




# Rural Municipality of North Shore Stanhope Peninsula Conceptual Water System

Final Report



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October 28, 2022

Ms. Stephanie Moase  
Chief Administrative Officer  
Rural Municipality of North Shore  
2120 Covehead Road  
York, PE COA 1P0

Dear Ms. Moase:

*RE: Stanhope Peninsula Conceptual Water System*

Enclosed is the final report for the above noted project. The report contains seven (7) chapters outlining the existing conditions, needs, and possible solutions to the concerns surrounding long term potable water quality at the Stanhope Peninsula. This report is intended to serve as an overall master plan for the study area to guide the Municipality's decision making through the implementation of a domestic water system.

Yours very truly,

CBCL Limited



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Project No.: 222609.00

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## Executive Summary

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This report has been written by CBCL Limited in consultation with G.A. Isenor Consulting Limited for the Rural Municipality of North Shore. The purpose of this report is to provide conceptual water system design and insight into the design and construction costs to aid in the Municipality's decision making and next steps required for the project. This report is not a feasibility study nor is it a needs assessment. It is understood that the need for a central domestic water system exists at the Peninsula as declining water quality has been well documented in the area over the past few decades. The study area considered is the Stanhope Peninsula west of Stanhope Lane excluding the Parks Canada land to the north. The land within the study area is primarily residential properties and empty lots, for the purposes of this report no distinction has been made between full time and seasonal properties. Four (4) possible wellfield locations were considered during the preparation of this report, these locations can be seen in Figure 3 in Appendix B. The municipality expressed interest in a location on Parks Canada owned land adjacent to Area D. The Parks Canada land was considered as an extension of Area D, it was extrapolated that similar capital costs and hydrogeological properties could be expected within this area. The cost estimate for the project included wellfield exploration, well drilling, control building and treatment, standby power generation, distribution piping and servicing to the property lines. The total system is expected to cost in the range of \$17.6 million, cost sharing is anticipated through federal and provincial aid funding. The remaining balance of the costs would be paid by the end users as calculated in the tariff structure once final construction costs have been determined and pending approval from IRAC. At the time of writing this report there is no federal funding available for the construction of a central water system. If the Municipality wishes to go ahead with this project, it is recommended that preliminary background and investigation work be completed as early as practical to expedite the process once funding becomes available. Some of these items include; entering into discussions with Parks Canada and reaching an agreement for use of Parks land for a potential wellfield site, creating a water utility and associated bylaws, wellfield exploratory drilling-investigation, climate change and greenhouse gas assessments and other study work typically required for federal funding. The suggested next steps can be seen in more detail in Chapter 7 of this report.

# 1 Background Information

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## 1.1 Introduction

CBCL Limited has been engaged by the Rural Municipality of North Shore to create a conceptual water system for the Stanhope Peninsula that meets the Community's domestic water needs and determine the probable costs of the proposed system. CBCL has engaged G.A. Isenor Consulting Limited to conduct financial analysis and calculate customer rates based on the opinion of probable cost for the conceptual system. The study area for this project referred to from this point forward as the Stanhope Peninsula is defined as the privately owned land bound by Covehead Bay to the south and west, the boundary of the Parks Canada land to the north and Stanhope Lane to the east. The study area can be seen on Figure 1 in Appendix A.

The Stanhope Peninsula is located within the Community of North Shore in Queens County Prince Edward Island, which is situated northwest of Charlottetown. The peninsula covers an area of approximately 310 hectares (766 acres). The northern third consists almost entirely of federally owned Parks Canada land while the remaining 203 hectares (502 acres) consists of privately-owned land. With population rates in PEI increasing well above the national average over the past 5 years it is expected that continued growth and the full development of the peninsula is inevitable. Population across the island has increased from 142,907(2016) to 154,331(2021), an 8.0% change. The Rural Municipality of North Shore has also seen steady growth rates over this same time as indicated by an increase in building permits in both North Shore and the Stanhope Peninsula region.<sup>1</sup>

The Peninsula is a popular summer destination with many seasonal residents. As the population continues to grow more year-round homes are being built and seasonal homes are being converted for year-round use. A "2007 drive by survey" estimated that the peninsula had 326 developed properties, 70 year-round and 256 seasonal use. Today it is estimated that there are 457 developed properties, 134 year-round and 323 seasonal use. This equates to a 40% increase in developed properties, while nearly doubling the number of year-round homes in the area. This suggests that the peninsula continues to experience steady growth averaging a 2.3% yearly growth rate over this time. This equates to an average of 9 new dwellings per year. If the peninsula continues to grow at a rate of 2.3% per year it is expected that all lots will be developed within the next 15 years (2037).

<sup>1</sup> *Population growth within the Rural Municipality of North Shore may not be a true representation of the growth within the study area as the Municipal boundaries have changed through the amalgamation of the Rural Municipality of North Shore, Pleasant Grove, and Grand Tracadie in 2018.*

The Stanhope Peninsula has a reported history of drinking water quality issues in various private wells. Over the years residents in the area have dealt with water quality issues such as saltwater intrusion, raised levels of nitrates, coliform and E. coli bacteria contamination, and elevated iron and manganese levels. Saltwater intrusion occurs most commonly in freshwater wells drilled near saltwater bodies of water. The Stanhope Peninsula is especially susceptible to this type of contamination in their freshwater wells because the relatively small landmass is surrounded on three sides by saltwater. Elevated nitrate levels can be caused by agricultural activity and other bacterial problems are expectedly due to increased density of ageing on-site septic systems. These issues have come up and been treated in the past but as the number of residents continues to rise and the peninsula becomes more densely populated water quality issues will persist and may no longer be able to be resolved.

A previous study estimated that septic tank effluent could increase to a level compromising groundwater quality, based on the current population and property usage the Peninsula could be nearing these levels. This information combined with the ongoing water quality issues being reported suggest that when financial support for infrastructure projects becomes available a central system could be a good option to solve both ongoing and future water quality issues. For these reasons this report has been written under the assumption that the Peninsula is dangerously close to a tipping point where the number of privately owned wells that have unacceptable water quality due to high bacteriological concentrations will increase significantly from the increasing population density and number of year-round properties.

In addition to clean safe drinking water the implementation of a central water system will ensure that individuals' property values and the community's reputation are protected. Many people have heard of Flint Michigan or other towns or communities that have had drinking water crisis' in the past. When a community has issues with its drinking water quality it presents many challenges, from attempting to secure potentially multi-millions of dollars in funding to resolve the issues, to having time consuming design and construction completed at a moment's notice, to recovering from negative media attention that the issue attracts, all while residents struggle to go on about their day to day lives without access to clean water. For these reasons the time to start changing from privately owned wells to a central domestic water system is now to ensure all residents maintain access to clean safe drinking water for the foreseeable future.



## 1.2 Summary of Available Information

The conceptual water system which forms the basis of this report has been created based on information obtained from multiple sources. Some of the information used is as follows:

- ▶ Provincial GIS information.
  - Property lines
  - 50cm contours
  - Roadways
  - Rivers and Streams
  - Buffer Zones
- ▶ IWMC - Collection Information.
- ▶ Rural Municipality of North Shore Number of Building Permit Applications.
- ▶ Water Quality Sample Results (2017-2022).
- ▶ Various previously completed studies and reports.

## 1.3 Existing Small Systems

The homes within the study area generally all serviced from private wells with individual on-site septic systems for their water and wastewater needs except for the properties on Auld Lane, Lighthouse Point Drive, and Point Pleasant Crescent. Although these homes still have individual on-site septic systems for wastewater, they are supplied water from a small privately owned central water system. There have been reports of saltwater intrusion and other water quality issues within not only this system but also other private wells throughout the community. This is likely due to well locations and the increasing density of on-site septic systems. The small privately owned system was first constructed in 2002 and expanded in 2006 and generally consists of 2 wells complete with bacteriological treatment and approximately 500m of 50mm diameter PVC waterline supplying domestic water to a potential 23 customers, of which approximately 13 are connected to the system.

## 2 Existing and Future Demands

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### 2.1 Land Usage

The Peninsula consists of approximately 310 hectares of Federally owned, Parks Canada land and privately owned land. The Parks Canada land runs along the north side of the Peninsula and makes up approximately 1/3 of the total area. The other 203 hectares are public and private right of ways and lots which make up the study area of this report.

#### 2.1.1 Existing developed land areas

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Based on the PEI GIS property mapping information and IWMC waste pickup information it is estimated there are 134 year-round properties and 323 seasonal properties on the Peninsula, another 172 parcels have been identified as undeveloped. This equates to 629 unique parcels of privately owned land within the study area. The current land use on a study area is summarized below in Table 2.1.

Table 2.1: Land Use Summary

Description	Number of Properties (2007)	Number of Properties (2022)	Average Lot Size in Hectares (2022)	% Private Land Usage (2022)
Year-Round	70	134	0.42	30.8
Seasonal	256	323	0.24	43.2
Undeveloped	184	172	0.28	26.0
<b>Total</b>	<b>510</b>	<b>629</b>	<b>0.29</b>	<b>100</b>

Since 2007 the number of developed lots has increased by 131. Over this same time the number of undeveloped lots has only decreased from 184 to 172. This is largely due to the subdivision of larger parcels into individual building lots. When looking at Figure 1 in Appendix A and comparing the average lot sizes for the different land uses in Table 2.1, we can see that the number of large, undeveloped lots remaining that have the potential to be subdivided is minimal. Most of the undeveloped lots identified have already been divided into individual building lots.

#### 2.1.2 Population Projections

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Based on the above property information and an average household size of 2.5 people (2021 Statistics Canada Census Profile – Rural Municipality of North Shore) it is estimate that the current equivalent population of the Peninsula is approximately 1,450 people. Assuming the average household size remains at 2.5 people, the ultimate buildout will result in an equivalent population of approximately 1,915 people.

It is estimated that the Peninsula is growing at a rate of 2.3% if this growth rate continues the remaining 172 undeveloped lots will be subdivided and developed within the next 15 years, making the ultimate buildout population of the Peninsula 2037. A previous study completed in 2009 (TerrAtlantic) suggested that a central water supply system would be required by the year 2032 when the Peninsula was expected to reach 55% with an ultimate buildout of 532 equivalent dwelling units (EDUs). It was predicted that the Peninsula would need a central water system when the number of EDUs reached 293 (55%). The 2009 report defined one (1) EDU as being equal to either one (1) year-round dwelling or four (4) seasonal dwellings. When applying the adjusted number of equivalent single-family homes for 2022 presented in Table 2.2 it is estimated that the Peninsula has reached 273 EDUs. This suggests that a central water system could be required within the next 2 years when the area is expected to reach 293 EDUs based on the current rate of development.

### 2.1.3 Ultimate Buildout and Demand

To size the conceptual domestic water system the ultimate buildout of the peninsula was considered. For the purpose of this project the ultimate buildout is assumed to be the development of all existing lots with typical single-family homes. This assumes that all undeveloped lots would be built on and that all homes would use the standard amount of water as a typical 3-bedroom home. Additional demands were assigned to single lots with multiple homes, clusters of cottages, campgrounds, and for larger undeveloped parcels that are expected to be subdivided. After adjusting the above number of properties for the ultimate buildout scenario, a breakdown of the number of equivalent homes expected can be seen below in Table 2.2.

Table 2.2: Ultimate Buildout – Adjusted Number of Homes

Description	Number of Properties (2022)	Adjusted Number of Equivalent Single-Family Homes
Year-Round	134	171
Seasonal	323	409
Undeveloped	172	186
<b>Total</b>	<b>629</b>	<b>766</b>

Based on the above adjusted number of equivalent single-family homes currently present and the ultimate buildout of the Peninsula the following demands were calculated, see Table 2.3. Note that no adjustments were made to differentiate between year-round, seasonal, or undeveloped properties as the central water system will be sized to accommodate the peak hour demand expected based on average demands and peaking factors found in the ACWWA Water Supply Guidelines. With the Peninsula expected to reach its ultimate buildout in the relatively near future the conceptual system has been sized for the peak hour anticipated for the ultimate buildout scenario.

Table 2.3: Ultimate Buildout – Theoretical Water Demands

Description	Average Day Demand <sup>1</sup> (m3/day)	Maximum Day Demand <sup>2</sup> (m3/day)	Peak Hour Demand <sup>2</sup> (m3/day)
Existing Residents	580	1450	2175
Ultimate Buildout	766	1915	2873

<sup>1</sup> ACWWA Water Supply Guidelines – average consumption of a typical 3-bedroom single-family home of 1,000L/day.

<sup>2</sup> ACWWA Water Supply Guidelines – peaking factors of 2.5 for max day, and 3.75 for peak hour are based on equivalent population of 1000-2000 people.

## 3 Conceptual Site Model (Wellfield)

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### 3.1 Previous Investigations

Evaluation of groundwater availability and production throughout PEI is concerned primarily with fluxes into and out of the red-bed Permian deposits comprising the province's fractured sandstone aquifer. Water wells installed in this rock are frequently less than 100 metres deep, with individual yields reaching up to several hundred imperial gallons per minute (IGPM). The cumulative and long-term effects of groundwater extractions is a component of the province's current water policy. Maintenance of baseflow to surface water, contamination by nitrates, and the potential for sea water intrusion are topics of focus for groundwater management.

Rock in the Stanhope area is described as conglomerate and coarse to medium wacke of the Orby Head Member. Surficial geology mapping indicates that the rock is overlain by glaciofluvial material, which typically includes significant thicknesses of sand and gravel. Sand and gravel can be a source of locally favourable yields for shallow wells but provides limited protection to the underlying bedrock aquifer. Water well depths in the Stanhope area generally vary from 20 to 30 metres, with casing lengths of 12 to 15 metres (PEICLE Water Well Database).

A long-term water and wastewater servicing study completed in 2009 (TerrAtlantic) included work to evaluate groundwater use and groundwater quality on the Stanhope Peninsula. Water supplies on the Peninsula generally showed adequate yields and acceptable water quality, but water quality issues were identified at select wells. Data compiled by the province from 2002 to 2006 showed the following:

- ▶ Total coliforms were detected in 13-16% of sampled supplies.
- ▶ E. coli was detected in up to 2.5% of sampled supplies.
- ▶ Nitrate concentrations exceeded the drinking water guideline of 10 mg/L in up to 7.5% of sampled supplies.
- ▶ Manganese concentrations exceeded 50 µg/L in 2 to 4% of wells.

The 2009 report discussed increasing risks to water quality due to the increasing density of wells and on-site wastewater systems. The bacterial quality of water was expected to deteriorate, concentrations of nitrate were expected to increase, and at coastal wells, chloride concentrations were expected to increase. Short-term solutions to address

concerns at individual wells included individual treatment systems, drilling of replacement wells, connection to other existing wells, and delivery of potable water. Recommendations for long-term management of water quality focused on the need to develop a central water supply drawn from a well field located off the Peninsula, with an adequate separation distance from the coastline and wastewater systems.

Wells located adjacent to the shoreline and on the western end of the Peninsula showed indications of saltwater intrusion. As the Peninsula is almost entirely surrounded by saltwater, reporting suggested that the Peninsula is similar to an island system, dependent on a freshwater lens, dependent on rainwater falling on the limited area of the Peninsula. Island systems are vulnerable to 'upconing' of sea water, which will tend to affect the deepest wells first. This differs from aquifers on the mainland that are recharged by rainwater captured in a more regional area, capable of sustaining higher production rates. The depth to the saltwater interface on the Stanhope Peninsula is predicted to decrease over time.

The 2009 Reporting included vulnerability mapping that helped to identify a potential exploration area on Beaver Run Road, to the east of the Peninsula.

