Director | CAO

The Corporation of **THE CITY OF NORTH VANCOUVER**
FINANCE DEPARTMENT

REPORT

To: Mayor Darrell R. Mussatto and Members of Council

From: Ben Themens, Director, Finance

SUBJECT: COST ALLOCATION AND INVOICING OF CITY UTILITY AND LONSDALE ENERGY CORP. CHARGES IN MULTI-UNIT BUILDINGS

Date: June 20, 2018 File No: 05-1820-01-0001/2018

The following is a suggested recommendation only. Please refer to Council Minutes for adopted resolution.

RECOMMENDATION:

PURSUANT to the report of the Director, Finance, dated June 20, 2018, entitled "Cost Allocation and Invoicing of City Utility and Lonsdale Energy Corp. Charges in Multi-Unit Buildings":

THAT the following amendment bylaws be considered:

- Water Utility Bylaw, 1994, No. 6417, Amendment Bylaw, 2018, No. 8658;
- Sewerage and Drainage Utility Bylaw, 1995, No. 6746, Amendment Bylaw, 2018, No. 8659; and
- City of North Vancouver Hydronic Energy Service Bylaw, 2004, No. 7575, Amendment Bylaw, 2018, No. 8660

ATTACHMENTS:

1. Council Resolution dated October 26, 2015, and report from the Deputy City Engineer entitled "Residential Water Metering Options" #1668908

2. Allocation of City and LEC Fees in Enerpro Rates #1668909

3. Water Utility Bylaw, 1994, No. 6417, Amendment Bylaw, 2018, No. 8658 #1668254

4. Sewerage and Drainage Utility Bylaw, 1995, No. 6746, Amendment Bylaw, 2018, No. 8659 #1668246

5. City of North Vancouver Hydronic Energy Service Bylaw, 2004, No. 7575, Amendment Bylaw, 2018, No. 8660 #1668240

PURPOSE:

This report discusses multi-unit residential City and LEC invoicing principles, provides a review of some of the rate setting and billing practices of multi-unit building metering and invoicing recently implemented in some City buildings through firms such as Enerpro Systems Corp. (Enerpro) and examines the potential impacts on City Utilities and Lonsdale Energy Corporation (LEC) rate payers. It also proposes options to amend practices and City bylaws to allocate the charges to the various strata or rental units on a basis that is in line with City invoicing principles, enhances transparency and maintains the integrity of the City and LEC cost of service.

BACKGROUND:

City and LEC have been contacted by residents, real estate agents and potential unit purchasers in recent years to obtain information and discuss the utility rates in various buildings where amounts invoiced by City and LEC are recalculated and allocated on the basis of Enerpro's cost allocation principles and assumptions. Currently Enerpro invoices LEC and City Utility costs in six of the 75 buildings serviced by LEC.

Some residents are concerned by the fact that they are being invoiced what they consider extremely high utility costs. Invoices lack clarity regarding rates and cost allocation of water, sewer and heating services. Some residents have indicated that they are using or intend to investigate alternative methods for in-suite heating to reduce costs.

It is important to note that the City and LEC invoices the developer initially for water, sewer and heating services, and then invoices the strata after occupancy is approved. The City and LEC were never consulted by Enerpro or the developers prior to the implementation of the metering and billing administered by Enerpro.

DISCUSSION:

City and LEC invoicing principles

The City is invoicing water and sewer services on a flat rate per suite basis in multi-unit buildings. The charge to each suite does not consider consumption for any individual unit. Council adopted a resolution at its Regular meeting of October 26, 2015 to maintain the pace of the "meter ready" strategy and to defer residential properties metering to a later time (**Attachment 1**). The report that was presented to Council at that time mentioned:

> "Consumption typically reduces when meters are installed. The reduction depends on the extent of discretionary water use. Indoor water use is fairly inelastic and is unaffected by cost. Outdoor water use is more affected by

> volumetric pricing. Those who know they are paying for water may not use as much to water their outdoor space."

It is believed that metering of multi-unit buildings would generate little consumption savings because of its high density and small outdoor to indoor watering demand ratio.

The City has implemented various residential water consumption reduction programs that are not financially driven. The Engineering, Parks and Environment report mentions there are little financial benefits to support residential metering:

> "Compared to other areas of North America where supply is limited, water in the Lower Mainland is generally abundant and cheap. From a purely financial perspective, expanding metering as a water conservation exercise will not save the City or region money in the short or medium term. Because the system is for the most part gravity fed, only a small percentage of costs are variable (energy for pumping and chemical treatment). For the City of North Vancouver, all of our costs are fixed and unaffected by the volume of water distributed to our customers. Reduced consumption across the region is eventually offset by higher water rates. With little savings at a macro scale, metering will add additional costs for reading, billing and maintenance. There are certainly benefits to metering, but reducing costs on a City wide scale should not be considered a benefit."

As for heating service from LEC, fixed charges are used to recover cost of equipment and activities that do not fluctuate with consumption. For instance, most of the equipment installed by LEC is based on meeting peak heating load demand of a building and not on consumption. That peak heating load is set by the engineer at time of building design and aims to ensure that everyone connected to LEC will be able to receive sufficient heating energy during peak conditions. LEC uses rates that are based on consumption to recover costs such as natural gas that fluctuate with demand. LEC aims to be as transparent as possible by providing rate adjustments that fluctuate with FortisBC natural gas pricing. In the end, more than half of LEC's charges are fixed and do not fluctuate with consumption.

Nevertheless, some developers have taken the initiative of implementing water, sewer and heating metering systems that allocate cost based on utility consumption per suite.

Enerpro System and Rates

One firm has been identified as providing suite metering services. Enerpro installs an average of 3 meters per suite that measure cold water volume, hot water volume and space heating energy consumption. Enerpro charges an administrative fee of approximately $11.75/month plus taxes. The fee increases if more than 3 meters are required to measure a suite's consumption. LEC has also recently been made aware that in some buildings all or part of the cost of the meters is recovered from the suite owners through a third party leasing arrangement that is invoiced by Enerpro as an "*iEMS System Recovery charges*". Those charges can be significant. Enerpro invoices each suite the Enerpro administrative fee, *iEMS System Recovery charges* and the share (determined by Enerpro) of the City and LEC water, sewer and heating charges.

Unfortunately, Enerpro substantially changes the City and LEC rates, as it invoices its customers by fully allocating City and LEC costs on the basis of consumption without any recognition of fixed charges included in the City and LEC invoices. This means that there is a significant disconnect between the amounts invoiced by Enerpro and the invoicing principles of the City and LEC. Integrity and transparency of the invoicing process is significantly compromised.

Enerpro's rationale is that the metering of consumption and invoicing on this basis enhances conservation. While this rationale is undeniable, the allocation of fixed costs on this basis does not reflect the fact that a major portion of City and LEC costs are fixed by nature and do not fluctuate with consumption. Considering that a significant portion of the costs invoiced by the City are fixed, a lower consumption does not translate into a reduction of the cost for the building as a whole but rather in a shifting of the cost from the low users to high users. For instance, the fixed cost to provide the service to an empty or sporadically occupied suite is borne by other suite owners that consume the service.

