulation of public sewers’, (the Bylaw) attached for reference (Attachment 5) authorizes the Engineer to waive the requirement to connect to a stormwater sewer when storm water management can be accommodated on site, Section 2.1 (1). The Engineer may also waive the requirement for non-residential properties where direct stormwater discharge to the sea can be achieved, Section 2.1 (2). For such a waiver the owner must meet the conditions stipulated in these sections and in Sections 2.2, 2.3 and 2.4.

Given the implications of climate change, specifically more intense rainfall events, it is unlikely that the conditions stipulated in the bylaw for on-site stormwater management could be met (in most cases). Notwithstanding, on-site stormwater management has positive implications for stormwater management in Uplands, particularly if the existing pipe is used as a future stormwater sewer. As noted, with climate change, more intense rainfall events are predicted. These may result in the capacity of existing storm sewers being exceeded. The pre-design study has identified sections of the existing combined sewer that do not meet current capacity design standards for stormwater flows. Surcharging, as evidenced by water flowing from manholes, is occurring in some parts of the Uplands. On-site rainwater management has the potential to reduce the peak flows reaching the storm sewer, possibly deferring the need for replacing some existing stormwater pipes with larger ones. Depending on the type of on-site rainwater management system employed there may be the added benefit of groundwater recharge.

Other municipalities are looking for ways to reduce the peak flow. The City of Victoria has implemented a stormwater utility and is providing incentives for property owners to install on-site

stormwater management systems and has produced a homeowner guide for rainwater management 'Rainwater Management Standards – Do-it-Yourself for Your Home'. The guide is available on-line. The District of Saanich requires on-site holding systems that allow rainwater to infiltrate groundwater with overflows draining to the storm sewer system. It is not known how effective these systems are in the long term, for example, does silting occur, reducing the storage capacity and hence their effectiveness to attenuate the stormflows? Both jurisdictions still require connections to the storm sewers.

District staff have identified the need to develop a drainage master plan. It is recommended that the District include an evaluation of the on-site management programs in other jurisdictions and develop a program specific to the District's conditions.

Assumption 12: On-site management will not be considered as an alternative to a connection to a storm sewer.

2. The feasibility of using the existing easements

Many of the challenges that surround this project stem largely from the topography of the Uplands neighbourhood and the manner in which the combined system was installed in the subdivision 100 years ago.

There were a number of attendees at the open houses who suggested reusing the existing ten foot-wide easements that run between, behind or across properties. In order to assess the feasibility of reusing the easements the Consultant conducted a field reconnaissance to gather more detailed information.

Reusing the easements will require access for an excavator and a truck for removing excavated material and delivering backfill material. Assuming the existing pipe is in the centre of the easement, then an excavator will have to be positioned off-centre to excavate a trench for a new pipe. Sufficient space will have to be left between the old and new pipes to avoid potential damage to the old pipe. This will necessitate negotiating with homeowners for an additional two metres to the existing three metre easement. To work efficiently, the excavator must be able to swing through 180 degrees, so an additional clear working area beyond the easement width will be required during construction. Paved driveways, stone walls, mature trees, hedges and other vegetation very likely will have to be removed to provide the necessary space for construction. There is also potential conflict with BC Hydro distribution lines in the existing easements. It is estimated that the construction cost would be greater than in the road right of way. It may be possible, however, at the design stage to consider use of certain easements and lanes for installation of a new sewer.

Assumption 2: That, in general, the existing or enlarged easements will not be used to accommodate a new sewer pipe.

3. Trenchless Technology

The feasibility of trenchless technology was also assessed. There are three common trenchless technologies, pipe bursting, pipe relining and directional drilling. Pipe bursting is used when an existing pipe is to be replaced or increased in size. Pipe relining is used to extend the life of an existing pipe and reduce inflow and infiltration (I&I). Neither of these technologies is relevant to separating the combined sewers, but may be relevant to increasing the capacity or reducing I&I in the existing pipe. Directional drilling contractors were contacted on the feasibility of directional

drilling for sewer lines where a gradient must be maintained. A large excavation is required at the entry and exit point and at any change in direction. Proximity to the existing pipes in the easements was a significant concern given the pipe material and age, and the difficulty of maintaining a linear alignment. Overall they advised against directional drilling. Directional drilling, however, would be possible for small diameter pressure pipes for service laterals on private property.

Assumption 6: That based on the results of the reconsideration of directional drilling, directional drilling is not a viable alternative for installing a municipal gravity sewer.

4. Deeper (Gravity) sewers to eliminate the need for pumps.

Five metres was established as the practical limit for excavation. Going deeper increases the construction risk and the likelihood of hitting rock. At the Open Houses, going deeper than five metres was suggested as a means of reducing the number of private pumps. In response, the Consultant undertook an assessment of the implication of going deeper in increments of 0 – 1 metre, 1 – 2 metres, 2 – 3 metres and greater than 3 metres to eliminate the need for private pumps. Going deeper than five metres will require a tiered or benched excavation process that will increase the level of disruption to local residents, and extend the construction timeframe. It is expected that the homeowner cost of connecting to the deeper gravity sewer will typically offset the cost of a pumped system, and likely exceed it. The Consultant estimated that for Option 1 the project cost would increase from $19.9 million to $29.6 million. This estimate has been prepared without a geotechnical investigation to determine the location of rock. Depending on the occurrence of rock, this estimate could increase significantly.

Assumption 5: That construction of gravity sewers greater than five (5) metres deep to eliminate the need for private pumps, is not a feasible option

5. Climate Change

Climate change models for this area predict warmer, wetter winters and longer drier summers, such as the 2015 summer we recently experienced. Rainfall events in the winter are predicted to be more intense, with more rain in a shorter time. When Uplands was developed it was likely designed for a 5-year storm event (Q5). Today, it is more typical to design for a 10-year storm event (Q10). Over time these statistical events are changing with climate change. This has implications for the existing storm sewers in the Uplands and other areas of the District. The Consultant has identified areas where the existing storm sewer is not large enough to accommodate the Q10 event, leading to surcharging of the sewers and potential overflows from manholes. If the proposed drainage masterplan is developed it should take climate change into consideration and identify potential ‘bottle necks’ in the existing system and plan for upgrades to accommodate storm flows, if the existing sewer is to be used for stormwater flows. A new stormwater sewer would be designed to current standards.

6. Power Outages

Members of the public expressed concern with the reliability of power supply and the implications for homes relying on pumps. There was the perception that power outages were sufficiently frequent and of a duration to put homes at risk of flooding. To address this concern power outages records were requested from BC Hydro. The reliability statistics for the feeder that serves the Uplands neighbourhood including interruptions due to planned outages are:

Fiscal Year	System Average Interruption Frequency (# of interruptions)[1]	Customer Average Interruption Duration Index (Hours)
2011	0.26	3.56
2012	2.60	2.65
2013	0.31	6.10
2014	2.13	3.16
2015	2.36	4.34

Note 1: This is a utility standard measure of how many sustained interruptions (longer than one minute) an average customer will experience over the course of a year.

Based on comments from the public and District staff there may have been isolated locations within Uplands that have experienced outages with a longer duration.

Assumption 11: Based on the statistics on the duration of power outages, the use of pumps on private property is viable.

The implications of power outages are discussed further under the 'Options Assessment' section of the report.

7. Shoreline Development Permit Area

Some residents raised the question of existing stormwater discharges directly to the sea. It is known that there are currently a number of properties along the Uplands shoreline that discharge stormwater onto the shoreline. The District does not necessarily have a record of all these discharges as some may have been installed in the past without the knowledge or approval of the District. Homeowners currently require a development permit to install a new pipe in the 15 metre development permit zone. It is suggested that if an approved or unapproved pipe exists its use be continued provided that the District's Engineer is satisfied that there is no environmental impact or physical damage to the shoreline. The current practice of requiring connection to a storm sewer whenever renovations or house replacements are undertaken should continue.

It is assumed that the existing stormwater discharges will be phased out over time as homes are renovated or replaced.

8. Other Areas of Oak Bay with Combined Sewers

A number of residents asked what the District planned to do about other areas of Oak Bay with combined sewers or no access to a storm sewer. Based on District records there are an number of locations in other parts of the District with combined sewers or no access to a storm sewer. Typically, these dispersed locations involve only a small number of homes. Homes at two of these locations discharge stormwater directly to the sea because a storm sewer is not available. It is expected that all of these homes will eventually be included in the District's ongoing infrastructure upgrading programme.

There are several homes at the North end of Beach Drive that are currently connected to the District of Saanich sewerage system. It is expected that these homes will be connected to the District's stormwater and sanitary sewage system as part of this project.

OPTIONS ASSESSMENTS:

All six options are technical solutions that will address the District's need to separate the existing combined sewer in the Uplands subdivision. The following section looks at some of the technical considerations that characterize each option.

1. Stormwater Pumps versus Sanitary Sewage Pumps.

In 2010, Council considered a low pressure pump solution for every household in the Uplands subdivision. There was insufficient information to address the concerns of residents and this option was not pursued. Several new homes are being built in Oak Bay using pumps to manage sanitary sewage and stormwater usually from developed basements and perimeter drains. There are also a number of homes in Uplands that have been serviced by pumps for decades. Still, feedback from residents indicates that pumps remain a concern for many of the people who attended the Open Houses and responded to the Survey, the majority being property owners from the Uplands subdivision. Respondents expressed slightly more concern with stormwater pumps than sanitary sewage pumps.

With sanitary pumps, backup power is considered optional in the event of a power failure given the holding capacity within the holding tank and the homeowner's ability to limit water use during the power outage. In the case of stormwater pumps, the homeowner has no control over the amount of water entering the holding tank during a power outage. Consequently, backup power is considered essential when stormwater pumps are being used.

2. Opportunity to reduce the number of pumps providing primary service.

At this pre-design phase, the Consultant assumed that the lowest level of homes would be serviced by either a gravity connection or by pump. No attempt was made to modify pipe gradient to allow a gravity connection even if there was a small elevation difference between a gravity connection and the need for a pumped connection.

At the detailed design phase more precise engineering may result in a reduction in the number of homes requiring pumps. The possibility of servicing the main level and above by gravity, with the lower, basement level serviced by a pump, should be examined at the design stage in order to reduce dependence on a pump for the primary sanitary service. This would reduce the perceived risk associated with power outages.

For stormwater, evaluating the possibility of servicing roof and surface drainage by gravity and perimeter drainage by pump to reduce the risk associated with power outages should also be examined at the design stage.

3. Advantages/Disadvantages of a new sanitary or new stormwater sewer

While providing separate sanitary and stormwater sewers in the Uplands area will achieve compliance with the MWR, the elapsed time to achieve the elimination of combined sewer overflows will depend whether the District chooses an option that uses the existing pipe for conveyance of sanitary sewage or for stormwater conveyance. Feedback from the public

indicated that timely completion of the project and the most appropriate use of the existing pipe were important considerations.

A new sanitary sewer has the following advantages:

- Pipe designed for the expected flows, requiring a smaller pipe than the existing combined sewer pipe.
- Inflow and infiltration (I & I) will also be reduced.

A new sanitary sewer has the following disadvantages:

- Sewage flows will remain combined until the last section of pipe is installed and the last house is connected to the separated sewers.
- Overflows will continue because of the ongoing combined sewage flows.
- A new sanitary sewer delays achievement of the perceived environmental benefit of no sanitary sewage being discharged to the sea during storm events.

A new stormwater sewer has the following advantages:

- Pipe sized to meet today's design standards.
- Eliminates the surcharging currently occurring.
- Flows to the Humber and Rutland pump stations could be progressively reduced as sewer separation proceeds, road drainage catch basins are connected to the new storm sewer and as existing homes with separated sewers are connected.
- The number of combined sewer overflows could be progressively reduced as the project proceeds thus achieving the secondary goal of the project earlier.

A new stormwater sewer has the following disadvantages:

- Sanitary sewage flows in the existing pipe would be higher because of the high I &I rates with the existing sewer.
- Higher operation and maintenance costs of the existing pipe as the pipe would be larger than that required for the expected flows leading to the possibility of deposition of solids in the pipe and the need for flushing.
- Using the existing pipe for sanitary sewage increases the potential for more odour occurrences because of the risk of deposition of solids in the existing larger than required stormwater pipe being used for sanitary sewage.

Regardless of the option selected, given the age of the existing pipe and the high I & I rates, rehabilitation/relining of the pipe will be required at some time in the not too distant future as part of the Districts ongoing infrastructure maintenance program and not eligible for grant funding.

Assumption 4: The existing pipe will continue to be used for either sanitary sewage or stormwater conveyance.

FUNDING ALTERNATIVES

Public feedback indicated that capital costs – both to the District and to impacted property owners - are primary concerns. In anticipation of moving ahead with this infrastructure project the District has been contributing to a Capital Works Replacement Reserve for the Uplands sewer separation since 2005 using Gas Tax Transfer funds received from the federal government and from sewer

user fees. Annual contributions are $770,000 from gas tax transfers and $400,000 from sewer user fees. The Reserve currently holds $7,140,638 comprised of gas tax and sewer user fees of $5,098,330 and $2,042,308 respectively.

For several years the District has required property owners in the Uplands to separate sanitary sewer and stormwater services on private property when undertaking major renovations or building a new home. As a result, fifty-eight (58) or thirty-nine (39) per cent of the homes in the Humber catchment and twenty-nine (29) or twelve (12) per cent of the homes in the Rutland catchment have separated sewers to the property boundary. Assuming, for discussion purposes, the most expensive option for the District of $17.1 million and assuming the construction costs in the Humber and Rutland catchments is proportional to the number of homes then the cost to separate Humber and Rutland would be $6.7 million and $10.4 million respectively.

Funding Alternative 1 - Assuming the project is funded entirely by the District using the existing reserve fund and the current contribution level from the federal Gas Tax Transfer funding and user fees, work on the Humber catchment could proceed immediately to completion within five (5) years with annual contracts of about $1.5 million. With the same level of contribution to the reserve as at present, an additional seven years would be required to completed the Rutland catchment. Completion of the Humber Catchment and separation of sewers on private property would reduce the number of overflows. With current funding levels separation of the sewers could be completed within about 12 years from approval to proceed.

Funding Alternative 2 – Assuming the project is funded entirely by the District but over an extended timeframe, recognizing that the contribution to the reserve may vary depending on other demands for other District infrastructure investments, a 20-year timeframe is suggested. This would equate to average annual funding of $855,000.

Funding Alternative 3 – Under this alternative the project would be funded entirely by the District but with early completion (within five (5) years) by utilizing the existing reserve fund and borrowing the balance as required, with debt serviced from the annual contributions to the reserve fund. Debt financing would be subject to approval.

Funding Alternative 4 – With this alternative the District receives provincial and federal infrastructure grant funding allowing work to proceed to early completion (within five (5) years). While the District has already submitted an application for provincial and federal funding a decision is unlikely until the District submits an approved project complete with budget details. Grant funding is typically time sensitive.

In choosing a funding alternative the Council will have to weigh this financial commitment against the other demands for capital investment within the District if grant funding is not available.

COMPLIANCE WITH THE PROVINCIAL MUNICIPAL WASTEWASTER REGULATION AND THE CORE AREA LIQUID WASTE MANAGEMENT PLAN

While the District is obligated to eliminate combined sewers and overflows the MWR does not stipulate the timeframe over which separation should be implemented. However, it does state that ‘the volume of overflows should be reduced by an average of 1% per year over a 10-year period’, (Division 2, Section 42 (2) (d)). In the current amendment to the CALWMP, the District was to have sewer separation completed by 2015. This time frame was based on the assumption that the low pressure system, funded in part by provincial and federal grants in 2010, would be

installed. As this deadline has passed the District must submit a new plan and timeframe to the Ministry of Environment by an amendment to the CRD CALWMP. As noted above, the timeframe for completion depends on the available funding. It is expected that the Ministry would accept any of the timeframes presented under the funding alternatives. However, based on conversations with the CRD and the MOE, a 100-year time frame for compliance is unlikely to be an acceptable alternative.

CONNECTIONS TO MUNICIPAL SANITARY AND STORMWATER SEWERS

The District administers connections to the sewer system by policy and by bylaw. The current policies are discussed in this section, the bylaw in the next.

1. Existing Practice – Uplands

For new homes, owners are required to install separate pipes for sanitary sewage and stormwater to the property line. A new single pipe is required within the municipal right of way to the combined sewer, including connection to a pipe in an easement. Because sanitary and stormwater flows are combined, a 150 mm connection is required between the property line and the combined sewer in the municipal right of way. Connections in the Uplands are more expensive because of the larger pipe, the depth (can be up to 8 feet), the longer length, boulevard trees, rock and archaeological requirements. Because of these factors the municipality provides a cost estimate for the work within the municipal right of way, for which the owner is 100 per cent responsible.

2. Existing Practice – Outside Uplands

For new homes, owners are required to separate the sewers and connect to the municipal sewers at their expense. The existing pipes may be used if they are PVC, otherwise the pipes within the municipal right of way must be replaced.

For renovations, additions and where the perimeter tile drain is being replaced the municipality requires that the home owner replace the service lines. Again the cost is borne by the homeowner. The fees for work within the municipal right of way are stipulated in Schedule A of Bylaw No. 3891. Service connections outside the Uplands are typically 100mm in diameter and less expensive to construct hence the use of a schedule of fees. An exception to this is where the laterals are more than eight feet deep or longer than ten metres. In these situations, a cost estimate is prepared and the property owner pays the full cost.

BYLAW NO. 3891 – A BYLAW FOR THE ADMINISTRATION AND REGULATION OF PUBLIC SEWERS

1. Current Requirements

Under the bylaw all buildings or structures from which domestic waste, non-domestic waste and storm water may be discharged are required to connect to a public sewer (Section 2. (1)). The exceptions for stormwater discharges to water courses (Section 2. (2)), for on-site disposal Section 2.1 (1)), and for property abutting the sea Section 2.1 (2)), were discussed earlier in the report.

Under Section 2. (3) when the District is separating combined sewers, homeowners are required to separate the combined lateral into individual storm sewer and sanitary sewer laterals and make the necessary connections to the public sewer within one year of the separated sewers being available. Failure to comply may result in the District undertaking the work at the expense of the

property owner - Section 2. (4) and adding the cost to the taxes payable on the property if the homeowner fails to pay.

In situations where the District is replacing a sewer and the property owner applies for a new connection from the property line to the main in time for the connection to be made as part of the sewer replacement construction, then the fee under Schedule A is discounted by 50 per cent Section 5. (2).

It is known that there are properties outside of Uplands that have a single pipe connection to the sanitary sewer despite a storm sewer being available. When a separate stormwater sewer was installed in other areas of Oak Bay, there apparently was no requirement to separate the existing single pipe connection on private property as there was no regulatory requirement to do so.

The objective of the Municipal Wastewater Regulation and the Core Area Liquid Waste Management Plan is to separate combined sewers to prevent overflows during storm events with a less than 5-year return period. Even though separate sewers are available in most other parts of the District, not all properties have separate sewer connections.

Given the various situations that occur within Oak Bay, the District needs to develop a consistent approach either by policy, such as for the Uplands sewer separation project or by bylaw to address the typical situations throughout Oak Bay.

The following policy suggestions are presented for consideration by COW:

2. Uplands Sewer Separation Project

1. For property owners that have separated their sewers and provided a new single pipe lateral to the combined sewer at their cost, a second connection to the property line would be provided at no cost, that is the cost would be included as a project cost. The connection to the sewers separated by the property owner would be made by the contractor during construction of the new municipal sewer. Requiring the owner to pay for the connection would be requiring the owner to pay twice as had the separate sewers been available, the property owner would have paid for the dual connection at the time.
2. As an incentive to property owners who have not separated their sewers, the sewer laterals from the property line to the separated municipal sewers would be provided at no cost to the property owner by the contractor during construction of the new sewer, provided that sewers on private property are separated prior to construction of the new sewer at that location.
3. Property owners intending to separate their sewers but have not done so prior to separation of the combined sewer may choose to have separate pipes constructed by the contractor within the municipal right of way to their property line at their expense.
4. Property owners that separate their sewers after construction of the new municipal sewer is completed at that location, would be responsible for the full cost of connection to the municipal sewers.

Council's direction is needed to develop policy and/or revisions to Bylaw No. 3891

3. Mandatory or Voluntary Sewer Separation for Property Owners

A number of attendees at the open houses raised the question of mandatory or voluntary separation of sewers and connection to the separated municipal sewers. As noted earlier, if the option of a new sanitary sewer is selected, sewage flows will remain combined and overflows will

continue until all properties in Humber and Rutland catchments have separate sanitary and storm connections. Bylaw 3891 stipulates mandatory separation within a year of a new sewer main being constructed for the purpose of separating the existing combined sewer system. This would mean mandatory separation of sanitary and storm sewers on private property as the sewer separation project proceeded, but could mean the District having to undertake the work if the property owner failed to do so within one year as stipulated in the bylaw. However, given that separation of the sanitary and storm flows is not possible in each catchment area until the sewers have been separated, an alternative approach would be to require separation on private property within one year of the municipal sewer being separated in each catchment, i.e., when the Humber or Rutland catchment is completed homeowners have one year to provide separate sewers. A third alternative would be to rely on home replacements and major renovations to achieve complete sewer separation. This would potentially mean continuing overflows long after the combined sewer separation project was completed. In summary, the three alternatives are:

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

Other jurisdictions are not mandating separation on private property due to the financial burden on home owners but are relying sewer separation when replacements and renovations are undertaken.

Essentially the difference between mandatory and voluntary connection of private services is the timeframe to achieve separation of sanitary and stormwater flows. Under alternative c), for example, elimination of combined sewers could be achieved before separation of private services.