## 3.2 Existing Water Quality and Quantity

An updated inventory of part-time and full-time dwelling units was used to estimate current water demand on the Stanhope Peninsula:

The average day demand was determined to be approximately 770 m<sup>3</sup>, with an equivalent pumping rate of 9L/s (120 IGPM).

The maximum day demand was determined to be approximately 1920 m<sup>3</sup>, with an equivalent pumping rate of 23L/s (300 IGPM).

Using typical pumping rates for high-capacity wells on PEI, a wellfield capable of meeting the maximum day demand is likely to require three 203 mm dia. production wells, installed to a depth of at least 100 metres. With adequate storage, demands could likely be met using two production wells. Details concerning the depth and number of wells required will be dependent on the site-specific conditions encountered at the time of drilling.

PEICLE provided updated sampling data for the Stanhope Peninsula, collected from 2017 to 2021. Total coliforms were detected in 33 to 39% of wells sampled, roughly double the rate of detections observed from 2002 to 2006. Bacteria sampling results show that water quality on the Peninsula has declined, most likely due to the density of on-site sewage systems and water supply wells. This decline in water quality further justifies the need for a central water system.

Figure 2 in Appendix B shows a summary of chloride concentrations in samples collected by PEICLE, grouped by street. Chloride concentrations are persistently high at select wells, particularly in areas directly adjacent to the coastline and on the western end of the

Peninsula where there are several higher capacity wells (TerrAtlantic, 2009). The data indicate that sea water intrusion is affecting wells on the Peninsula. Chloride concentrations are likely to increase over time as the salt-water interface advances and up-coning continues. Water quality issues on the Peninsula are expected to worsen unless production is moved to a central wellfield located on the mainland.

### 3.3 Groundwater Exploration

Figure 3 in Appendix B shows a map of the yield index, developed using driller records from the PEICLE water well database. Well locations shown on Figure 3 are subject to a level of error and may not always reflect the true position of the well. The yield index is based on the approximate well yield as estimated by the driller at the time of well installation, adjusted for well depth and the log-normal distribution of well yields. Figure 3 shows four potential exploration areas, selected based on the yield index and apparent land uses/availability indicated by satellite imagery:

- ▶ Areas A and B are furthest from the Peninsula, reducing the risk of saltwater intrusion and eliminating the influence of wastewater disposal. Area A was identified in by TerrAtlantic in 2009.
- ▶ Area C is based on a water well record showing a high yield index, but is also located in an area identified in 2009 as exhibiting high nitrate concentrations.
- ▶ Area D<sup>1</sup> was previously identified and recommended by government staff (CBCL 2007), but may be within a zone of elevated nitrate concentrations, and drillers have reported high iron concentrations in this area. Area D is also closer to the coastline and existing on-site wastewater systems.

<sup>1</sup> An extension of Area D was considered. The extension was for a well site on Parks Canada Lands. While no well data was available for this area it was extrapolated as a possible well site with properties and costs similar to that of Area D due to its close proximity, and the similar land use objectives between Park land and a protected wellfield

The following work is recommended to develop a secure water supply for the Stanhope Peninsula:

- ▶ Begin budgeting and exploration work to finalize the location of a central well field.
- ▶ Conduct site reconnaissance and property mapping in each of the exploration areas as identified on Figure 3. PIDs surrounding each of the four (4) wellfield sites identified can be found on Figure 4 in Appendix C.
- ▶ Conduct a door-to-door water well survey of private water users within 500 metres of each exploration area.
- ▶ Collect new water quality samples from a representative number of existing wells within each exploration area.
- ▶ Complete a windshield survey of potential contaminant sources in the area.
- ▶ Consult with PEICLE on potential constraints/permitting issue and government recommendations.
- ▶ Determine property access and, if possible, collect GPS coordinates of target drilling sites.

Well field exploration and development programs typically include the following work:

- ▶ Application to PEICLE for a groundwater exploration permit.
- ▶ Drilling of three to five 150mm test wells to provide a preliminary estimate of yield and water quality. Test well drilling should be completed in as many of the exploration areas as possible.
- ▶ A step-drawdown test of each well including water quality sampling.
- ▶ Pending the results of step-drawdown tests, a 24-hour constant-rate test at select well(s).
- ▶ Negotiation of an agreement to either lease or purchase land for a wellfield control/storage building and water transmission main.
- ▶ Installation of two to three 200 to 300mm dia. production wells at the selected well field, followed by step-drawdown and 72-hour constant-rate tests of each well.
- ▶ Development of a numerical model of groundwater flow to delineate the capture area of each well, source water protection zones, and confirm freshwater sustainable yield.

The opinion of probable costs identified in Chapter 6 include estimates for the wellfield exploration and development programs and numerical model work described above.



## 4 Hydraulic Model Development

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A hydraulic model of the conceptual water distribution system was created for the supply of domestic water to the residents and businesses of the Stanhope Peninsula within the study area using Bentley's WaterGEMS® software. The model was created using available GIS data from provincial GIS layers and IWMC collection data for the area. A Digital Terrain Model (DTM) was created using 50cm contour shapefiles obtained from the province, and elevations of water system nodes were assigned based on this DTM. Figure 4 in Appendix C shows the layout and sizing of the distribution system. All pipes within the distribution system have been sized based on the criteria outlined below.

### 4.1 Assumptions and Model Development

To create the hydraulic model the material of new pipes was assumed to be PVC. This is largely due to its popularity in the current market, long lifespan, and good roughness characteristics. For design purposes the new pipes being modelled were assigned a C factor of 120 to mimic future conditions when the roughness of pipes increases. The existing pipes on Auld Lane, Lighthouse Point Drive and Point Pleasant Crescent are PVC and assumed to be in good condition, these pipes were also assigned a C factor of 120. The roughness of this material is not expected to degrade significantly below that value throughout its design life.

Provincial GIS civic number information and IWMC collection data was used to determine what lots were developed and if residents were seasonal or year-round. A map was produced to compare the developed land with aerial imagery to determine if the information obtained aligned with expectations for the area. The aerial imagery was reviewed along with property line information to determine what parcels contained multiple homes, cottages, and campers. Additional demands were assigned in the model accordingly for these non-standard lots as well as for larger vacant parcels that had the potential to be subdivided.

## 4.2 Demand Allocation

To create the hydraulic model of the Peninsula first the expected demands needed to be created and distributed. To do this the equivalent number of single-family homes was determined and an average consumption rate of 1,000L/day was applied. Peak hour factors were then applied, and the demands distributed in the model for each civic address based on proximity to the closest model node. This ensured that the system demands were distributed accurately. The modelling was completed using an ultimate system demand of 2873m<sup>3</sup>/day under peak hour conditions.

## 4.3 Model Results

The scenario used to determine the watermain sizing was the peak hour demands applied to the ultimate buildout of the Peninsula. This was done to size the system to accommodate not only the existing flows but also future flows expected to be experienced when the remaining lots are developed. The system was modelled with a hydraulic grade line (HGL) of 55.0m at the control building. This allows for a maximum system pressure under static conditions at an elevation of 0.0m to be 78psi. This maximum pressure is in line with the maximum recommended pressure for household plumbing of 80psi. The lowest pressure experienced within the study area occurs along the transmission main on Eastern Road between Bayshore Road and Friston Road. This area has an elevation of 23.5m resulting in a static pressure of 45psi. This pressure is acceptable as it is above the 40psi recommended acceptable minimum for customers. The ground elevations on the Peninsula are generally between 0-16m resulting in the majority of the system operating at pressure between 55psi and 78psi.

## 5 Climate Change Considerations

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Understanding the impacts of climate change and adapting to emerging conditions is imperative for long term sustainability of infrastructure and water resources. In the coming decades, PEI is expected to experience warmer temperatures, increased intensity and frequency of rainfall events, sea level rise, increased storm surges, among other changes. Given the proximity of the proposed infrastructure to the coastline and the increasingly present impacts of climate change, there are numerous climate-related risks that the project could potentially face over its lifespan, such as the following:

- ▶ Saltwater intrusion into the well field resulting from sea level rise, which has already been noted to occur at some residential properties in the region.
- ▶ Seasonal low water levels and flow rates resulting from increasing mean and extreme temperatures and drought conditions.
- ▶ Increased runoff and potential impacts to water quality resulting from increases in the variability and intensity of precipitation events.
- ▶ Damage to the proposed pumphouse building and other supporting infrastructure resulting from increases in intensity and frequency of storm events, such as hurricanes.
- ▶ Damage to the proposed distribution system resulting from shoreline erosion due to storm surge and coastal flooding events.

To formally identify potential impacts and evaluate their criticality with respect to the Stanhope Peninsula Potable Water System Project, a Climate Change Resilience Assessment (CCRA) should be conducted. The purpose of the CCRA would be to identify possible risks to the wellfield, distribution systems, and pumphouse building based on their design criteria with respect to projected climate changes. Risks may include physical damage to infrastructure, operational disruptions, or health and safety risks to downstream users, among other factors. Recommendations for adaptation can be developed for high priority risk items to assist the owner with project development and asset management.

It is expected that federal funding will be sought for the development of the water system and the most likely current federal funding project is the Investing in Canada Infrastructure Program. Under the Investing in Canada Infrastructure Program, a Climate Lens Assessment is typically required for eligible projects that exceed costs of \$10 Million, which includes conducting a CCRA and a Greenhouse Gas (GHG) Mitigation Assessment. According to Infrastructure Canada's Climate Lens General Guidance, the purpose of the

CCRA is to employ a risk management approach to anticipate, prevent, withstand, respond to, and recover and adapt from climate change related disruptions or impacts, while a GHG mitigation assessment is intended to measure the anticipated GHG emissions impact of an infrastructure project.

It is recommended that both a CCRA and GHG Mitigation assessment be conducted at the preliminary design phase to align with federal funding initiatives and incorporate climate resilience and mitigation into the project design, as necessary.

## 6 Recommended Tariff Structure

### 6.1 Water System OPC

To determine the feasibility of a construction project of this magnitude all costs to have the work completed, from conceptual design all the way to construction, and even ongoing operational costs must be considered. These capital costs form the basis for the tariff structure and ultimately the anticipated customer billing rates. The estimated capital costs will also determine what funding sources the project may be eligible to apply for and determine how much of the costs can be shared between the end users and different levels of government. A breakdown of the estimated capital costs are as follows. See Table 6.1.

Table 6.1: Estimated Capital Costs

Item	Engineering and Hydrogeology	Construction	Cost <sup>1</sup>
Wellfield Investigation	\$80,000	\$100,000	\$180,000
Production Well Drilling	\$75,000	\$100,000	\$175,000
Wellhead and Control Building <sup>2</sup>	\$150,000	\$1,515,000	\$1,665,000
		<b>Subtotal</b>	<b>\$2,020,000</b>
Water Distribution System	\$979,570	\$12,081,300	\$13,060,870
Arterial Main from Well A	\$188,250	\$2,321,750	\$2,510,000
		<b>Subtotal</b>	<b>\$15,570,870</b>
		<b>Total</b>	<b>\$17,590,870</b>

\* Well B      -\$1,026,000<sup>3</sup>

\*\* Well C     -\$1,890,000<sup>3</sup>

\*\*\* Well D   -\$2,400,000<sup>3</sup>

<sup>1</sup> The capital costs presented above exclude the cost for homeowners to bring the water service from the property line into their home, connect to existing house plumbing and abandon existing wells. This type of work is expected to cost on average \$2,000 for a typical home. This could vary based on the homes distance from the property line, interior plumbing configurations, and location and depth of the well to be abandoned.

<sup>2</sup> The separation distance required between well heads is highly dependant on hydrogeological conditions encounter, it is estimated a minimum of 1.2 hectares of land maybe required for the

*physical infrastructure required for well heads, control/storage building and access road. An allowance of \$50,000 has been included to purchase land for well field infrastructure.*

<sup>3</sup> *Indicates the expected reduction in total capital costs associated with the development of different wellfield sites due to a reduction in the length of transmission main piping required.*

## 6.2 Estimated Water Rates and Tariffs

The Prince Edward Island Regulatory & Appeals Commission (IRAC) has general supervision over all municipal water and sewer utilities in the province with the exception of Charlottetown, Summerside, Stratford and Cornwall.

Primarily the Commission:

- ▶ determines water and sewer rates;
- ▶ considers applications for construction or changes to central water/sewer systems, particularly as to how proposed projects are expected to impact on utility rates;
- ▶ provide support and direction to utilities;
- ▶ assists with the resolution of disputes; and,
- ▶ responds to various inquiries.

The water rates in this report have been calculated by the consulting team and are subject to review and adjustment by IRAC as all rates for water in Stanhope must be approved by the Commission in accordance with the Water and Sewerage Act.

In order to charge water rates a Utility will need to be formed and a rate application must be prepared, and an application made to the Commission. The Commission will conduct a review and an independent analysis of the utility's filing. A notice of application will be published to allow ratepayers an opportunity to provide comments on the utility's application. The Commission will then prepare a decision on the rates and issue a written Order which will include a Tariff of Rates and Charges.

On the Water and Sewer FAQ (Frequently Asked Questions) section of the IRAC web page the following items are noted since they impact how rates are set and charged.

- ▶ *Do I have to pay for water/sewer service if I'm not connected to a central system?*
  - "If the service goes by your property and there is a building on the land that has plumbing facilities on site (i.e. kitchen/bathroom), the property owner is required to pay for the service regardless of whether you are connected per section 10.1 of the Water and Sewerage Act."
  
- ▶ *Can I still be billed for water/sewer service when I'm not using the building year-round?*
  - "Yes. Utility charges are set in annual amounts. Temporarily-vacated properties, seasonally-occupied premises and long-term vacancies continue to be billed for

service. There is a cost for having service in the ground and available for use whether it's needed or not and having available service adds value to a property. Utilities rely on all serviced customers to share expenses."

Service that goes by undeveloped vacant lands can be charged a frontage rate per year based on the length of the property that has services available.

### Number of Properties Served

As noted in Section 2.1.1 of the report the number of properties in the service area total 629 with 134 Year-Round Use, 323 Seasonal Use and 172 undeveloped properties. While the Year-Round and Seasonal Use properties (457 in total) would be charged the annual amounts the undeveloped properties must be charged a frontage fee.

## 6.2.1 Detailed Accounting Structure for a Water Utility

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The Island Regulatory and Appeals Commission (IRAC) publishes a Uniform System of Accounts for Municipal Utilities (see Appendix D). This document contains details of accounts for capital plant in service as well as revenue and operating expenditures that a typical water utility would need to record their capital expenditures and their revenue and operating expenditures. The breakdown of the estimated capital costs is provided elsewhere in the report. An estimated operating budget has been developed based on the information available at this time. When the system proceeds to the construction phase the Water Utility should review the Uniform System of Accounts to ensure that it meets the requirements of IRAC and add any accounts necessary for the proper tracking of utility operating costs.

### Water Meters or Flat Rate

Water Utility rates are designed based on the costs to provide the service. All rates must be approved by IRAC in accordance with Section 9 of the Water and Sewage Act.

If the service goes by the property and there is a building on the land that has plumbing facilities onsite (i.e. kitchen/bathroom) then the property owner is required to pay for the service regardless of whether you are connected per section 10.1 of the Water and Sewerage Act.

Unless otherwise ordered by the Commission and subject to anything else in the Rules and Regulations, bills for all classes of service shall be rendered to each customer at intervals of (1) one, (2) two or (3) months at the option of the Utility. Unmetered customers shall be billed in advance. All bills are payable within (30) thirty days after the date rendered and if not paid shall be deemed to be in arrears.

Some water utilities use water meters to measure consumption for billing purposes. The meters are purchased by the Utility and the customer pays for the installation. For the Stanhope system this would only be practical for the 134 year-round customers as the meters for the 323 seasonal customers would not be protected from freezing during the winter season and it would be impractical to install and remove the meters in seasonal properties every season. If meters were to be installed in the 134 year-round customers then they would have to be read on a periodic basis in order to establish the consumption bill and the billing system would need to have the ability to generate a bill based on consumption.