Since a large portion of the costs do not fluctuate with consumption, residents are ultimately competing between themselves to reduce their costs by reducing consumption and transferring a larger portion of the fixed cost to other residents. Worst, for instance, if all the residents were to reduce their respective consumption by 50%, the fixed cost portion of their invoice would remain constant and billing would largely remain unreduced and unaffected by the decrease in consumption. Enerpro would need to recover the same amount by increasing rates. Particularly with regard to water and sewer services and, to some extent to heating services, residents reducing their consumption will receive no savings unless the percentage of their personal consumption in proportion of the total building consumption is reduced.

The following table provides a theoretical example of the water and sewer charge of a 4 unit building where consumption of each suite is respectively 10%, 20%, 30% and 40% of the total building consumption.

Unit #	CNV Water and Sewer Fee (1)	Share of Consumption	Invoiced on basis of consumption	Variance of CNV and allocated fee
1	$ 474.05	10%	$ 189.62	-60%
2	$ 474.05	20%	$ 379.24	-20%
3	$ 474.05	30%	$ 568.86	20%
4	$ 474.05	40%	$ 758.48	60%
Total	$ 1,896.20	100%	$ 1,896.20	0%

(1) 2018 fee per bylaw 6417 and 6746 including $274 for water service, $225 for sewer service less 5% for early payment

As shown in the above table, in this simplified example, one suite owner would save of 60% of the City fee at the expense of another owner who would pay 60% more.

LEC understands that such metering is also implemented in some rental buildings. This allows building owners to transfer the utility costs to tenants and if the cost allocation is based on the same principles, it is conceivable that such an allocation could allow the allocation of the utility costs of vacant suites to other building renters.

LEC has compiled the information made available by Enerpro regarding some of the buildings they service. Attachment 2 shows how City and LEC Fees are re-distributed in Enerpro Rates. In 2018, multi-dwelling City water and sewer levies were fixed at $474.05 per year per unit by the City. In the buildings we have reviewed, this cost is recovered on a litre basis. Cold water is charged at approximately $0.0044/litre to recover both part of the water and sewer levies.

LEC's meter and capacity charges that are also fixed on a building by building basis are now recovered on a kWh basis of "heat" and "hot water" charges. LEC's variable cost invoiced under its commodity charge at less than $0.03/kWh is recovered with the capacity and meter charges through a heating charge of approximately $0.0785/kWh in the Enerpro model. To explain this high rate, it is important to note that in addition to recovering LEC's meter, capacity and commodity charges, the Enerpro model assumes that only approximately 80% of the energy makes it to the suites and is measured by the in-suite meters. A premium is included in the unit cost to offset in-building losses.

Enerpro estimates that 20% is lost through the in-building distribution and circulation process. However, LEC is concerned that since the heat is lost within the building, it could end up being transferred to units located near the location of the losses. Such "free energy" would reduce consumption and further transfer costs to users that do not benefit from this "free energy".

Finally, Enerpro has a charge of approximately $0.0083/litre for hot water consumption. This charge aims at recovering a combination of City Water and Sewer costs as well as LEC domestic hot water heating cost. The consumption of hot water is metered on the basis of volume (liters) consumed by the occupants. The amount of heat used in the domestic hot water heating process is not measured. Instead it is estimated on the basis of a theoretical assumption of the temperature increase of the water and the heat consumed to achieve this increase.

The use of such an estimate can be problematic particularly if due to location in the building there are significant hot water temperature differences between suites or delays between the time when the hot water tap is turned on and when hot water is actually available at the tap. Hence, estimates should not be used for such a purpose.

Another issue that increases invoicing complexity is that as mentioned above. While Enerpro compiles cold water, hot water and heat rates and uses them in the preparation of its invoices, Enerpro does not include any of these rates on its invoices. Enerpro stated in an email that "rates can only be posted by utilities. The strata [through Enerpro] is recovering its costs and is obviously not a utility, therefore there are not any

rates to be displayed." Enerpro verbally mentioned to staff that BCUC does not allow the use of rates or they could be considered a utility and subject to BCUC rate approval reviews if rates were included in invoices. Consequently, Enerpro invoices only provide the suite consumption and cost for each of the three services.

In late May 2018, LEC staff met with Enerpro and approximately 40 unit owners of buildings metered by Enerpro. The amount of misinformation and misinterpretation between LEC's and Enerpro's rates made up for a significant amount of confusion during the discussion. The meeting organizer best summed it when she wrote the next day to Enerpro and LEC: "Thank you very much for coming and speaking to the owners at [name of building omitted]. As you can hear, lots of questions, confusion and anger, about how difficult it is for all of us to figure out how to decipher our bills and how to have some control over our energy/utility costs."

Some of the owners are so concerned by the high costs, that they are using alternative (non-bylaw-compliant) heating sources in the hope of reducing costs. The information provided to them has led many to believe that LEC's energy cost is unaffordable. Some compare the heating cost of their former houses with Enerpro's invoices and find the cost to be unreasonably high. It seems that in many cases, those that are making such comparisons are not aware or do not take into account water, sewer and metering costs included in the invoice.

The Enerpro representative further contributed to the misunderstanding by mentioning that those that are absent from their unit on a regular basis would see their costs increase if costs were to be allocated on the basis of each unit entitlement (which is understood to mean the unit entitlement as defined in the *British Columbia Strata Property Act* that is used in calculations to determine the strata lot's share of the common expenses and liabilities of the strata corporation). Some residents added that they did not want to pay for their neighbours' hot water or heating. Such concerns were valid given the current invoicing mechanism.

However, such comments do not take into account the fact that a significant portion of the amount being invoiced is fixed and that a decrease in consumption does not produce savings at the building level. In fact, following the meeting, based on information provided by Enerpro, staff have determined that residents can control only 10% of the cost invoiced by Enerpro through pro-active behaviour changes to reduce consumption.

The table below concerning an average unit cost allocation provides the information in percent. To respect owners' confidentiality, amounts provided by Enerpro are concealed.

From this table, since some of LEC's costs are recovered through the strata fee on the basis of unit entitlement, it is clear that the metering costs represent more than 28% of the in-suite invoiced cost. Based on this reasoning, City utility charges for sewer and water represent more than 38% of the in-suite invoice. LEC charges make for approximately 30% of the in-suite invoice, taking into account that more than 6% of the total amount is recovered through strata fees.

Average Unit Cost Allocation				
	Average Monthly Cost per unit	Percent	Charged to Strata	Currently Allocated by Enerpro to Occupants
Metering Related Charges				
Enerpro Basic Charge		11%	Fixed	Fixed charge to each unit
IEMS Lease		17%	Fixed	Variable based on in-suite use
Sub-total		28%		
City Utility Charges				
City of North Vancouver Water		20%	Fixed	Variable based on in-suite use
City of North Vancouver Sewer		18%	Fixed	Variable based on in-suite use
Sub-total		38%		
LEC Charges				
LEC Meter Charge		2%	Fixed	Variable for in-suite and unit entitlement for common
LEC Capacity Charge		16%	Fixed	Variable for in-suite and unit entitlement for common
LEC Common Area Energy		6%	Variable	Unit entitlement
LEC in-suite Heating Energy		5%	Variable	Variable based on in-suite use
LEC in-suite DHW Energy		5%	Variable	Variable based on in-suite use
		34%		
Average Unit Cost		100%		

In all, only 10% of the total cost invoiced to unit owners through Enerpro or strata fees is variable and under the control of suite owners. Those amounts are highlighted in yellow. Each of LEC in-suite space heating cost and LEC in-suite domestic hot water (DHW) heating represent 5% of the total invoice. To put things in perspective, if a resident was to reduce heating consumption in their suite by 20%, they would reduce their invoice by approximately 1% for space heating and 1% for DHW heating.