Council's direction is needed to develop policy and/or revisions to Bylaw No. 3891.

4. Need to Update Bylaw 3891

As noted previously, there are many homes in the District with single pipe connections despite the availability of separate sewers. This is evidenced by the fact that annual average flows are significantly higher than other, older municipalities like Victoria and Esquimalt. There is a need to review and update the bylaw, in particular Section 2 'Requirements to Connect to Public Sewers' to address the implications of the Uplands sewer separation project to ensure consistency throughout the District. Assuming the District decides to rely on home replacements and renovations to achieve sewer separation then the following is suggested for inclusion in the bylaw:

1. New homes, to be provide separate sanitary and storm sewer connections to the District sewers, at the expense of the property owner. A new single or dual pipe connection (lateral) from the property line to the municipal sewer(s) to be provided at the expense of the property owner;
2. When renovations exceed $100,000, or an existing bathroom is renovated, or a bathroom is added, the requirements for new homes would apply;
3. When a perimeter drain is replaced, separate sanitary and storm sewers to be provided. A new single or dual pipe connection (lateral) from the property line to the municipal sewer(s) to be provided at the expense of the property owner; and

4. If a single pipe has to be replaced, the property owner must provide new separate sewers to the property line and a new single or dual pipe connection (lateral) from the property line to the municipal sewer(s).

With direction from Council amendments to the bylaw will be drafted and brought to council at a later date.

DECISION CRITERIA

As noted earlier, the purpose of undertaking this project is to eliminate combined sewers in the Uplands area to comply with the MWR. Evaluating the project from that focused perspective would potentially lead to a preference for a new gravity sewer (Options 1, 3, 5 and 6). However, sewage flows would remain combined and overflows to the environment would continue until all the sewers were separated and all homes are connected with separated sewers. However, adding the environmental benefit of reducing overflows to the sea to the compliance objective would potentially lead to a preference for a new stormwater sewer (Options 2 and 4). While compliance with the MWR may not be achieved any sooner, combined sewer overflows would be reduced sooner as storm flows would be progressively reduced as the project proceeded with the connection of already separated homes and road surface drainage.

The results of the public engagement indicate that a gravity solution is preferred, that pumps are viewed negatively and a solution that minimizes direct costs to Uplands residents is preferred by Uplands residents. However, the public engagement feedback also indicates that the small percentage of residents who participated in the survey that live in Oak Bay but not in the Uplands believe it is important to minimize the costs to the District and selecting an option that takes into account a long term view.

As noted earlier Council must decide between complying strictly with the Minister's directive to eliminate combined sewers (all of the options), as municipalities on the lower mainland are doing or comply with the directive and progressively reduce combined sewer overflows (Options 2 and 4), assuming separation of sewers on private property is not mandatory.

SUMMARY

The following is a summary of the assumptions and policy issues for consideration by COW:

1. *That on-site management will not be considered as an alternative to a connection to a storm sewer.*
2. *That, in general, the existing or enlarged easements will not be used to accommodate a new sewer pipe.*
3. *That based on the results of the reconsideration of directional drilling, directional drilling is not a viable alternative for installing a municipal gravity sewer.*
4. *That construction of gravity sewers greater than five (5) metres deep to eliminate the need for private pumps, is not a feasible option*
5. *That based on the statistics on the duration of power outages, the use of pumps on private property is viable*.
6. *That existing stormwater discharges will be phased out over time as homes are renovated or replaced.*
7. *On-site management will not be considered as an alternative to a connection to a storm sewer.*

8. *That with direction from Council amendments to the bylaw will be drafted and brought to council at a later date*

Next Steps

1. **Council provide direction to staff on what additional information they may need in order to make an informed decision**
2. **Council direct staff if further public consultation is required and for what specific information**
3. **And /or direct staff to bring forward a preferred option to an upcoming COW (for further discussion or an upcoming Council meeting (for decision).**

Following the selection of an option by Council, the proposed next steps in this overall project are:

1. Provide the CRD with the District's proposal including the rationale and time frame for the combined sewer separation for submission to the Ministry of Environment as part of an amendment to the Core Area Liquid Waste Management Plan.
2. Resubmit the grant application to the province/federal government with the details of the approved plan.
3. Staff to develop the financial plan for moving this project forward.
4. The District to continue its discussions with First Nations on the archaeological impact of this project.
5. Prepare a terms of reference for a request for proposals for a geotechnical investigation of the Humber and Rutland catchments along the proposed new pipe alignment to ascertain sub-surface conditions for use during detailed design.
6. Prepare the terms of reference for a request for proposals (RFP) for the detailed design of the first phase of the combined sewer separation project.
7. Issue the RFP for the geotechnical investigation after a response to the grant application has been received. (Note that any work done prior to a decision on the grant would be ineligible for funding).

Humber Pump Station Overflows

Date	Duration in minutes	Date	Duration in minutes	Date	Duration in minutes
12-Dec-15	34	28-Nov-14	35	30-Sep-13	31
9-Dec-15	106	23-Nov-14	46	29-Sep-13	46
8-Dec-15	201	25-Oct-14	27	29-Sep-13	44
17-Nov-15	447	22-Oct-14	72	28-Sep-13	64
17-Nov-15	55	11-Oct-14	32	25-Sep-13	17
13-Nov-15	25	2-Sep-14	61	5-Sep-13	23
12-Nov-15	798	2-Sep-14	23	5-Sep-13	1
31-Oct-15	162	5-Mar-14	14	27-Aug-13	14
31-Oct-15	40	5-Mar-14	32	12-Jun-13	15
31-Oct-15	100	17-Feb-14	33	12-Jun-13	1
10-Oct-15	28	16-Feb-14	17	12-Mar-13	93
23-Aug-15	15	11-Jan-14	20	8-Jan-13	201
24-Apr-15	12				
21-Mar-15	16				
15-Mar-15	147				
27-Feb-15	42				
18-Jan-15	89				
5-Jan-15	193				
Total Duration:	2510		412		548
Number of Overflows:	18		12		12

Rutland Pump Station Overflows

Date	Duration in minutes	Date	Duration in minutes	Date	Duration in minutes
18-Dec-15	17	23-Nov-14	9	30-Sep-13	21
12-Dec-15	38	25-Oct-14	28	29-Sep-13	31
9-Dec-15	152	22-Oct-14	55	29-Sep-13	38
8-Dec-15	34	11-Oct-14	28	28-Sep-13	62
8-Dec-15	217	2-Sep-14	57	25-Sep-13	29
17-Nov-15	22	2-Sep-14	21	5-Sep-13	24
17-Nov-15	0	15-Mar-14	29	5-Sep-13	28
17-Nov-15	437	8-Mar-14	40	27-Aug-13	13
17-Nov-15	93	5-Mar-14	17	12-Jun-13	7
13-Nov-15	23	5-Mar-14	32	12-Mar-13	25
12-Nov-15	826	17-Feb-14	35	8-Jan-13	199
31-Oct-15	131	16-Feb-14	20	8-Jan-13	14
31-Oct-15	33	11-Jan-14	17		
31-Oct-15	118				
10-Oct-15	22				
28-Aug-15	7				
24-Apr-15	26				
21-Mar-15	16				
15-Mar-15	194				
27-Feb-15	58				
10-Feb-15	0				
18-Jan-15	37				
18-Jan-15	70				
18-Jan-15	10				
5-Jan-15	205				
5-Jan-15	18				
Total Duration:	2803		389		489
Number of Overflows:	26		13		12

ATTACHMENT 2

OPTION 1 - Install deeper gravity sanitary sewer system and use existing combined system to carry stormwater.

Option 1: Key Considerations

- Five metres has been established as the maximum practical and economic depth for trench excavation.
- Existing pipe is old and leaks at joints allowing water to enter and escape the pipe.
- Creating a new sanitary sewer system minimizes sewage leakage.
- Requires the least number of pumps on private property. Costs for pumps will be the responsibility of the homeowner. Backup power generators optional.
- Sanitary sewer requires smaller pipe infrastructure (20 cm) than larger stormwater infrastructure (60 cm).
- Deep trench excavation costs more to excavate and install pipes, and is more disruptive to neighbourhoods as it has a longer construction timeframe.
- Trench excavation is invasive and may negatively impact mature trees and landscaping on public and private property.
- Existing pipe is the appropriate size for carrying stormwater.

Catchment	Humber	Rutland
Proposed Sanitary Sewer Pumps	29	39
Existing Sanitary Sewer Pumps	10	7
Number of Properties	150	236

Option 1: Cost Estimate	
Total Project cost	$19.9 M
District of Oak Bay cost	$16.4 M
Range of costs to homeowners with new pump system	$17K* to $20K*
Range of costs to homeowners not requiring new pump system	$8 K* to $11 K*

Note that 17 existing pumped services and 63 existing gravity services are expected to be re-used.

*Homeowner cost estimates are based on a general assessment of the work required on private property and will vary depending on the specific circumstances and actual work required on each property. Costs associated with the archaeological discoveries on private or public property and compliance with the *Heritage Conservation Act* are not included in the cost estimates.

OPTION 2 - Install deeper gravity stormwater system and use existing combined system to carry sanitary sewage.

Option 2: Key Considerations

- Five metres has been established as the maximum practical and economic depth for trench excavation.
- Existing pipe is old and leaks. Using this pipe to carry sanitary sewage minimizes project environmental benefits and would accelerate the need to rehabilitate or replace the existing pipe.
- Requires the least number of pumps on private property. Costs for pumps will be the responsibility of the homeowner. Backup power generators are recommended.
- Existing pipe is larger than required for sanitary sewage conveyance. Lower flows may result in insufficient volume to flush solids from the pipe, odor and solids accumulation may occur requiring more frequent maintenance.
- Deep trench excavation costs more to excavate and install pipes, and is more disruptive to neighbourhoods as it has a longer construction timeframe.
- Trench excavation is invasive and may negatively impact mature trees and landscaping on public and private property.

Catchment	Humber	Rutland
Proposed Stormwater Pumps	32	40
Existing Stormwater Pumps	7	6
Number of Properties	150	236

Option 2: Cost Estimate	
Total Project cost	$20.7 M
District of Oak Bay cost	$17.1 M
Range of costs to homeowners with new pump system	$17K* to $20K*
Range of costs to homeowners not requiring new pump system	$8 K* to $11 K*

Note that 13 existing pumped services and 80 existing gravity services are expected to be reused.

*Homeowner cost estimates are based on a general assessment of the work required on private property and will vary depending on the specific circumstances and actual work required on each property. Costs associated with the archaeological discoveries on private or public property and compliance with the *Heritage Conservation Act* are not included in the cost estimates.

OPTION 3 - Install pumped low pressure sanitary sewer and use existing system as stormwater drain.

Option 3: Key Considerations

- 100% of properties in both catchments would require sanitary sewage pumps. Costs will be the responsibility of the homeowner. Backup power generators optional.
- This option requires a shallow, small diameter pipe that minimizes trench excavation requirements.
- This option is the least disruptive to neighbourhoods and poses the lowest risk to damaging mature trees and landscaping on public and private property.
- Lower capital costs for the District of Oak Bay.
- Higher capital costs for homeowners.
- Existing pipe is old and leaks at joints allowing water to enter and escape the pipe.
- Existing pipe is more suitable for conveying stormwater than sanitary sewage.

Catchment	Humber	Rutland
Proposed Sanitary Sewer Pumps	140	229
Existing Sanitary Sewer Pumps	10	7
Number of Properties	150	236

Option 3: Cost Estimate	
Total Project cost	$13.9 M
District of Oak Bay cost	$6.9 M
Range of costs to homeowners with new pump system	$17K* to $20K*
Range of costs to homeowners not requiring new pump system	N/A

Note that 17 existing pumped services and 63 existing gravity services are expected to be re-used.

*Homeowner cost estimates are based on a general assessment of the work required on private property and will vary depending on the specific circumstances and actual work required on each property. Costs associated with the archaeological discoveries on private or public property and compliance with the *Heritage Conservation Act* are not included in the cost estimates.

OPTION 4 - Hybrid: Install shallow gravity stormwater system. Localized areas serviced by new municipally owned pump stations for roadway runoff. Existing system to carry sanitary sewage.

Option 4: Key Considerations

- Up to three metres has been established as the maximum depth for shallow trench construction.
- This option requires more properties to have stormwater pumps than Option 2. Costs for pumps will be the responsibility of the homeowner.
- Power outages are a greater risk for stormwater pump systems due to the potential volume of stormwater during wet weather months. Backup power generators would be required.
- Capital costs are higher for homeowners to pump stormwater than sanitary sewage.
- Two new municipal stormwater pump stations would be installed with the costs carried by the District of Oak Bay.
- Shallow trench excavation is less disruptive to neighbourhoods as it will have a shorter construction timeframe than deep trench construction.
- Trench excavation is invasive and may negatively impact mature trees and landscaping on public and private property.
- Shallow trench excavation is less costly than deep trench excavation.
- Existing pipe is old and leaks. Using this pipe to carry sanitary sewage minimizes the project's environmental benefits, and would accelerate the need to rehabilitate the existing pipe.
- Existing pipe is larger than required for sanitary sewage conveyance. Due to lack of flow and adequate volume to flush the pipe, odor and solids accumulation may occur requiring more frequent maintenance.

Catchment	Humber	Rutland
Proposed Stormwater Pumps	65	101
Existing Stormwater Pumps	7	6
Number of Properties	150	236

Option 4: Cost Estimate	
Total Project cost	$14.4 M
District of Oak Bay cost	$10.1 M
Range of costs to homeowners with new pump system	$17K* to $20K*
Range of costs to homeowners not requiring new pump system	$5 K* to $8 K*

Note that 13 existing pumped connections and 40 of 80 existing gravity connections are expected to be re-used.

*Homeowner cost estimates are based on a general assessment of the work required on private property and will vary depending on the specific circumstances and actual work required on each property. Costs associated with the archaeological discoveries on private or public property and compliance with the *Heritage Conservation Act* are not included in the cost estimates.

OPTION 5 - Hybrid: Install shallow gravity sanitary sewer system, with sanitary sewer pumps where necessary. Existing sewer system would carry stormwater.

Option 5: Key Considerations

- Up to three metres has been established as the maximum depth for shallow trench construction.
- This option requires approximately 50% of properties in both catchment areas to install sanitary sewage pumps. Costs will be the responsibility of the homeowner. Backup power generators optional.
- Existing pipe is old and leaks at joints allowing water to enter and escape the pipe.
- Shallow trench excavation is less disruptive to neighbourhoods as it will have a shorter construction timeframe than deep trench construction.
- Sanitary sewage systems require smaller pipe infrastructure (20 cm) than for stormwater infrastructure (60 cm).
- Trench excavation is invasive and may negatively impact mature trees and landscaping on public and private property.
- Shallow trench excavation is less costly than deep trench excavation.
- Existing pipe is more suitable for conveying stormwater than sanitary sewage.

Catchment	Humber	Rutland
Proposed Sanitary Sewer Pumps	60	114
Existing Sanitary Sewer Pumps	10	7
Number of Properties	150	236

Option 5: Cost Estimate	
Total Project cost	$14.6 M
District of Oak Bay cost	$10.3 M
Range of costs to homeowners with new pump system	$17K* to $20K*
Range of costs to homeowners not requiring new pump system	$5 K* to $8 K*

Note that this assumes 17 existing pumped connections and 40 existing gravity connections can be re-used.

*Homeowner cost estimates are based on a general assessment of the work required on private property and will vary depending on the specific circumstances and actual work required on each property. Costs associated with the archaeological discoveries on private or public property and compliance with the *Heritage Conservation Act* are not included in the cost estimates.

OPTION 6 - Hybrid: Install shallow gravity sanitary sewer system, with localized community sanitary sewer pumping stations where necessary. Existing sewer system would carry stormwater.

Option 6: Key Considerations

- Up to three metres has been established as the maximum depth for shallow trench construction.
- Fewer properties in both catchment areas will require sanitary sewage pumps than in Option 5. Costs will be the responsibility of the homeowner. Backup power generators optional.
- Existing pipe is old and leaks at joints allowing water to enter and escape the pipe.
- Two new municipal sanitary sewer pump stations would be installed with the costs carried by the District of Oak Bay.
- Shallow trench excavation is less disruptive to neighbourhoods as it will have a shorter construction timeframe than deep trench construction.
- Sanitary sewer system requires smaller pipe infrastructure (20 cm) than stormwater infrastructure (60 cm).
- Shallow trench excavation is less costly than deep trench excavation.

Catchment	Humber	Rutland
Proposed Sanitary Sewer Pumps	**40**	**96**
Existing Sanitary Sewer Pumps	**10**	**7**
Number of Properties	**150**	**236**

Option 6: Cost Estimate	
Total Project cost	**$15.4M**
District of Oak Bay cost	**$11.6M**
Range of costs to homeowners with new pump system	**$17K* to $20K***
Range of costs to homeowners not requiring new pump system	**$5K* to $8K***

Note that this assumes 17 existing pumped connections and 40 existing gravity connections can be re-used.

*Homeowner cost estimates are based on a general assessment of the work required on private property and will vary depending on the specific circumstances and actual work required on each property. Costs associated with the archaeological discoveries on private or public property and compliance with the *Heritage Conservation Act* are not included in the cost estimates.

ATTACHMENT 3
PUBLIC ENGAGEMENT OVERVIEW

Context

Separating the combined sanitary and stormwater sewers is a provincially mandated initiative for the purposes of eliminating raw sewage overflows at the Humber and Rutland pump stations in the Uplands subdivision. Overflows occur when there are heavy rains and stormwater overwhelms the capacity of the pump infrastructure.

The unique layout and topography of the Uplands subdivision presents a formidable challenge to identifying an infrastructure solution that will achieve the environmental requirements of the provincial government while balancing off the key consideration of affordability for the District (all Oak Bay homeowners), and for property owners impacted by the final decision for whom there will be addition cost implications.

McElhanney Consulting Services Ltd (Consultant) was retained by the District to undertake a pre-design study that resulted in six options to achieve sewer separation in the Uplands neighbourhood. To help guide and inform Council's decision, District staff and project consultants were asked to seek input from residents of Oak Bay. While this project will take place in the Uplands neighbourhood, it has cost implications for all taxpayers in the municipality.

Public Engagement Objectives

To ensure that all Oak Bay residents:

- understand the need for the project;
- have access to clear and accurate project information in a format that is accessible and easily understood;
- have access to the consulting engineers and District staff in person, by phone and online;
- are encouraged to bring forward questions and concerns to enable meaningful discussions that test project assumptions; and,
- have an opportunity to record their opinions and that this personal feedback will be received by Council.

To ensure that the consulting engineers and District Staff:

- understand how each option presented impacts all residents of Oak Bay;
- have the opportunity to meet property owners and discuss a highly technical project in plain language over a period of time;
- have the opportunity to listen to residents and to respond directly to questions and concerns;
- hear directly from residents what project considerations and impacts are most important;
- identify gaps in the information presented and respond appropriately and in a timely manner; and,
- incorporate public opinion and ideas, as appropriate, in any modifications to the options presented for Council's consideration.

Engagement Overview

Action Taken	Outreach	Details
Article introducing the project: Oak Bay News	November 2	Article referenced Open House schedule and call to action to become informed
Open House flyers posted throughout community	Oak Bay Recreation Centre Henderson Recreation Centre Learning Resource Centre Library Monterey Centre Windsor Park Municipal Hall	Flyer attached for reference
Open Houses (5) *see flyer/ad	Saturday Nov. 7 : • Oak Bay High School Tuesday Nov. 10 • Royal Victoria Yacht Club Friday Nov 20 and Saturday Nov 21 • Uplands Campus (Henderson Road) Monday Nov 30 • Municipal Hall	Five Open Houses were hosted by the District 247 people attended 26 presentation boards were created to share with the public 75 per cent of attendees were residents from the Uplands neighbourhood Additional Open House was added to the schedule for November 30th to encourage more attendance
Advertisement of Open Houses in Oak Bay News	October 30 November 4, 13, 18, 20, 27	Ad is attached for reference
Open House handouts	Frequently Asked Questions, Option Summaries with cost estimates, and hard copies of the Public Opinion Survey	Handouts were available at each Open House, on line and in hard copy at the Municipal Hall
District of Oak Bay website:	Home page Spot Light link Promoting Open Houses with link off the home page to all project information and public opinion survey	All information presented at the Open Houses was made available on the District's website along with two archeology reports, and the Project Manager's reports to Council
Presentation material at Municipal Hall	A complete set of the Open House presentation boards were available at the Municipal Hall to address resident's questions and concerns.	Project Manager was available by phone and email to respond to technical inquiries

Public Opinion Survey	Hosted on the District of Oak Bay's website link from the home page From the website, the survey could be filled in on line or downloaded/printed and returned to the Municipal Hall Available in hard copy at the Open Houses and at the Municipal Hall	Public Opinion Survey (Survey) was available between November 9 and December 11 Online Survey linked to Open House project information Survey was restricted to one IP address per respondent Deadline was extended to encourage more participation 117 respondents total
Oak Bay News Editorial promoting the survey	November 25	
Oak Bay News advertisement: Call to action for the Public Opinion Survey	November 18 and 20	117 survey submissions were received by the deadline of December 11
Public access to Project Manager and communications staff:	The Project Manager and the communications project team member were identified as project contacts. Both responded to resident inquiries that came to the District by phone, email and formal correspondence. Ongoing	
Social media	District of Oak Bay's twitter account	Followers retweeted call to action to get engaged
Dedicated Committee of the Whole Meeting February 2	Project update from the Project Manager and report out on the Public Engagement Opportunity for Oak Bay residents to speak directly to Council	Reports posted on the District website on January 27th

Public consultation and engagement on this important Oak Bay project focussed primarily on Open Houses, a Public Opinion Survey and the District web site which served as the "go to" source for all project information. All attendees at the Open Houses and Survey respondents gave generously of their time and their knowledge to help inform Council's decision. Their important contributions identified several themes as well as new information for consideration. While there were some very disparate opinions, there was a common desire for Council to make an informed decision that everyone can live with.