Metered rates generally are comprised of a base charge for being connected to the system and a consumption charge which is a combination of a rate per cubic metre (CM) and the amount of CM used. Flat rates are common for unmetered systems and would need to be used for the 323 seasonal customers. Frontage charges are permitted for undeveloped properties and is calculated based on the method identified by IRAC. Using this method of calculation undeveloped properties will pay approximately 50% of what developed properties pay.

Virtually all of the water utilities regulated by IRAC have flat rates and it would appear that with the breakdown of the customer base being largely either seasonal or undeveloped that flat rate would be the preferred rate option for Stanhope at this time. It would be the easiest to administer as there would be no need for meter reading or billing software and the current property tax billing system would likely be adapted to billing flat rates. The billing could be either handled in house or contracted to an outside service provider.

If constructed the water supply and distribution system would provide equal access to clean water to all residents. As such properties with access to the system will be charged a rate for either developed or undeveloped service. This means that each property would be required to pay the approved IRAC rates regardless of the size of the lot, cost of the home, number of washrooms, seasonal property usage or ultimate water consumption.

## 6.2.2 Estimated Capital and Operating Budgets

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Estimated annual Operating and Capital Budgets were prepared for each of the well locations (A, B, C, and D) based on the data available and includes allowances for staff and projected expenses in the first year of operation. The capital cost for each of the potential well locations is taken from the estimates in the report based and presented separately in the following section of the report. It is noted that the estimated costs do not include HST.



These costs include a small allowance for land for well heads and control building an allowance for work associated with pipeline easements has also been included. Disturbance caused by work within the public right of way and on private property will be reinstated to their original intended use as part of the project.

Debt servicing has been calculated based on a 25-year loan period at 5% interest rate. The interest rate and the term are subject to change which will impact the estimated rates/tariffs.

### Estimated Annual Total Revenue Requirement excluding Meters

Item	Estimated Capital Cost	Depreciation Rate	Depreciation
Wellfield Investigation	\$ 180,000.00	1.20	\$ 2,160.00
Production Well Drilling	\$ 175,000.00	1.20	\$ 2,100.00
Wellhead / Control Building	\$ 1,075,000.00	1.20	\$ 12,900.00
Pumps and Controls	\$ 450,000.00	5.00	\$ 22,500.00
Standby Power	\$ 140,000.00	5.00	\$ 7,000.00
Water Distribution System	\$11,647,040.00	1.20	\$139,764.48
Water Services	\$ 1,113,330.00	2.00	\$ 22,266.60
Legal Easements	\$ 234,500.00	-	\$ -
Service Truck and Misc. Tools	\$ 66,000.00	20.00	\$ 13,200.00
<b>Subtotal without Connection to Well</b>	\$15,080,870.00		\$221,891.08
Well A - Arterial Main	\$ 2,510,000.00	1.20	\$ 30,120.00
<b>Well A Total</b>	<b>\$17,590,870.00</b>		<b>\$252,011.08</b>

### Annual Repayment Schedule with No Outside Funding

**Loan Calculator**  
**Long Term Debt**

<b>Interest Rate</b>	<b>5.0%</b>
<b>Term in years</b>	<b>25</b>
<b>Capital</b>	<b>\$ 17,590,870</b>

#### Payment Schedule for Capital Works

	Principal	Interest	Total	Balance
Year				
1	\$368,571.95	\$879,543.50	1,248,115.45	17,222,298.05
2	\$387,000.55	\$861,114.90	1,248,115.45	16,835,297.50
3	\$406,350.58	\$841,764.87	1,248,115.45	16,428,946.92
4	\$426,668.11	\$821,447.35	1,248,115.45	16,002,278.81
5	\$448,001.51	\$800,113.94	1,248,115.45	15,554,277.30
6	\$470,401.59	\$777,713.87	1,248,115.45	15,083,875.71
7	\$493,921.67	\$754,193.79	1,248,115.45	14,589,954.05
8	\$518,617.75	\$729,497.70	1,248,115.45	14,071,336.30
9	\$544,548.64	\$703,566.81	1,248,115.45	13,526,787.66

10	\$571,776.07	\$676,339.38	1,248,115.45	12,955,011.59
11	\$600,364.87	\$647,750.58	1,248,115.45	12,354,646.72
12	\$630,383.12	\$617,732.34	1,248,115.45	11,724,263.60
13	\$661,902.27	\$586,213.18	1,248,115.45	11,062,361.33
14	\$694,997.39	\$553,118.07	1,248,115.45	10,367,363.94
15	\$729,747.26	\$518,368.20	1,248,115.45	9,637,616.69
16	\$766,234.62	\$481,880.83	1,248,115.45	8,871,382.07
17	\$804,546.35	\$443,569.10	1,248,115.45	8,066,835.72
18	\$844,773.67	\$403,341.79	1,248,115.45	7,222,062.05
19	\$887,012.35	\$361,103.10	1,248,115.45	6,335,049.70
20	\$931,362.97	\$316,752.49	1,248,115.45	5,403,686.73
21	\$977,931.12	\$270,184.34	1,248,115.45	4,425,755.62
22	\$1,026,827.67	\$221,287.78	1,248,115.45	3,398,927.95
23	\$1,078,169.06	\$169,946.40	1,248,115.45	2,320,758.89
24	\$1,132,077.51	\$116,037.94	1,248,115.45	1,188,681.38
25	\$1,188,681.38	\$59,434.07	1,248,115.45	0.00

### Estimated Annual Operating Budget

	Projected Budget
<b>Water Production and Distribution</b>	
Wages and Benefits	50,000
Chemicals	2,000
Electrical Power	29,000
Lab Testing	2,200
Snow Removal and Grass Mowing	1,000
Service Truck Fuel & Maintenance	5,000
Repair Parts Allowance	2,000
Other Operating Expenses	7,500
Other	
<b>TOTAL SOURCE OF SUPPLY</b>	<b>98,700</b>
<b>Administration and General</b>	
Wages and Salaries	25,000
Dues and Fees	150
Insurance	2,000
IRAC Assessment	2,000
Office Expenses	3,000
Professional Fees Allowance	3,000
Telephone	500
Other	
<b>TOTAL ADMINISTRATION AND GENERAL</b>	<b>35,650</b>
<b>TOTAL OPERATING BUDGET</b>	<b>134,350</b>

### 6.2.3 Estimated Tariff Structure (Wellfield A)

Based on the above information the following average rates/tariffs have been calculated for various levels of AID or Outside Funding from senior levels of government.

<b>Expenses</b>	<b>0% AID Funding</b>	<b>50% AID Funding</b>	<b>66.7% AID Funding</b>	<b>74% AID Funding</b>
		50.0%	66.7%	74.0%
<b>Fixed Expenses</b>				
Principal	\$368,571.95	\$184,285.98	\$122,734.46	\$95,828.71
Interest	\$879,543.50	\$439,771.75	\$292,887.99	\$228,681.31
Depreciation	\$252,011.08	\$252,011.08	\$252,011.08	\$252,011.08
Sub-total	\$1,500,126.53	\$876,068.81	\$499,542.14	\$576,521.10
<b>Variable Expenses</b>				
Administration and Billing	\$35,650.00	\$35,650.00	\$35,650.00	\$35,650.00
Operations	\$98,700.00	\$98,700.00	\$98,700.00	\$98,700.00
Sub-total	\$134,350.00	\$134,350.00	\$134,350.00	\$134,350.00
<b>Total Revenue Required</b>	\$1,634,476.53	\$1,010,418.81	\$801,983.53	\$710,871.10
<b>Number of developed properties</b>	457	457	457	457
<b>Number of undeveloped properties</b>	172	172	172	172
<b>Estimated Rates for Developed Properties</b>				
Annual Cost per customer	<b>\$3,010.09</b>	<b>\$1,860.81</b>	<b>\$1,476.95</b>	<b>\$1,309.15</b>
Quarterly Cost per customer	<b>\$752.52</b>	<b>\$465.20</b>	<b>\$369.24</b>	<b>\$327.29</b>
<b>Estimated Charge for Undeveloped Properties</b>				
Per Lineal Foot per Year	<b>\$15.05</b>	<b>\$9.30</b>	<b>\$7.38</b>	<b>\$6.55</b>
Per Lineal Foot per Quarter	<b>\$3.76</b>	<b>\$2.33</b>	<b>\$1.85</b>	<b>\$1.64</b>

### Estimated Revenue from Proposed Rates/Tariff Structure

<b>Revenue from 457 Developed Properties</b>	\$1,375,609.16	\$850,389.31	\$674,965.88	\$598,283.78
<b>Revenue from Undeveloped Properties based on 100 lineal feet of frontage on average</b>	\$258,867.37	\$160,029.50	\$127,017.65	\$112,587.32
<b>TOTAL REVENUE</b>	<b>\$1,634,476.53</b>	<b>\$1,010,418.81</b>	<b>\$801,983.53</b>	<b>\$710,871.10</b>

## 6.2.4 Water Rate Comparisons

The following table compared the Rates/Tariffs for the various well locations based on 74% AID funding.

<b>Comparison of Costs by Well Location with 74% Aid Funding</b>					
	Well "A"	Well "B"	Well "C"	Well "D"	Reduced System <sup>1</sup>
<b>Developed Properties</b>					
Estimated Annual Cost per Customer	\$1,309.15	\$1,251.62	\$1,203.18	\$1,174.58	\$2,697.78
Estimated Quarterly Costs per Customer	\$327.29	\$312.91	\$300.79	\$293.64	\$674.44
<b>Undeveloped Properties</b>					
Estimated Cost per Linear ft per Year	\$6.55	\$6.26	\$6.02	\$5.87	\$13.49
Estimated Cost per Linear ft per Quarter	\$1.64	\$1.56	\$1.50	\$1.47	\$3.37

<sup>1</sup> A "reduced system" was considered as the first phase of a multi-phased implementation of the full system. High upfront costs create complications with billing and cost sharing among the end users of the system. The reduced system includes pipes and infrastructure sized to allow for them to fit into the overall full system when all phases are constructed. A phased approach will generally lead to a higher overall system cost and in turn higher rates for all end users, for this reason a reduced system or phased approach is not recommended.

The "reduced system" includes a reduced number of wells, smaller well pumps, reduced operating costs such as chemicals, electrical power and administration costs, approximately 4km of 150mm distribution main from wellfield D to the intersection of Auld Lane where it would connect to the existing private system was considered for the first phase. This scenario also excludes standby power generation at the wellfield. The control building would be set up to allow for the addition of standby power generation later and to allow for future expansion ensuring infrastructure would remain usable as the system expanded. This scenario was estimated to service approximately 42 year-round customers, 47 seasonal customers, and 25 empty lots. The customers considered are those with frontage along Bayshore Road are anyone who the watermain would pass along a short section of Stanhope Lane, and Bayshore Road to the intersection of Auld Lane and the customers of the existing private system at the point. Taking over and connecting to the existing customers of the private system would allow the water utility to benefit from an increased customer base without the upfront capital costs associated with installing the watermains and services to the existing private system customers.

It is expected that the end user costs under this scenario were higher than those explored under the full system scenarios due to a few factors. The main one being the upfront capital cost of wellfield exploration and development remain high. Another factor increasing the end user costs under this scenario is the watermain along Bayshore Road primarily only serves customers on one side making it more expensive per customer to install than a typical watermain servicing customers on both sides of the road. Alternate routing through the center of the Peninsula was considered, the overall length remained the same at approximately 4km. While the number of customers serviced did increase from 114 to 174 (40 year-round, 68 Seasonal, and 66 empty lots) the added system complexity, legal costs, easement costs, tree removals and disturbance to private property owners are expected to outweigh the benefits of servicing the additional customers.

A more detailed breakdown of the costs and rates used for this comparison as well as comparisons under different levels of AID funding can be found in Appendix E.

## Water Rates in Other Locations

The following schedule of water rates has been taken from the IRAC web page (irac.pe.ca). The detailed sewer rates have been removed for clarity.

### PRINCE EDWARD ISLAND REGULATORY AND APPEALS COMMISSION Schedule of Sewer & Water Rates Municipal & Private Utilities

Rates are based on the average annual cost for a single-family dwelling.  
To determine costs to service other types of facilities, please refer to each Utility's approved Tariff of Rates and Charges by clicking on the Utility name below.

		WATER			SEWER & WATER
Utility	Metered	Annual Rate	Frontage Charge	Eff.	Combined Charge
Borden-Carleton	Yes	\$284.60		Jul-01-2011	\$769.08
Crapaud		\$380.00		Jul-01-2013	\$765.00
Georgetown	Yes	\$130.06		Jul-01-1997	\$392.06
Granville Water		\$360.00		Jan-01-2018	
Kensington	Yes	\$267.00		Jan-01-2022	\$642.00
		\$282.00		Jan-01-2023	\$669.00
		\$300.00		Jan-01-2024	\$699.00
		\$318.00		Jan-01-2025	\$729.00
MacMillan Point Water (formerly Covehead)		\$350.00	\$1.75	Jan-01-2017	
Montague	Yes	\$288.00		Oct-01-2021	\$812.00
North Rustico	Yes	\$300.00		Jan-01-2013	\$650.00
Seawood Water	(See Table Below)				
Tignish		\$320.00		Jul-01-2010	\$500.00
Victoria		\$304.00		Oct-01-2017	\$856.00
<b>WATER – Effective Apr-15-2012</b> (Provided by Seawood Water Utility)					S&W Combined
		<b>Annual</b>			
Customer > 6 months		\$463.00			\$1,203.00
Customer < 6 months		\$328.00			\$1,068.00
Undeveloped Lot		\$193.00			=( $\$1.98 \times \# \text{ of ft} + \$175$ ) + \$193

Based on a review of the regulated water rates in Nova Scotia the highest rates currently noted were in the \$250 per quarter range (\$1,000 per year). The estimated costs presented in this report for the central system exceed the highest rates observed in Prince Edward Island and Nova Scotia. This is primarily due to large increases in civil construction and material costs over the past few decades. High interest rates and little to no contributions from private developers add to the higher estimated rates. Many central systems constructed previously began by connecting multiple existing private systems to a larger central system. That combined with municipal services being available to large areas of undeveloped land create opportunities for developers to expand the central system at little to no cost to the utility or its existing customers. Stanhope is unique in most of the existing homes are connected to individual wells with only one small private system on the peninsula. Furthermore nearly all the undeveloped land has previously been subdivided into individual building lots, remaining vacant lots are also distributed fairly evenly throughout the Peninsula leaving no opportunity for the utility to gain future customers without the upfront costs of installing the required infrastructure through agreements with subdivision developers.