LEC has considered the metering of suites in the past. The above information, confirms LEC's findings at that time that metering cost was unjustified considering potential cost and energy savings.

Impacts and consequences

Staff has identified several ramifications and concerns with regard to Enerpro's approach to rate setting and utility billing:

1) The invoicing based solely on consumption creates important and disproportional seasonal fluctuations particularly with regard to heating costs. While infrastructure and equipment is available on a continual basis and recovered through fixed charges, Enerpro recovers most of the cost of year-round available heating equipment during heating season only.

2) The billing of fixed costs on a variable consumption basis means that those who use the system pay a disproportionate and significant share of the cost. Some of those costs are related to fixed assets which are available to everyone when needed. Empty suites are billed low charges, if any. This creates winners and losers. Families with children that likely consume more water may pay more than their fair share of the building utility bill and municipal fixed assets. Those paying a higher proportion of the cost may blame the City and LEC for those high cost unless they are appropriately informed they are paying for those who are not

using the service in their building. This information does not seem to be provided adequately by Enerpro. Invoices make no mention of sewer charges. Enerpro's hot water charge that combines water, sewer and heating charges is interpreted by some to represent the cost of hot water that is used for the delivery of heat by LEC.

3) With no published or invoiced rates, the Enerpro system provides no transparency. The allocation mechanism provided by Enerpro is based on numerous assumptions and are somewhat unreliable. This makes it impossible for the City and LEC to justify or reconcile the rates charged to customers who contact the City or LEC for explanation. Over payments/under payments are impossible to track by anyone other than Enerpro and perhaps the Property Manager or the owner in the case of rental properties. There does not seem to be a formal mechanism to reallocate or reimburse over/under payments. With no rates provided on invoices, the savings of a reduction in consumption cannot be estimated by individual residents. Worst, to ensure that Enerpro can maintain the total amount collected for a building, rates and charges for a stable consumption can increase indiscriminately if some of the other owners reduce their consumption.

4) Based on Enerpro's comments, one stated goal of developers who implement the system is to minimize the strata fees in order to enhance suites marketability by transferring charges to utility costs. This was mentioned in an informal discussion with an Enerpro representative. When a written confirmation was sought, Enerpro provided a formal reply that states: "The developers come to us for a number of reasons, reduction in strata fees, LEED/built green credits, sustainability, cost allocation, etc. They all have different reasons for doing it and we don't really [want] to the influence or change those reasons." Staff cannot determine if suite buyers and renters are provided accurate or reliable information when electing to purchase or rent a suite. This could further enhance resident frustration.

5) More importantly, perceived high costs and potential savings are resulting in poor energy source switching decisions by residents. At the late May meeting, one resident has indicated using his air conditioning heat pump in heating mode to heat his suite to save on Enerpro invoiced costs. In the past, another resident mentioned using a portable electric space heater. It is widely recognized that such devices are involved in numerous residential fires each year. In addition to the hazard, the high cost of electricity will not provide significant financial relief to tenants and will result in higher overall costs for the building by simply transferring costs to other residential suites.

It is important to note that available documentation is incomplete regarding the above issues. The information has been compiled from several emails and comments received during meetings or complaints from customers. There is no transparency with regard to the system and its impact on residents. In many cases, the information is anecdotal.

Cost Allocation Modification Challenges and Options

Enerpro has indicated to LEC on a few occasions that any change to the cost allocation requires the approval of 100% of the strata owners. This assertion seems to be supported by section 100 of the *British Columbia Strata Property Act,* which states that such a change must be done through a resolution passed by a unanimous vote at an annual or special meeting. Given the inequity of the current invoicing system, it is unlikely that 100% of the strata owners will support a change to current billing methodology. This being said, this issue is not under the control of the City or LEC and would need to be resolved by residents. Staff have not been provided the exact wording of the strata's current cost allocation resolution and it is not possible to determine if the resolution provides some flexibility in the allocation mechanism.

However, in this regard, Enerpro stated the following in an email to LEC:

> "There is a very high unlikeliness that the metering is terminated as the strata must abide by the *Strata Act* and would need a vote to enforce a change to the budget and how the costs are allocated. There were many people in attendance last night that are in support of allocating the costs by metered consumption. The strata must abide by the provincial regulations and there are no avenues for exemption. Strata cost allocations are outside of municipal jurisdictions as well."

The City and LEC have consulted with their solicitor and identified the following options to ensure that invoicing is equitable, allows metering to be used when in line with City and LEC invoicing principles, enhances transparency and maintains the integrity of the City and LEC cost of service.

Option 1 (Recommended):

Under this option, the City's "Water Utility Bylaw, 1994, No. 6417", "Sewerage and Drainage Utility Bylaw, 1995, No. 6746", and "City of North Vancouver Hydronic Energy Service Bylaw, 2004, No. 7575", and all amendments thereto, which respectively dictate the rates to be charged for water, sewer and hydronic energy services would be amended to clarify that for rental buildings wishing to invoice water, sewer and hydronic energy services or strata buildings wishing to invoice those services on another basis than unit entitlement, invoicing must be at the rate charged by the City and the invoice must clearly specify the rate and the calculation of the amount owing. Such a procedure would remain adequate if the City was to eventually implement water metering requirements or if universal metering was to be implemented at a regional level.

Furthermore, consumption estimates would not to be allowed; only measured consumption could be used. This procedure would prevent the use of estimates, such as an estimate of the heat used to provide DHW and the assignment of theoretical energy losses to units. Such unmeasured energy consumption or losses would need to be recovered through the rental fee of rental properties or strata fee of a strata through the usual unit entitlement of strata lot calculation.

Lastly, for strata buildings that would not comply with such requirements, the City could invoice fixed water and sewer fees to each unit directly. For several years, the Finance department has invoiced each unit in strata buildings of 6 units or less. In larger

buildings, all suites are invoiced together in one invoice to the strata. This practice has been implemented to reduce costs and simplify payment process by residents. The invoicing on a suite-by-suite basis of those fees, would ensure that strata buildings comply with City rate-setting principles.

As long as it would be limited to the 4 LEC connected strata buildings currently invoiced by Enerpro, the cost of invoicing each suite could be absorbed by the City initially and a surcharge could eventually be introduced if such individual suite invoicing becomes significant.

Option 2:
This option would essentially take an approach similar to Option 1, but modification of the 3 bylaws would also include fines for strata or building owners that do not comply with invoicing requirements. This option is not recommended at this time. It is deemed preferable to achieve compliance without the use of fines which can be administratively burdensome and create resentment.