Open Houses

Five Open Houses were held throughout the month of November: two in North Oak Bay, two in South Oak Bay and one in the Uplands neighbourhood. The Open House format was chosen as it provided the public with an invitation to learn about the project from project engineers and District staff, and to have questions and concerns addressed directly in an informal format over a period of time. Residents were encouraged to provide feedback and insight as well as to identify information gaps, and test assumptions. The six options were represented along with key features and considerations for each option. Residents were asked to register and record their address. While not everyone who attended registered, the vast majority of residents who did were property owners directly impacted by the project. Some residents who attended the Open Houses were also gathering information for neighbours and a few of these mentioned specifically that their neighbour was elderly and unable to attend in person.

Twenty six presentation boards were distributed throughout the venue. In attendance to speak about the project with Oak Bay residents: McElhanney Consulting project engineer, Project Manager (engineer), District engineering and public works staff, District CAO, and the CRD's Aboriginal Liaison Officer and project communications consultants. Council members attended one or more of the Open House sessions to review the material with the project team, and to engage with residents. Hard copies of the public opinion surveys were set out on tables and people were encouraged to complete the survey at the Open House or take it home, and complete it there.

All Open House presentation materials and project related reports can be found at: https://www.oakbay.ca/municipal-hall/plans-reports/uplands-sewer-separation/story-boards#sthash.lgO10yll.dpuf

Project Information	Humber and Rutland Catchment Areas	Six Options: Cost Estimates
Why Are We Doing This? The Heritage Conservation Act What is a Blanket Heritage Inspection Permit? Why Easements are Excluded from the Project Solutions Sanitary Sewer Pumps Stormwater Management on Municipal Property Public Feedback: We Want to Hear From You! – See more at:	Project Site Plan Existing: Humber – Combined Sanitary Sewage and Stormwater System Existing: Rutland – Combined Sanitary Sewage and Stormwater System Easements: Humber Easements: Rutland. Possible Community Stormwater Storage Locations	Option 1: Humber Option 1: Rutland Option 2: Humber Option 2: Rutland Option 3: Humber Option 3: Rutland Option 4: Humber Option 4: Rutland Option 5: Humber Option 5: Rutland Option 6: Humber Option 6: Rutland Cost Estimates Summary for 6 Options

Hand out materials available at the Open House sessions and on the District website included:

- Frequently Asked Questions
- Brochure from the provincial government archeology branch
- Summary document of the six options reflecting costs
- Hard copies of Public Opinion Survey (Strategic Initiatives Inc.)

The Public Opinion Survey was also online and public feedback was collected by staff during the Open Houses. In addition, Project staff were identified at Municipal Hall as well as on the District website to assist with residents' concerns, questions and requests for more information.

Public Opinion Survey (the Survey)

The District engaged Strategic Initiatives Inc. (SII), a local survey firm to assist with the gathering and analysing of public opinion among Oak Bay residents. The purpose of the Survey was to help the District gather feedback from residents of Oak Bay about the six options under consideration to separate the combined sanitary sewer and stormwater system in the Uplands neighbourhood. A total of 117 residents completed the Survey, and the vast majority of the respondents lived in one of the two project catchment areas in the Uplands neighbourhood. See Attachment 4: *The Uplands Combined Sewer Separation Project – Report on Survey Research.*

The low public response and interest in the Survey is difficult to explain given how widely advertised it was through mainstream media as well as in high traffic areas in the community. It may be that Oak Bay residents were provided with sufficient information and are prepared to accept Council's eventual decision. It may be that some of our senior residents may not be comfortable with, or able to access online data. Alternatively, it may be that the highly technical nature of this project is an explanation for the low public uptake. The public may have found it challenging to review and process the significant amount of information provided in order to complete the Survey. Without the benefit of attending an Open House to engage directly with the information and project staff, the online format may have been daunting for some. In addition, the online Survey required that the respondents complete it in one sitting, and there was no mechanism to save the survey and start again. While only five residents recorded problems with the Survey with SII or the project team, it is possible that many more tried and gave up.

Anticipating these potential challenges in advance, information was provided on the Survey directing residents to seek assistance from SII, and efforts were made to provide broader access to the Survey other than just online. A hard copy of the Survey was available as a PDF for downloading off the District's project webpage, and hard copies were available at each Open House as well as at the Municipal Hall. Advertisements and a project editorial in the Oak Bay News focused attention on the Open Houses and the Public Opinion Survey inviting residents to attend, and informing residents that hard copies of the Survey were available for downloading or could be picked up at one of the Open Houses or Municipal Hall. Of the 117 completed Surveys, 60 were submitted in hard copy.

There is a high correlation between the Survey results and the opinions expressed in conversation at the Open Houses. While all six options are technically feasible, this is a very challenging project for everyone involved and as such, each option evokes strong opinions – both for and against – depending on how the project impacts the resident respondent (directly, as a homeowner living in the project area; or indirectly, as a taxpayer living outside of the project area).

It is significant to note that the total number of Survey respondents disproportionally represents property owners living in the Humber and Rutland catchment areas of the Uplands neighbourhood – homeowners whose properties are most likely to be impacted by this project. While the Survey findings must be interpreted within this context, several conclusions, however, can be drawn from the data.

What We Heard – Survey and Open House Themes

Affordability

The most important project consideration for property owners living in Oak Bay was affordability (costs to property owners living in the Uplands AND to property owners living outside of the Uplands neighbourhood).

For property owners living in the Uplands, minimizing costs related to necessary work on their properties as well as ongoing operations and maintenance costs were the most important considerations.

For property owners living in neighbourhoods outside of the Uplands, minimizing the capital costs to the District was the most important consideration. Knowing how the District is going to finance this project and over what timeframe was linked directly to these concerns, as was ensuring that the decision reflects the best interests of all tax payers.

Almost half of the Survey respondents (44.4%) took advantage of the opportunity to respond to the open-ended question asking what other considerations that they would like to bring to Council's attention. In this section, concern was raised regarding the absence of life cycle costs for each option and the need for these numbers to be shared with the public. Several respondents asked that Council look at the lowest long term costs over the entire life-cycle of the system. Concern was also raised regarding the risk of escalating costs on a project of this magnitude. Some residents inquired if the District would be supplying the pumps to the residents if the option chosen required the property owner to have a pump (as was considered in 2010), and for the District to consider financial concessions given the overall cost implications for impacted property owners.

At the Open Houses and in the Survey, cost estimates were presented for impacted property owners in the Uplands neighbourhood specific to each option. It was pointed out by some that these estimates are not representative of the actual costs to be borne by homeowners given the complex features and amenities on each property. The actual costs were anticipated to be significantly higher for some residents.

While the Survey data indicates that impacted property owners in the Uplands neighbourhood strongly favour a deep gravity solution, given the feedback regarding the unrealistic cost estimates from some property owners, a deep gravity solution could have far greater cost implications than costs associated with installing a pump system that requires less invasive installation requirements. Bringing these divergent project considerations together may influence the opinions of some impacted property owners.

Most Environmentally Appropriate Use of Existing Pipe

Property owners throughout Oak Bay were somewhat aligned with a decision that would see the most environmentally appropriate use of the existing pipe. If the existing pipe is to remain a sanitary sewer, then consideration must be given to addressing concerns of a leaky pipe.

Some residents at the Open Houses assessed each option against achieving the goal of reducing raw sewage overflow in a timely manner. Options that reflect a new stormwater sewer would have an immediate impact on overflows as each homeowner connected. Options that reflect a new sanitary sewer would require the entire neighbourhood to hook up before any environmental impact would be achieved.

Ensuring Project Is Completed In a Timely Fashion

Property owners outside of the Uplands neighbourhood favoured a timely completion of the project more so than residents of the Uplands. Written comments however linked the timely completion of the project to affordability and a strong concern for cost overruns if the project dragged on. How the project will be financed is a primary concern.

Several respondents to the Survey explored how compliance could be achieved over a period of time. An observation was made that if the District cannot wait for the natural cycle of renovation and rebuild to modernize the drainage systems of existing older homes, then Option 4 is the only option as affected houses could continue to direct sanitary sewage to the older existing sewer, and redirect rainwater to onsite stormwater management or a new stormwater sewer as it is installed.

Negative Reaction to Pumps

The majority of respondents to the Survey, and in anecdotal information from conversations at the Open Houses, clearly indicated strong support for deep gravity Option 1 as the preferred solution. Option 3, where 100 per cent of homes in the impacted area have pumps, received little support. Concerns expressed about pumps included complications of prolonged power outages (risk of sewer back up and stormwater flooding), and costs of purchasing, installing and maintaining pumps and generators.

The importance of perceived fairness was also noted from two very different perspectives:

- Many Uplands property owners impacted by the project felt that gravity service should be maintained as the priority for the District. Others indicated that if a pump system was going to be introduced, the District should contribute to the costs. Some Uplands residents alleged a possible negative impact on property values should pumps have to be installed.
- For property owners living outside of the Uplands, concerns were raised about the capital costs of the options being borne by all Oak Bay residents. Of importance was the need to ensure that the decision reflects the best interests (affordability) of all taxpayers and not just the wishes of those directly impacted citing that the vast majority of Oak Bay taxpayers live outside of the Uplands neighbourhood.

Discussions at the Open Houses were supported by presentation materials that included a comprehensive mapping of water and sewer infrastructure, background and contextual information, as well as a map of the Uplands showing homes that have existing stormwater and or sewer pumps.

District staff noted that several homes throughout Oak Bay have pumps, and new homes under construction, particularly those that have deep basements may have pump support for sanitary and/or stormwater services. This includes homes under construction and recently constructed homes in the Uplands neighbourhood.

Preferred Options

Property owners living in the Uplands preferred Option 1 (deep gravity new sanitary sewer) and least preferred Option 3 (100 per cent pumps).

Property owners living outside of the Uplands preferred Option 3 (100 per cent) pumps and least preferred Option 1 (deep gravity new sanitary sewer).

These findings reflect the financial impact of this project on each property owner.

For both Uplands property owners and property owners living outside the Uplands, the differences in average rankings of the remaining technical options were not significant (see figure 17, Attachment 4: *Uplands Combined Sewer Separation Project – Report on Survey Research*).

The majority of respondents indicated their preference for a new sanitary sewer system while noting the existing pipe leaks and is therefore, more appropriate for stormwater. The Survey comments also noted that a new stormwater management system may be the only solution that allows for a reduction in overflows (environmental impact) in a timely fashion.

What We Heard – Open Houses and Surveys

The opportunity to discuss this project directly with Oak Bay residents at the Open Houses, and in following up on inquiries provided valuable information. Most attendees acknowledged that stopping raw sewage discharge onto local beaches is an important goal.

During the five Open Houses, residents raised concerns, provided new information, and suggested alternative considerations. Those who attended from the Uplands neighbourhood had detailed questions specific to their properties and sought detailed information beyond what is currently available due to the restricted scope of the discovery/options exercise. Having access to more specific information in order to make an informed decision from the perspective of the impacted property owners in the Uplands was identified as an underlying concern. Residents were informed that more information specific to their property will be available to the public at the next stage of detailed design.

The following concerns and comments were raised in the Survey and the Open Houses:

- **Some residents strongly advocate for taking responsibility for stormwater management on their properties arguing that the large property footprints would allow for this and that returning stormwater to the ground is the most desirable solution.**
  This has been addressed in the Consultant's report.

- **The decision regarding the exclusion of the easements was challenged repeatedly and recommendations were made identifying directional drilling as a possible viable solution allowing the activation of easements.**
  This has been addressed in the Consultant's report.

- **There was recognition that many older homes throughout Oak Bay still have a combined sewer connection (homeowners who have not/ may not have separated stormwater from sanitary sewer from the home to the street). Discussions included the fair and equal treatment for all Oak Bay residents (incentives and compliance).**
  This has been addressed in the Consultant's report.

- **There was recognition that small areas exist in other Oak Bay neighbourhoods where separate stormwater services have not yet been installed. Discussions included the fair and equitable treatment for all Oak Bay residents (incentives and compliance).**
  This has been addressed in the Consultant's report.
- **There was recognition that more information was needed with regard to the archeological implications of this project on impacted property owners in the Uplands.**
  This has been addressed in the Consultant's report. The provincial government's archeology branch is the source for this information.
- **The question as to whether or not residents will be forced to install a pump, hook up appropriately or unhook appropriately was raised.**
  How to proceed with compliance has been addressed in the Consultant's report.
- **Protect the mature landscape and trees on private and public property.**
  This has been addressed in part within the Consultant's report under the section that discusses easements.

Other public comments captured for Council's consideration include:

- District should explore the opportunity to share capital costs of the project with other utilities such as BC Hydro, BC Tel and FORTIS BC.
- Concern whether or not the District would play a role in coordinating construction work on private property as well as public property.
- Some residents, particularly seniors, may not have adequate financial resources to comply with this initiative.
- Some homeowners living in the Uplands have already invested in separating stormwater and sanitary sewer to the property line (as directed by the District) and have paid for their connection to the combined system. Some may have to invest again to install a pump, or invest again to connect to the selected option.
- The decision making process that will arrive at a single option recommendation for Council should include local representation (Oak Bay residents including Uplands property owners).
- The final decision should reflect a long-term view (a solution that will last another 100 years).
- A new stormwater management system may be the only solution that allows for a reduction in overflows (environmental impact) in a timely fashion.
- The final decision should account for climate change which is going to have a significant impact on stormwater management.
- Concern was expressed over the negative cumulative impact of stormwater discharge to the Salish Sea. While not a requirement under the current provincial government regulation, the impact of urban discharges is a growing significant issue.

Some respondents/attendees inquired about an Option 7, and suggested other solution considerations:

- **Is this the opportunity to have 100 per cent gravity service in the Uplands?**
  This has been addressed in the Consultant's report.

- **Why is the focus of this project on one single solution being applied to both catchments? Given that the topography is different in each catchment, is it possible that each catchment area has solutions that are unique to the area and perhaps more cost effective?**
  The Consultant has advised that the two catchment areas have very similar characteristics. While this possibility (different solutions for each catchment) hasn't been explored at this stage, it could be considered at the detailed design stage.

- **Could the existing pressurized water supply be re-purposed for an appropriate use?**
  The Consultant has advised that water mains could theoretically be re-usable as a pressure sewer system, in this case however, the water main diameters are too large and would result in anaerobic conditions due to long travel time through the system. In addition, a new water distribution system would be needed to replace the existing one. The cost of this approach would exceed that of Option 3, which is a pressure sewer system but with a smaller diameter pipe than that required for a new water distribution system.

- **Is it possible to address overflows by enlarging the two pumping stations?**
  This was reviewed during an earlier study by engineering firm Kerr Wood Leidal and Associates, and was deemed to be impractical and unaffordable. It would require changes to the primary East Coast interceptor infrastructure.

Public feedback through the public engagement initiatives suggest that Council will need to reconcile the competing desires and values of taxpaying residents whose properties will be directly impacted by this project, with those desires and values of Oak Bay taxpayers living in neighbourhoods outside the project area. Finding a solution that everyone can live with is the goal.

Attachment 4: *The Uplands Combined Sewer Separation Project – Report on Survey Research*

OAKBAYNEWS

Oak Bay serious about Uplands sewer solutions

by Christine van Reeuwyk - Oak Bay News
posted Nov 2, 2015 at 4:00 PM

Oak Bay's provincially mandated sewer separation project in Uplands primarily needs public input to make a next move.

The Uplands neighbourhood currently has a single pipe system to convey both sanitary sewage and storm water.

During heavy rainfall, the volume of water exceeds the capacity of the system, sending overflows into the ocean at the Rutland and Humber pumping stations.

"The idea is to resolve the outflows to the beach," said Oak Bay Mayor Nils Jensen.

Separation is also required to comply with BC's Municipal Wastewater Regulation that all municipalities have separate stormwater and sanitary sewer systems.

Oak Bay plans to mandate sewer separation and connection to the separated municipal sewers when available for new homes in Uplands, to mandate sewer separation for homes undergoing renovations of $100,000 or more and connection to the separated municipal sewers when available and to update its permit fees to reflect current costs.

"We are looking at incentives for homeowners," Jensen said. "Our goal is to create an incentive for people already separated, to hook up."

Oak Bay will consider a policy to cover the cost of connecting properties with sewers separated prior to the municipality separating the combined sewers. Those costs would be included in the sewer separation construction contracts.

Because the district has for several years required property owners in the Uplands to separate their services during major renovations or building a new home, 12 per cent of the homes in the Rutland catchment and 39 per cent of the homes in the Humber catchment have separated sewers to the property boundary.

In May, the district hired McElhanney Consulting Services, which developed of six possible options to separate the sewer system. All six assume easements through private property are not in play.

Those easements would uproot significant trees and other green growth in swaths of five metres.

"By staying out of these easements more homes would have more pumps," said water management consultant Jack Hull.

However, using the existing easements would significantly add to both cost and time, including negotiating two additional metres of easement with private landowners (currently three metres, five are required) as well as devastating five metres of established trees and foliage.

Options include adding a deeper gravity system alongside the existing system; new pumped low-pressure system alongside the existing system; a new shallow-gravity storm water system with municipal pumping stations for roadway runoff; and a hybrid of shallow system pumped where necessary using the existing system.

A series of four public information sessions is planned:

- **Saturday, Nov. 7 from 2 to 5 p.m.** in the Neighbourhood Learning Centre, Oak Bay High;
- **Tuesday, Nov. 10 from 5 to 8 p.m.** at the Royal Victoria Yacht Club (3475 Ripon Rd.);
- **Friday, Nov. 20 from 5 to 8 p.m.** at Uplands Campus;
- **Saturday, Nov. 21 from 2 to 5 p.m.** at Uplands Campus (3461 Henderson Rd.)

The plan is to present information to attendees then solicit feedback, said communications consultant Kathi Springer.

Information boards will show homes already with separated sewers to their property boundary and homes with pumps for the Humber and Rutland catchment areas.

They will also outline the six options as presented to council, with the addition of associated cost estimates which council has not yet seen. "We see this process as an education process," Springer said, adding there will also be physical pumps on hand for residents to see.

Residents can also offer written comments at the meetings or to the municipality by Dec. 4.

Information is online at oakbay.ca.

"The cost will impact the whole community," Jensen said.

Council expects a report in January that incorporates the public feedback and cost estimates.

OAKBAYNEWS

Uplands sewer separation affects all residents

posted Nov 25, 2015 at 9:00 PM

Final open house Monday, Nov. 30

The recent heavy rain storms are a stark reminder of the responsibility the District of Oak Bay and our citizens have under the provincial government's Municipal Wastewater Regulation to separate the existing combined stormwater and sanitary sewer system in the Uplands neighbourhood.

We are obliged to separate the two pipes because combined flows during heavy rains overwhelm the two pump stations at Humber Road and Rutland Road, and raw sewage overflows in the shallow ocean waters.

When the Uplands neighbourhood was designed over a century ago, a network of easements was introduced along the sides and backs of properties where the single pipe infrastructure was placed, maximizing the influence of the area's topography to allow for a gravity system. A wider easement would be required to install a second pipe and the wider easement would have to be cleared of all vegetation and fences. The six options being examined exclude the use of easements in the solutions.

This month, more than 200 Oak Bay residents attended one or more of the four open houses to review the options and test assumptions directly with project engineers and district staff. We are fortunate to have many residents with expertise, and this opportunity to convene around this project has allowed for constructive dialogue that will help strengthen a recommendation to council in the new year. Conversations to date have touched on the merits and challenges of trench construction, the capital costs to Oak Bay taxpayers, the possibility of directional drilling, the opportunity for stormwater management solutions and the desire to see a solution that takes a long-term view with maximum environmental and community benefit.

This is a complex infrastructure initiative that requires careful and thoughtful consideration of project benefits and impacts. It's not easy and we want to hear from you. Council is grateful to all those who have given their time, expertise and passion to this important project to date, and the district is hosting one more open house Monday, Nov. 30 from 5 to 8 p.m. at the municipal hall.

If you're unable to attend in person, all information presented at the open houses is on the district's website, including a public opinion survey that can be downloaded or completed online. The online survey is also available in hard copy at the municipal hall and will be at the open house. All project surveys must be completed and handed in by Dec. 4. While this project will take place in the Uplands over several years, the capital costs on municipal property will affect everyone.