## 6.3 Capital Funding Sources

Possible funding sources/options for the development of a new water system include but are not limited to:

### Investing in Canada Infrastructure Program

Launched in 2016 this plan committed over \$180 billion over 12 years for infrastructure that benefits Canadians. This infrastructure stream is expected to providing Federal funding at a rate of 40% for municipal projects, part of this agreement also states that provincial governments will contribute a minimum of 33.33% funding towards municipal projects bringing the estimated funding contribution through this stream to be 73.33%. At the time of writing the ICIP program is closed for applications. It is unclear at this time if this funding stream will reopen and begin accepting applications again. If intakes reopen and funding becomes available through the Investing in Canada Infrastructure Program, it is recommended that the municipality be ready to apply should you wish to proceed with this project. Without funding aid, it is unlikely that a project of this magnitude could be constructed at the Peninsula. More information of the ICIP program can be found at:

<https://www.infrastructure.gc.ca/plan/icp-pic-INFC-eng.html>

### Canada Community – Building Fund

The Canada Community-Building Fund is a permanent source of funding paid out twice-a-year to the province. The province divvies this funding to municipalities for infrastructure

projects. In recent years, the Rural Municipality of North Shore has received funding through CCBF in the range of \$60,000/year. Relying solely on the Canada Community-Building Fund to construct such a large capital project does not seem feasible at this time. More information about the Canada Community-Building Fund can be found at: <https://www.infrastructure.gc.ca/plan/gtf-fte-eng.html>

The partnership/funding options presented are not a finite list but include programs with aspects that apply to the project considerations outlined in this report. The two programs identified above are currently the only funding sources for infrastructure projects administered by the Province of PEI. The investing in Canada Infrastructure Program or one of comparable funding aid is the communities' best option to fund this project. ICIP has been a reliable source of funding for the past 6 years for municipalities across the country and many billions of dollars in infrastructure projects have been completed under this funding stream. Prior to the ICIP program the Municipal-Rural Infrastructure Fund (MRIF) was available for water and wastewater treatment projects for small communities. MRIF started in 2003 and closed in 2014, this program consisted of 1/3 aid from federal sources, 1/3 aid from provincial sources, and 1/3 paid by the ultimate recipient. Historically the federal and provincial governments have provided a funding source with similar contributions to those listed above, it is likely future Federal and Provincial governments will continue to support funding programs for municipal infrastructure particularly in communities such as Stanhope that will experience more direct impacts from climate change.

the ICIP funding will begin accepting applications again or a new funding stream will become available.



# 7 Discussion and Conclusion

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The design, development and construction of a new production wellfield, multiple kilometres of distribution main and servicing of hundreds of homes is a large undertaking. It is likely that a project of this scale will require multiple years to complete with a large amount of background work being completed before any pipe ever goes in the ground. With the Investing in Canada Infrastructure program not currently accepting applications it is unlikely that any major project milestones will be met in the coming months. While the Municipality awaits the funding to become available some background items can still be completed. If there is a desire to move ahead with this project some next step items could include the following.

The municipality has expressed a desire to pursue the use of Parks Canada land as a potential wellfield site. If this is desired, the next step is to continue discussions with Parks Canada with the goal of reaching an agreement for the use of Parks land as a potential wellfield site. The letter from Parks Canada dated January 14, 2009 provided an outline of some items that the municipality would need to submit prior to an agreement being reached. This report could be provided to Parks Canada along with the additional information requested to begin the discussion surrounding this topic.

If the information provided satisfied Parks Canada and the idea of having the community wellfield within the park land was determined to be a viable option, the following items could be completed as well:

- ▶ Begin budgeting and exploration work to finalize the location of a central wellfield.
- ▶ Conduct a door-to-door water well survey of private water users within 500 metres of the exploration area.
- ▶ Collect new water quality samples from a representative number of existing wells within the exploration area.
- ▶ Complete a windshield survey of potential contaminant sources in the area.
- ▶ Consult with PEICLE on potential constraints/permitting issue and government recommendations.
- ▶ Determine property access and, if possible, collect GPS coordinates of target drilling sites.

If a preliminary agreement with Parks Canada is reached the following items could also be completed.

- ▶ Application to PEICLE for a groundwater exploration permit.
- ▶ Drilling of three to five 150 mm test wells to provide a preliminary estimate of yield and water quality. Test well drilling should be completed in as many of the exploration areas as possible.
- ▶ A step-drawdown test of each well including water quality sampling.

- Pending the results of step-drawdown tests, a 24-hour constant-rate test at select well(s).

Some of these items may require funding aid some may be accomplished with the municipality's own forces. Depending on available funds and funding sources the municipality could conduct this background work in anticipation of proceeding with a future central water system project. At a minimum it is recommended that the items required to determine the site suitability and to reach an agreement with Parks Canada should the site be suitable for wellfield use be completed as soon as possible.

## Project Tasks and Estimated Expected Durations

Item #	Description	Potential Duration
1	Revise the Rural Municipality of North Shore's area of jurisdiction creating a municipal water utility complete with bylaws.	3 months
2	Provide Parks Canada with the conceptual water system study and complete discussions with Parks Canada to address their requirements related to potentially constructing the wellfield within the park boundary.	6 months - 1 year
3	Access initial funding and have wellfield investigation and exploration completed.	1 year
4	Conduct Climate Change Resilience Assessment and Green House Gas (GHG) Mitigation Assessment in anticipation of federal funding requirement for a Climate Lens Assessment for projects greater than \$10 million.	3 months
5	Hydrogeological Study/report/commence ground water monitoring and water allocation application.	3-6 months + monitoring (1 year)
6	Engineering design of water supply, storage, and distribution systems.	1 year
7	Construct production well and fit up well pumps, control and water storage building.	1 year
8	Transmission main construction	1-3 months
9	Distribution system construction (approximately 20km)	2 years (minimum)



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# APPENDIX A

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## Property Usage Mapping



Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

**Legend**

- Study Area
- Property Lot Type
- Year Round
- Seasonal
- Empty Lot
- Wetlands



Client



Project Description

Stanhope Peninsula Conceptual Water System  
Property Usage

Revision or Issue

Issued for Final Report

Project No	222609.00	Drawn	SMO	Approved	TDG
Scale	1:9,000	Date	MAY 2022	Figure No	1

# APPENDIX B

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## Hydrogeological Mapping



Client RURAL MUNICIPALITY OF NORTH SHORE

Project Description STANHOPE PENINSULA WATER SYSTEM

Figure Title OBSERVED RANGE OF CHLORIDE CONCENTRATIONS (mg/L) IN PRIVATE WATER WELLS, 2017 TO 2021

Project No	222609.00	Date	JUNE 2022	Figure No	2
Scale	1:10,000				



**Legend**

**Yield Index**

- <1 (less favourable)
- 1.0 - 1.5
- 1.5 - 2.0
- >2.0 (more favourable)

- Potential Exploration Area
- Servicing Area
- Wetland
- 60 m Surface Water Buffer



Client **RURAL MUNICIPALITY OF NORTH SHORE**

Project Description **STANHOPE PENINSULA WATER SYSTEM**

Figure Title **YIELD INDEX FROM WATER WELL RECORDS, PROVINCIAL DATABASE**

Project No	222609.00	Date	JUNE 2022	Figure No	3
Scale	1:20,000				



# APPENDIX C

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## Water System General Arrangement



**LEGEND**

- EXISTING WATERMAIN
- 50mm (2") WATERMAIN
- 100mm (4") WATERMAIN
- 150mm (6") WATERMAIN
- 200mm (8") WATERMAIN
- POTENTIAL WELLFIELD

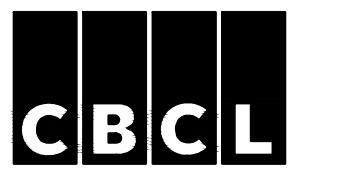


No.	Description	Date	By
2	FINAL REPORT	OCT 28/22	TDG
1	DRAFT FINAL REPORT	AUG18/22	TDG

Revision or Issue

**RURAL MUNICIPALITY OF NORTH SHORE**  
STANHOPE PENINSULA POTABLE WATER SYSTEM  
CONCEPTUAL CIVIL

**POTENTIAL WELLFIELD PROPERTY OWNERSHIP**



CBCL No 222609.00	Contract No	Date JUNE 2022	Scale 1:7500
Designed TDG	Checked TDG	Drawn TDG	Approved
Sheet No 1 of 1		Drawing No <b>4</b>	

DRAWING NAME: R:\CBCL\_JOB\_FOLDERS\2022\222609.00 NORTH SHORE - STANHOPE PENINSULA WATER SYSTEM\44 CAD\01 CIVIL\222609.00 NORTH SHORE POTENTIAL WELLFIELD PROPERTY OWNERSHIP.DWG LAYOUT NAME: PLAN PROFILE 500 PLOT DATE: October 28, 2022 9:34:35 AM CAD OPERATOR: TOLLANT

PLAN  
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# APPENDIX D

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## IRAC Uniform System of Accounts for Municipal Utilities



**THE ISLAND REGULATORY AND  
APPEALS COMMISSION**

Prince Edward Island  
Île-du-Prince-Édouard  
CANADA

***Quick Reference  
Guide***

**Uniform System of  
Accounts for  
Municipal Utilities**

**2005**

# *Quick Reference Guide*

## **Uniform System of Accounts for Municipal Utilities**

**2005**

### **Utility Accounting Procedures**

This Guide is a quick reference to the Commission's  
*Uniform System of Accounts for Municipal Utilities* manual.  
It is not a substitute for the manual.

Readers are encouraged to consult the manual for specific  
details on each account.

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## BALANCE SHEET ACCOUNTS

### Current and Accrued Assets

Current and accrued assets are cash, those assets which are readily convertible into cash or are held for current use in operations.

131. Cash

This account shall include the amount of cash on hand or on deposit in banks.

The following subaccounts shall be maintained:

- 131.1 Cash on Hand
- 131.2 Petty Cash
- 131.3 Bank

132. Special Deposits

This account shall include special deposits with fiscal agents or others for the payment of interest.

133. Other Special Deposits

This account shall include deposits with fiscal agents or others for purposes other than the payment of interest.

135. Temporary Cash Investments

This account shall include the book cost of investments, such as demand and time loans, bankers' acceptances, marketable securities, certificates of deposit and other similar investments, acquired for the purpose of temporarily investing cash.

141. Customer Accounts Receivable

This account shall include amounts due from customers for utility service. This account shall not include amounts due from associated parties.

142. Other Accounts Receivable

This account shall include amounts due the utility upon open accounts, plus merchandising, jobbing and contract work, other than amounts due from associated parties and from customers for utility services.

143. Accumulated Provision for Uncollectible Accounts--Cr

This account shall be credited with amounts provided for losses on accounts receivable which may become uncollectible and also with collections on accounts previously charged hereto.

151. Plant Materials and Supplies

This account shall include the cost of fuel on hand and materials purchased primarily for use in the utility business for construction, operation and maintenance purposes.

152. Materials Inventory

This account shall include the book cost of materials and supplies held primarily for merchandising, jobbing and contract work.

153. Other Materials and Supplies

This account shall include the book cost of materials and supplies held primarily for nonutility purposes.

162. Prepayments/Prepaid Expenses

This account shall include the amounts representing prepayments of insurance, rents, interest and miscellaneous items and shall be kept or supported in such manner as to disclose the amount of each class of prepayment.

172. Rents Receivable

This account shall include rents receivable or accrued on property rented or leased by the utility to others.

173. Accrued Utility Revenues

At the option of the utility, with approval of the Commission, the estimated amount accrued for service rendered, but not billed at the end of any accounting period, may be included herein.

174. Miscellaneous Current and Accrued Assets

This account shall include the book cost of all other current and accrued assets, appropriately designated and supported so as to show the nature of each asset included herein.

**Fixed Assets**

**WATER UTILITY PLANT ACCOUNTS**

- 301. Organization
- 303. Land and Land Rights
- 304. Structures and Improvements
- 305. Collecting and Impounding Reservoirs
- 306. Lake, River and Other Intakes
- 307. Wells and Springs
- 308. Infiltration Galleries and Tunnels
- 309. Supply Mains
- 310. Power Generation Equipment
- 311. Pumping Equipment
- 320. Water Treatment Equipment
- 330. Distribution Reservoirs and Standpipes
- 331. Transmission and Distribution Mains
- 333. Services
- 334. Meters and Meter Installations
- 335. Hydrants
- 339. Other Plant and Miscellaneous Equipment
- 340. Office Furniture and Equipment
- 341. Transportation Equipment
- 342. Stores Equipment
- 343. Tools, Shop and Garage Equipment
- 344. Laboratory Equipment
- 345. Power Operated Equipment
- 346. Communication Equipment
- 347. Miscellaneous Equipment
- 348. Other Tangible Plant
- 349. Accumulated Depreciation

**SEWER UTILITY PLANT ACCOUNTS**

- 351. Organization
- 353. Land and Land Rights
- 354. Structures and Improvements
- 360. Collection Sewers
  - 360.1 Collection Sewers – Force
  - 360.2 Collection Sewers – Gravity
  - 360.2 Special Collecting Structures
- 363. Services to Customers
- 364. Flow Measuring Devices
- 365. Flow Measuring Installations
- 370. Receiving Wells
- 371. Pumping Equipment
- 380. Treatment and Disposal Equipment
- 381. Plant Sewers
- 382. Outfall Sewer Lines
- 389. Other Plant and Miscellaneous Equipment
- 390. Office Furniture and Equipment
- 391. Transportation Equipment
- 392. Stores Equipment
- 393. Tools, Shop and Garage Equipment
- 394. Laboratory Equipment
- 395. Power Operated Equipment
- 396. Communication Equipment
- 397. Miscellaneous Equipment
- 398. Other Tangible Plant
- 399. Accumulated Depreciation



### **Water Utility Plant Accounts**

301. Organization

This account shall include all fees paid to federal or provincial governments for the privilege of organization and expenditures incident to organizing the utility and putting it into readiness to do business.

303. Land and Land Rights

This account shall include the cost of land and land rights used in connection with source of supply, pumping, water treatment plant, transmission and distribution and general plant operations.

304. Structures and Improvements

This account shall include cost in place of structures and improvements used in connection with source of supply, pumping, water treatment, transmission and distribution and general plant.

305. Collecting and Impounding Reservoirs

This account shall include the cost in place of structures and improvements used for impounding, collecting and storing water in the source of supply system.

306. Lake, River and Other Intakes

This account shall include the cost installed of lake, river and other intakes used as a source of water supply.

307. Wells and Springs

This account shall include the cost installed of wells and springs used as a source of water supply.

308. Infiltration Galleries and Tunnels

This account shall include the cost installed of infiltration galleries and tunnels used as a source of water supply.

309. Supply Mains

This account shall include the cost installed of supply mains, pipes, aqueducts and canals and their appurtenances.

310. Power Generation Equipment

This account shall include the cost installed of any equipment used for the production of power principally used in pumping operations.

311. Pumping Equipment

This account shall include the cost of pumping equipment driven by electric power, diesel engines, steam engines and hydraulic water wheels and turbines. A sample of items to be included in this account is listed in the accounting manual.

320. Water Treatment Equipment

This account shall include the cost installed of apparatus, equipment and other facilities used for the treatment of water. A sample of items to be included in this account is listed in the accounting manual.

330. Distribution Reservoirs and Standpipes

This account shall include the cost in place of reservoirs, tanks, standpipes and appurtenances used in storing water for distribution. A sample of items to be included in this account is listed in the accounting manual.

331. Transmission and Distribution Mains

This account shall include the cost installed of transmission and distribution mains and appurtenances. A sample of items to be included in this account is listed in the accounting manual.

333. Services

This account shall include the cost installed of service pipes and accessories leading to the customers' premises.

334. Meters and Meter Installations

This account shall include the cost of meters, devices and appurtenances attached thereto, used for measuring the quantity of water delivered to users, whether actually in service or held in reserve. It shall also include the cost of labor employed, materials used and expenses incurred in connection with the original installation of a customer's meters and devices and appurtenances attached thereto.

335. Hydrants

This account shall include the cost installed of hydrants in service owned by the utility.

339. Other Plant and Miscellaneous Equipment

This account shall include the cost installed of all other intangible, source of supply and pumping, water treatment and transmission and distribution plant not provided for in the foregoing accounts.

340. Office Furniture and Equipment

This account shall include the cost of office furniture and equipment owned by the utility and devoted to utility service and not permanently attached to buildings, except the cost of such furniture and equipment which the utility elects to assign to other plant accounts on a functional basis.

341. Transportation Equipment

This account shall include the cost of transportation vehicles used for utility purposes.