FINANCIAL IMPLICATIONS:

The financial implications are explained throughout the report. The cost of implementing the proposed bylaw modifications is not expected to be significant for the City and LEC.

Metering and cost allocation of utility services should be transparent, fair and simple to administer by the utility and to understand by users. The allocation needs to provide information that may lead to behavioural changes with a clear understanding of potential financial impacts.

INTER-DEPARTMENTAL IMPLICATIONS:

This report has been reviewed by the Engineering, Parks and Environment Department.

RESPECTFULLY SUBMITTED:

Ben Themens, MBA, P.Eng., CPA, CGA
Director, Finance

MINUTES OF THE **REGULAR MEETING OF COUNCIL** HELD IN THE COUNCIL CHAMBER, CITY HALL, 141 WEST 14th STREET, NORTH VANCOUVER, BC, ON **MONDAY, OCTOBER 26, 2015.**

REPORTS OF COMMITTEES, COUNCIL REPRESENTATIVES AND STAFF

24. Residential Water Metering Options – File: 11-5600-03-0001/2015

Report: Deputy City Engineer, October 21, 2105

Moved by Councillor Keating, seconded by Councillor Buchanan

PURSUANT to the report of the Deputy City Engineer, dated October 21, 2015, entitled "Residential Water Metering Options":

THAT Option 1 (maintain the current pace of the "meter ready" strategy) of the report, be endorsed.

CARRIED UNANIMOUSLY

Dept. Manager	Director	CAO

The Corporation of **THE CITY OF NORTH VANCOUVER**
ENGINEERING PARKS AND ENVIRONMENT DEPARTMENT

REPORT

To: Mayor Darrell R. Mussatto and Members of Council

From: Peter Navratil, Deputy City Engineer

SUBJECT: RESIDENTIAL WATER METERING OPTIONS

Date: October 21, 2015 File No: 11-5600-03-0001/2015

The following is a suggested recommendation only. Please refer to Council Minutes for adopted resolution.

RECOMMENDATION:

PURSUANT to the report of the Deputy City Engineer, dated October 21, 2015, entitled "Residential Water Metering Options":

THAT Option 1 (maintain the current pace of the "meter ready" strategy) of the report is endorsed.

ATTACHMENTS:

1. Appendix A: City of North Vancouver – Water Conservation Strategy Summary

PURPOSE:

The purpose of this report is to review the current residential metering policy in light of the recent water restrictions experienced this past summer. Escalating to Stage 3 of the Water Shortage Response Plan has served to increase the dialogue about regional and municipal water systems. Many municipalities are reviewing their water conservation strategies and Metro is re-examining the timing of their storage expansion plans. In early 2014, Council approved a 10 point water conservation strategy that covers a range of conservation initiatives, such as education, enforcement, pricing strategies and metering.

The report examines the arguments for and against residential water metering and concludes by recommending no changes to the City's current pace of our "meter ready" program.

BACKGROUND

City of North Vancouver Water Conservation Strategy

Metering is just one of many ways to address water conservation. In 2014, Council approved the water conservation strategy. The strategy has a 10 year goal of a 10% reduction in total per capita consumption, supported by 10 conservation strategies targeting all sectors of water use. The full list of strategies is contained in Appendix A.

Many of the initiatives contained in the strategy have been implemented and appear to be showing results. Most notably, the increase in educational resources relating to summer time water use received positive results in 2014 and was easily scaled up for this past summer. The City hosted two rain barrel truckload sales in May selling over 800 units. Council also approved a seasonal rate structure for existing metered customers. The seasonal rate structure places a higher unit rate in the summer when the system relies on supply and a lower rate in the offseason when water is more plentiful. An initiative is just getting underway to address in-system leaks. Leak detection technology has improved over the past number of years allowing City crews to find leaks on mains and connections.

Regarding residential metering, the water conservation strategy reaffirmed the "meter ready" approach whereby properties undergoing renovation or redevelopment are pre-plumbed for meters. It is worth noting, all Industrial, Commercial and Institutional (ICI) customers – which account for approximately 40% of consumption – are already metered. "Meter ready" refers to the residential sector. This program is expected to run until 2030-35 when the majority of properties would have all necessary infrastructure needed to host a meter (underground chamber and all necessary plumbing). To convert a "meter ready" property to a billing site is relatively easy and cost effective. A technician accesses the meter chamber, isolates the service, installs the meter and calibrates the reading device in approximately one hour.

Consumption Trends

When examining water consumption, two metrics are typically analyzed – total per capita consumption and per capita residential consumption. Both analytics are important as the land use distribution is different from jurisdiction to jurisdiction. A municipality with a high total per capita may have a thriving industrial sector and may not necessarily be a high consumer. When comparing residential consumption, the distribution of single family and multi-family is another important consideration.

Figure 1 isolates the residential use comparing municipal consumption rates. The City has average consumption when compared across the region. Of note, the District of West Vancouver (fully metered) and the City of Richmond (50% residential meter) have higher per capita consumption figures.