Options being examined reflect a range of total project capital costs from $13.9 million to $20.7 million. Options include:

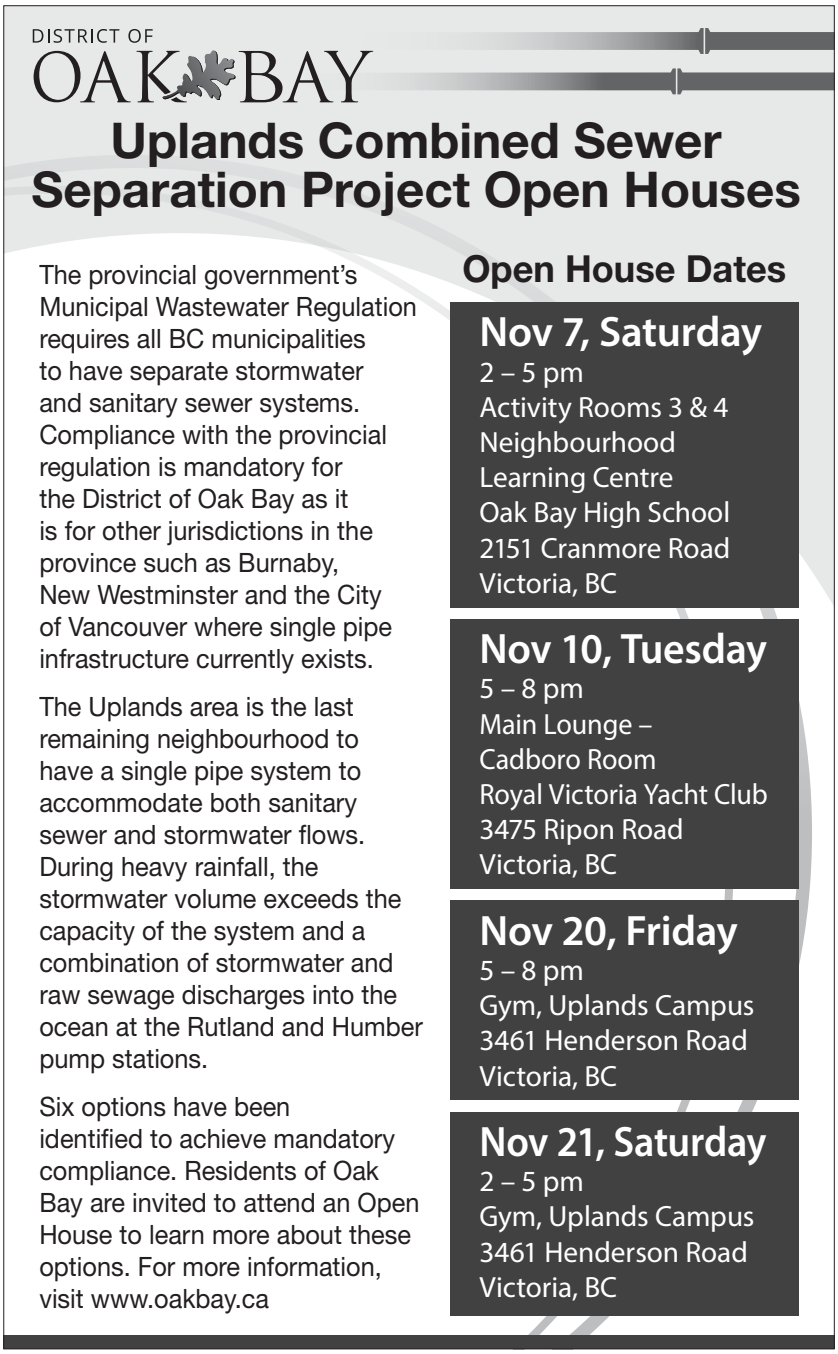
- A new deeper gravity sanitary sewer system. The existing pipes would carry stormwater;
- A new deeper gravity system for storm water. The existing pipes would carry sanitary sewage;
- A low-pressure shallow sanitary sewer system. The existing pipes would carry stormwater;
- Shallow, gravity stormwater sewers pumped where necessary. The existing pipes would carry sanitary sewage;
- Shallow, gravity sanitary sewer system pumped where necessary. The existing pipes would carry stormwater;
- Shallow gravity sanitary sewer system with community sanitary pump systems where necessary. The existing pipes would carry stormwater.

Further community engagement will take place in January followed by the finalization of the technical report. A recommendation from district staff for a single option will be presented to council in the new year for consideration and decision.

The project will proceed to detailed design in 2016. It's anticipated this project will be phased in over several years based on available funding. Compliance with the provincial regulation is mandatory for the District of Oak Bay as it is for other jurisdictions in the province.

Visit the district website at oakbay.ca to view the project information and complete the survey. Council thanks you for your time and attention on this important project. We want to hear from you.

Nils Jensen,
Mayor, District of Oak Bay


DISTRICT OF
OAK BAY
Uplands Combined Sewer Separation Project Open Houses
The provincial government's Municipal Wastewater Regulation requires all BC municipalities to have separate stormwater and sanitary sewer systems. Compliance with the provincial regulation is mandatory for the District of Oak Bay as it is for other jurisdictions in the province such as Burnaby, New Westminster and the City of Vancouver where single pipe infrastructure currently exists.
The Uplands area is the last remaining neighbourhood to have a single pipe system to accommodate both sanitary sewer and stormwater flows. During heavy rainfall, the stormwater volume exceeds the capacity of the system and a combination of stormwater and raw sewage discharges into the ocean at the Rutland and Humber pump stations.
Six options have been identified to achieve mandatory compliance. Residents of Oak Bay are invited to attend an Open House to learn more about these options. For more information, visit www.oakbay.ca
Open House Dates
Nov 7, Saturday
2 – 5 pm
Activity Rooms 3 & 4
Neighbourhood Learning Centre
Oak Bay High School
2151 Cranmore Road
Victoria, BC
Nov 10, Tuesday
5 – 8 pm
Main Lounge – Cadboro Room
Royal Victoria Yacht Club
3475 Ripon Road
Victoria, BC
Nov 20, Friday
5 – 8 pm
Gym, Uplands Campus
3461 Henderson Road
Victoria, BC
Nov 21, Saturday
2 – 5 pm
Gym, Uplands Campus
3461 Henderson Road
Victoria, BC

DISTRICT OF
OAK BAY

Uplands Combined Sewer Separation Project Open Houses

We Want To Hear From You!

The District of Oak Bay would like to hear from residents of Oak Bay on the six options under consideration to separate the combined sewer system in the Uplands neighbourhood as mandated by the provincial government under the Municipal Wastewater Regulation.

Please join us at the Open House **November 30** or go to the District's website **www.oakbay.ca** to review all the Open House Presentation materials and to complete a short online survey.

This survey will help inform Council's decision-making moving forward.

The provincial government's Municipal Wastewater Regulation requires all BC municipalities to have separate stormwater and sanitary sewer systems. Compliance with the provincial regulation is mandatory for the District of Oak Bay as it is for other jurisdictions in the province such as Burnaby, New Westminster and the City of Vancouver where single pipe infrastructure currently exists. The Uplands area is the last remaining neighbourhood to have a single pipe system to accommodate both sanitary sewer and stormwater flows. Six options have been identified to achieve mandatory compliance.

Open House

November 30, Monday

5 – 8 pm
Oak Bay Municipal Hall
2167 Oak Bay Ave., Victoria, BC

DISTRICT OF
OAK BAY

Uplands Combined Sewer Separation Project

We Want To Hear From You!

Survey Deadline Extended to Midnight, Friday, December 11

www.oakbay.ca

Access the survey from the homepage.

The provincial government's Municipal Wastewater Regulation requires all BC municipalities to have separate stormwater and sanitary sewer systems. Compliance with the provincial regulation is mandatory for the District of Oak Bay as it is for other jurisdictions in the province such as Burnaby, New Westminster and the City of Vancouver where single pipe infrastructure currently exists. The Uplands area is the last remaining neighbourhood to have a single pipe system to accommodate both sanitary sewer and stormwater flows. Six options have been identified to achieve mandatory compliance.

The District of Oak Bay would like to hear from residents of Oak Bay on the six options under consideration to separate the combined sewer system in the Uplands neighbourhood as mandated by the provincial government under the Municipal Wastewater Regulation.

- Go online to **www.oakbay.ca** and follow links to complete an online survey.
- Download a hard copy of the survey **www.oakbay.ca**
- Pick up a hard copy of the survey at Municipal Hall and go online to review the project information.

Hard copies must be returned to Municipal Hall by December 11.

DISTRICT OF
OAK BAY

Uplands Combined Sewer Separation Project

Council is hosting a special *Committee of the Whole* meeting dedicated to the Uplands Combined Sewer Separation Project

Tuesday February 2, 2016

Monterey Recreation Centre
1442 Monterey Avenue – **7:00 PM**

Oak Bay residents are invited to attend this special project update to share views, ideas, concerns and support in relation to six options that are being considered to separate the existing combined sanitary and stormwater sewer in the 465 acre (190 hectare) Uplands subdivision.

A comprehensive staff report will be available on the District website on January 27 along with project materials presented at the Open Houses held in November and December.
www.oakbay.ca

The public is welcome to submit correspondence for inclusion on the agenda to Acting Director of Corporate Services
mjones@oakbay.ca
Deadline for submissions is 3:00 pm on February 2, 2016

About the Uplands Combined Sewer Separation Project:

The provincial government through its Municipal Wastewater Regulation requires all B.C. communities that have single pipe infrastructure to take the appropriate action to separate stormwater flow from sanitary sewage flow. Compliance is mandatory.

ATTACHMENT 4

THE UPLANDS COMBINED SEWER SEPARATION PROJECT – REPORT ON SURVEY RESEARCH

Uplands Combined Sewer Separation Project

Report on Survey Research

PREPARED BY:

STRATEGIC INITIATIVES INC.

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250-381-3376

info@StrategicInitiatives.ca

www.StrategicInitiatives.ca

January, 2016

Executive Summary

- This document reports on the findings from a survey conducted by Strategic Initiatives (SII) on behalf of the District of Oak Bay among Oak Bay residents and/or property owners. The purpose of the survey was to help the District gather feedback and understand opinions from residents of Oak Bay about the six options under consideration to separate the combined sewer system in the Uplands neighbourhood. A total of 117 completed responses were received. Of the 117 respondents, 70% owned property in the Uplands; 95% of these in the Humber/Rutland area.
- Respondents indicated that of the various considerations about which they were asked, the most important were: minimizing operations/maintenance costs to Uplands property owners (78% rated either very important or somewhat important); most environmentally appropriate use of existing pipe (67%); and minimizing capital costs to Uplands property owners (64%). The least important considerations (based on "bottom 2 box" scores, or the percentage of respondents rating the consideration either very unimportant or somewhat unimportant) were: project is completed in a timely fashion (34%); minimize capital costs to the District (32%); and minimize length of neighbourhood disruption (25%).
- Based on respondents' average ratings on a scale from 1 to 5, the most important considerations were: minimize operations/maintenance costs to Uplands property owners (4.2); most environmentally appropriate use of existing pipe (4.0); and minimize capital costs to Uplands property owners (3.9).
- Oak Bay homeowners whose property was not located in the Uplands ("Other OB Homeowners") were significantly more likely than owners of property in the Uplands ("Uplands Homeowners") to rate as important: most environmentally appropriate use of pipe (4.5 vs. 3.8); project is completed in a timely fashion (3.7 vs. 3.0); minimize capital costs to the District (4.6 vs. 2.8); and minimize operations/maintenance costs to the District (4.6 vs. 3.4). Uplands homeowners were significantly more likely than other OB homeowners to rate as important: minimize capital costs to Uplands property owners (4.4 vs. 2.6); and minimize operations/maintenance costs to Uplands property owners (4.6 vs. 2.9).
- Minimizing capital costs to Uplands property owners was rated most important by the largest percentage of all respondents to the survey (26%), followed by minimizing operations/maintenance costs to Uplands property owners (19%); and minimizing capital costs to the District (13%).
- Uplands homeowners were significantly more likely than other OB homeowners to rank as most important: minimize capital costs to Uplands property owners (37% vs. 0%); and minimize operations/maintenance costs to Uplands property owners (26% vs. 3%). Other OB homeowners were significantly more likely than Uplands homeowners to rank as most important: minimize capital costs to the District (45% vs. 2%); and minimize operations/maintenance costs to the District (28% vs. 2%).
- Almost half (44.4%) of those completing the survey took advantage of the opportunity of responding to an open-ended question asking them what other considerations they would like to make Council aware of to comment regarding cost issues – either capital or operating/maintenance. One third (32.5%) of respondents either expressed their strong preference for a gravity-based system, or indicated negative feelings about pumps and generators.
- Option 1 was the technical option preferred by the highest percentage of respondents, with 46% of all those responding to the survey ranking Option 1 first in order of preference, followed by Option 3 (10%) and Option 6 (9%).
- Based on mean ranking scores, Uplands homeowners were significantly more likely than other OB homeowners to rank Option 1 and Option 2 as their most preferred of the six technical options. Other OB homeowners were significantly more likely than Uplands homeowners to rank Option 3 as their most preferred option. The differences between Uplands homeowners and other OB homeowners in their average rankings of the remaining technical options were not significant.
- When asked for the one or two reasons why they preferred the technical option they had ranked "1", almost half of those responding to the survey (47.9%) said their preference was related to gravity systems being "better", or to negative feelings about pumps. More than one third of the responses (35.0%) indicated that the preference for a specific option was related to cost issues. One quarter of respondents (24.8%) related their preference for their first choice option to their concern that the current pipe be used for storm water and the new pipe be used for the sanitary system. Less than one quarter of people (17.1%) preferred their first choice option because they perceived it as less disruptive.

Contents

Introduction and Background

This document reports on the findings, conclusions and indicated actions from a survey conducted by Strategic Initiatives (SII) on behalf of the District of Oak Bay. The survey was conducted among Oak Bay residents and/or property owners between November 9 and December 11, 2015 in order to help the District gather feedback and understand opinions from residents of Oak Bay about the six options under consideration to separate the combined sewer system in the Uplands neighbourhood, as mandated by the provincial government under the Municipal Wastewater Regulation. Responses to the survey will help inform Council's decision-making moving forward.

The survey instrument (questionnaire) was developed by Strategic Initiatives in close collaboration with the District of Oak Bay. In addition to seven closed-ended questions, the survey included two open-ended questions. Responses to the survey questions are summarized within this report. A spreadsheet including all the responses received to the open-ended questions, verbatim, is attached as appendix 1.

The online survey was hosted by Strategic Initiatives. Respondents were directed to the online survey via a clickable link on the Oak Bay website, by mentions at open houses and via social media. Paper copies of the survey were distributed at open houses and at the Oak Bay municipal offices, for those preferring to complete the survey in hard copy. A link to a downloadable hard copy version of the survey was also included on the Oak Bay website.

Of the total of 117 completed surveys, 60 were submitted in hard copy. Hard copy responses were entered into the survey software by Strategic Initiatives. Responses to open-ended questions submitted in hard copy were transcribed, verbatim, into the survey software.

Once data collection and data entry of the hard copy surveys was complete, the raw data were cleaned and tabulated. Responses to open-ended questions were coded and tabulated. Cross-tabulations were run to calculate responses to each question in the online survey according to whether respondents owned property in the Uplands. (Unfortunately, due to the small sample size, it was inappropriate to cross-tabulate responses by other variables.) Significance tests were performed at the 95% confidence level (described in the report as “significantly more likely”). Statistically significant differences between Uplands property owners and non-owners have been called out in the report. Otherwise, the reader may assume that no statistically significant differences were observed.

With a sample size of 117, survey results are accurate to within an estimated margin of error of ±9.06% at a 95% level of confidence (i.e. 19 times out of 20).

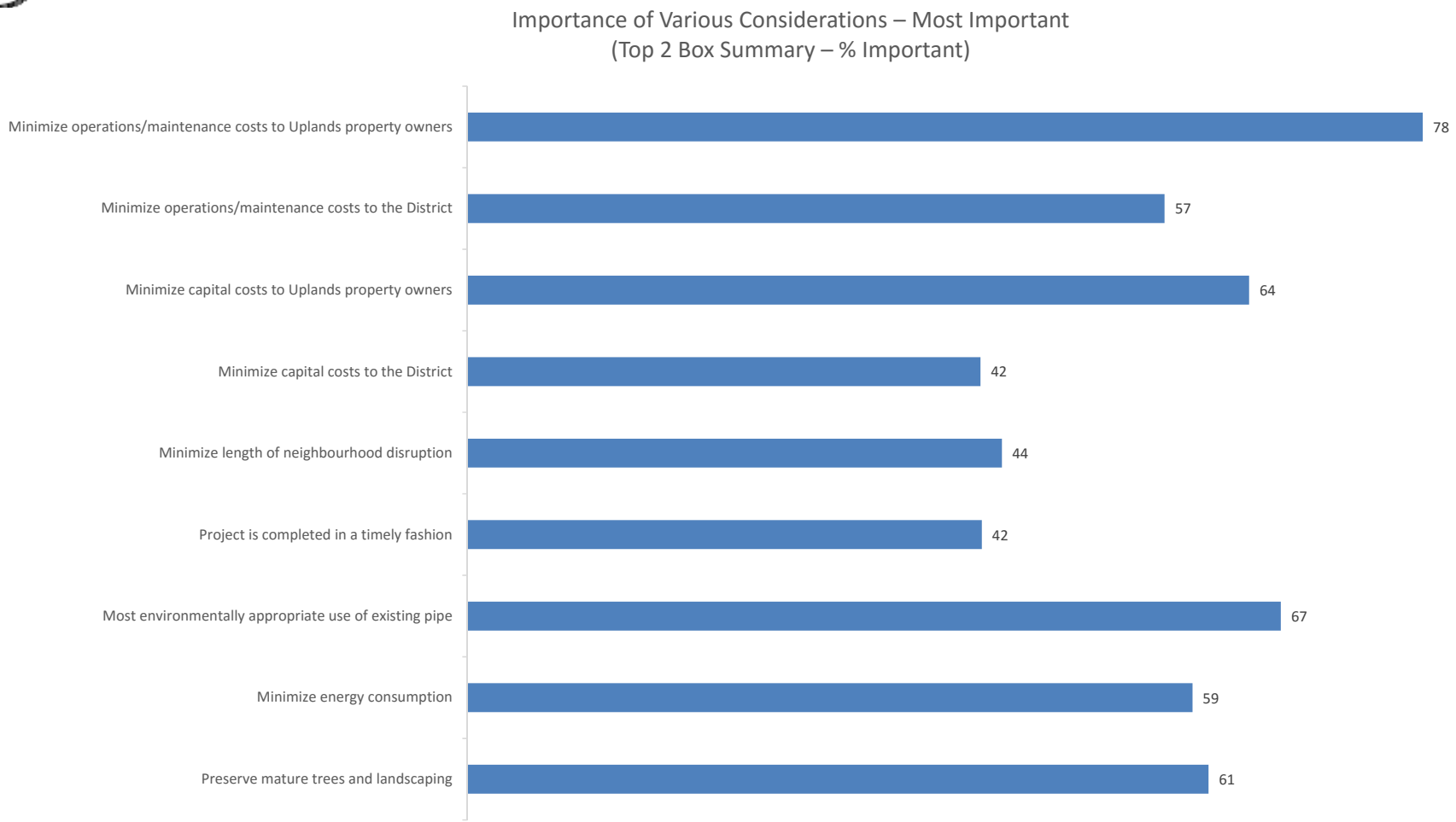
Respondent Demographics

The first four questions of the survey (Q1 through Q4) were used to screen and classify respondents. Individuals who were not either residents of Oak Bay or Oak Bay property owners were disqualified from completing the survey.

The base of 117 survey respondents broke down as follows:

- 93% of those beginning the survey identified themselves as residents of Oak Bay;
- 93% of all respondents said they owned property in Oak Bay;
- 70% of Oak Bay property owners indicated their property was in the Uplands (82 respondents); and
- 95% of Uplands property owners said their property was located in the Humber/Rutland catchment area (78 respondents).

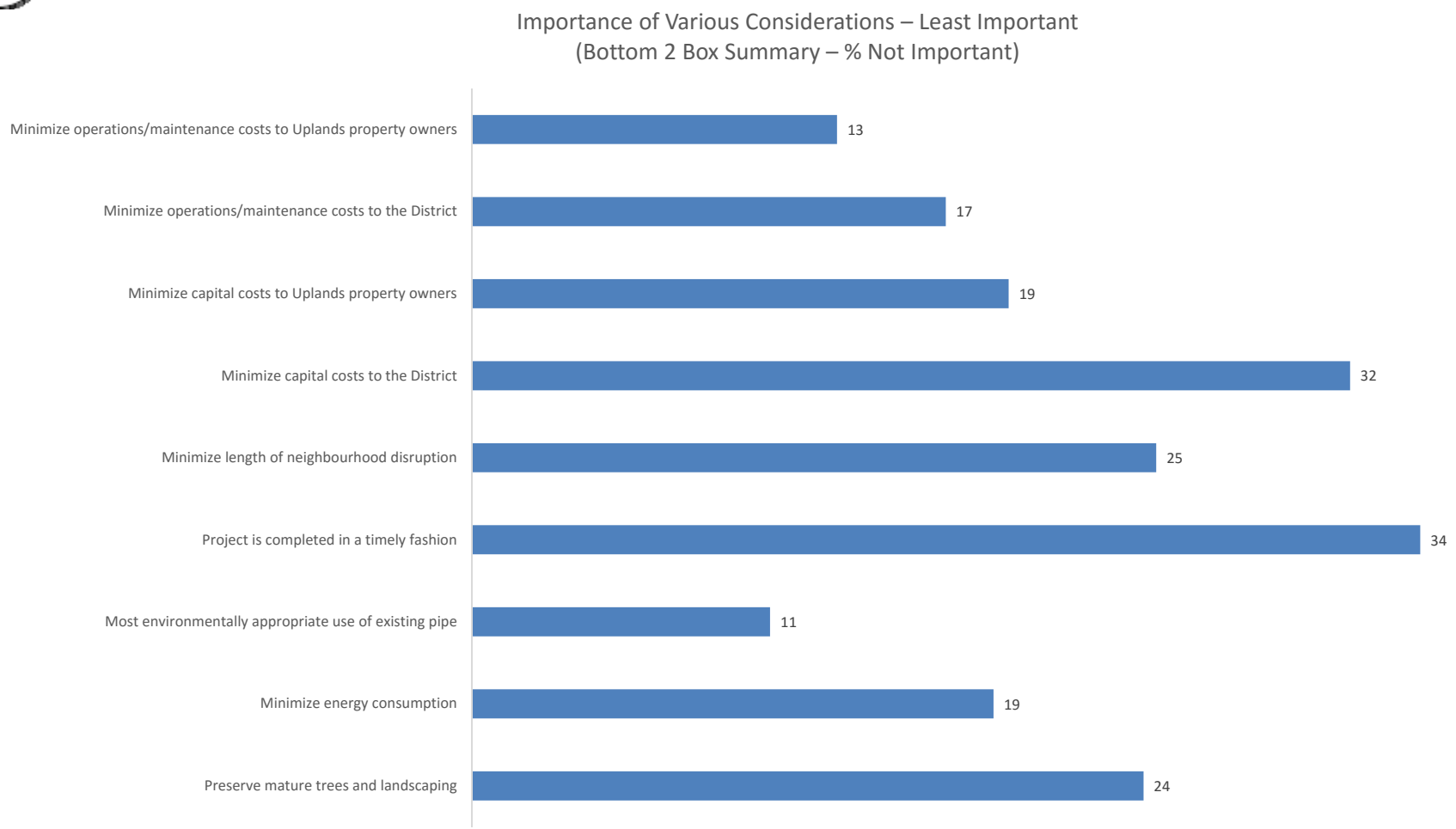
Overall Importance of Various Considerations



Q5 Council will be weighing a number of considerations as it determines how best to comply with the provincial government's mandatory Municipal Wastewater Regulation. Please rate the importance of each of the following considerations.