342. Stores Equipment

This account shall include the cost of equipment used for the receiving, shipping, handling and storage of materials and supplies.

343. Tools, Shop and Garage Equipment

This account shall include the cost of tools, implements and equipment used in construction, repair work, general shops and garages and not specifically provided for or includible in other accounts.

344. Laboratory Equipment

This account shall include the cost installed of laboratory equipment used for general laboratory purposes and not specifically provided for or includible in other departmental or functional plant accounts.

345. Power Operated Equipment

This account shall include the cost of power operated equipment used in construction or repair work exclusive of equipment includible in other accounts.

346. Communication Equipment

This account shall include the cost installed of telephone, telegraph and wireless equipment for general use in connection with utility operations.

347. Miscellaneous Equipment

This account shall include the cost of equipment, apparatus, etc., used in utility operations and which is not includible in any other account.

348. Other Tangible Plant

This account shall include the cost of tangible utility plant not provided for elsewhere.

349. Accumulated Depreciation

This account shall include the accumulated depreciation and amortization applicable to water utility plant and equipment.

### **Sewer Utility Plant Accounts**

351. Organization

This account shall include all fees paid to federal or provincial governments for the privilege of organization and expenditures incident to organizing the corporation and putting it into readiness to do business.

353. Land and Land Rights

This account shall include the cost of land and land rights used in connection with sewage collection, pumping, treatment and disposal and general plant operations.

354. Structures and Improvements

This account shall include cost in place of structures and improvements used in connection with sewage collection, pumping, treatment and disposal and general plant operations.

360. Collection Sewers

360.1 Collection Sewers - Force

This account shall include all sewers which are used to lift sewage from a low elevation to a higher elevation.

360.2 Collection Sewers - Gravity

This account shall include the installed cost of all gravity collecting sewers, interceptor, branch, trunk, lateral including services wye, including manholes and lampholes. Manholes shall be included as a separate unit of property.

360.3 Special Collecting Structures

Inverted siphon shall be included in this account but so distinctly noted; also any other special designed structures unusual to sewer systems should be included herein but specifically noted as to what they are.

363. Services to Customers

This account shall include the installed cost of service sewers, from collection sewer to the customer's property or curb line.

364. Flow Measuring Devices

This account shall include the cost of flow measuring and recording equipment and initial testing used for measuring the quantity of sewage or sewage effluent delivered by customers, whether actually in service or held in reserve.

365. Flow Measuring Installations

This account shall include the cost of labor employed, materials used and expenses incurred in connection with the original installation of customers' flow measuring equipment.

370. Receiving Wells

This account shall include the cost of constructing wells at pumping stations or at other junction points along the collecting system, used for intercepting sewage for clearing and screening, transfer to a pumping well or otherwise further convey it along the collecting system to the treatment plant or point of final discharge. This account shall include any chemical feed apparatus and holding basins associated with the receiving well.

371. Pumping Equipment

This account shall include the cost installed of pumping equipment driven by electric power or diesel engines

380. Treatment and Disposal Equipment

This account shall include the cost installed of apparatus, equipment and other facilities used for the treatment of sewage and disposal of sewage wastes

381. Plant Sewers

This account shall include the cost installed of plant yard piping and appurtenances and facilities required to dispose of treatment plant liquid effluent into the outfall sewer line.

382. Outfall Sewer Lines

This account shall include the installed cost of sewer line carrying effluent from treatment facility to point of discharge. Includible in this account would be headwall or outlet.

389. Other Plant and Miscellaneous Equipment

This account shall include the cost installed of all other intangible, collection system pumping and treatment and disposal plant not provided for in the foregoing accounts.

390. Office Furniture and Equipment

This account shall include the cost of office furniture and equipment owned by the utility and devoted to utility service and not permanently attached to buildings, except the cost of such furniture and equipment which the utility elects to assign to other plant accounts on a functional basis.

391. Transportation Equipment

This account shall include the cost of transportation vehicles used for utility purposes.

392. Stores Equipment

This account shall include the cost of equipment used for the receiving, shipping, handling and storage of materials and supplies.

393. Tools, Shop and Garage Equipment

This account shall include the cost of tools, implements and equipment used in construction, repair work, general shops and garages and not specifically provided for or includible in other accounts.

394. Laboratory Equipment

This account shall include the cost installed of laboratory equipment used for general laboratory purposes and not specifically provided for or includible in other departmental or functional plant accounts.

395. Power Operated Equipment

This account shall include the cost of power operated equipment used in construction or repair work exclusive of equipment includible in other accounts. Include, also, the tools and accessories acquired for use with such equipment and the vehicle on which such equipment is mounted.

396. Communication Equipment

This account shall include the cost installed of telephone, telegraph and wireless equipment for general use in connection with utility operations.

397. Miscellaneous Equipment

This account shall include the cost of equipment, apparatus, etc., used in utility operations and which is not includible in any other account.

398. Other Tangible Plant

This account shall include the cost of tangible utility plant not provided for elsewhere.

399. Accumulated Depreciation

This account shall include accumulated depreciation and amortization applicable to sewer utility plant and equipment.

**Deferred Debits**

181. Interfund Accounts

These accounts record transactions between the revenue fund and capital fund. The interfund accounts must be in balance.

181.1 Interfund Account - Revenue Fund

This account records transactions initially recorded in the revenue fund which relate to capital fund transactions. This account can record both debit and credit transactions depending on the nature of the transactions.

181.2 Interfund Account - Capital Fund

This account records transactions initially recorded in the capital fund which relate to current fund transaction. This account can record both debit and credit transactions depending on the nature of the transaction.

### **Current and Accrued Liabilities**

Current and accrued liabilities are those obligations which have either matured or which become due within one year from the date thereof.

231. Accounts Payable

This account shall include all amounts payable by the utility within one year, which are not provided for in other accounts.

232. Notes Payable

This account shall include the face value of all notes, drafts, acceptance, or other similar evidences of indebtedness, payable on demand or within a time not exceeding one year from date of issue, to other than associated parties.

233. Accounts Payable to Associated Parties

This account shall include all amounts payable by the utility to associated companies which are not provided for in other accounts.

234. Notes Payable to Associated Parties

This account shall include amounts owing to associated parties on notes, drafts, acceptance, or other similar evidences of indebtedness, payable on demand or within a time not exceeding one year from date of issue or creation.

235. Customer Deposits

This account shall include all amounts deposited with the utility by customers as security for the payment of bills.

237. Accrued Interest

This account shall include the amount of interest accrued but not matured on all liabilities of the utility not including, however, interest which is added to the principal of the debt on which incurred.

241. Miscellaneous Current and Accrued Liabilities

This account shall include the amount for all other current and accrued liabilities not provided for elsewhere appropriately designated and supported so as to show the nature of each liability.



### **Long-Term Debt**

224. Long-Term Debt

This account shall include, until maturity, all long-term debt not otherwise provided for.

### **Contributions in Aid of Construction**

271. Contributions in Aid of Construction

A. This account shall include:

1. Any amount or item of money, services or property received by a utility, from any person or governmental agency, any portion of which is provided at no cost to the utility, which represents an addition or transfer to the capital of the utility and which is utilized to offset the acquisition, improvement or construction costs of the utility's property, facilities, or equipment used to provide utility services to the public.

2. Amounts transferred from account 252 - Advances for Construction, representing unrefunded balances of expired contracts or discounts resulting from termination of contracts in accordance with the Commission's rules and regulations.

3. Compensation received from governmental agencies and others for relocation of water mains or other plants.

B. The credits to this account shall not be transferred to any other account without the approval of the Commission.

272. Accumulated Amortization of Contributions in Aid of Construction

This account shall reflect the amortization accumulated on account 271 - Contributions in Aid of Construction, if recognized by the Commission.

### **Surplus (Deficit)**

215. Unappropriated Surplus

This account shall include the balance, either debit or credit, of unappropriated surplus. It shall not include items includible in any of the accounts for paid-in capital.

## **INCOME ACCOUNTS**

### **Operating Revenues**

The utility revenues are recorded in the following accounts:

Water: 460 through 474

Sewer: 521 through 536

### **Operating Expenses**

The utility expenditures are recorded in the following accounts:

Water: 600 through 695

Sewer: 700 through 795

## **Water Operating Revenue Accounts**

### **Water Sales**

- 460. Unmetered Water Revenue
- 461. Metered Water Revenue
- 462. Fire Protection Revenue
  - 462.1 Public Fire Protection
  - 462.2 Private Fire Protection
- 464. Other Sales to Public Authorities
- 465. Sales to Irrigation Customers
  - 465.1 Metered Sales to Irrigation Customers
  - 465.2 Flat Rate Sales to Irrigation Customers

### **Other Water Revenues**

- 470. Delayed Payment Charges
- 471. Miscellaneous Service Revenues
- 472. Rents from Water Property
- 473. Interdepartmental Rents
- 474. Other Water Revenues

## **Sewer Operating Revenue Accounts**

### **Sewer Sales**

- 521. Flat Rate Revenues
  - 521.1 Residential Revenues
  - 521.2 Commercial Revenues
  - 521.3 Industrial Revenues
  - 521.4 Revenues from Public Authorities
  - 521.5 Multiple Family Dwelling Revenues
  - 521.6 Other Revenues
- 522. Measured Revenues
  - 522.1 Residential Revenues
  - 522.2 Commercial Revenues
  - 522.3 Industrial Revenues
  - 522.4 Revenues from Public Authorities
  - 522.5 Multiple Family Dwelling Revenues
  - 522.6 Other Revenues
- 523. Revenues from Public Authorities
- 525. Interdepartmental Revenues
- 530. Frontage Rates

### **Other Sewer Revenues**

- 531. Sale of Sludge
- 532. Delayed Payment Charges
- 534. Rents from Sewer Property
- 536. Other Sewer Revenues

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## **Water Operating Revenue Accounts**

### **Water Sales**

460. Unmetered Water Revenue

This account shall include the net billing for water supplied for residential, commercial and industrial (except irrigation) purposes where the charge is not dependent in any way on the quantity of water delivered but is based on diameter of service pipe, room, foot of frontage or other similar unit.

461. Metered Water Revenue

This account shall include the net billing for measured water supplied for residential, commercial or industrial (except irrigation) purposes where the total charge is, or may be, in any way dependent on the quantity of water delivered.

462. Fire Protection Revenue

Include herein all revenue from public agencies and others for hydrant charges, private fire protection service, street sprinkling, sewer flushing and similar sources. The following subaccounts shall be maintained:

- 462.1 Public Fire Protection
- 462.2 Private Fire Protection

464. Other Sales to Public Authorities

This account shall include the net billing for water supplied to municipalities, or other subdivisions or agencies of state or federal governments, billed under special contracts or agreements or service classifications applicable only to public authorities.

465. Sales to Irrigation Customers

This account shall include the net billing for water supplied for commercial irrigation purposes, under distinct irrigation rates, billed under either metered or flat rate tariff schedules. The following subaccounts shall be maintained:

- 465.1 Metered Sales to Irrigation Customers
- 465.2 Flat Rate Sales to Irrigation Customers

### **Other Water Revenues**

470. Delayed Payment Charges

This account shall include the amount of discounts forfeited or additional charges imposed because of failure of customers to pay their water bills on or before a specified date.

471. Miscellaneous Service Revenues

This account shall include revenues for all miscellaneous services and charges billed to customers which are specifically provided for in other accounts.

472. Rents from Water Property

This account shall include rents received for the use by other of land, buildings and other property devoted to water operations by the utility.

473. Interdepartmental Rents

This account shall include rents credited to the water department on account of rental charges made against other departments (i.e. sewer of the utility). In the case of property operated under a definite arrangement to allocate the cost among the departments using the property, any reimbursement to the water department for interest, fair return, depreciation or taxes shall be credited to this account.

474. Other Water Revenues

This account shall include revenues derived from water operations not includible in any of the foregoing accounts.

### **Sewer Operating Revenue Accounts**

#### **Sewer Sales**

521. Flat Rate Revenues

This account shall be credited with all revenue for sewage service rendered to residential, commercial and industrial property where the charge is not dependent upon metered water consumption or metered effluent output but is based on diameter of service, structure size, area front footage or other similar unit. The following subaccounts shall be maintained:

- 521.1 Residential Revenues
- 521.2 Commercial Revenues
- 521.3 Industrial Revenues
- 521.4 Revenues from Public Authorities
- 521.5 Multiple Family Dwelling Revenues
- 521.6 Other Revenues

522. Measured Revenues

This account shall be credited with all revenue for sewage service rendered to residential, commercial and industrial property where the charge is, or may be, in any way dependent on the quantity of water consumed or the quantity of effluent output by the customers. The following subaccounts shall be maintained:

- 522.1 Residential Revenues
- 522.2 Commercial Revenues
- 522.3 Industrial Revenues
- 522.4 Revenues from Public Authorities
- 522.5 Multiple Family Dwelling Revenues
- 522.6 Other Revenues

523. Revenues from Public Authorities

This account shall be credited with revenues derived from sewage service to properties of municipalities or other divisions or agencies of federal or provincial governments where such service is rendered and billed under special contracts or agreements or service classifications applicable only to public authorities. Service to public authority customers billed under general service (flat rate or measured service) rate schedules shall be credited to account 521 or 522 as appropriate.

525. Interdepartmental Revenues

This account shall include amounts charged by the sewer department at tariff or other specified rates for sewer service by it to other utility departments.

530. Frontage Rates

This account includes the total charges of those customers whose lots are serviced or capable of being served with sewerage service adjacent to a sewerage main.

### **Other Sewer Revenues**

531. Sale of Sludge

This account shall include revenues received from the sale of the by-product sludge sold as fertilizer.

532. Delayed Payment Charges

This account shall include the amounts which the utility allows its customers on condition that they pay their sewage bills on or before a specified date and which are forfeited by customers because of failure to pay within the specified time. There shall likewise be credited hereto the amounts of penalties imposed by the utility on its customers because of failure to pay bills within a specified time.

534. Rents from Sewer Property

This account shall include rents received for the use by others of land, buildings and other property devoted to sewer operations by the utility.

536. Other Sewer Revenues

This account shall include revenues for all miscellaneous services and charges billed to customers which are not specifically provided for in other accounts.

### Operation and Maintenance Expense Accounts

#### WATER

- 600. Salaries and Wages - Operational Employees
- 605. Materials and Supplies
- 610. Repairs and Maintenance
- 615. Rentals
  - 615.1 Building/Real Property
  - 615.2 Equipment
- 620. Power or Electricity
- 625. Chemicals
- 630. Water Testing and Analysis
- 650. Salaries and Wages - Administrative Employees
- 655. Employee Pensions and Benefits
- 660. Office Supplies and Other Office Expenses
- 661. Interest and Bank Service Charges
- 665. Contractual Services
  - 665.1 Engineering
  - 665.2 Accounting/Audit
  - 665.3 Legal
  - 665.4 Management Fees
  - 665.5 Other
- 670. Transportation Expenses
- 675. Insurance
  - 675.1 General Liability
  - 675.2 Vehicle
  - 675.3 Workman's Compensation
  - 675.4 Other
- 680. Amortization - Rate Case Expense
- 685. Regulatory Commission Fees
- 690. Miscellaneous Expenses
- 695. Bad Debt Expense

#### SEWER

- 700. Salaries and Wages - Operational Employees
- 705. Materials and Supplies
- 710. Repairs and Maintenance
- 715. Rentals
  - 715.1 Building/Real Property
  - 715.2 Equipment
- 720. Power or Electricity
- 725. Chemicals
- 750. Salaries and Wages - Administrative Employees
- 755. Employee Pensions and Benefits
- 760. Office Supplies and Other Office Expenses
- 761. Interest and Bank Service Charges
- 765. Contractual Services
  - 765.1 Engineering
  - 765.2 Accounting/Audit
  - 765.3 Legal
  - 765.4 Management Fees
  - 765.5 Other
- 770. Transportation Expenses
- 775. Insurance
  - 775.1 General Liability
  - 775.2 Vehicle
  - 775.3 Workman's Compensation
  - 775.4 Other
- 780. Amortization - Rate Case Expense
- 785. Regulatory Commission Fees
- 790. Miscellaneous Expenses
- 795. Bad Debt Expense



## **Water Operation and Maintenance Expense Accounts**

600. Salaries and Wages - Operational Employees

This account shall include the compensation (salaries, bonuses and other consideration for services) paid or accrued to employees of the utility company for work related to operation and maintenance of that utility company.