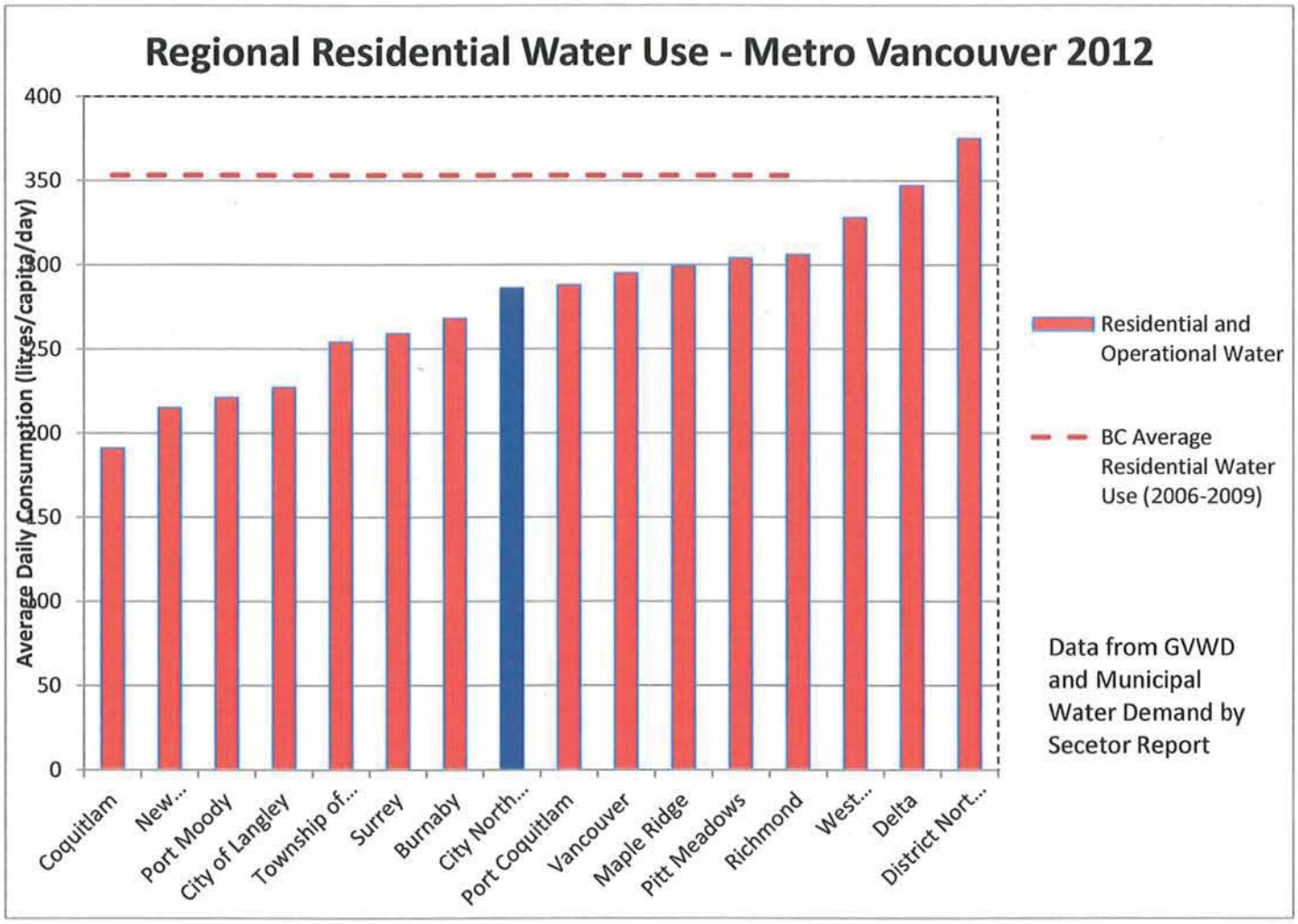


Figure 1 – Residential Per Capita Consumption Comparison

Figure 2 provides trending over the past 30 years on total per capita use. Overall, water consumption per capita has decreased due to technological improvements and conservation policy. The City's total per capita consumption is slightly below the Metro Vancouver average and below both the District of North Vancouver and District of West Vancouver even considering the robust Industrial, Commercial and Institutional (ICI) sectors.

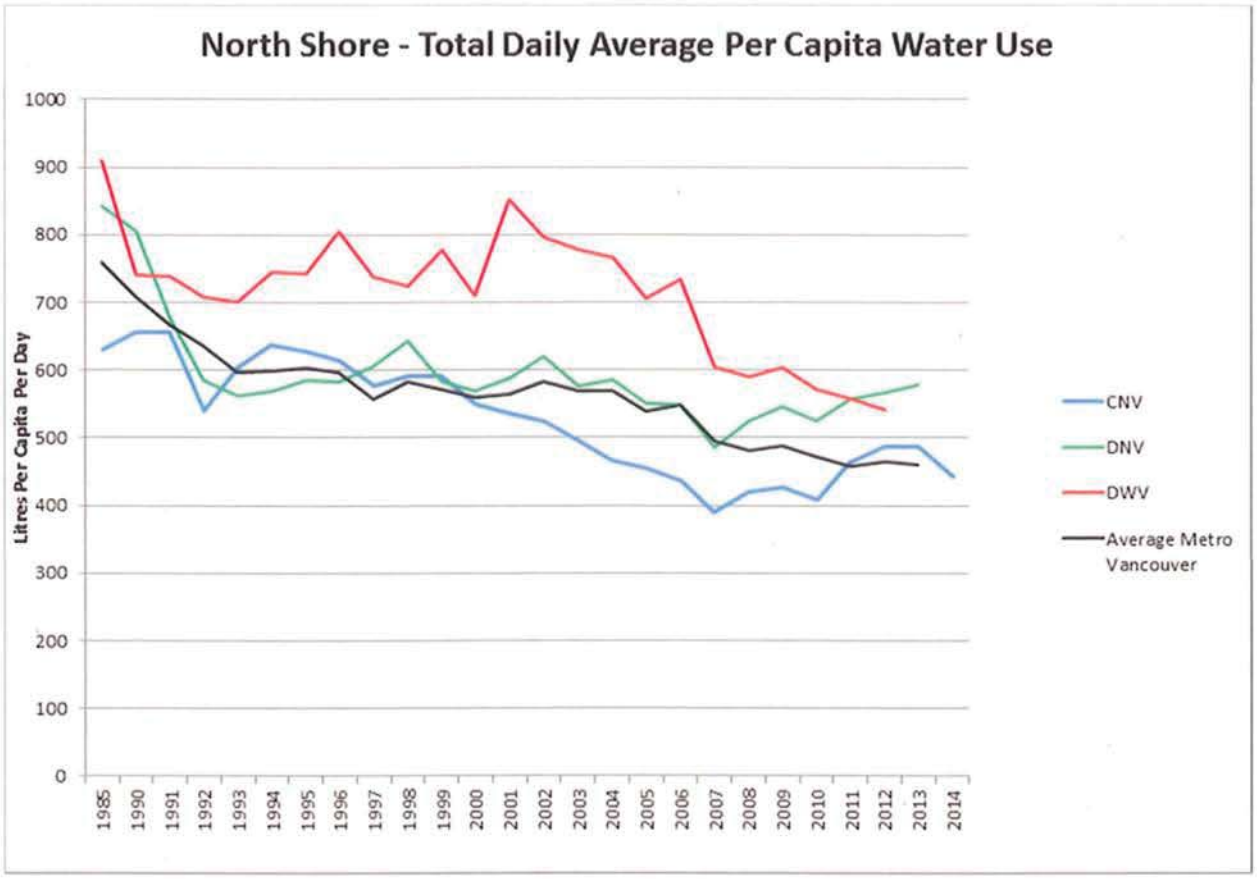


Figure 2 – CNV Total per Capita Consumption Trends

The Water Conservation Strategy has shown some early results. The year over year difference between 2013 and 2014 per capita consumption is encouraging, and while only one data point, it shows an initial reduction trend. The 2015 data is not yet available, and will be provided as part of the 2016 water utility report.

Summer Water Restrictions

Over this past summer, the region experienced an unprecedented drought. Low snowpack and record low rainfall in May, June and July forced the escalation of Metro Vancouver's drought response plan up to Stage 3. The drought response plan has 4 stages of activation designed to primarily reduce outdoor water use. This was the first time since 2003 that the water shortage response plan was advanced beyond Stage 1.

During the drought, the City increased the education and enforcement effort by employing a student education team coupled with additional auxiliary bylaw enforcement staff. Regionally, the combined effort of all the municipalities was extremely effective particularly during Stage 3. Metro Vancouver had set a 1.2 billion litre daily consumption target. During Stage 3, that target was never exceeded. The restrictions were reduced back to Stage 2 and Stage 1 through September following several systems of heavy rain.

Generally, the public was supportive of the measures taken by Metro Vancouver and enforced by the municipality. The City received a number of media requests inquiring about enforcement rates and general compliance.

The following table summarizes the summer education and enforcement statistics for the City:

	Total to Date
Education brochures distributed	750
Water Violations - Public Complaints & Staff Inspections	214
Number of Written Warnings Issued	52
Number of Tickets Issued	7

DISCUSSION:

Regional Water Storage Capacity

Before discussing metering in greater detail, it is important to understand the storage component of the overall system.