Respondents indicated that of the various considerations about which they were asked, the most important were: minimize operations/maintenance costs to Uplands property owners (78% rated either very important or somewhat important); most environmentally appropriate use of existing pipe (67%); and minimize capital costs to Uplands property owners (64%).

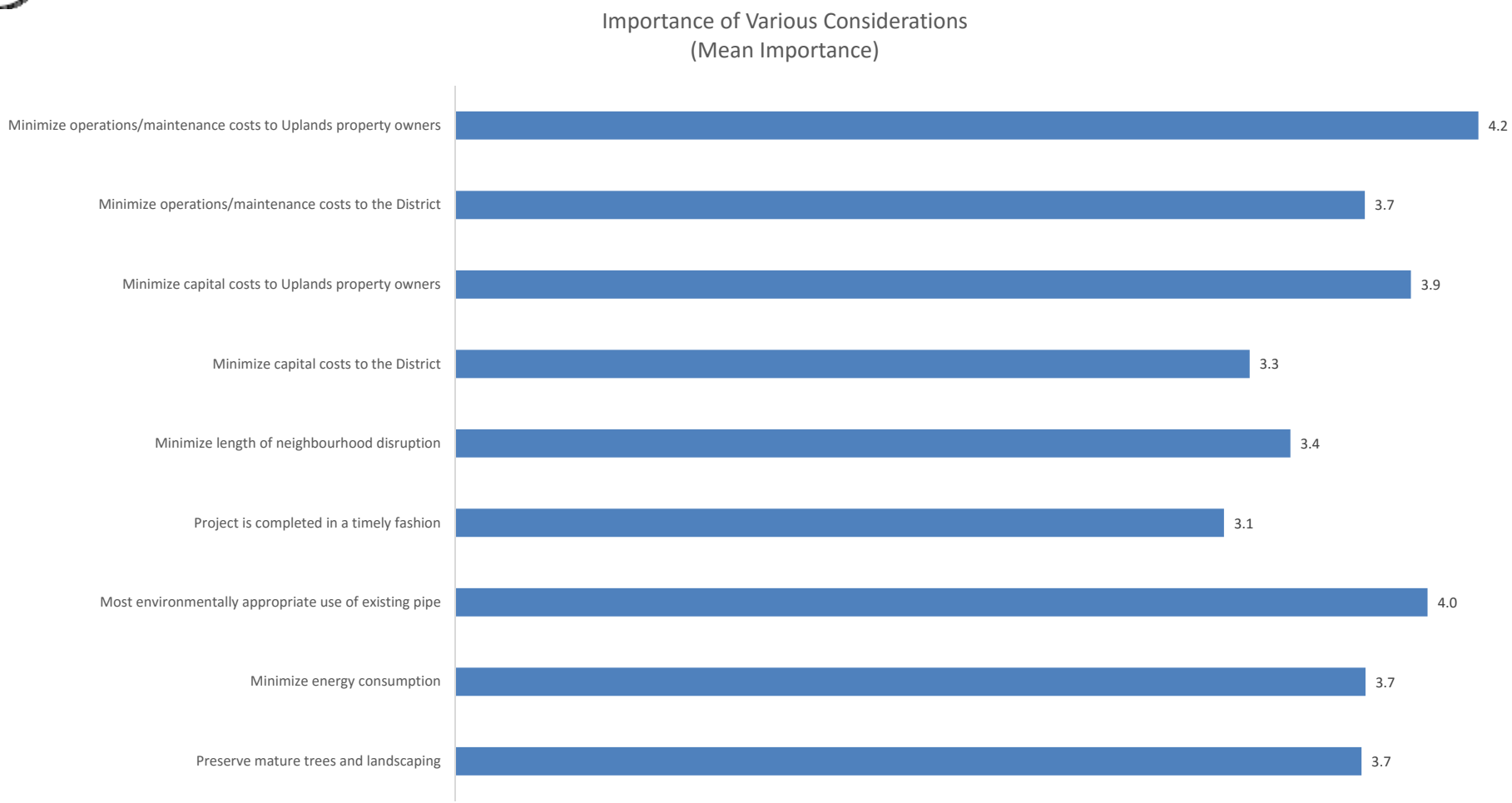
Overall Importance of Various Considerations



Q5 Council will be weighing a number of considerations as it determines how best to comply with the provincial government's mandatory Municipal Wastewater Regulation. Please rate the importance of each of the following considerations.

The least important considerations (based on "bottom 2 box" scores, or the percentage of respondents rating the consideration either very unimportant or somewhat unimportant) were: project is completed in a timely fashion (34%); minimize capital costs to the District (32%); and minimize length of neighbourhood disruption (25%).

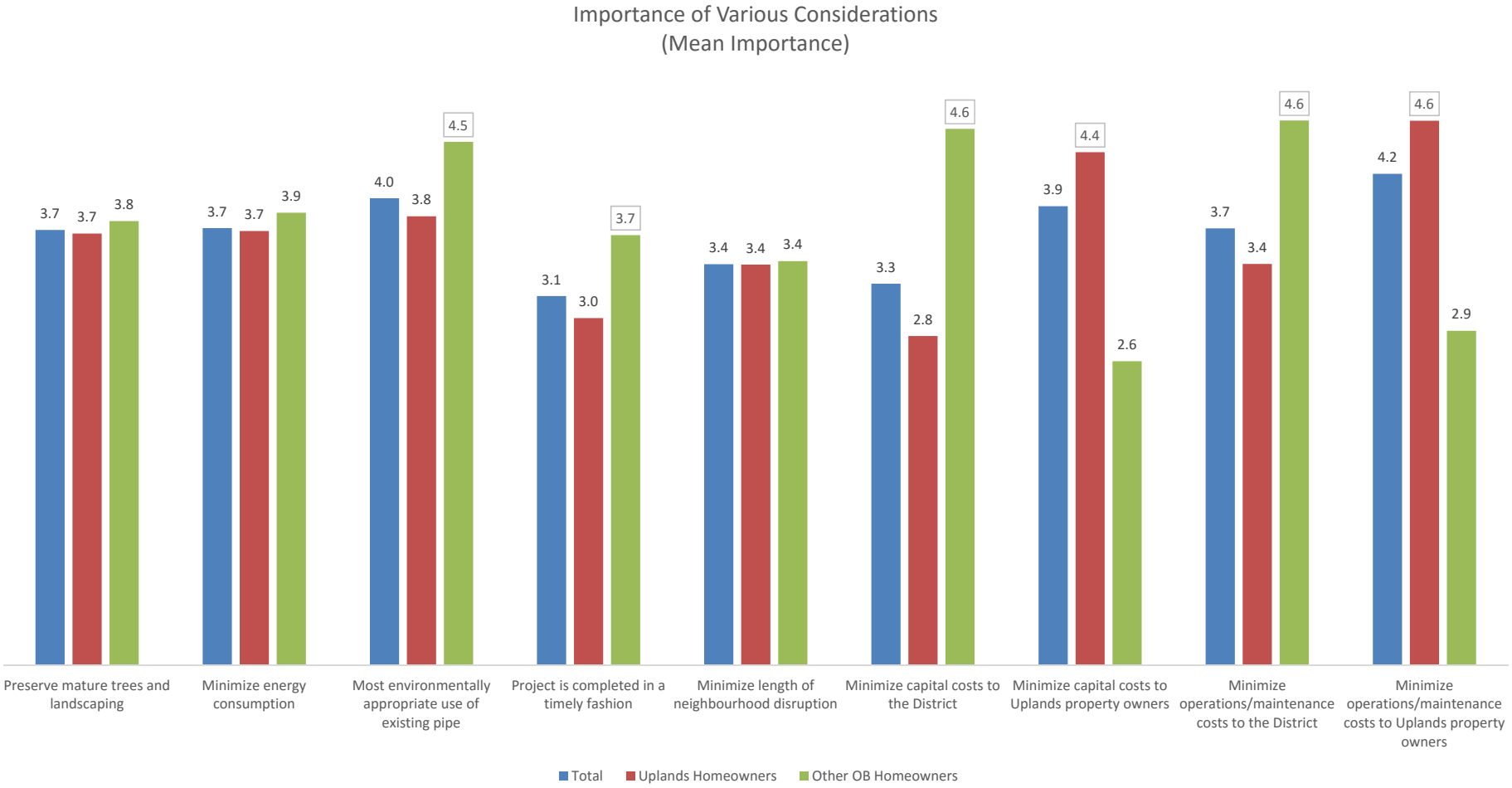
Overall Importance of Various Considerations



Q5 Council will be weighing a number of considerations as it determines how best to comply with the provincial government's mandatory Municipal Wastewater Regulation. Please rate the importance of each of the following considerations.

Based on respondents' average ratings on a scale from 1 to 5, the most important considerations were: minimize operations/maintenance costs to Uplands property owners (4.2); most environmentally appropriate use of existing pipe (4.0); and minimize capital costs to Uplands property owners (3.9). Considerations with the lowest average importance scores were: project is completed in a timely fashion (3.1); minimize capital costs to the District (3.3); and minimize length of neighbourhood disruption (3.4).

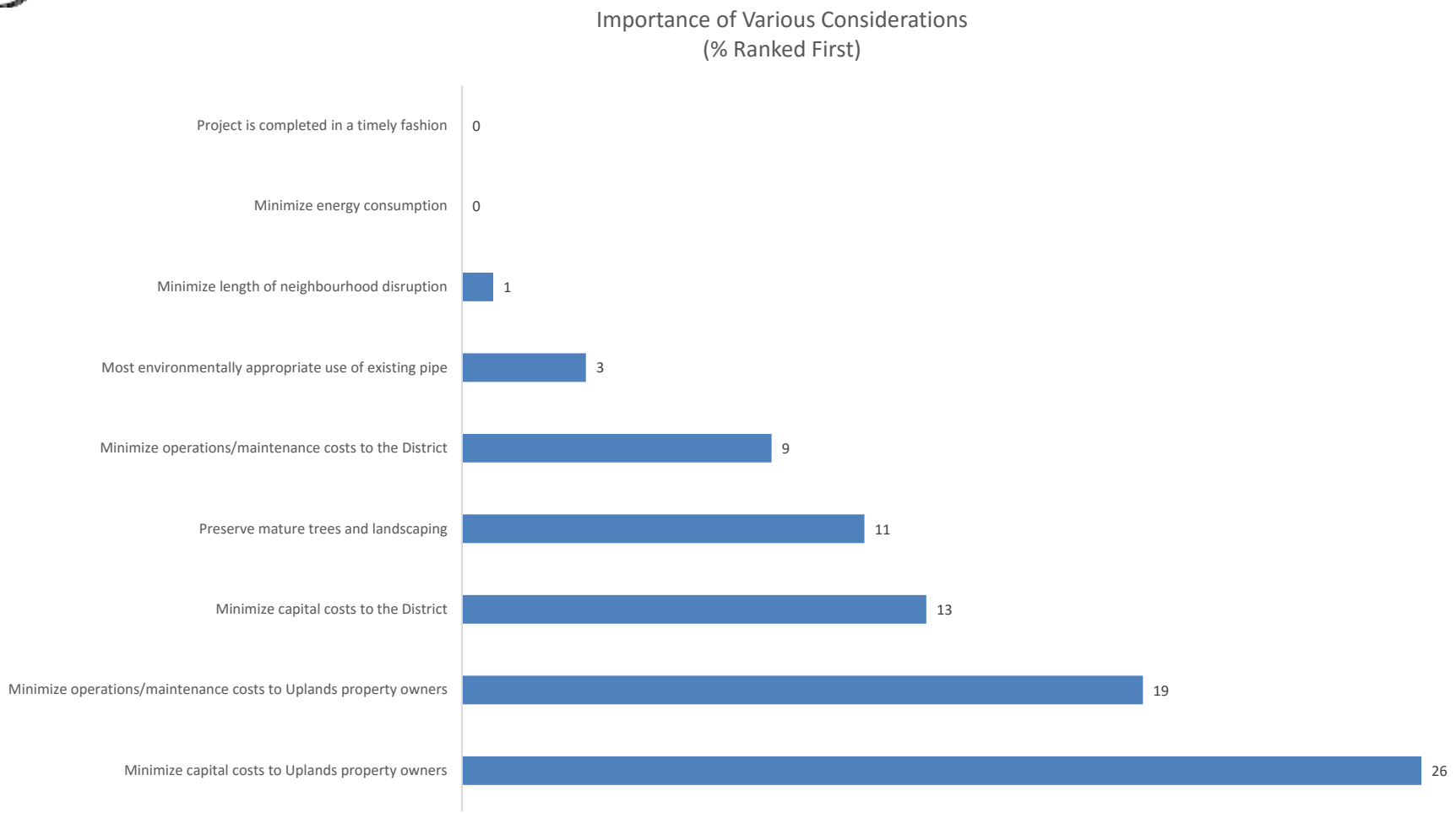
Overall Importance of Various Considerations



Q5 Council will be weighing a number of considerations as it determines how best to comply with the provincial government's mandatory Municipal Wastewater Regulation. Please rate the importance of each of the following considerations.

Oak Bay property owners whose property was not located in the Uplands ("Other OB Homeowners") were significantly more likely than owners of property in the Uplands ("Uplands Homeowners") to rate as important: most environmentally appropriate use of pipe (4.5 vs. 3.8); project is completed in a timely fashion (3.7 vs. 3.0); minimize capital costs to the District (4.6 vs. 2.8); and minimize operations/maintenance costs to the District (4.6 vs. 3.4). Uplands homeowners were significantly more likely to rate as important: minimize capital costs to Uplands property owners (4.4 vs. 2.6); and minimize operations/maintenance costs to Uplands property owners (4.6 vs. 2.9).

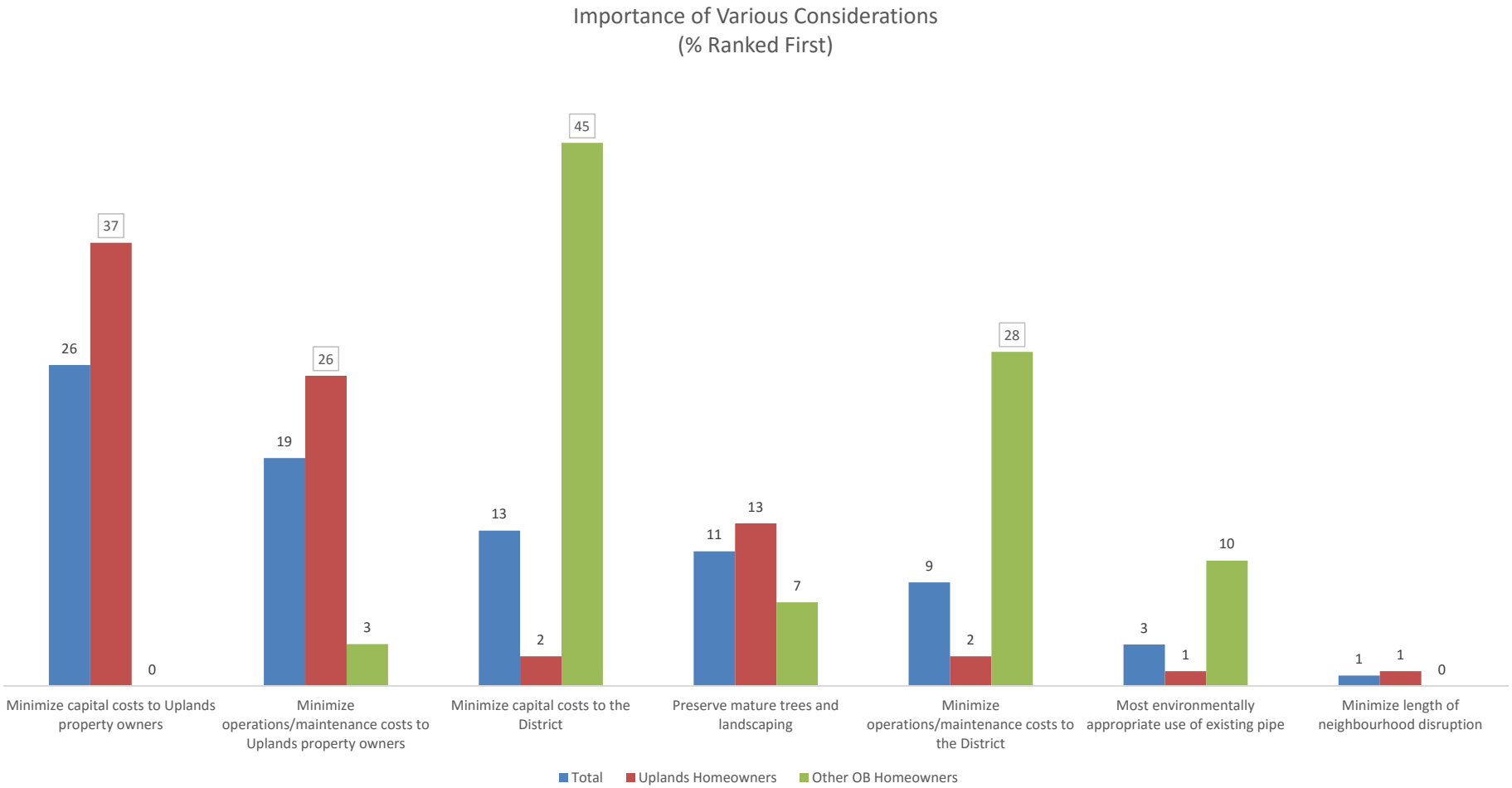
Ranked Importance of Various Considerations



Q6 Please indicate which 3 of the following considerations are the most important to you.

Minimize capital costs to Uplands property owners was rated the most important consideration by the largest percentage of all respondents to the survey (26%), followed by minimize operations/maintenance costs to Uplands property owners (19%); and minimize capital costs to the District (13%).

Ranked Importance of Various Considerations



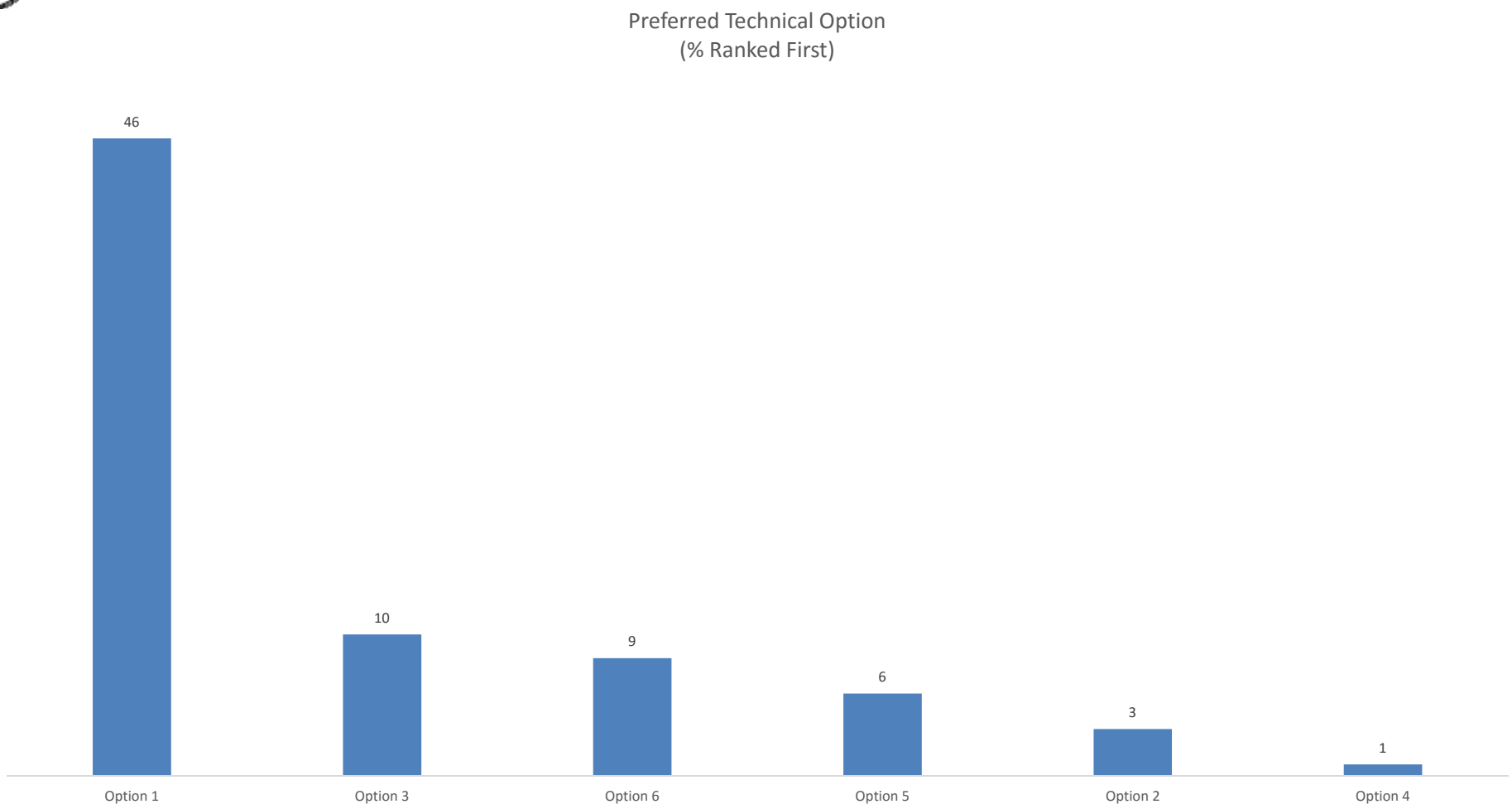
Q6 Please indicate which 3 of the following considerations are the most important to you.