605. Materials and Supplies

This account shall include all materials and supplies used in operation of the water system, other than materials and supplies charged to Contractual Services Accounts.

610. Repairs and Maintenance

This account shall include all expenses relating to the ongoing maintenance and repair of the water system. Items include minor repairs and maintenance performed by external contractors.

615. Rentals

615.1 Building/Real Property

This account shall include those costs associated with the rental of buildings or real property which are properly treated as period costs.

615.2 Equipment

This account shall include costs associated with the rental of equipment, except vehicles, used in the operation of the utility.

620. Power or Electricity

This account shall include the cost of all electric power expense incurred by the utility.

Alternatives, this account shall include the cost of fuel used in the production of power to operate the pumps.

625. Chemicals

This account shall include the cost of all chemicals used in the treatment of water.

630. Water Testing and Analysis

This account shall include the cost of the collection and the analysis of water quality samples, including laboratory fees.

650. Salaries and Wages - Administrative Employees

This account shall include the compensation (salaries, bonuses and other consideration for services) paid or accrued to administrative employees, officers and directors of the utility.

655. Employee Pensions and Benefits

This account shall include all accruals under employee pensions plans to which the utility has irrevocably committed such funds and payments for employee accident, sickness, hospital and death benefits or insurance therefor. Include also expenses for medical, educational or recreational activities of employees.

660. Office Supplies and Other Office Expenses

This account includes all office supplies and material used in the direct administration of the utility. In addition, this account includes other miscellaneous direct offices expenses.

661. Interest and Bank Service Charges

This account shall include fees paid for monthly bank service charges and interest charges relating to short-term current account overdraft charges.

665. Contractual Services

665.1 Engineering

This account shall include costs paid to outside engineers or engineering firms to perform ongoing, recurring engineering work for the utility. Engineering services for plant items are properly includible in the appropriate plant account. Engineering services for rate relief filings shall be included in accounts 186.1 - Deferred Rate Case Expense and 680 - Amortization - Rate Case Expense, as appropriate.

665.2 Accounting/Audit

This account shall include costs paid to outside accounting companies to maintain or audit the books and records of the utility. Accounting expenses for rate relief filings shall be included in account 186.1 - Deferred Rate Case Expense and 680 - Amortization - Rate Case Expense.

665.3 Legal

This account shall include costs paid to outside legal firms to perform legal services for the utility. Legal services for rate proceedings before the Commission shall be included in account 186.1 - Deferred Rate Case Expense and 680 - Amortization - Rate Case Expense.

665.4 Management Fees

This account shall include contractual costs (other than those properly included in accounts 600 and 650 - Salaries and Wages) paid for the performance of management functions.

665.5 Other

This account shall include those operations costs contracted for which are not included in above accounts.

670. Transportation Expenses

This account shall include all truck, automobile, construction equipment and other vehicle expense chargeable to utility operations, except depreciation and insurance.

675. Insurance

675.1 General Liability

This account shall include insurance costs associated with general liability coverage of the utility company.

675.2 Vehicle

This account shall include costs associated with insurance of automobiles and trucks used for utility purposes.

675.3 Workman's Compensation

This account shall include insurance costs associated with workman's compensation coverage for employees of the utility company.

675.4 Other

This account shall include insurance costs associated with coverage for the utility company which are not included in account 675.1 - 675.3.

680. Amortization - Rate Case Expense

This account shall include amortization of account 186 - Miscellaneous Deferred Debits. Cost associated with rate cases shall be first charged to account 186 and then amortized as prescribed by the Commission to this account.

685. Regulatory Commission Fees

This account shall include all fees incurred by the utility which are payable to Island Regulatory and Appeals Commission.

690. Miscellaneous Expenses

This account shall include all expenses not includible in other operating expense accounts.

695. Bad Debt Expense

This account shall be charged with amounts sufficient to provide for losses from uncollectible utility revenues. Concurrent credits shall be made to account 143.

**Sewer Operation and Maintenance Expense Accounts**

700. Salaries and Wages - Operational Employees

This account shall include the compensation (salaries, bonuses and other consideration for services) paid or accrued to employees of the utility company for work related to operation and maintenance of that utility company. This account shall not include the salaries and wages of administrative employees, officers and directors of the utility.

705. Materials and Supplies

This account shall include all materials and supplies used in operation and maintenance of the sewer system, other than materials and supplies charged to Contractual Services Accounts.

710. Repairs and Maintenance

This account shall include all expenses relating to the ongoing maintenance and repair of the sewer system. Items include minor repairs and maintenance performed by external contractors.

715. Rentals

715.1 Building/Real Property

This account shall include those costs associated with the rental of buildings or real property which are properly treated as period costs.

715.2 Equipment

This account shall include costs associated with the rental of equipment, except vehicles, used in the operation of the utility. Vehicle rentals and leases are properly included in account 770 - Transportation Expenses.

720. Power or Electricity

This account shall include the cost of all electric power expenses incurred by the utility. Alternatives, this account shall include the cost of fuel used in the production of power to operate the pumps.

725. Chemicals

This account shall include the cost of all chemicals used in the treatment of sewage.

750. Salaries and Wages - Administrative Employees

This account shall include the compensation (salaries, bonuses and other consideration for services) paid or accrued to administrative employees, officers and directors of the utility.

755. Employee Pensions and Benefits

This account shall include all accruals under employee pensions plans to which the utility has irrevocably committed such funds and payments for employee accident, sickness, hospital and death benefits or insurance therefore. Include also expenses for medical, educational or recreational activities of employees.

760. Office Supplies and Other Office Expenses

This account includes all office supplies and material used in the direct administration of the utility. In addition, this account includes other miscellaneous office expenses.

761. Interest and Bank Service Charges

This account shall include fees paid for monthly bank service charges and interest charges relating to short-term current account overdraft balances.

765. Contractual Services

765.1 Engineering

This account shall include costs paid to outside engineers or engineering firms to perform ongoing, recurring engineering work for the utility. Engineering services for plant items are properly includible in the appropriate plant account. Engineering services for rate relief filings shall be included in account 780 - Amortization - Rate Case Expense and account 186.1 - Deferred Rate Case Expense, as appropriate.

765.2 Accounting/Audit

This account shall include costs paid to outside accounting companies to maintain or audit the books and records of the utility. Accounting expenses for rate relief filings shall be included in account 780 - Amortization - Rate Case Expense or account 186.1 - Deferred Rate Case Expense.

765.3 Legal

This account shall include costs paid to outside legal firms to perform legal services for the utility. Legal services for rate proceedings before the Commission shall be included in account 780 - Amortization - Rate Case Expense or account 186.1 - Deferred Rate Case Expense.

765.4 Management Fees

This account shall include contractual costs (other than those properly included in accounts 700 and 750 - Salaries and Wages) paid for the performance of management functions.

765.5 Other

This account shall include those operations costs contracted for which are not included in above accounts.

770. Transportation Expenses

This account shall include all truck, automobile, construction equipment and other vehicle expense chargeable to utility operations, except depreciation and insurance.

775. Insurance

775.1 General Liability

This account shall include insurance costs associated with general liability coverage of the utility company.

775.2 Vehicle

This account shall include costs associated with insurance of automobiles and trucks used for utility purposes.

775.3 Workman's Compensation

This account shall include insurance costs associated with workman's compensation coverage for employees of the utility company.

775.4 Other

This account shall include insurance costs associated with coverage for the utility company which are not included in account 775.1 - 775.3.

780. Amortization - Rate Case Expense

This account shall include amortization of account 186 - Miscellaneous Deferred Debits. Cost associated with rate cases shall be first charged to account 186 and then amortized as prescribed by the Commission to this account.

785. Regulatory Commission Fees

This account shall include all fees incurred by the utility which are payable to the Island Regulatory and Appeals Commission.

790. Miscellaneous Expenses

This account shall include all expenses not includible in other operating expense accounts.

795. Bad Debt Expense

This account shall be charged with amounts sufficient to provide for losses from uncollectible utility revenues. Concurrent credits shall be made to account 143.

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**Other Operating - Water and Sewer**

802./902.     Small Tools Written Off During the Year

This account shall be charged with expenses relating to tools and equipment which cost \$200.00 or less. Most items of this nature represent minor values which do not warrant capitalization as a fixed asset for the utility.

803./903.     Depreciation Expenses

A.     This account shall be charged with depreciation credited to account 399 - Accumulated Depreciation of Sewer Plant or account 349 - Accumulated Depreciation of Water Plant and credited with amortization debited to account 272 - Accumulated Amortization of Contributions in Aid of Construction. Depreciation shall be accrued on a straight-line remaining life basis or straight-line basis as required by the Commission. A single composite depreciation rate may be used if approval from the Commission is obtained.

B.     Depreciation for property not used in operations is charged to account 826/926 - Miscellaneous Nonutility Expenses and is credited to account 122 - Accumulated Depreciation and Amortization of Nonutility Property.

804./904.     Interest on Long-Term Debt

The utility's interest on long-term debt should be recorded in this account. The following subaccounts shall be maintained:

- 804.1/904.1     Interest on Long-Term Debt
- 804.2/904.2     Interest on Customer Deposits
- 804.3/904.3     Interest – Other

**Other Income and Deductions – Water and Sewer**

813./913.     Income from Utility Plant Leased to Others

This account shall include, revenues from utility property constituting a distinct operating unit or system leased by the utility to others and which property is properly includible in account 102 - Utility Plant Leased to Others and the expenses attributable to such property.

814./914.     Gains (Losses) from Disposition of Utility Property

This account shall include, when authorized by the Commission, gains and losses from the sale, conveyance, exchange or transfer of utility property to another.



815./915. Revenues from Merchandising, Jobbing and Contract Work

These Accounts shall include respectively, all revenues derived from the sale of merchandise and jobbing or contract work, including any profit or commission accruing to the utility on jobbing work performed by it as agent under contracts whereby it does jobbing work for another for a stipulated profit or commission and all expenses incurred in such activities.

816./916. Costs and Expenses of Merchandising, Jobbing and Contract Work

This account shall include all costs relating to merchandising and jobbing or contract work.

819./919. Interest and Dividend Income

This account shall include interest revenues on securities, loans, notes, advances, special deposits, tax refunds and all other interest bearing assets and dividends on stocks of other companies, whether the securities are carried as investments or included in sinking or other special funds accounts.

821./921. Nonutility Income

In this account is entered all income not includible in operating revenue.

826./926. Miscellaneous Nonutility Expenses

This account shall contain all expenses other than expenses of utility operations and interest expense.

### **Extraordinary Items**

950. Extraordinary Income

Upon approval of the regulatory authority this account shall be credited with nontypical, noncustomary, infrequently recurring gains, which would significantly distort the current year's income computed before extraordinary items, if reported other than as extraordinary items.

951. Extraordinary Deductions

Upon approval of the Commission, this account shall be debited with nontypical, noncustomary, infrequently recurring losses, which would distort the current year's income, if not reported separately.

# APPENDIX E

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## Estimated Budgets and Tariff Structures

## Well "A" Costs

### Well "A" Estimated Total Capital Cost and Annual Depreciation Charge Excluding HST and Water Meters

Item	Estimated Capital Cost	Depreciation Rate	Depreciation
Wellfield Investigation	\$ 180,000.00	1.20	\$ 2,160.00
Production Well Drilling	\$ 175,000.00	1.20	\$ 2,100.00
Wellhead / Control Building	\$ 1,075,000.00	1.20	\$ 12,900.00
Pumps and Controls	\$ 450,000.00	5.00	\$ 22,500.00
Standby Power	\$ 140,000.00	5.00	\$ 7,000.00
Water Distribution System	\$11,647,040.00	1.20	\$139,764.48
Water Services	\$ 1,113,330.00	2.00	\$ 22,266.60
Legal Easements	\$ 234,500.00	-	\$ -
Service Truck and Misc. Tools	\$ 66,000.00	20.00	\$ 13,200.00
<b>Subtotal without Connection to Well</b>	<b>\$15,080,870.00</b>		<b>\$221,891.08</b>
Well A - Arterial Main	\$ 2,510,000.00	1.20	\$ 30,120.00
<b>Well A Total Excluding HST</b>	<b>\$17,590,870.00</b>		<b>\$252,011.08</b>

**Well "A" Annual Repayment Schedule with No Outside Funding**

**Loan Calculator**  
**Long Term Debt**

<b>Interest Rate</b>	<b>5.0%</b>
<b>Term in years</b>	<b>25</b>
<b>Capital</b>	<b>\$ 17,590,870</b>

**Payment Schedule for Capital Works**

	Principal	Interest	Total	Balance
Year				
1	\$368,571.95	\$879,543.50	1,248,115.45	17,222,298.05
2	\$387,000.55	\$861,114.90	1,248,115.45	16,835,297.50
3	\$406,350.58	\$841,764.87	1,248,115.45	16,428,946.92
4	\$426,668.11	\$821,447.35	1,248,115.45	16,002,278.81
5	\$448,001.51	\$800,113.94	1,248,115.45	15,554,277.30
6	\$470,401.59	\$777,713.87	1,248,115.45	15,083,875.71
7	\$493,921.67	\$754,193.79	1,248,115.45	14,589,954.05
8	\$518,617.75	\$729,497.70	1,248,115.45	14,071,336.30
9	\$544,548.64	\$703,566.81	1,248,115.45	13,526,787.66
10	\$571,776.07	\$676,339.38	1,248,115.45	12,955,011.59
11	\$600,364.87	\$647,750.58	1,248,115.45	12,354,646.72
12	\$630,383.12	\$617,732.34	1,248,115.45	11,724,263.60
13	\$661,902.27	\$586,213.18	1,248,115.45	11,062,361.33
14	\$694,997.39	\$553,118.07	1,248,115.45	10,367,363.94
15	\$729,747.26	\$518,368.20	1,248,115.45	9,637,616.69
16	\$766,234.62	\$481,880.83	1,248,115.45	8,871,382.07
17	\$804,546.35	\$443,569.10	1,248,115.45	8,066,835.72
18	\$844,773.67	\$403,341.79	1,248,115.45	7,222,062.05
19	\$887,012.35	\$361,103.10	1,248,115.45	6,335,049.70
20	\$931,362.97	\$316,752.49	1,248,115.45	5,403,686.73
21	\$977,931.12	\$270,184.34	1,248,115.45	4,425,755.62
22	\$1,026,827.67	\$221,287.78	1,248,115.45	3,398,927.95
23	\$1,078,169.06	\$169,946.40	1,248,115.45	2,320,758.89
24	\$1,132,077.51	\$116,037.94	1,248,115.45	1,188,681.38
25	\$1,188,681.38	\$59,434.07	1,248,115.45	0.00

**Well "A" Estimated Annual Operating Budget**

	<b>Projected Budget</b>
<b>Water Production and Distribution</b>	
Wages and Benefits	50,000
Chemicals	2,000
Electrical Power	29,000
Lab Testing	2,200
Snow Removal and Grass Mowing	1,000
Service Truck Fuel & Maintenance	5,000
Repair Parts Allowance	2,000
Other Operating Expenses	7,500
Other	
<b>TOTAL SOURCE OF SUPPLY</b>	<b>98,700</b>
<b>Administration and General</b>	
Wages and Salaries	25,000
Dues and Fees	150
Insurance	2,000
IRAC Assessment	2,000
Office Expenses	3,000
Professional Fees Allowance	3,000
Telephone	500
Other	
<b>TOTAL ADMINISTRATION AND GENERAL</b>	<b>35,650</b>
<b>TOTAL OPERATING BUDGET</b>	<b>134,350</b>

## Well "A" Estimated Tariff Structure

Based on the above information the following average rates/tariffs have been calculated for various levels of AID or Outside Funding from senior levels of government.