From Metro Vancouver's perspective, the most appealing storage expansion potentials involve the Coquitlam and Seymour lakes. Coquitlam is the largest of the three main lake sources, and extraction is limited by intake capacity. A second intake, located mid-lake, would provide enough regional capacity until at least 2050 and potentially out to 2100. The second phase of capacity increase would likely see the level of the Seymour Falls dam raised to increase storage capacity. Ongoing discussions about source expansion will likely focus on timing of expansion for these two sources.

While Metro Vancouver can best influence supply, municipalities can best address demand management. The remainder of this report focuses specifically on the opportunities and challenges of accelerating water metering policy.

Benefits of Metering

Metering can offer many benefits such as:

- Reduced consumption
- Leak detection
- Improved user pay equity
- Seasonal rate setting tools

Reduced Consumption

Consumption typically reduces when meters are installed. The reduction depends on the extent of discretionary water use. Indoor water use is fairly inelastic and is unaffected by cost. Outdoor water use is more affected by volumetric pricing. Those who know they are paying for water may not use as much to water their outdoor space. In communities that have large outdoor watering demands, meters may reduce consumption in the order of 25%. In denser communities like the City of North Vancouver, reductions of 10-15% are likely more realistic in the residential sector. A 15% reduction in the residential sector would equate to a 9% overall reduction in city

consumption. The Water Conservation Strategy has set a 10 year goal of a 10% overall reduction in consumption without the widespread introduction of residential meters.

Leak Detection

Meters are an excellent way to identify leaks on private property. Without a meter, a leak can go unnoticed or unfixed for long periods of time. Best practice for a water system owner is to read meters monthly in order to detect leaks quickly and notify owners of their requirement to rectify the leak.

User Pay Equity

User pay equity issues can be alleviated by volumetric consumption metering. Larger homes with more occupants pay for actual use rather than a flat rate. In some communities, particularly where single home sizes widely vary, the decision to advance metering has largely been driven by this issue.

Seasonal Rate Setting Tools

Meters enable the use of different price strategies, such as seasonal rates, declining block rates, and inclining block rates.

The City is only the second municipality to implement seasonal rates where the volumetric price is 25% in the high season over the low season. In the event of drought-like conditions, policy changes could be made to the City's price structure that would temporarily raise the high season cost of water as a way to reduce consumption further.

The Financial Business Case for Metering

The largest impediment to widespread residential metering in the region has been cost. Compared to other areas of North America where supply is limited, water in the Lower Mainland is generally abundant and cheap. Technological advancements and progressive policy, such as low flow toilets and seasonal sprinkling restrictions have lowered per capita consumption to a point that has nearly offset population growth over the past 25 years. Because of this, most municipalities in the region have taken a flat rate billing approach to their single family, duplex and multi-residential housing.

From a purely financial perspective, expanding metering as a water conservation exercise will not save the City or region money in the short or medium term. Because the system is for the most part gravity fed, only a small percentage of costs are variable (energy for pumping and chemical treatment). For the City of North Vancouver, all of our costs are fixed and unaffected by the volume of water distributed to our customers. Reduced consumption across the region is eventually offset by higher water rates. With little savings at a macro scale, metering will add additional costs for reading, billing and maintenance. There are certainly benefits to metering, but reducing costs on a City wide scale should not be considered a benefit.

In the long term, a financial business case does exist if conservation activities can delay the need to expand supply or transmission capacity. Metro Vancouver has estimated intake capacity expansion at Coquitlam Lake at approximately $800 Million. If water conservation could delay a large project by 5-10 years, there would be a deferral savings. This is a business case that Metro Vancouver would need to produce and

should be added to a future revision of the Drinking Water Management Plan as a way to improve the overall case for expanded metering in the region.

Administrative Changes Required for Expanded Metering Activity

If the City were to increase the amount of metered customers, a corresponding increase in resources would be required to read, bill and maintain the new meters. In terms of ongoing administration overhead, figures published by the City of Vancouver in 2012 estimated an additional $40-$60 per account per year. The City of Vancouver assesses a $29 fee per bill (3 per year) as a base fee to recover meter servicing costs. Similarly, West Vancouver charges $56 per quarter as a base fee which includes administration costs. In each case, consumers are charged for their consumption above and beyond the base fee ($1.20 m^3 in West Vancouver and $0.96 m^3 (average) in Vancouver). The City of North Vancouver charges its customers for a minimum of 30 m^3 per month ($1.04 m^3 average) which would need to be restructured if single family metering were commenced.

Additional resourcing needs would be required in the Finance and EPE Departments as and when the number of customer accounts increased.

The City has some of the lowest flat rates in the region. The chart below compares flat rates for several municipalities with unmetered residential sectors:

Municipality	Annual water cost for single family home (2015)
City of North Vancouver	$400
City of Vancouver	$568
District of North Vancouver	$630
City of Burnaby	$561
City of Coquitlam	$457

Meter Strategy Options

Moving forward, there are three options available – maintain the current "meter ready" strategy, accelerate the "meter ready" program or officially commence metering for residential properties.

OPTION 1 – Maintain current pace of "Meter Ready" strategy **(RECOMMENDED)**

Maintaining the current pace of the "meter ready" program is recommended by Staff largely because the increased water demand from population growth has been nearly offset by water conservation policy and improved technology. In 1985 the City's population was roughly 36,000 and the total per capita consumption was 640 lpcd and in 2014 the population was about 52,000 using 445 lpcd. When compared, it works out to less than 1% increase in total water demand over 30 years. This trend is consistent across the region and because of this, the demand on summer storage has not greatly increased and still allows time to gradually (and more efficiently) install metering infrastructure.

A potential factor not discussed is the effects of climate change, which may force acceleration of either supply capacity or water conservation policy. The unprecedented drought this summer increased those concerns. Instead of accelerating the "meter ready" now, Staff recommends annual reporting of the summer supply capacity during the annual rate reports. That would give Council an opportunity each year to consider a policy change with respect to residential metering.

OPTION 2 – Accelerating the "Meter Ready" strategy **(NOT RECOMMENDED)**

Presently, 36% of all residential properties are "meter ready". If current redevelopment rates continue, the City should be fully metered by 2030-2035. Once meter ready, the conversion to meters could be done relatively quickly (3-4 months) at an approximate cost of $1.2 Million (2015). It is anticipated that the water utility stabilization reserve would have sufficient funds to support the conversion program with little financial impact to customers or the water utility.

The rate at which the city becomes meter ready could be accelerated by targeting old services for renewal. Rather than waiting for old services to fail, City operations staff could proactively renew old services close to the end of useful life and pre-fit the connection with the meter box and plumbing. By adding an additional $100k (approximate 1% increase to water rates) to the service renewal budget in the water utility, the City would make an additional 20-30 properties meter ready and could reduce the current build out period by 5 years.

This option is not recommended as it accelerates the replacement of old but still useful services before they have completely expired.

OPTION 3 – Commence Metering for Residential Properties **(NOT RECOMMENDED)**

If Council chose to begin residential metering, a number of different phasing options exist. Implementation of a full retrofit program, similar to West Vancouver would cost between $6 and $8 Million. Ongoing operating costs for each account would range between $40 and $60 per year.