Respondents owning property in the Uplands were significantly more likely than those whose Oak Bay property was located outside the Uplands ("Other OB Homeowners") to rank as the most important consideration: minimize capital costs to Uplands property owners (37% vs. 0%); and minimize operations/maintenance costs to Uplands property owners (26% vs. 3%). Other OB homeowners were significantly more likely than Uplands homeowners to rank as the most important criteria: minimize capital costs to the District (45% vs. 2%); and minimize operations/maintenance costs to the District (28% vs. 2%).

Other Considerations

- Almost half (44.4%) of those completing the survey took advantage of the opportunity of responding to an open-ended question asking them what other considerations they would like to make Council aware of to comment regarding cost issues – either related to the capital costs of the sewer separation project or to long term costs related to operation/maintenance.
- One third (32.5%) of respondents either expressed their strong preference for a gravity-based system, or indicated negative feelings about pumps and generators. They included comments such as: pumps and generators are unfair/ridiculous/an unnecessary expense, too big a burden, unacceptable, etc.; pumps are a concern because of power outages (especially lengthy and severe in the Uplands); Oak Bay is predominantly gravity, therefore Uplands should be too; pumps are unreliable and require frequent/costly maintenance; gravity is the least costly in the long term, requires least maintenance, relies on fewer pumps, etc.; and gravity always works/is most appropriate/is a natural solution (2.6%).
- A number of those responding to the survey (9.4%) said that they felt the solution should be fair for Uplands residents who already pay high taxes, indicating that they want Uplands property owners to be treated the same as any other Oak Bay neighbourhood, that treating the Uplands differently is "discriminatory" and that the eventual decision should reflect the best interests of all taxpayers in Oak Bay.
- A smaller percentage of respondents (8.5%) suggested a number of alternative solutions, such as alternate storm water disposal methods for homeowners, solving property problems on an individual basis, separate street drains, holding tanks, etc.
- Interestingly, some respondents (6.8%) encouraged Council to ensure they focus on the best solution for the long term, and to do it correctly/once/right even if this might mean the least expensive solution was not adopted.

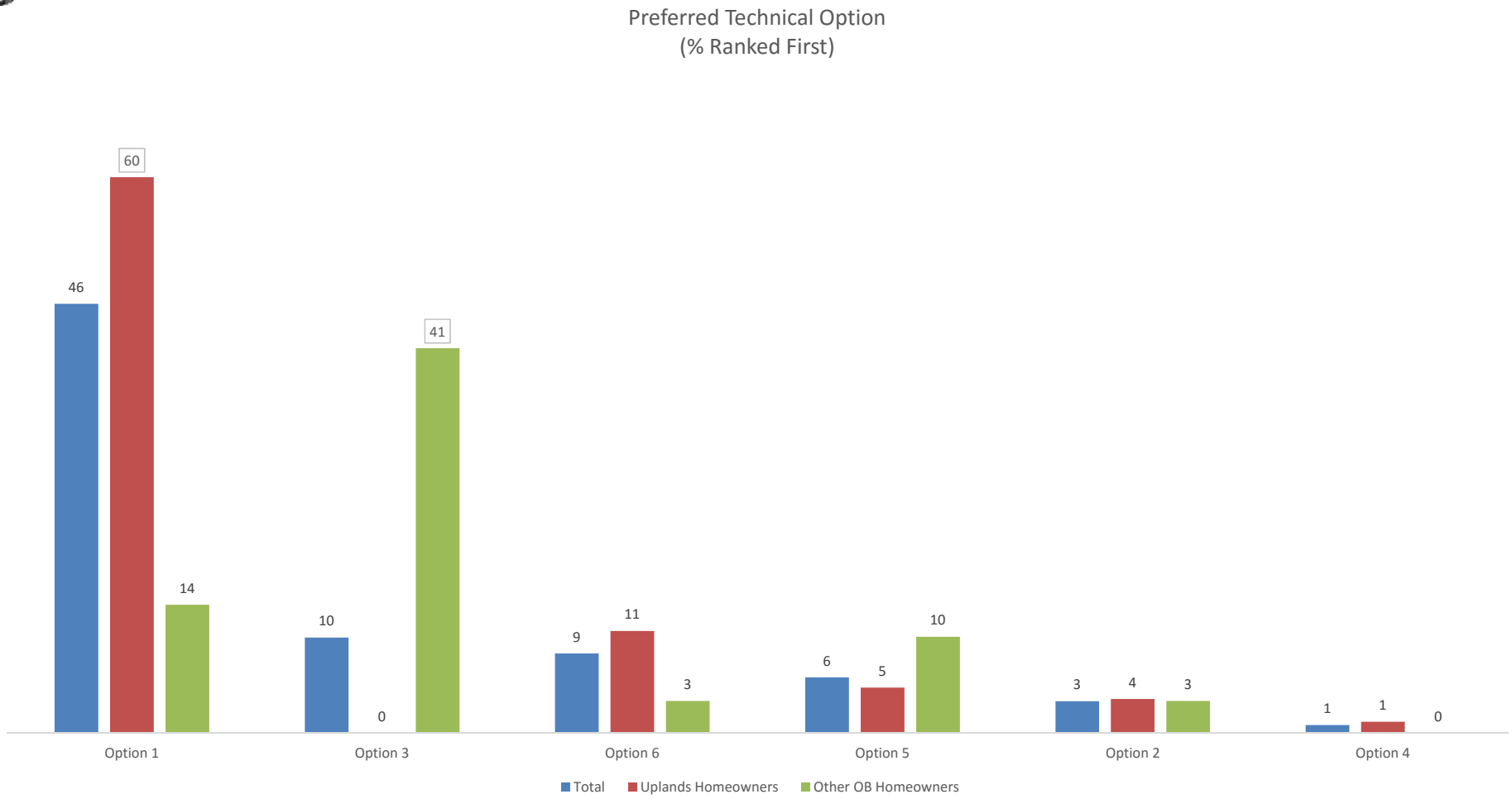
Preferred Technical Option



Q8 Six options have been developed by engineering firm McElhanney Consulting Services Ltd. To separate the combined sewer in the Uplands. Please rank the six technical options in order of your preference.

Option 1 was the technical option preferred by the highest percentage of respondents, with 46% of all those responding to the survey ranking Option 1 first in order of preference, followed by Option 3 (10%) and Option 6 (9%).

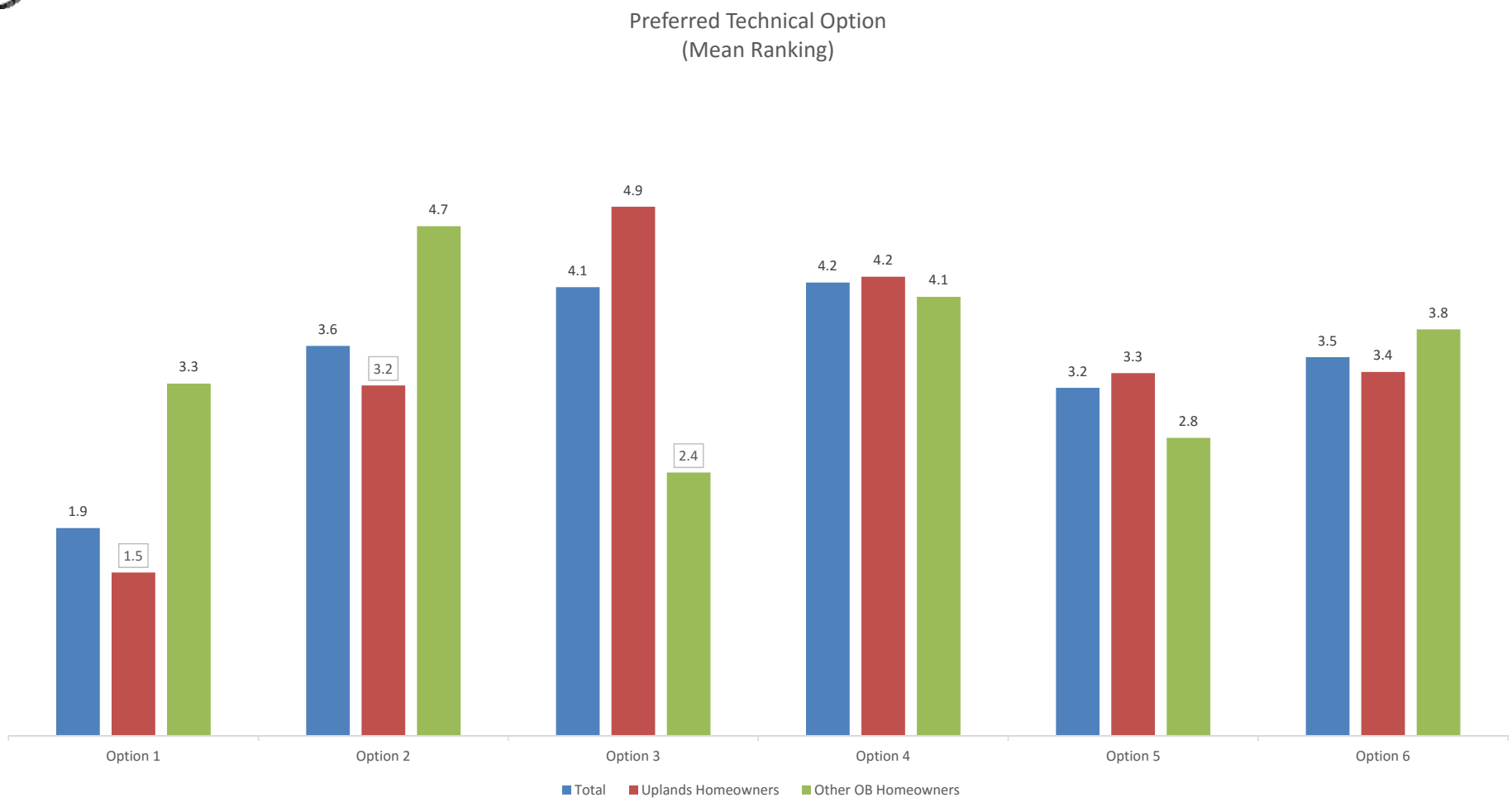
Preferred Technical Option



Q8 Six options have been developed by engineering firm McElhanney Consulting Services Ltd. To separate the combined sewer in the Uplands. Please rank the six technical options in order of your preference.

Uplands homeowners were significantly more likely than other OB homeowners to rank Option 1 as their most preferred of the six technical options (60% vs. 14%). Other OB homeowners were significantly more likely than Uplands homeowners to rank Option 3 as their most preferred option (41% vs. 0%).

Preferred Technical Option



Q8 Six options have been developed by engineering firm McElhanney Consulting Services Ltd. To separate the combined sewer in the Uplands. Please rank the six technical options in order of your preference.

N.B. Lowest mean score indicates highest ranking of preference. Option 1 was the most preferred among all survey-takers, with an average ranking of 1.9. Uplands homeowners were significantly more likely than other OB homeowners to rank Option 1 and Option 2 as their most preferred of the six options (mean ranking 1.5 vs. 3.3 and 3.2 vs 4.7 respectively). Other OB homeowners were significantly more likely than Uplands homeowners to rank Option 3 as their most preferred technical option (mean ranking 2.4 vs 4.9). The differences between Uplands homeowners and other OB homeowners in their average rankings of the remaining technical options were not significant.

Reasons for Preference

- When they were asked to indicate the one or two reasons why they preferred the technical option they had ranked "1", almost half of those responding to the survey (47.9%) said their preference was related to gravity systems being "better", or to negative feelings about pumps. These comments were completely consistent with (and in some cases repeated) the responses made to Q7, the earlier open-ended question.
- More than one third of the responses (35.0%) indicated that the preference for a specific option was related to cost issues, whether the lowest cost to Uplands property owners or to the District. Some of these comments included specific references to long term costs or operating/maintenance costs, but not all comments cited either capital costs or operating/maintenance costs; nor did all of the comments specifically mention which parties would bear the costs to which the comment referred (i.e. Uplands property owners or the District).
- One quarter of respondents (24.8%) related their preference for their first choice option to their concern that the current pipe be used for storm water and the new pipe be used for the sanitary system; several said specifically that if the old pipes were to leak, storm water leakage would be acceptable but leaking sewage would not be acceptable.
- The reasons given by less than one quarter of people (17.1%) for their preferred option were because they perceived the option as being less disruptive.

Conclusions and Indicated Actions

- Respondents to the survey were drawn heavily from Uplands homeowners and, within this group, were almost entirely owners of properties located in the Humber/Rutland catchment area so the survey findings must be interpreted within this context. That said, several conclusions can be drawn from the data:
  - While two of the most important considerations, as rated by respondents, clearly related to the fact that most were the owners of property in the Uplands (minimizing capital costs to Uplands property owners and minimizing operations/maintenance costs to Uplands property owners), making the most environmentally appropriate use of existing pipe was also rated highly in terms of its importance, regardless of whether the respondent was an Uplands homeowner or not.
  - In addition to making the most environmentally appropriate use of the existing pipe, ensuring the project is completed in a timely fashion and minimizing both capital and operations/maintenance costs to the District were important to other OB homeowners.
  - There are clearly a number of Oak Bay residents who will be watching the cost implications of the sewer separation project closely. Comments regarding cost issues – either related to the capital costs for installation or the long term ongoing costs of operating/maintaining the system – were made by almost half of the respondents to the survey. A number expressed concerns about the costs related to a specific technical option, while others were concerned about possible capital cost overruns, or (depending on where one's property was located) about costs being unduly onerous for Uplands residents, or about all Oak Bay taxpayers being required to share a cost burden that Uplands homeowners should be shouldering.
  - Preference for a gravity-based system was strongly expressed by between one third and one half of respondents to the survey; this was either expressed as a positive about gravity systems (they are "better") or as a negative about systems requiring pumps and/or generators. Comments such as "let gravity do the work" or "gravity never fails" were made in response to both of the two open-ended questions in the survey.
  - Option 1 was clearly the most preferred of the six technical options among Uplands homeowners, however, other OB homeowners were significantly more likely to prefer Option 3. The differences between Uplands homeowners and other OB homeowners in their average rankings of the remaining technical options were not significant.

THE CORPORATION OF THE DISTRICT OF OAK BAY

BYLAW NO. 3891
(**amended by Bylaws No. 4056, 4103, 4171, 4333, 4368, 4395 and 4403)
A Bylaw for the administration and regulation of public sewers

The Municipal Council of The Corporation of the District of Oak Bay, in open meeting assembled, HEREBY ENACTS as follows:

1. DEFINITIONS/INTERPRETATION

(1) In this Bylaw:

"air" means the atmosphere but, except in a sewer (or a storm water management facility) or as the context may otherwise require, does not include the atmosphere inside a constructed enclosure that is not open to the weather;

"air contaminant" means any substance or odour whether gaseous, liquid, solid or a combination that is emitted into the air and that:

(a) injures or is capable of injuring the health or safety of a person,

(b) injures or is capable of injuring property or any life form,

(c) interferes or is capable of interfering with visibility,

(d) interferes or is capable of interfering with the normal conduct of business,

(e) causes or is capable of causing material physical discomfort to a person, or

(f) damages or is capable of damaging the environment;

"biomedical waste" means biomedical waste as defined in GUIDELINES FOR THE MANAGEMENT OF BIOMEDICAL WASTE established by the Canadian Council of Ministers of the Environment (CCME) and dated February 1992;

"BOD" means biochemical oxygen demand, being the quantity of oxygen utilized in the biochemical oxidation of organic substances under standard laboratory procedures in 5 days at 20 degrees Celsius expressed in milligrams per litre, as determined by the appropriate procedure in Standard Methods;

"COD" means chemical oxygen demand, being a measure of the oxygen equivalent of the organic matter content of a sample that is susceptible to oxidation by a strong chemical oxidant, as determined by the appropriate procedure in Standard Methods;

"colour" means the true colour unit of water from which turbidity has been removed, as determined by the appropriate procedure in Standard Methods;

"combined lateral" means a sewer lateral designed for the collection and transmission of uncontaminated water, wastewater, and storm water;

"combined sewer" means a sewer designed for the collection and transmission of uncontaminated water, wastewater , and storm water;

"composite sample" means a sample which is composed of equivalent portions of a specified number of grab samples collected manually or automatically at the same sampling point, at specified times or flow intervals during a specified sampling period;

"condensed water" means water which is produced through the process of condensation and includes condensate drainage from refrigeration equipment, air conditioning equipment and steam heating systems;

"connection" means that section of a public sewer to which the sewer lateral servicing a parcel of land is connected; (illustrated for convenience in Schedule "F")

"contaminant" means any substance, whether gaseous, liquid, or solid, whether dissolved or suspended, or any wastewater quality parameter that, when present above a certain concentration in wastewater:

(a) injures or is capable of injuring the health or safety of a person,

(b) injures or is capable of injuring property or any life form,

(c) interferes or is capable of interfering with the proper operation of a sewer or storm water management facility,

(d) causes or is capable of causing material physical discomfort to a person, or

(e) damages or is capable of damaging the environment;

"Council" means the Municipal Council of The Corporation of the District of Oak Bay;

"discharge" means to directly or indirectly introduce a substance by spilling, disposing of, abandoning, depositing, leaking, seeping, pouring, draining, emptying, or by any other means;

"domestic waste" means sanitary waste and the water-carried wastes from drinking, culinary uses, washing, bathing, laundering or food processing, which is produced on a residential property;

"enactment" means any applicable act, regulation, bylaw, order, or authorization, by a federal, provincial, regional, municipal government or their authorized representatives;

"engineer" means the Director of Engineering for the Municipality or his designate;

"garbage" means solid wastes from the domestic or commercial preparation, cooking and dispensing of food and from the handling, storage and sale of produce;

"grab sample" means a sample of waste, water or storm water collected at a particular time and place;

"high volume discharge" means any discharge of non-domestic waste into a sewer in excess of 10 cubic metres per day or 300 cubic metres over any consecutive 30 day period but not including water from a pool;

"main sewer" see **"Sewer"** (illustrated for convenience in Schedule "F")

"monitoring point" means an access point to a sewer or a lateral for the purpose of

(a) measuring the rate of flow or volume of wastewater being discharged from a building or a structure,

(b) collecting representative samples of wastewater being discharged from a building or a structure;

"Municipality" means The Corporation of The District of Oak Bay;

"non-domestic waste" means all waste except domestic waste, trucked liquid waste, sanitary waste, storm water, and uncontaminated water;

"oil and grease" means an organic substance or substances recoverable by procedures set out in Standard Methods or procedures authorized by the Engineer and includes, but is not limited to, hydrocarbons, esters, fats, oils, waxes, and high-molecular weight carboxylic acids;

"owner" means any person who is registered under the *Land Title Act* as the owner of land, or any other person who is in lawful possession of land or who is in lawful possession or occupancy of any buildings situated on the land;

"PCB" means any monochlorinated, dichlorinated, or polychlorinated biphenyl or any mixture that contains one or more of these;

"permission" means permission given by the Engineer or his duly authorized representative;

"pesticides" means pesticides regulated under the *Pesticide Control Act* of British Columbia;

"pH" means the expression of the acidity or basicity of a solution as defined and determined by the appropriate procedure described in STANDARD METHODS;

"pollution" means the presence in the environment of substances or contaminants that substantially alter or impair the usefulness of the environment;

"pool" means any water receptacle designed for decorative purposes or used for swimming or as a bath or hot tub designed to accommodate more than one bather at a time;

"premises" means any land or building, structure or all or any part thereof;

"prohibited waste" means , for sanitary and combined sewers, prohibited wastes as defined in Schedule "B", and for storm sewers and watercourses, prohibited wastes as defined in Schedule "D";

"public property" means a highway, road, roadway, street, public sidewalk, boulevard, lane, alley, or land controlled by the Municipality and includes a right of way;

"public sewer" see **"Sewer"** (illustrated for convenience in Schedule "F")

"radioactive materials" means radioactive materials as defined in the *Atomic Energy Control Act of Canada* and Regulations under that Act;

"Regional District" means the Capital Regional District;

"residential property" means a property which is used primarily for the purpose of residence by persons on a permanent, temporary or seasonal basis;

"right of way" means an acquired legal right for the specific use of land owned by others;

"sanitary waste" means waste that contains human faeces, urine, blood or body fluids originating from sanitary conveniences or other sources;