<b>Expenses</b>	<b>0% AID Funding</b>	<b>50% AID Funding</b>	<b>66.7% AID Funding</b>	<b>74% AID Funding</b>
		50.0%	66.7%	74.0%
<b>Fixed Expenses</b>				
Principal	\$368,571.95	\$ 184,285.98	\$ 122,734.46	\$ 95,828.71
Interest	\$879,543.50	\$ 439,771.75	\$ 292,887.99	\$ 228,681.31
Depreciation	\$ 252,011.08	\$ 252,011.08	\$ 252,011.08	\$ 252,011.08
Sub-total	\$ 1,500,126.53	\$ 876,068.81	\$ 499,542.14	\$ 576,521.10
<b>Variable Expenses</b>				
Administration and Billing	\$ 35,650.00	\$ 35,650.00	\$ 35,650.00	\$ 35,650.00
Operations	\$ 98,700.00	\$ 98,700.00	\$ 98,700.00	\$ 98,700.00
Sub-total	\$ 134,350.00	\$ 134,350.00	\$ 134,350.00	\$ 134,350.00
<b>Total Revenue Required</b>	\$ 1,634,476.53	\$ 1,010,418.81	\$ 801,983.53	\$ 710,871.10
<b>Number of full time customers</b>	457	457	457	457
<b>Number of undeveloped properties</b>	172	172	172	172
<b>Estimated Rates for Developed Properties</b>				
Annual Cost per customer	\$ 3,010.09	\$ 1,860.81	\$ 1,476.95	\$ 1,309.15
Quarterly Cost per customer	\$ 752.52	\$ 465.20	\$ 369.24	\$ 327.29
<b>Estimated Charge for Undeveloped Properties</b>				
Per Lineal Foot per Year	\$ 15.05	\$ 9.30	\$ 7.38	\$ 6.55
Per Lineal Foot per Quarter	\$ 3.76	\$ 2.33	\$ 1.85	\$ 1.64

## Well "A" Estimated Revenue from Proposed Rates/Tariff Structure

<b>Revenue from 457 Developed Properties</b>	\$ 1,375,609.16	\$ 850,389.31	\$ 674,965.88	\$ 598,283.78
<b>Revenue from Undeveloped Properties based on 100 lineal feet of frontage on average</b>	\$ 258,867.37	\$ 160,029.50	\$ 127,017.65	\$ 112,587.32
<b>TOTAL REVENUE</b>	<b>\$ 1,634,476.53</b>	<b>\$ 1,010,418.81</b>	<b>\$ 801,983.53</b>	<b>\$ 710,871.10</b>

## Well "B" Costs

### Well "B" Estimated Total Capital Cost and Annual Depreciation Charge Excluding HST and Water Meters

Item	Estimated Capital Cost	Depreciation Rate	Depreciation
Wellfield Investigation	\$ 180,000.00	1.20	\$ 2,160.00
Production Well Drilling	\$ 175,000.00	1.20	\$ 2,100.00
Wellhead / Control Building	\$ 1,075,000.00	1.20	\$ 12,900.00
Pumps and Controls	\$ 450,000.00	5.00	\$ 22,500.00
Standby Power	\$ 140,000.00	5.00	\$ 7,000.00
Water Distribution System	\$11,647,040.00	1.20	\$139,764.48
Water Services	\$ 1,113,330.00	2.00	\$ 22,266.60
Legal Easements	\$ 234,500.00	-	\$ -
Service Truck and Misc Tools	\$ 66,000.00	20.00	\$ 13,200.00
<b>Subtotal without Connection to Well</b>	<b>\$15,080,870.00</b>		<b>\$221,891.08</b>
Well B - Arterial Main	\$ 1,484,000.00	1.20	\$ 17,808.00
<b>Well B Total Excluding HST</b>	<b>\$16,564,870.00</b>		<b>\$239,699.08</b>

**Well "B" Annual Repayment Schedule with No Outside Funding**

<b>Loan Calculator</b>	<b>Interest Rate</b>	<b>5.0%</b>
<b>Long Term Debt</b>	<b>Term in years</b>	<b>25</b>
	<b>Capital</b>	<b>\$ 16,564,870</b>

**Payment Schedule for Capital Works**

	Principal	Interest	Total	Balance
Year				
1	\$347,074.73	\$828,243.50	1,175,318.23	16,217,795.27
2	\$364,428.47	\$810,889.76	1,175,318.23	15,853,366.80
3	\$382,649.89	\$792,668.34	1,175,318.23	15,470,716.91
4	\$401,782.39	\$773,535.85	1,175,318.23	15,068,934.52
5	\$421,871.51	\$753,446.73	1,175,318.23	14,647,063.02
6	\$442,965.08	\$732,353.15	1,175,318.23	14,204,097.94
7	\$465,113.33	\$710,204.90	1,175,318.23	13,738,984.60
8	\$488,369.00	\$686,949.23	1,175,318.23	13,250,615.60
9	\$512,787.45	\$662,530.78	1,175,318.23	12,737,828.15
10	\$538,426.82	\$636,891.41	1,175,318.23	12,199,401.33
11	\$565,348.16	\$609,970.07	1,175,318.23	11,634,053.16
12	\$593,615.57	\$581,702.66	1,175,318.23	11,040,437.59
13	\$623,296.35	\$552,021.88	1,175,318.23	10,417,141.24
14	\$654,461.17	\$520,857.06	1,175,318.23	9,762,680.07
15	\$687,184.23	\$488,134.00	1,175,318.23	9,075,495.84
16	\$721,543.44	\$453,774.79	1,175,318.23	8,353,952.40
17	\$757,620.61	\$417,697.62	1,175,318.23	7,596,331.79
18	\$795,501.64	\$379,816.59	1,175,318.23	6,800,830.15
19	\$835,276.72	\$340,041.51	1,175,318.23	5,965,553.42
20	\$877,040.56	\$298,277.67	1,175,318.23	5,088,512.86
21	\$920,892.59	\$254,425.64	1,175,318.23	4,167,620.27
22	\$966,937.22	\$208,381.01	1,175,318.23	3,200,683.06
23	\$1,015,284.08	\$160,034.15	1,175,318.23	2,185,398.98
24	\$1,066,048.28	\$109,269.95	1,175,318.23	1,119,350.70
25	\$1,119,350.70	\$55,967.53	1,175,318.23	0.00



**Well “B” Estimated Annual Operating Budget**

	<b>Projected Budget</b>
<b>Water Production and Distribution</b>	
Wages and Benefits	50,000
Chemicals	2,000
Electrical Power	29,000
Lab Testing	2,200
Snow Removal and Grass Mowing	1,000
Service Truck Fuel & Maintenance	5,000
Repair Parts Allowance	2,000
Miscellaneous	7,500
Other	
<b>TOTAL SOURCE OF SUPPLY</b>	<b>98,700</b>
<b>Administration and General</b>	
Wages and Salaries	25,000
Dues and Fees	150
Insurance	2,000
IRAC Assessment	2,000
Office Expenses	3,000
Professional Fees Allowance	3,000
Telephone	500
Other	
<b>TOTAL ADMINISTRATION AND GENERAL</b>	<b>35,650</b>
<b>TOTAL OPERATING BUDGET</b>	<b>134,350</b>

## Well "B" Estimated Tariff Structure

Based on the above information the following average rates/tariffs have been calculated for various levels of AID or Outside Funding from senior levels of government.

<b>Expenses</b>	<b>0% AID Funding</b>	<b>50% AID Funding</b>	<b>66.7% AID Funding</b>	<b>74% AID Funding</b>
		50.0%	66.7%	74.0%
<b>Fixed Expenses</b>				
Principal	\$347,074.73	\$ 173,537.37	\$ 115,575.89	\$ 90,239.43
Interest	\$828,243.50	\$ 414,121.75	\$ 275,805.09	\$ 215,343.31
Depreciation	\$ 239,699.08	\$ 239,699.08	\$ 239,699.08	\$ 239,699.08
Sub-total	\$ 1,415,017.31	\$ 827,358.20	\$ 471,200.76	\$ 545,281.82
<b>Variable Expenses</b>				
Administration and Billing	\$ 35,650.00	\$ 35,650.00	\$ 35,650.00	\$ 35,650.00
Operations	\$ 98,700.00	\$ 98,700.00	\$ 98,700.00	\$ 98,700.00
Sub-total	\$ 134,350.00	\$ 134,350.00	\$ 134,350.00	\$ 134,350.00
<b>Total Revenue Required</b>	\$ 1,549,367.31	\$ 961,708.20	\$ 765,430.05	\$ 679,631.82
<b>Number of full time customers</b>	457	457	457	457
<b>Number of undeveloped properties</b>	172	172	172	172
<b>Estimated Rates for Developed Properties</b>				
Annual Cost per customer	\$ 2,853.35	\$ 1,771.10	\$ 1,409.63	\$ 1,251.62
Quarterly Cost per customer	\$ 713.34	\$ 442.78	\$ 352.41	\$ 312.91
<b>Estimated Charge for Undeveloped Properties</b>				
Per Lineal Foot per Year	\$ 14.27	\$ 8.86	\$ 7.05	\$ 6.26
Per Lineal Foot per Quarter	\$ 3.57	\$ 2.21	\$ 1.76	\$ 1.56

## Well "B" Estimated Revenue from Proposed Rates/Tariff Structure

Revenue from 457 Developed Properties	\$ 1,303,979.49	\$ 809,393.45	\$ 644,201.72	\$ 571,992.16
Revenue from Undeveloped Properties based on 100 lineal feet of frontage on average	\$ 245,387.82	\$ 152,314.74	\$ 121,228.33	\$ 107,639.66
<b>TOTAL REVENUE</b>	\$ 1,549,367.31	\$ 961,708.20	\$ 765,430.05	\$ 679,631.82

## Well "C" Costs

### Well "C" Estimated Total Capital Cost and Annual Depreciation Charge Excluding HST and Water Meters

Item	Estimated Capital Cost	Depreciation Rate	Depreciation
Wellfield Investigation	\$ 180,000.00	1.20	\$ 2,160.00
Production Well Drilling	\$ 175,000.00	1.20	\$ 2,100.00
Wellhead / Control Building	\$ 1,075,000.00	1.20	\$ 12,900.00
Pumps and Controls	\$ 450,000.00	5.00	\$ 22,500.00
Standby Power	\$ 140,000.00	5.00	\$ 7,000.00
Water Distribution System	\$11,647,040.00	1.20	\$139,764.48
Water Services	\$ 1,113,330.00	2.00	\$ 22,266.60
Legal Easements	\$ 234,500.00	-	\$ -
Service Truck and Misc Tools	\$ 66,000.00	20.00	\$ 13,200.00
<b>Subtotal without Connection to Well</b>	<b>\$15,080,870.00</b>		<b>\$221,891.08</b>
Well C - Arterial Main	\$ 620,000.00	1.20	\$ 7,440.00
<b>Well C Total Excluding HST</b>	<b>\$15,700,870.00</b>		<b>\$229,331.08</b>

**Well "C" Annual Repayment Schedule with No Outside Funding**

Loan Calculator  
Long Term Debt

Interest Rate	5.0%
Term in years	25
Capital	\$ 15,700,870

**Payment Schedule for Capital Works**

Year	Principal	Interest	Total	Balance
1	\$328,971.81	\$785,043.50	1,114,015.31	15,371,898.19
2	\$345,420.40	\$768,594.91	1,114,015.31	15,026,477.79
3	\$362,691.42	\$751,323.89	1,114,015.31	14,663,786.37
4	\$380,825.99	\$733,189.32	1,114,015.31	14,282,960.39
5	\$399,867.29	\$714,148.02	1,114,015.31	13,883,093.10
6	\$419,860.65	\$694,154.65	1,114,015.31	13,463,232.44
7	\$440,853.69	\$673,161.62	1,114,015.31	13,022,378.76
8	\$462,896.37	\$651,118.94	1,114,015.31	12,559,482.39
9	\$486,041.19	\$627,974.12	1,114,015.31	12,073,441.20
10	\$510,343.25	\$603,672.06	1,114,015.31	11,563,097.95
11	\$535,860.41	\$578,154.90	1,114,015.31	11,027,237.54
12	\$562,653.43	\$551,361.88	1,114,015.31	10,464,584.11
13	\$590,786.10	\$523,229.21	1,114,015.31	9,873,798.00
14	\$620,325.41	\$493,689.90	1,114,015.31	9,253,472.60
15	\$651,341.68	\$462,673.63	1,114,015.31	8,602,130.92
16	\$683,908.76	\$430,106.55	1,114,015.31	7,918,222.15
17	\$718,104.20	\$395,911.11	1,114,015.31	7,200,117.95
18	\$754,009.41	\$360,005.90	1,114,015.31	6,446,108.54
19	\$791,709.88	\$322,305.43	1,114,015.31	5,654,398.66
20	\$831,295.38	\$282,719.93	1,114,015.31	4,823,103.29
21	\$872,860.14	\$241,155.16	1,114,015.31	3,950,243.14
22	\$916,503.15	\$197,512.16	1,114,015.31	3,033,739.99
23	\$962,328.31	\$151,687.00	1,114,015.31	2,071,411.68
24	\$1,010,444.72	\$103,570.58	1,114,015.31	1,060,966.96
25	\$1,060,966.96	\$53,048.35	1,114,015.31	0.00

**Well "C" Estimated Annual Operating Budget**

	<b>Projected Budget</b>
<b>Water Production and Distribution</b>	
Wages and Benefits	50,000
Chemicals	2,000
Electrical Power	29,000
Lab Testing	2,200
Snow Removal and Grass Mowing	1,000
Service Truck Fuel & Maintenance	5,000
Repair Parts Allowance	2,000
Miscellaneous	7,500
Other	
<b>TOTAL SOURCE OF SUPPLY</b>	<b>98,700</b>
<b>Administration and General</b>	
Wages and Salaries	25,000
Dues and Fees	150
Insurance	2,000
IRAC Assessment	2,000
Office Expenses	3,000
Professional Fees Allowance	3,000
Telephone	500
Other	
<b>TOTAL ADMINISTRATION AND GENERAL</b>	<b>35,650</b>
<b>TOTAL OPERATING BUDGET</b>	<b>134,350</b>

## Well "C" Estimated Tariff Structure

Based on the above information the following average rates/tariffs have been calculated for various levels of AID or Outside Funding from senior levels of government.