The marginal cost increase to upgrade a service replacement project to become "meter ready" and then add a meter at a later date is approximately $500 compared to a stand-alone meter installation that would cost between $1000 and $1200 each. The stand-alone meter project would be a less efficient option as the "meter ready" strategy allows us to maximize the lifespan of the current connection assets

If Council choses Option 3, Staff would report back with multiple implementation scenarios describing resourcing and financial impacts. Likely, use of the water stabilizing reserve and cross subsidy of flat rate payers would be needed to support a residential metering program.

FINANCIAL IMPLICATIONS:

The Staff recommendation of maintaining the current pace of "meter ready" conversion would not have any financial implications.

If Council chose Option 2 and directed Staff to accelerate the "meter ready" program to reduce the system conversion time by 5 years, an additional $100k would be added to the service replacement budget. This would result in roughly a 1% increase to water rates to accommodate the program. If Option 2 is endorsed by Council, the 2016 water utility budget would be adjusted for approval in December.

If Council choses to commence metering, Staff will report back the costs and financing options available to support a voluntary metering program. The flat rates for each sector (SFD, Duplex & Multi-family) would likely need adjusting and access to funds in the water stabilizing reserve would also likely be requested.

INTER-DEPARTMENTAL IMPLICATIONS:

Any changes to current policy impact both the EPE and Finance Departments. This report was reviewed and endorsed by the Major Projects Committee on October 20, 2015.

CORPORATE PLAN AND/OR POLICY IMPLICATIONS:

The recommendations contained in this report support goal 8.1 of the Official Community Plan:

8.1 Provide the community with public infrastructure that protects the natural environment at an affordable cost.

RESPECTFULLY SUBMITTED:

Peter Navratil, P.Eng, MPA
Deputy City Engineer

Appendix A
City of North Vancouver – Water Conservation Strategy

Goal –To reduce total per capita consumption by 10% by 2024

Strategy #1 Continue the property connection renewal program with the aim of making all properties "meter ready" by 2030.

Strategy #2 Phase out the toilet rebate program and subsidized indoor & outdoor water saver kits in favor of laundry appliance rebate programs and a subsidized "2 season" rain barrel program

Strategy #3 Ensure compliance with regional summer lawn watering restrictions through an education and enforcement program

Strategy #4 Explore and potentially recommend seasonal water rates for all metered customers

Strategy #5 Collaborate with the City's top 25 water users towards ways in which they can reduce consumption

Strategy #6 Continue investing into the educational theatre program for elementary school age children

Strategy #7 Champion building codes revisions that support water conservation and re-use

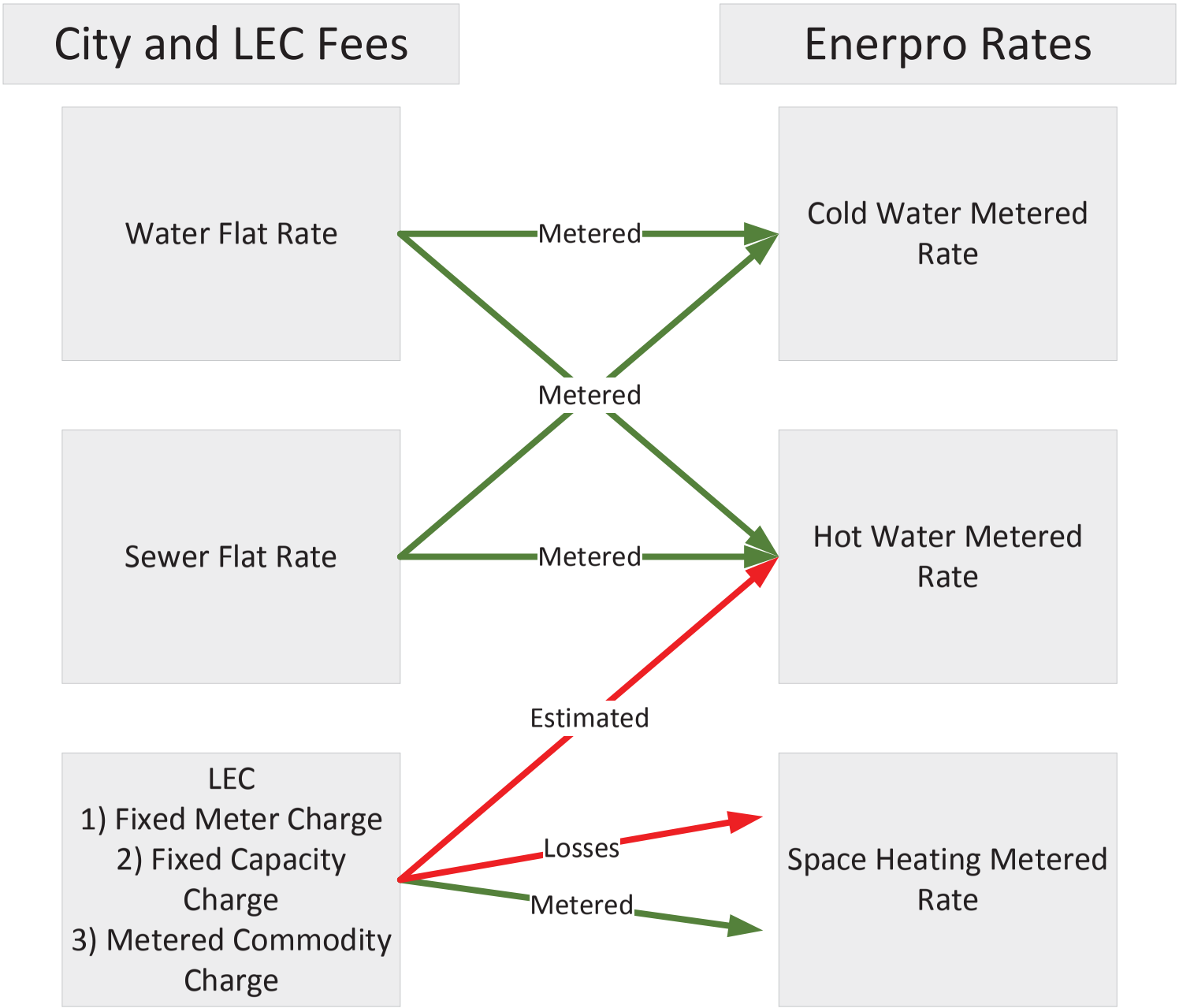
Strategy #8 Implement an annual leak detection program targeting the municipal distribution system

Strategy #9 Optimize watering procedures in City Parks

Strategy #10 Include all of the strategies in a "One Water" message that stresses water management from our alpine water sources to our ocean receiving waters.