"sanitary sewer lateral" means the section of sewer piping from the sanitary sewer connection to the building or structure it serves and is intended to receive only sewage; (illustrated for convenience in Schedule "F")

"sewage" means waste water from buildings, structures, lands and industrial establishments, together with such storm water that is not intentionally admitted;

"sewage facility" means works owned or otherwise under the control or jurisdiction of the Municipality that gathers, treats, transports, stores, utilizes or discharges waste;

"sewage treatment plant" means any arrangement of devices and structures used for treating sewage;

"sewer" means all pipes, conduits, drains, and other equipment and facilities, owned or otherwise under the control or jurisdiction of the Regional District, the Municipality or one or more municipalities, for collecting, pumping, and transporting waste-water and includes all such pipes, conduits, drains, and other equipment and facilities which connect with those of the Regional District, the Municipality or one or more municipalities, but which does not include a sewer lateral or a sewer connection; (illustrated for convenience in Schedule "F")

"sewer lateral" means the pipe or conduit that connects the public sewer to the building or structure it serves; (illustrated for convenience in Schedule "F")

"sewer main" see **"sewer"** (illustrated for convenience in Schedule "F")

"sharps" means hypodermic needles, hypodermic syringes, blades, broken glass, and any devices, instruments or other objects which have acute rigid corners, edges or protuberances;

"Special Waste" means Special Waste as defined in the *Waste Management Act of British Columbia* or any legislation that replaces the Waste Management Act;

"Special Waste Regulation" means the SPECIAL WASTE REGULATION enacted pursuant to the Waste Management Act or any legislation that replaces the *Waste Management Act*;

"Standard Methods" means the current or latest edition of STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER jointly prepared and published from time to time by the American Public Health Association, American Water Works Association, and the Water Environment Federation;

"storm sewer" means all pipes, conduits, drains, and other equipment and facilities for the collection and transmission of storm water or uncontaminated water; (illustrated for convenience in Schedule "F")

"storm sewer lateral" means the section of sewer piping from the storm sewer connection to the building or structure it serves and is intended to receive only storm water; (illustrated for convenience in Schedule "F")

"storm water" means water resulting from natural precipitation from the atmosphere and which is directed into a storm sewer, or a watercourse;

"storm water management facility" means an impoundment and appurtenant structures, connections and controls for containment, detention or retention of storm water and its delayed release at a controlled rate to a receiving storm sewer or water-course;

"structure" includes paved parking surfaces;

"Subdivision and Development Bylaw" means Bylaw 3578, being the *Subdivision and Development Bylaw, 1987* as amended, or its successor Bylaws as adopted by Council;

"suspended solids" means solids that either float on the surface of, or are in suspension in, water sewage or other liquids, and which are removable by laboratory filtering;

"trucked liquid waste" means any waste that is collected and transported from the site where the waste originated by means other than discharge to a sewer including, but not limited to, holding tank waste, septic tank waste, chemical toilet contents, oil

and grease from interceptors or traps, and other sludges of organic or inorganic origin;

"uncontaminated water" means any water excluding storm water but including cooling water, condensed water and water from municipal waterworks or a private water supply to which no contaminant has been added as a consequence of its use, or to modify its use by any person;

"waste" means any substance whether gaseous, liquid or solid, that is or is intended to be discharged or discarded, directly or indirectly, to a sewer, storm sewer or storm water management facility;

"wastewater" means the composite of water and water-carried wastes from residential, commercial, industrial or institutional premises or any other source;

"wastewater quality parameter" means any parameter used to describe the quality of wastewater;

"water" includes surface water, ground water and ice;

"watercourse" means:

(a) a river, stream, creek, waterway, lagoon, lake, spring, swamp, marsh or other natural body of fresh water, or

(b) a canal, ditch, reservoir or other man-made surface feature designed to carry or hold water or storm water whether it contains or conveys water continuously or intermittently;

"waterworks" means any works owned or otherwise under the control or jurisdiction of the Regional District or one or more of its member municipalities or the Greater Victoria Water District or an Improvement District that collects, treats, transports, or stores drinking water;

"work order" means a written application for work to be undertaken by or through the Municipality, incorporating a commitment from the applicant to pay for the costs of same, including but not limited to materials, labour, equipment, and engineering charges, substantially in the form annexed to this bylaw in Schedule "E".

(2) The Headings in this Bylaw and the contents of Schedule "F" annexed hereto are for the convenience of reference only and are not intended to interpret, define, or limit the scope, extent or intent of the provisions of this Bylaw.

REQUIREMENTS TO CONNECT TO PUBLIC SEWERS

2. (1) The owner of every building or structure from which domestic waste, non-domestic waste or storm water is being discharged or from which domestic waste, non-domestic waste or storm water may be discharged, is required to connect such building or structure to the public sewer.

(2) Notwithstanding subsection (1), the owner of a building or structure constructed prior to the adoption of this bylaw and from which storm water is being discharged to a watercourse, may continue to discharge storm water to that watercourse, except:

(a) where in the opinion of the Engineer, the continuance of the discharge to the watercourse will be in conflict with existing or proposed underground utilities, will have a deleterious effect upon the watercourse, or will create a hazard to life or constitute a public nuisance; or

(b) where a renovation, addition, or upgrading of the perimeter drains of the building or structure is undertaken and where a public storm sewer is available to receive the storm water discharge from the building or structure.

(3) Where the Municipality has on its own initiative installed or is installing a new sewer main the purpose of which is to separate an existing combined sewer system into individual storm sewer and sanitary sewer systems an owner whose property was previously served by the said combined sewer and whose property was connected to the combined sewer by a combined lateral, shall within one year from the date the Engineer certifies that new sewer main is operational, separate the combined lateral serving the property into individual storm sewer and sanitary sewer laterals and make the necessary connections to the public sewer.

(4) In the event of the owner failing to apply and pay all required fees for the necessary connection to the public sewer within sixty (60) days after being notified in writing by the Engineer to do so, without limiting any other recourse or remedy available to the Municipality the Engineer may cause the Municipality, by its workers or others, to have the required work completed at the expense of such owner including but not limited to the fees set out in Schedule "A", the invoice for which if unpaid on the 31st day of December next ensuing shall be added to and form part of the taxes payable in respect of the property served by the connection as taxes in arrears.

*(**Bylaw 4333, adopted Dec. 11/06)*

(5) Notwithstanding the foregoing, an owner failing to apply and pay all required fees for connection of his building or structure to the public sewer within the aforesaid period of sixty (60) days shall still be liable for any penalties provided by this Bylaw.

*(**Bylaw 4333, adopted Dec. 11/06)*

(6) Notice in writing required to be given by the Engineer pursuant to this Section shall be sufficiently given if sent by registered mail to the owner at the address as shown on the last revised assessment roll of the Municipality.

2.1 Notwithstanding Section 2(1), the Engineer may waive in whole or in part the requirement to connect to the public storm sewer system:

(1) where after considering engineering parameters including but not necessarily limited to soil perviousness, lot size, proximity of buildings, and grade, all in the context of a report commissioned and submitted by the owner from a professional engineer or professional geoscientist with experience or training in geotechnical study and geohazard assessment, the Engineer is satisfied that storm water run-off from the non-connected buildings or lands can be absorbed or infiltrated on the parcel either naturally or through the installation and maintenance of a storm water management

system without adversely affecting soil stability, redirecting storm water to other lands or other storm water collection systems, creating health issues associated with ponding of water, creating a nuisance for or potential for damage to any other property, or adversely affecting receiving water quality; or

(2) where the land abuts the sea and

(a) the Engineer is satisfied that direct discharge of storm water to the sea can be achieved without causing soil erosion or increasing the probability of land slippage;

(b) the owner has obtained approval from the Province of British Columbia, including without limitation a lease, licence or other form of tenure or right to occupy Crown land, for any required works on the foreshore or the seabed;

(c) the owner has obtained any and all approvals, endorsements, permits and certificates required by the Government of Canada with regard to fish-bearing waters;

(d) the owner has obtained any and all permits required under the *Building and Plumbing Bylaw* of the Municipality;

(e) the owner has obtained any and all approvals, endorsements, permits and certificates required under the *Environmental Management Act* and regulations thereunder, and any other applicable enactment, or successor enactment, of the Province of British Columbia;

(f) the direct discharge of storm water to the sea does not conflict with any enactment of the Capital Regional District; and

(g) the principal use of the land is for non-residential purposes, with a total parcel area not less than 7,500 square metres.

2.2 The Engineer may grant a waiver pursuant to Section 2.1 subject to conditions designed to ensure that all of the criteria set out therein are met, with which every owner of the land subject to the waiver shall comply.

2.3 No owner of land subject to a waiver granted pursuant to Section 2.1 shall fail to keep in good repair and renew, rebuild or replace any system or works the construction or installation of which was required by the Engineer as a condition of the granting of such waiver, where required to maintain or restore compliance with all of the criteria set out in Section 2.1.

2.4 Without limitation, conditions imposed by the Engineer pursuant to Section 2.2 may include a requirement that the owner enter into a covenant in favour of the Municipality, to be registered against the title to the land, setting out the construction and maintenance requirements for the system or works described in Section 2.3 and indemnifying the Municipality against claims arising directly or indirectly out of a waiver granted pursuant to Section 2.1.

*(**Bylaw No. 4368, adopted Jul. 23/07)*

DESIGN AND INSTALLATION

3. Pursuant to the provisions of this Bylaw, and subject to the authority of the Engineer under the *Subdivision and Development Bylaw*, all drainage and sewerage works provided by persons other than the Municipality shall be constructed and installed strictly in accordance with the *Subdivision and Development Bylaw* of the Municipality and shall comply with the relevant provisions of the current or latest editions of the British Columbia Plumbing Code or British Columbia Building Code as the case may require.

APPLICATION FOR SERVICE

4. (1) Each connection to the public sewer shall be made only where, and in the manner authorized or ordered by the Municipality.

(2) Each application to connect to the public sewer shall be made to the Municipality by the owner or his authorized agent in the form prescribed by the Engineer.

(3) Such owner shall, on making application, pay to the Municipality the applicable connection fee as set out in Schedule "A" attached to and forming part of this Bylaw. If such connection is practicable, the Engineer shall, within ninety (90) days, weather permitting, provide and install a sewer connection for service to the applicant's property. If such connection is not practicable, the Engineer shall so notify the applicant within sixty (60) days and the Municipality shall refund the charges or fees paid by the applicant.

(4) It shall be the responsibility of the applicant for a sewer connection to provide the Municipality with accurate information as required by the application and to construct any building or structure or to locate therein any fixtures requiring discharge to a sewer connection at such elevation or provide such equipment or device as will permit their discharge into the municipal sewer.

(5) Without derogating from the authority of the Engineer conferred by Section 6(1), a sewer connection will be installed at the location requested by the applicant wherever practicable. In the event that the applicant's preferred location is not practicable due to topographical features, boulevard trees or other plantings, utility poles, transformers, street light standards, surface improvements, or underground utilities, the Engineer shall designate the location of each service connection to each parcel of land or premises.

*(**Bylaw 4171, adopted Nov. 12/02)*

5. Notwithstanding Section 4(3),

(1) Where, in the circumstances described in Section 2(3), the owner of a property served by a combined lateral has been required to separate such lateral into individual storm sewer and sanitary sewer laterals, the connection fee that would otherwise be payable by the owner for the work shall be waived

(2) Where an owner of property connected by way of a sewer lateral to a sewer main which the Municipality is in the process of replacing applies for the installation of a new connection from the property line to the main, and provided that the application is received by the Engineer within a time that allows the installation to be carried out while the appropriate portion of the

sewer main remains exposed and before any intervening curb, driveway crossing or sidewalk has been constructed or reconstructed, the fee payable by the owner for the work shall be discounted by a factor equal to fifty percent (50%) of the amount calculated in accordance with Schedule "A"."

*(**Bylaw 4171, adopted Nov. 12/02)*

INSTALLATION OF SEWERS

6. (1) The Engineer shall determine the location, size and depth of each sewer connection or sewer lateral on public property.

(2) Whenever possible, the connection to the public sewer shall be installed at a gradient and elevation that will allow gravity flow of sewage or storm water from the building to the main sewer.

(3) When, in the opinion of the Engineer, problems may occur because of the surcharging of the public sewer, the Engineer may refuse an application and the provisions of the *Subdivision and Development Bylaw* shall apply.

(4) The connecting of a sanitary sewer lateral or a storm sewer lateral into a public sewer shall conform to the requirements of the current or latest editions of the Building and Plumbing Codes or other applicable rules and regulations of the Municipality. All such connections or laterals shall be made gas-tight and water-tight and be verified by proper testing in accordance with Standard Methods. Any deviation from the prescribed procedures and materials must be approved by the Engineer before installation.

(5) The Engineer may require a user of sewer services to provide information needed to determine compliance with this Bylaw. These requirements may include:

(a) sewage or storm water discharge peak rate and volume over a specified time period;

(b) chemical analysis of sewage;

(c) Information on raw materials, processes and products affecting sewage volume and quality;

(d) quantity and disposition of specific liquid, sludge, oil, solvent or other materials important to sewer use control;

(e) a plot plan of sewer laterals on the user's property showing details of sewage pre-treatment facilities; or

(f) details of systems to prevent and control the losses of materials through spills to the public sewer.

(6) When the Engineer has reasonable grounds to believe that Restricted Waste or Prohibited Waste may be discharged to a public sewer, he may require the owner of a property to install monitoring points to facilitate monitoring of discharges as specified in this bylaw.

MAINTENANCE OF SEWER LATERALS/SEWER CONNECTIONS

7. (1) The owner of a property served by a public sewer shall be responsible for the cost of servicing, clearing, rodding, removing blockages or tree roots, or maintaining in any way the sewer lateral or sewer connection that serves the property including any portion of the sewer lateral or sewer connection which is upon, under or over public property with the exception, however, that in the event that such portion of the sewer lateral or sewer connection has become blocked solely due to the intrusion of municipal boulevard tree roots, and without relieving the property owner from responsibility for scheduling and bearing the cost of preventive maintenance, the Municipality shall, upon application, either

(a) reimburse the owner for the cost reasonably incurred by him, supported by receipts at prevailing local rates, of clearing the blockage; or, at the Municipality's option,

(b) clear the blockage at its cost using its own or contracted labour and equipment,

where the source of the blockage has been confirmed to the satisfaction of the Engineer, and provided that such portion of the sewer lateral is otherwise in serviceable condition and does not exhibit age-related deterioration to the point that it requires repair or replacement.

(2) The owner of a property served by a public sewer shall be responsible for the cost of repair or replacement by the Municipality of the portion of the sewer lateral which is upon, under or over public property, such cost to be calculated in accordance with Schedule "A".

*(**Bylaw 4171, adopted Nov. 12/02)*

8. (1) Where the owner of a property served by a public sewer commits to the payment of the associated costs through the signing of a work order substantially in the form set out in Schedule "E", the Engineer may cause the investigation of a sewer connection or the portion of the sewer lateral which is upon, under or over public property with a view to assessing its condition. If such investigation reveals that the source of the problem which triggered the request for investigation lies not with any portion of the sewer lateral, but with the sewer main or the point of connection of the lateral thereto, and has not been caused by the discharge of any prohibited or restricted waste (as defined in Schedules "B", "C" and "D") from the owner's property, then the Engineer shall release the owner from the obligation created by the work order.

(2) Notwithstanding Section 7(2) and subject to Section 8(6), where the Engineer determines that the replacement or repair of the portion of the sewer lateral which is upon, under or over public property is required as a result of the deterioration of the said portion of the sewer lateral, and where the owner of the property served by the same applies for such repair or replacement, the fee to be paid by the owner shall be given by the value of the term "OC" represented in the formula:

$OC = F[A - 5) \div 30]$

Where

A = the age in years of the portion of the sewer lateral which is upon, under or over public property, "years" being the number of 12 month consecutive periods having elapsed since installation, rounded down to the nearest integer value;

F = the fee for the work calculated in accordance with Schedule "A"; and

(A – 5) is deemed to equal

(a) zero if its arithmetic value is less than zero; and

(b) thirty (30) if its arithmetic value is greater than thirty (30);

provided also that the Engineer's corroborating determination with regard to the need for repair or replacement is required only where the value of (A – 5) is less than thirty (30).

(3) The age of the portion of the sewer lateral which is upon, under or over public property shall be determined in accordance with the records of the Municipality. In the event that no records exist which confirm the age of the said portion of the sewer lateral, it shall be deemed to be equal to the age of the building served by it.

(4) Notwithstanding any other part of this Bylaw, the owner of a property served by a public sewer is responsible for the full cost of repair or replacement by the Municipality of the sewer connection, clean-out fixture or the portion of the sewer lateral which is upon, under or over public property, such cost to be calculated in accordance with Schedule "A", where the repair or replacement is required as a result of a blockage or damage which has occurred as a result of a condition existing on the owner's property, an improper connection at the property line, or the discharge of a prohibited or restricted waste (as defined in Schedules "B", "C" and "D") from the owner's property.

(5) Notwithstanding Section 7(2), but subject to Section 8(7), where the owner of a property served by a public sewer makes application for replacement of the portion of the sewer lateral which is upon, under or over public property, and where

(a) the said portion of the sewer lateral is subject to penetration and obstruction by municipal boulevard tree roots to the extent that, in the assessment of the Engineer based on his review of the relevant evidence, regular root cutting at intervals of one (1) year or less is required to prevent blockages and keep the lateral in serviceable condition;

(b) the placement of the said portion of the sewer lateral is such that it cannot be removed and replaced in the same location without either removing or, in the assessment of the Manager of Parks Services based on advice from a certified arborist, seriously endangering the health of a proximate municipal boulevard tree;

(c) the Engineer declines to replace the said portion of the sewer lateral in its original location, and

(d) the relocation of the said portion of the sewer lateral would require that the owner, in order to make connection to the public sewer, re-route a portion of the sewer lateral located on his own property,

then the charge to the owner calculated in accordance with Schedule "A" for installing in a different location a new sewer lateral from the sewer main to the property line shall be reduced by the cost that the Municipality would have otherwise incurred to remove and dispose of the boulevard tree, reinstate and make good the boulevard to the standard prevailing in the block, and purchase and plant a replacement tree, as estimated by the Manager of Parks Services using the costing methods employed by the Municipality for like projects, with such cost estimate to include charges for labour, equipment, supplies, rentals and contracted work, and provided always that the credit to the applicant shall not exceed the fee calculated in accordance with Schedule "A".

(6) Notwithstanding Section 7(2), but subject to Section 8(7), where the portion of the sewer lateral which is upon, under or over public property has deteriorated to the point where it cannot be made usable through the use of any available pipe clearing or rodding equipment and methods, and where such deterioration is attributable principally to structural damage caused by boulevard tree roots, such assessments to be made by the Engineer based on his review of the pertinent evidence, then the fee calculated in accordance with Schedule "A" shall be waived for the owner of the property applying for replacement or repair of such sewer lateral.

(7) In the event of the construction of a new principal building, or the reconstruction of an existing principal building from its foundation upward, on a parcel of land connected by way of a sewer lateral to a sewer main, the owner shall apply and pay the fee calculated in accordance with Schedule "A" for the replacement of the portion of any existing sewer lateral upon, under or over public property which is:

(a) constructed of unjointed clay tile, jointed clay tile which is ungasketed, or a tar-based composite; or

(b) in a significantly deteriorated condition as determined by the Engineer based on his examination of the relevant evidence.

*(**Bylaw 4171, adopted Nov. 12/02)*

DISCHARGES TO SANITARY SEWERS

9. (1) No person shall discharge into any sanitary sewer

(a) any Prohibited Waste, as described in Schedule "B";

(b) any Restricted Waste, as described in Schedule "C" unless that person has obtained written permission from the Engineer;

(c) any high volume discharge unless that person has obtained written permission from the Engineer;

(d) any uncontaminated water in a volume greater than 2.0 cubic metres per day without prior written permission from the Engineer;

(e) any storm water without prior written authorization from the Engineer.

DISCHARGES TO COMBINED SEWERS

10. (1) No person shall discharge into any combined sewer

(a) any Prohibited Waste, as described in Schedule "B";

(b) any Restricted Waste, as described in Schedule "C" unless that person has obtained written permission from the Engineer;

(c) any High Volume Discharge unless that person has obtained written permission from the Engineer;

11. (1) If any Restricted Waste as described in Schedule "C" is discharged or is proposed to be discharged to the public sewers and which, in the judgement of the Engineer, may have a deleterious effect upon the sewage facilities, processes, or equipment or which may otherwise create a hazard to life or constitute a public nuisance, the Engineer may:

(a) reject the Restricted Waste;

(b) require pre-treatment to an acceptable condition prior to the discharge into the public sewers;

(c) require control over the quantities and rates of discharge; and/or

(d) require payment to cover the added cost of handling and treating the non-domestic waste not covered by existing taxes or sewer charges.

(2) When considering the above alternatives, the Engineer shall give consideration to the economic impact of each alternative on the discharger. If the Engineer permits the pre-treatment or equalization of waste flows, the design and installation of the plans and equipment shall be subject to review and approval by the Engineer.

(3) Grease, oil and sand interceptors shall be provided when, in the opinion of the Engineer, they are necessary for the proper handling of non domestic waste containing floatable grease in excessive amounts, as specified in Schedule "C", or any flammable wastes, sand or other harmful ingredients; except that such interceptors shall not be required for private living quarters or dwelling units. All interceptors shall be of a type and capacity approved by the Engineer, and shall be located as to be readily and easily accessible for cleaning and inspection. In the maintaining of these interceptors, the owner(s) shall be responsible for the proper removal and disposal by appropriate means of the captured materials and shall maintain records of the dates and means of disposal, which are subject to review by the Engineer. Any removal and hauling of the collected materials not performed by the owner's personnel must be performed by currently licenced waste disposal firms.