<b>Expenses</b>	<b>0% AID Funding</b>	<b>50% AID Funding</b>	<b>66.7% AID Funding</b>	<b>74% AID Funding</b>
		50.0%	66.7%	74.0%
<b>Fixed Expenses</b>				
Principal	\$328,971.81	\$ 164,485.90	\$ 109,547.61	\$ 85,532.67
Interest	\$785,043.50	\$ 392,521.75	\$ 261,419.49	\$ 204,111.31
Depreciation	\$ 229,331.08	\$ 229,331.08	\$ 229,331.08	\$ 229,331.08
Sub-total	\$ 1,343,346.39	\$ 786,338.73	\$ 447,334.35	\$ 518,975.06
<b>Variable Expenses</b>				
Administration and Billing	\$ 35,650.00	\$ 35,650.00	\$ 35,650.00	\$ 35,650.00
Operations	\$ 98,700.00	\$ 98,700.00	\$ 98,700.00	\$ 98,700.00
Sub-total	\$ 134,350.00	\$ 134,350.00	\$ 134,350.00	\$ 134,350.00
<b>Total Revenue Required</b>	\$ 1,477,696.39	\$ 920,688.73	\$ 734,648.18	\$ 653,325.06
<b>Number of full time customers</b>	457	457	457	457
<b>Number of undeveloped properties</b>	172	172	172	172
<b>Estimated Rates for Developed Properties</b>				
Annual Cost per customer	\$ 2,721.36	\$ 1,695.56	\$ 1,352.94	\$ 1,203.18
Quarterly Cost per customer	\$ 680.34	\$ 423.89	\$ 338.24	\$ 300.79
<b>Estimated Charge for Undeveloped Properties</b>				
Per Lineal Foot per Year	\$ 13.61	\$ 8.48	\$ 6.76	\$ 6.02
Per Lineal Foot per Quarter	\$ 3.40	\$ 2.12	\$ 1.69	\$ 1.50

## Well "C" Estimated Revenue from Proposed Rates/Tariff Structure

<b>Revenue from 457 Developed Properties</b>	\$ 1,243,659.76	\$ 774,870.63	\$ 618,295.06	\$ 549,851.85
<b>Revenue from Undeveloped Properties based on 100 lineal feet of frontage on average</b>	\$ 234,036.63	\$ 145,818.11	\$ 116,353.12	\$ 103,473.21
<b>TOTAL REVENUE</b>	\$ 1,477,696.39	\$ 920,688.73	\$ 734,648.18	\$ 653,325.06

## Well "D" Costs

### Well "D" Estimated Total Capital Cost and Annual Depreciation Charge Excluding HST and Water Meters

Item	Estimated Capital Cost	Depreciation Rate	Depreciation
Wellfield Investigation	\$ 180,000.00	1.20	\$ 2,160.00
Production Well Drilling	\$ 175,000.00	1.20	\$ 2,100.00
Wellhead / Control Building	\$ 1,075,000.00	1.20	\$ 12,900.00
Pumps and Controls	\$ 450,000.00	5.00	\$ 22,500.00
Standby Power	\$ 140,000.00	5.00	\$ 7,000.00
Water Distribution System	\$11,647,040.00	1.20	\$139,764.48
Water Services	\$ 1,113,330.00	2.00	\$ 22,266.60
Legal Easements	\$ 234,500.00	-	\$ -
Service Truck and Misc Tools	\$ 66,000.00	20.00	\$ 13,200.00
<b>Subtotal without Connection to Well</b>	<b>\$15,080,870.00</b>		<b>\$221,891.08</b>
Well D - Arterial Main	\$ 110,000.00	1.20	\$ 1,320.00
<b>Well D Total Excluding HST</b>	<b>\$15,190,870.00</b>		<b>\$223,211.08</b>

**Well "D" Annual Repayment Schedule with No Outside Funding**

**Loan Calculator**  
**Long Term Debt**

<b>Interest Rate</b>	<b>5.0%</b>
<b>Term in years</b>	<b>25</b>
<b>Capital</b>	<b>\$ 15,190,870</b>

**Payment Schedule for Capital Works**

	Principal	Interest	Total	Balance
Year				
1	\$318,286.06	\$759,543.50	1,077,829.56	14,872,583.94
2	\$334,200.36	\$743,629.20	1,077,829.56	14,538,383.59
3	\$350,910.38	\$726,919.18	1,077,829.56	14,187,473.21
4	\$368,455.89	\$709,373.66	1,077,829.56	13,819,017.32
5	\$386,878.69	\$690,950.87	1,077,829.56	13,432,138.63
6	\$406,222.62	\$671,606.93	1,077,829.56	13,025,916.00
7	\$426,533.75	\$651,295.80	1,077,829.56	12,599,382.25
8	\$447,860.44	\$629,969.11	1,077,829.56	12,151,521.81
9	\$470,253.46	\$607,576.09	1,077,829.56	11,681,268.34
10	\$493,766.14	\$584,063.42	1,077,829.56	11,187,502.20
11	\$518,454.44	\$559,375.11	1,077,829.56	10,669,047.76
12	\$544,377.17	\$533,452.39	1,077,829.56	10,124,670.59
13	\$571,596.03	\$506,233.53	1,077,829.56	9,553,074.57
14	\$600,175.83	\$477,653.73	1,077,829.56	8,952,898.74
15	\$630,184.62	\$447,644.94	1,077,829.56	8,322,714.12
16	\$661,693.85	\$416,135.71	1,077,829.56	7,661,020.27
17	\$694,778.54	\$383,051.01	1,077,829.56	6,966,241.73
18	\$729,517.47	\$348,312.09	1,077,829.56	6,236,724.26
19	\$765,993.34	\$311,836.21	1,077,829.56	5,470,730.92
20	\$804,293.01	\$273,536.55	1,077,829.56	4,666,437.91
21	\$844,507.66	\$233,321.90	1,077,829.56	3,821,930.25
22	\$886,733.04	\$191,096.51	1,077,829.56	2,935,197.21
23	\$931,069.69	\$146,759.86	1,077,829.56	2,004,127.52
24	\$977,623.18	\$100,206.38	1,077,829.56	1,026,504.34
25	\$1,026,504.34	\$51,325.22	1,077,829.56	0.00



**Well “D” Estimated Annual Operating Budget**

	<b>Projected Budget</b>
<b>Water Production and Distribution</b>	
Wages and Benefits	50,000
Chemicals	2,000
Electrical Power	29,000
Lab Testing	2,200
Snow Removal and Grass Mowing	1,000
Service Truck Fuel & Maintenance	5,000
Repair Parts Allowance	2,000
Miscellaneous	7,500
Other	
<b>TOTAL SOURCE OF SUPPLY</b>	<b>98,700</b>
<b>Administration and General</b>	
Wages and Salaries	25,000
Dues and Fees	150
Insurance	2,000
IRAC Assessment	2,000
Office Expenses	3,000
Professional Fees Allowance	3,000
Telephone	500
Other	
<b>TOTAL ADMINISTRATION AND GENERAL</b>	<b>35,650</b>
<b>TOTAL OPERATING BUDGET</b>	<b>134,350</b>

## Well "D" Estimated Tariff Structure

Based on the above information the following average rates/tariffs have been calculated for various levels of AID or Outside Funding from senior levels of government.

<b>Expenses</b>	<b>0% AID Funding</b>	<b>50% AID Funding</b>	<b>66.7% AID Funding</b>	<b>74% AID Funding</b>
		50.0%	66.7%	74.0%
<b>Fixed Expenses</b>				
Principal	\$318,286.06	\$ 159,143.03	\$ 105,989.26	\$ 82,754.37
Interest	\$759,543.50	\$ 379,771.75	\$ 252,927.99	\$ 197,481.31
Depreciation	\$ 223,211.08	\$ 223,211.08	\$ 223,211.08	\$ 223,211.08
Sub-total	\$ 1,301,040.64	\$ 762,125.86	\$ 433,246.53	\$ 503,446.76
<b>Variable Expenses</b>				
Administration and Billing	\$ 35,650.00	\$ 35,650.00	\$ 35,650.00	\$ 35,650.00
Operations	\$ 98,700.00	\$ 98,700.00	\$ 98,700.00	\$ 98,700.00
Sub-total	\$ 134,350.00	\$ 134,350.00	\$ 134,350.00	\$ 134,350.00
<b>Total Revenue Required</b>	\$ 1,435,390.64	\$ 896,475.86	\$ 716,478.32	\$ 637,796.76
<b>Number of full time customers</b>	457	457	457	457
<b>Number of undeveloped properties</b>	172	172	172	172
<b>Estimated Rates for Developed Properties</b>				
Annual Cost per customer	\$ 2,643.45	\$ 1,650.97	\$ 1,319.48	\$ 1,174.58
Quarterly Cost per customer	\$ 660.86	\$ 412.74	\$ 329.87	\$ 293.64
<b>Estimated Charge for Undeveloped Properties</b>				
Per Lineal Foot per Year	\$ 13.22	\$ 8.25	\$ 6.60	\$ 5.87
Per Lineal Foot per Quarter	\$ 3.30	\$ 2.06	\$ 1.65	\$ 1.47

## Well "D" Estimated Revenue from Proposed Rates/Tariff Structure

<b>Revenue from 457 Developed Properties</b>	\$ 1,208,054.37	\$ 754,492.57	\$ 603,002.93	\$ 536,782.91
<b>Revenue from Undeveloped Properties based on 100 lineal feet of frontage on average</b>	\$ 227,336.27	\$ 141,983.28	\$ 113,475.39	\$ 101,013.85
<b>TOTAL REVENUE</b>	\$ 1,435,390.64	\$ 896,475.86	\$ 716,478.32	\$ 637,796.76

## **"Reduced System" Costs (Phased Approach)**

### **"Reduced System" Estimated Total Capital Cost and Annual Depreciation Charge**

Excluding HST and Water Meters

Item	Estimated Capital Cost	Depreciation Rate	Depreciation
Wellfield Investigation	\$ 180,000.00	1.20	\$ 2,160.00
Production Well Drilling	\$ 175,000.00	1.20	\$ 2,100.00
Wellhead / Control Building	\$ 800,000.00	1.20	\$ 9,600.00
Pumps and Controls	\$ 200,000.00	5.00	\$ 10,000.00
Standby Power	\$ -	5.00	\$ -
Water Distribution System	\$ 2,812,810.00	1.20	\$ 33,753.72
Water Services	\$ 157,530.00	2.00	\$ 3,150.60
Legal Easements	\$ -	-	\$ -
Service Truck and Misc Tools	\$ 66,000.00	20.00	\$ 13,200.00
Subtotal without Connection to Well	\$ 4,391,340.00		\$ 73,964.32
Arterial Main	\$ -	1.20	\$ -
<b>"Reduced System" Total Excluding HST</b>	<b>\$ 4,391,340.00</b>		<b>\$ 73,964.32</b>

**"Reduced System" Annual Repayment Schedule with No Outside Funding**

Loan Calculator	Interest Rate	5.0%
Long Term Debt	Term in years	25
	Capital	\$ 4,391,340

Payment Schedule for Capital Works

Year	Principal	Interest	Total	Balance
1	\$92,009.36	\$219,567.00	311,576.36	4,299,330.64
2	\$96,609.83	\$214,966.53	311,576.36	4,202,720.80
3	\$101,440.32	\$210,136.04	311,576.36	4,101,280.48
4	\$106,512.34	\$205,064.02	311,576.36	3,994,768.14
5	\$111,837.96	\$199,738.41	311,576.36	3,882,930.18
6	\$117,429.85	\$194,146.51	311,576.36	3,765,500.33
7	\$123,301.35	\$188,275.02	311,576.36	3,642,198.98
8	\$129,466.41	\$182,109.95	311,576.36	3,512,732.57
9	\$135,939.74	\$175,636.63	311,576.36	3,376,792.83
10	\$142,736.72	\$168,839.64	311,576.36	3,234,056.11
11	\$149,873.56	\$161,702.81	311,576.36	3,084,182.55
12	\$157,367.24	\$154,209.13	311,576.36	2,926,815.31
13	\$165,235.60	\$146,340.77	311,576.36	2,761,579.72
14	\$173,497.38	\$138,078.99	311,576.36	2,588,082.34
15	\$182,172.25	\$129,404.12	311,576.36	2,405,910.09
16	\$191,280.86	\$120,295.50	311,576.36	2,214,629.23
17	\$200,844.90	\$110,731.46	311,576.36	2,013,784.33
18	\$210,887.15	\$100,689.22	311,576.36	1,802,897.18
19	\$221,431.50	\$90,144.86	311,576.36	1,581,465.68
20	\$232,503.08	\$79,073.28	311,576.36	1,348,962.60
21	\$244,128.23	\$67,448.13	311,576.36	1,104,834.36
22	\$256,334.65	\$55,241.72	311,576.36	848,499.72
23	\$269,151.38	\$42,424.99	311,576.36	579,348.34
24	\$282,608.95	\$28,967.42	311,576.36	296,739.39
25	\$296,739.39	\$14,836.97	311,576.36	0.00

**Estimated Operating Budget**

	Projected Budget
Water Production and Distribution	
Wages and Benefits	50,000
Chemicals	1,500
Electrical Power	20,000
Lab Testing	2,200
Snow Removal and Grass Mowing	1,000
Service Truck Fuel & Maintenance	5,000
Repair Parts Allowance	2,000
Miscellaneous	7,500
Other	
<b>TOTAL SOURCE OF SUPPLY</b>	<b>89,200</b>
Administration and General	
Wages and Salaries	20,000
Dues and Fees	150
Insurance	2,000
IRAC Assessment	2,000
Office Expenses	2,000
Professional Fees Allowance	3,000
Telephone	500
Other	
<b>TOTAL ADMINISTRATION AND GENERAL</b>	<b>29,650</b>
<b>TOTAL OPERATING BUDGET</b>	<b>118,850</b>

## “Reduced System” Estimated Tariff Structure

Based on the above information the following average rates/tariffs have been calculated for various levels of AID or Outside Funding from senior levels of government.

Expenses	0% AID Funding	50% AID Funding	66.7% AID Funding	74% AID Funding
		50.0%	66.7%	74.0%
<b>Fixed Expenses</b>				
Principal	\$92,009.36	\$ 46,004.68	\$ 30,639.12	\$ 23,922.43
Interest	\$219,567.00	\$ 109,783.50	\$ 73,115.81	\$ 57,087.42
Depreciation	\$ 73,964.32	\$ 73,964.32	\$ 73,964.32	\$ 73,964.32
Sub-total	\$ 385,540.68	\$ 229,752.50	\$ 128,385.05	\$ 154,974.17
<b>Variable Expenses</b>				
Administration and Billing	\$ 29,650.00	\$ 29,650.00	\$ 29,650.00	\$ 29,650.00
Operations	\$ 89,200.00	\$ 89,200.00	\$ 89,200.00	\$ 89,200.00
Sub-total	\$ 118,850.00	\$ 118,850.00	\$ 118,850.00	\$ 118,850.00
<b>Total Revenue Required</b>	<b>\$ 504,390.68</b>	<b>\$ 348,602.50</b>	<b>\$ 296,569.25</b>	<b>\$ 273,824.17</b>
Number of full time customers	89	89	89	89
Number of undeveloped properties	25	25	25	25
<b>Estimated Rates for Developed Properties</b>				
Annual Cost per customer	\$ 4,969.37	\$ 3,434.51	\$ 2,921.86	\$ 2,697.78
Quarterly Cost per customer	\$ 1,242.34	\$ 858.63	\$ 730.47	\$ 674.44
<b>Estimated Charge for Undeveloped Properties</b>				
Per Lineal Foot per Year	\$ 24.85	\$ 17.17	\$ 14.61	\$ 13.49
Per Lineal Foot per Quarter	\$ 6.21	\$ 4.29	\$ 3.65	\$ 3.37

## “Reduced System” Estimated Revenue from Proposed Rates/Tariff Structure

Revenue from 89 Developed Properties	\$ 442,273.60	\$ 305,671.16	\$ 260,045.94	\$ 240,101.99
Revenue from Undeveloped Properties based on 100 lineal feet of frontage on average	\$ 62,117.08	\$ 42,931.34	\$ 36,523.31	\$ 33,722.19
<b>TOTAL REVENUE</b>	<b>\$ 504,390.68</b>	<b>\$ 348,602.50</b>	<b>\$ 296,569.25</b>	<b>\$ 273,824.17</b>



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