Attachment 2

Allocation of City and LEC Fees in Enerpro Rates



THE CORPORATION OF THE CITY OF NORTH VANCOUVER

BYLAW NO. 8658

A Bylaw to Amend "Water Utility Bylaw, 1994, No. 6417"

The Council of The Corporation of the City of North Vancouver, in open meeting assembled, enacts as follows:

1. This Bylaw shall be known and cited for all purposes as **"Water Utility Bylaw, 1994, No. 6417, Amendment Bylaw, 2018, No. 8658".**

2. "Water Utility Bylaw, 1994, No. 6417" is amended by adding Section 711 as follows:

711 Sub-Metering and allocation of Water Fees

1. Unless a fee set out in Schedule "B" of this Bylaw is recovered in compliance with section 99(2) of the *Strata Property Act*, every strata corporation that wishes to collect the fee from a strata lot owner must do so only in compliance with Section 711.3.

2. Unless a fee set out in Schedule "B" of this Bylaw is included in the lump sum regular monthly rent payments stipulated in a rental agreement between the rental property owner and renter, every rental property owner who wishes to collect the fee from a rental unit renter or other occupier must do so only in compliance with Section 711.3.

3. Every strata corporation or rental property owner referred to in Sections 711.1 or 711.2 must collect a fee set out in Schedule "B" of this Bylaw only on the following basis:

(a) a flat fee must be recovered on a flat fee basis with the invoice clearly showing

(i) the flat fee set out in Schedule "B" of this Bylaw, and

(ii) the calculation of the amount owing;

(b) a metered fee must be recovered on a metered fee basis with the invoice clearly showing

(i) the metered fee set out in Schedule "B" of this Bylaw,

(ii) the quantity of metered water in cubic metres, and

(iii) the calculation of the amount owing;

(c) a mark-up above the fee must

(i) be provided on a separate line on the invoice,

(ii) identify the purpose of the mark-up, and

(iii) specify that the amount of the mark-up is not regulated by the City of North Vancouver;

(d) for a metered fee under this Bylaw, the quantity of metered water in respect of the amount of the fee due and owing must be metered. No person may issue an invoice for a fee or otherwise collect a fee based on an estimate of usage or through the use of a device other than a volumetric water measuring device.

READ a first time on the <> day of <>, 2018.

READ a second time on the <> day of <>, 2018.

READ a third time on the <> day of <>, 2018.

ADOPTED on the <> day of <>, 2018.

MAYOR

CITY CLERK

THE CORPORATION OF THE CITY OF NORTH VANCOUVER

BYLAW NO. 8659

A Bylaw to Amend "Sewerage and Drainage Utility Bylaw, 1995, No. 6746"

The Council of The Corporation of the City of North Vancouver, in open meeting assembled, enacts as follows:

1. This Bylaw shall be known and cited for all purposes as **"Sewerage and Drainage Utility Bylaw, 1995, No. 6746, Amendment Bylaw, 2018, No. 8659".**

2. "Sewerage and Drainage Utility Bylaw, 1995, No. 6746" is amended by adding Section 806 as follows:

806 Sub-Metering and allocation of Sanitary Sewer Fees

1. Unless a fee set out in Schedule "B" of this Bylaw is recovered in compliance with section 99(2) of the *Strata Property Act*, every strata corporation that wishes to collect the fee from a strata lot owner must do so only in compliance with Section 806.3.

2. Unless a fee set out in Schedule "B" of this Bylaw is included in the lump sum regular monthly rent payments stipulated in a rental agreement between the rental property owner and renter, every rental property owner who wishes to collect the fee from a rental unit renter or other occupier must do so only in compliance with Section 806.3.

3. Every strata corporation or rental property owner referred to in Sections 806.1 or 806.2 must collect a fee set out in Schedule "B" of this Bylaw only on the following basis:

(a) a flat fee must be recovered on a flat fee basis with the invoice clearly showing

(i) the flat fee set out in Schedule "B" of this Bylaw, and

(ii) the calculation of the amount owing;

(b) a metered fee must be recovered on a metered fee basis with the invoice clearly showing

(i) the metered fee set out in Schedule "B" of this Bylaw,

(ii) the quantity of metered water in cubic metres, and

(iii) the calculation of the amount owing;

(c) a mark-up above the fee must

(i) be provided on a separate line on the invoice,

(ii) identify the purpose of the mark-up, and

(iii) specify that the amount of the mark-up is not regulated by the City of North Vancouver;

(d) for a metered fee under this Bylaw, the quantity of metered water in respect of the amount of the fee due and owing must be metered. No person may issue an invoice for a fee or otherwise collect a fee based on an estimate of usage or through the use of a device other than a volumetric water measuring device.

READ a first time on the <> day of <>, 2018.

READ a second time on the <> day of <>, 2018.

READ a third time on the <> day of <>, 2018.

ADOPTED on the <> day of <>, 2018.

MAYOR

CITY CLERK

THE CORPORATION OF THE CITY OF NORTH VANCOUVER

BYLAW NO. 8660

A Bylaw to amend the City of North Vancouver "Hydronic Energy Service Bylaw, 2004, No. 7575"

The Council of The Corporation of the City of North Vancouver, in open meeting assembled, enacts as follows:

1. This Bylaw shall be known and cited for all purposes as **"City of North Vancouver Hydronic Energy Service Bylaw, 2004, No. 7575, Amendment Bylaw, 2018, No. 8660".**

2. Schedule "B" of "Hydronic Energy Service Bylaw, 2004, No. 7575" is amended by adding Section 14.10 as follows:

14.10 Sub-Metering and allocation of Hydronic Energy Fees - Customers may allocate to a Person, fees billed by the Service Provider on the following basis:

(a) Unless a fee set out in Schedule "B" and "C" of this Bylaw is recovered in compliance with section 99(2) of the *Strata Property Act*, every strata corporation that wishes to collect the fee from a strata lot owner must do so only in compliance with paragraph (c).

(b) Unless a fee set out in Schedule "B" and "C" of this Bylaw is included in the lump sum regular monthly rent payments stipulated in a rental agreement between the rental property owner and renter, every rental property owner who wishes to collect the fee from a rental unit renter or other occupier must do so only in compliance with paragraph (c).

(c) Every strata corporation or rental property owner referred to in paragraphs (a) and (b) must collect a fee set out in Schedule "B" and "C" of this Bylaw only on the following basis:

(i) a flat fee, including Meter Charge and Capacity Charge, must be recovered on a flat fee basis with the invoice clearly showing

A. the flat fee set out in Schedule "B" and "C" of this Bylaw, and

B. the calculation of the amount owing;

(ii) a metered fee, including Commodity Charge, must be recovered on a metered fee basis with the invoice clearly showing

A. the metered fee set out in Schedule "B" of this Bylaw,

B. the quantity of metered hydronic energy in kilowatt hours, and

C. the calculation of the amount owing;

(iii) a mark-up above the fee must

A. be provided on a separate line on the invoice,

B. identify the purpose of the mark-up, and

C. specify that the amount of the mark-up is not regulated by the City of North Vancouver;

(iv) for a metered fee under this Bylaw, the quantity of metered Hydronic Energy in respect of the amount of the fee due and owing must be metered. No person may issue an invoice for a fee or otherwise collect a fee based on an estimate of usage or through the use of a device other than a thermal metering device that measures flow and temperature differential at point of delivery.

READ a first time on the <> day of <>, 2018.

READ a second time on the <> day of <>, 2018.

READ a third time on the <> day of <>, 2018.

ADOPTED on the <> day of <>, 2018.

MAYOR

CITY CLERK