12. MONITORING OF DISCHARGES

(1) The Engineer may require that a person who is discharging any waste other than domestic sewage into a sewer shall, at his or her expense, install one or more monitoring points suitable for inspection, flow monitoring, and sample collection at locations determined by the Engineer, to be constructed in accordance with plans approved by the Engineer and maintained in good working order by the person.

(2) A monitoring point required under subsection 12(1) shall be installed in a manner so as not to be affected by any discharge of domestic waste from a premises, unless otherwise authorized by the Engineer.

(3) A monitoring point required under subsection 12(1) shall, for the purposes of enforcing this bylaw, be deemed to be the point or points at which a discharge into a sewer or sewage facility is made.

(4) In the absence of a monitoring point under subsection 12(1), the point of discharge into a sewer or sewage facility shall, for the purposes of enforcing this bylaw, be the location determined by the Engineer where access can be had to the waste for the purpose of sampling.

(5) Where a person is required to install a monitoring point under subsection 12(1), and the person cannot comply with such requirement within 60 days of being notified of the requirement by the Engineer the person shall, within 60 days of the notice being issued by the Engineer, inform the Engineer of his or her inability to install the monitoring point and the District may install or cause to be installed the monitoring point at the person's expense.

(6) The owner of a premises shall ensure that all monitoring points, flow measuring devices including water meters, are accessible for inspection by the Engineer at all times.

(7) The Engineer may require that a person who is discharging waste into a sewer undertake, at that person's expense, sampling and analysis of the waste discharged.

(8) All sampling and analysis required by an Engineer shall be carried out in accordance with methods and procedures specified in Standard Methods or in a manner specified by the Engineer.

(9) Samples which have been collected as the result of a requirement of the Engineer shall be analyzed by an independent agency or by a laboratory authorized by the Engineer.

DISCHARGES TO STORM SEWERS AND WATERCOURSES

13. (1) No person shall discharge or allow or cause to be discharged into a storm sewer or watercourse any domestic waste, non domestic waste , trucked liquid waste or prohibited waste as set out in Schedule "D".

(2) Notwithstanding the prohibition contained in subsection 13(1), a person may discharge into a storm sewer or watercourse water resulting from domestic activities customarily incidental to a residential use of land including:

(a) water resulting from natural precipitation, and drainage of such water;

(b) water resulting from garden and lawn maintenance, non-commercial car washing, building washing and driveway washing; and

(c) uncontaminated water.

(3) Notwithstanding the prohibition contained in subsection (2), a person may discharge into a storm sewer or watercourse water resulting from non-domestic activities as follows:

(a) street and hydrant flushing;
(b) water main flushing; and
(c) fire fighting activities.

PROHIBITIONS

14. (1) It shall be unlawful for any person to place, deposit or permit to be deposited in any unsanitary manner on public or private property within the Municipality, or in any area under the jurisdiction of the said Municipality, any human or animal excrement, garbage or objectionable waste.

(2) No person shall maliciously, willfully or negligently break, damage, destroy, uncover, deface or tamper with any structure, appurtenance or equipment which is part of the sewer system.

(3) No person shall make any connection whatsoever to the sewer or in any way tamper with the sewer or sewer connection without first obtaining permission from the Engineer.

(4) (a) No person shall connect or allow to remain connected any sanitary sewer lateral or combined lateral to any public storm sewer or to any storm sewer connection.

*(**Bylaw 4333, adopted Dec. 11/06)*

(b) No person shall connect or allow to remain connected any storm sewer lateral or combined lateral to any public sanitary sewer or sanitary sewer connection.

*(**Bylaw 4333, adopted Dec. 11/06)*

(c) In the event of an owner failing to disconnect a connection of the type described in paragraph (a) or (b) within ninety (90) days after being notified in writing by the Engineer to do so, without limiting any other recourse or remedy available to the Municipality the Engineer may cause the Municipality, by its workers or others, to have the required work completed at the expense of such owner including but not limited to the fees set out in Schedule "A", the invoice for which if unpaid on the 31st day of December

next ensuing shall be added to and form part of the taxes payable in respect of the property served by the connection as taxes in arrears.

*(**Bylaw 4333, adopted Dec. 11/06)*

(d) For the purpose of paragraph (c), "disconnect" includes applying and paying all required fees for the necessary connection from the storm sewer lateral to the public storm sewer, or from the sanitary sewer lateral to the public sanitary sewer, as the case may be, along with any work on private property required to separate storm water flows from sewage flows, with the provisions of Sections 2 and 4 to apply mutatis mutandis to the connection portion of the required work.

*(**Bylaw 4333, adopted Dec. 11/06)*

(e) For the purpose of this subsection, a requirement that sewage or storm water be pumped in order to create a functional connection to the public sanitary sewer or storm sewer, as the case may be, shall not be deemed to render the required connection "not practicable" within the meaning of Section 4(3), and the installation of a pump for that purpose shall constitute part of the work required to be undertaken by and at the cost of the owner in order to effect the required disconnection.

*(**Bylaw 4333, adopted Dec. 11/06)*

(f) Notwithstanding the foregoing, an owner failing to disconnect his building or structure sewer lateral from the public sewer pursuant to this Section within the aforesaid period of ninety (90) days shall still be liable for any penalties provided by this Bylaw.

*(**Bylaw 4333, adopted Dec. 11/06)*

(g) Notice in writing required to be given by the Engineer pursuant to this Section shall be sufficiently given if sent by registered mail to the owner at the address as shown on the last revised assessment roll of the Municipality.

*(**Bylaw 4333, adopted Dec. 11/06)*

(h) Paragraph (d) notwithstanding, where the elimination of a storm water lateral-to-sanitary sewer main connection made prior to 1990 requires the pumping of storm water from a parcel into the storm sewer main, the connection fee set out in Schedule "A" shall be reduced by one-half for the new connection to the storm sewer main, provided that the elimination of the storm water lateral-to sanitary sewer main connection is completed before June 30, 2008 or the end of the period specified in a notice from the Engineer pursuant to paragraph (c), whichever comes first.

*(**Bylaw 4333, adopted Dec. 11/06)*
*(**Bylaw 4395, adopted Jan. 14/08)*

(5) Where any public sewer is laid in private property in respect of which the Municipality holds a right of way for sewer purposes, no person shall connect to, or disturb, such sewer except by direction of, and with permission of, the Engineer.

(6) No person shall connect or attempt to connect or allow to be connected or allow to remain connected any real property to the sanitary sewer or storm sewer system otherwise than in accordance with the provisions of this Bylaw.

ENFORCEMENT

15. Should any person who is required by the provisions of this Bylaw to do any matter or thing be in default of it being done by that person, such matter or thing may be done at the expense of the person in default and the Council may recover the expense thereof, with costs in like manner as municipal taxes.

INSPECTION

16. The Engineer or a bylaw enforcement officer may enter at all reasonable times, on any property that is subject to this Bylaw to ascertain whether the regulations of this Bylaw are being observed or the requirements of this Bylaw are being met.

PENALTIES

17. Any person who violates any of the provisions of this bylaw or who suffers or permits any act or thing to be done in contravention of this Bylaw, or who neglects to do or refrains from doing any act or thing required to be done by the provisions of this Bylaw, shall be guilty of an offence and shall be liable, upon conviction, to a fine of not less than Two Hundred ($200.00), not more than Two Thousand Dollars ($2,000.00) or to a term of imprisonment not exceeding six (6) months or to both, for each offence; and each day during which any violation, contravention or breach shall continue shall be deemed a separate offence.

GENERAL

18. (1) No person shall hinder or prevent the Engineer, a person authorized by the Engineer, or a bylaw enforcement officer from entering any premises or from carrying out his or her duties with respect to the administration of this Bylaw.

(2) Nothing in this Bylaw shall be interpreted as relieving a person discharging waste from complying with Federal, Provincial and local government enactments governing the discharge of storm water into storm sewers and watercourses, and in the event of a conflict between the provisions of this Bylaw and a Federal or Provincial enactment, the provisions of the Federal or Provincial enactment shall prevail.

(3) In this Bylaw words importing the male gender include the female gender and either includes the neuter and vice versa, and words importing the singular number include the plural number and vice versa.

(4) Schedules A, B, C, D and E annexed to this Bylaw shall be deemed to be integral parts of this Bylaw.

(5) If any provision of this Bylaw is found to be invalid by a court of competent jurisdiction it may be severed from the Bylaw.

REPEALS

19. The following Bylaws are hereby repealed except insofar as they repeal any other Bylaw:

Bylaw No. 3391, "Public Sewer Bylaw, ";
Bylaw No. 3533, "Public Sewer Bylaw Amendment Bylaw", 1986";
Bylaw No. 3744, "Public Sewer Bylaw Amendment Bylaw", 1993".

PROVIDED that such repeals shall not affect any offence committed, or penalty or punishment incurred, under such repealed Bylaws or any one of them, and any such penalty or punishment may be imposed as if this Bylaw had not been passed.

20. This Bylaw may be cited as the "PUBLIC SEWER BYLAW, 1996"

READ a first, second and third time by the Municipal Council on

ADOPTED and FINALLY PASSED by the Municipal Council on

_____ _____

Mayor Municipal Clerk

Sealed with the Seal of The Corporation of the District of Oak Bay.

SCHEDULE "A"

FEES AND PERMITS

1. (1) For installing or replacing the portion of a sewer lateral which is located upon, under or over public property, including a connection to a sewer main located in a municipal right of way:

(a) For a connection to a sewer main via a lateral consisting of a single 100 mm diameter pipe of length not exceeding ten (10) metres and related joints and fittings: $3,075.00.

*(**Bylaw 4403, adopted Feb. 25/08)*

(b) For a connection to two (2) sewer mains via laterals consisting of two (2) 100 mm diameter pipes of length not exceeding ten (10) metres and related joints and fittings, installed in the same trench at the same time: $3,800.00.

*(**Bylaw 4403, adopted Feb. 25/08)*

(c) For a connection to a sewer main via a lateral:

(i) consisting of a pipe of diameter greater than 100 mm and related joints and fittings;

(ii) consisting of a pipe of length greater than ten (10) metres and related joints and fittings; or

(iii) laid at a depth which requires trenching to a depth greater than 2.3 metres,

the fee payable shall be equal to either:

(iv) the charge set out in paragraph (a) or (b), whichever is applicable; or

(v) the Engineer's estimate of the cost of the work, such estimate to include charges for labour external and internal, equipment charges external and internal, materials, fittings, supplies, rentals, consulting, contracted work and engineering costs external and internal, and all costs of excavation and reinstatement,

whichever is greater.

*(**Bylaw 4333, adopted Dec. 11/06)*

(2) For the repair of the sewer connection at the main, or for the repair or installation of a clean-out fixture, in the circumstances described in Section 8(4) of the main body of this Bylaw, the fee payable shall be equal to the Engineer's estimate of the cost of the work, such estimate to include charges for labour external and internal, equipment charges external and internal, materials, fittings, supplies, rentals, consulting, contracted work and engineering costs external and internal, and all costs of excavation and reinstatement.

*(**Bylaw 4333, adopted Dec. 11/06)*

(3) All fees must be paid in advance.

(4) Fees based on a cost estimated in accordance with 1(1)(c) or 1(2) of this Schedule are, on completion of the work, subject to refund of any unused rock blasting contingency.

(5) A request by an owner for maintenance or examination of the portion of a sewer lateral which is located upon, under or over public property, or the sewer connection at the main, will be carried out only after the owner of the property served by the said lateral or connection has signed a work order substantially in the form set out in Schedule "E" committing the owner to payment of all costs incurred by the Municipality for examination or maintenance including without limitation labour external and internal, equipment charges external and internal, materials, fittings, supplies, rentals, consulting, contracted work and engineering costs external and internal, and all costs of excavation and reinstatement, except as otherwise provided in this Bylaw.

*(**Bylaw 4171, adopted Nov. 12/02)*
*(**Bylaw 4333, adopted Dec. 11/06)*

SCHEDULE "B"

SANITARY SEWERS AND COMBINED SEWERS

PROHIBITED WASTE

Prohibited Waste means:

1. Special Waste

Special Waste as defined by the WASTE MANAGEMENT ACT OF BRITISH COLUMBIA and its Regulations or any legislation that replaces the WASTE MANAGEMENT ACT.

2. Air Contaminant Waste

Any waste which, by itself or in combination with another substance, is capable of creating, causing or introducing an air contaminant, causing air pollution outside any sanitary sewer or sewage facility or is capable of creating, causing or introducing an air contaminant within any sanitary sewer or sewage facility which would prevent safe entry by authorized personnel.

3. Flammable or Explosive Waste

Any waste, which by itself or in combination with another substance, is capable of causing or contributing to an explosion or supporting combustion in any sanitary sewer or sewage facility including but not limited to, gasoline, naphtha, propane, diesel, fuel oil, kerosene or alcohol.

4. Obstructive Waste

Any waste which by itself or in combination with another substance, is capable of obstructing the flow of, or interfering with, the operation or performance of any sanitary sewer or sewage facility including, but not limited to earth, sand , sweepings, gardening or agricultural waste, ash, chemicals, paint, metal, glass, sharps, rags, cloth, tar, asphalt, cement based products, plastic, wood, waste portions of animals, fish or fowl and solidified fat.

5. Corrosive Waste

Any waste with corrosive properties which, by itself or in combination with any other substance, may cause damage to any sanitary sewer or sewage facility or which may prevent safe entry by authorized personnel.

6. High Temperature Waste

(a) Any waste which, by itself or in combination with another substance, will create heat in amounts which will interfere with the operation and maintenance of a sanitary sewer or sewage facility or with the treatment of waste in a sewage facility;

(b) Any waste which will raise the temperature of waste entering any sewage facility to 40 degrees Celsius or more;

(c) Any non-domestic waste with a temperature of 65 degrees Celsius or more.

7. Biomedical Waste

Any of the following categories of Biomedical Waste: human anatomical waste, animal waste, untreated microbiological waste, waste sharps and untreated human blood and body fluids listed in "Risk Group 4" as defined in "Laboratory Biosafety Guidelines", published by Health and Welfare Canada and dated 1990.

8. PCBs, Pesticides

Any waste containing PCBs or pesticides.

9. Miscellaneous Wastes

Any waste , other than sanitary waste, which by itself or in combination with another substance:

(a) constitutes or may constitute a health or safety hazard to any person;

(b) may interfere with any sewage treatment process;

(c) may cause a discharge from a sewage facility to contravene any requirements by or under any B.C. Waste Management Discharge Permit or any other act, law or regulation governing the quality of the discharge, or may cause the discharge to result in a hazard to people, animals, property, or vegetation.

SCHEDULE "C"

SANITARY SEWERS AND COMBINED SEWERS
RESTRICTED WASTES

In this Schedule, Restricted Waste means:

1. **Specified Waste**

Any waste which, at the point of discharge into a sewer, contains any contaminant at a concentration in excess of the limits set out below. All concentrations are expressed as total concentrations which includes all forms of the contaminant, whether dissolved or undissolved. The concentration limits apply to both grab and composite samples. Contaminant definitions and methods of analysis are outlined in Standard Methods or methods specified by the Engineer.

Any of the contaminants listed below in tables (a), (b) or (c) that are present in a waste at dissolved concentrations in excess of the Special Waste Regulation Leachate Quality Criteria will qualify that waste, regardless of the sampling method used, as a Special Waste.

(a) CONVENTIONAL CONTAMINANTS [mg/L]	
Biochemical Oxygen Demand (BOD)	300
Chemical Oxygen Demand (COD)	600
Oil and Grease*	100
Suspended Solids	350

Note: *Total oil and grease includes Petroleum Hydrocarbons (see table (b))

(b) ORGANIC CONTAMINANTS [mg/L]	
Benzene, Ethyl Benzene, Toluene, Xylenes (BETX)	1
Chlorinated Phenols	0.05
Polycyclic Aromatic Hydrocarbons (PAH)	0.05
Phenols	1
Petroleum Hydrocarbons	15

(c) INORGANIC CONTAMINANTS [mg/L]	
Arsenic (As)	0.2
Cadmium (Cd)	0.1
Chromium (Cr)	5
Cobalt (Co)	5
Copper (Cu)	1
Cyanide (CN)	1
Iron (Fe)	50
Lead (Pb)	0.5
Manganese (Mn)	5
Mercury (Hg)	0.05
Molybdenum (Mo)	5
Nickel (Ni)	1
Silver (Ag)	2
Sulphate (SO_4)	1500
Sulphide (S)	1
Zinc (Zn)	3

2. **Food Waste**

Any non-domestic waste from cooking and handling of food that, at the point of discharge into a sewer, contains particles larger than 0.5 centimetres in any dimension.

3 **Radioactive Waste**

Any waste containing radioactive materials that, at the point of discharge into a sewer, exceeds radioactivity limitations as established by the Atomic Energy Control Board of Canada.

4. **pH Waste**

Any non-domestic waste which, at the point of discharge into a sewer, has a pH lower than 5.5 or higher than 11.0, as determined by either a grab or a composite sample.

5. **Dyes and Colouring Material**

Dyes or colouring materials which may pass through a sewage facility and discolour the effluent from a sewage facility except where the dye is used by the District, or one or more of its municipalities, as a tracer.

SCHEDULE "D"

STORM SEWERS
PROHIBITED WASTE

Prohibited Waste means:

1. Special Waste

Special Waste as defined by the WASTE MANAGEMENT ACT OF BRITISH COLUMBIA and its Regulations or any legislation that replaces the WASTE MANAGEMENT ACT.

2. Biomedical Waste

Any of the following categories of Biomedical Waste: human anatomical waste, animal waste, untreated microbiological waste, waste sharps and untreated human blood and body fluids listed in "Risk Group 4" as defined in "Laboratory Biosafety Guidelines", published by Health and Welfare Canada and dated 1990.

3. Air Contaminant Waste

Any waste which, by itself or in combination with another substance, is capable of creating, causing or introducing an air contaminant, causing air pollution outside any storm sewer or storm water management facility or is capable of creating, causing or introducing an air contaminant within any storm sewer or storm water management facility which would prevent safe entry by authorized personnel.

4. Flammable or Explosive Waste

Any waste, which by itself or in combination with another substance, is capable of causing or contributing to an explosion or supporting combustion in any storm sewer, watercourse or storm water management facility, including but not limited to, gasoline, naphtha, propane, diesel, fuel oil, kerosene or alcohol.

5. Obstructive Waste

Any waste which by itself or in combination with another substance is capable of obstructing the flow of, or interfering with, the operation, performance or flow of any storm sewer, watercourse or storm water management facility, including but not limited to, earth, sand, sweepings, gardening or agricultural waste, ash, chemicals, paint, metal, glass, sharps, rags, cloth, tar, asphalt, cement-based products, plastic, wood, waste portions of animals, fish or fowl and solidified fat.

6. Corrosive Waste

Any waste with corrosive properties which, by itself or in combination with any other substance, may cause damage to any storm sewer or storm water management facility or which may prevent safe entry by authorized personnel.

7. High Temperature Waste

(a) Any waste which, by itself or in combination with another substance, will create heat in amounts which will interfere with the operation and maintenance of a storm sewer or storm water management facility;

(b) Any waste which will raise the temperature of waste discharged by a storm sewer, water-course or storm water management facility by 2 degrees Celsius or more;

(c) Any waste with a temperature of 40 degrees Celsius or more at the point of discharge.

8. PCBs, Pesticides

Any waste containing PCBs or pesticides.

9. Pool Water

Any water from a pool containing residual chlorine or chloramine.

10. Radioactive Waste

Any waste containing radioactive materials that, prior to the point of discharge into a storm sewer or watercourse, exceeds radioactivity limitations as established by the Atomic Energy Control Board of Canada.

11. pH Waste

Any waste which, prior to the point of discharge into a storm sewer or watercourse, has a pH lower than 6.0 or higher than 9.0 as determined by either a grab sample or composite sample.

12. Dyes and Colouring Material

Dyes or colouring materials which produce in a grab sample or composite sample a colour value greater than or equal to 50 true colour units, or that causes discolouration of water to such an extent that the colour cannot be determined by the visual comparison method as set out in Standard Methods, except where the dye is used by a municipality or regional district as a tracer.

13. Miscellaneous Wastes

Any waste which by itself or in combination with another substance:

(a) constitutes or may constitute a health or safety hazard to any person;

(b) causes pollution in any storm sewer, watercourse or storm water management facility.

14. Disinfectant Process Water

Any water from a waterworks containing residual chlorine or chloramine remaining from the disinfection of the waterworks or any part of the waterworks, but does not include water containing chlorine or chloramine ordinarily added to a supply of potable water by a municipality, the Regional District, the Greater Victoria Water District or an Improvement District.

SCHEDULE "E"

THE CORPORATION OF THE DISTRICT OF OAK BAY

WORK ORDER

Note: This work order **MUST** be signed by the property owner or occupier **BEFORE ANY WORK** is carried out by Municipal employees.

I HEREBY AUTHORIZE The Corporation of the District of Oak Bay, through its employees or agents, to supply the necessary materials and perform the following work for the benefit of my premises at: _____.
(Civic Address)

Work Requested:_____

_____

_____

_____

_____

I agree to pay upon demand the cost of all work authorized by this work order including but not limited to materials, labour and equipment charges, contract costs, engineering costs, and costs of excavation and reinstatement as determined necessary by the Engineer.

It is agreed and acknowledged that the performance of work by the Municipality or its agents pursuant to this Work Order is not an admission of liability on the part of the Municipality, its servants, agents, employees, and assigns.

DATED THIS _____day of _____, 20__.

_____ _____

Name of Property Owner or Occupier
(Please print)

Signature